

SPECIFICATION NO. 1803
REPAIR AND RECONSTRUCTION OF SEWER IN WATERMAN AVENUE, TRENCH
THIRD STREET AND BELLE STREET, THE CITY
OF SAN BERNARDINO, CALIFORNIA.

APPROXIMATE ESTIMATE OF WORK TO BE DONE.
To furnish all labor and materials necessary for and to construct a vitrified pipe sewer together with manholes, connecting sewers and wyes as shown on the plans.

Linear feet of 8" vitrified pipe sewer including 8" x 4" wyes 1884.42
Linear feet of 4" vitrified pipe connecting sewer 596.25
Number of 8" x 4" wyes and 4" connecting sewer 41
Number of manholes 5

PLAN AND PROFILE

The work herein provided for shall be done in accordance with these specifications, plans and profiles on file in the office of the City Engineer of the City of San Bernardino.

EXCAVATION

The subgrade for pipe sewers shall be the exterior bottom of the pipe and the excavation shall be made a sufficient distance between the depth indicated by the grade line on the profile and shown on the grade stakes set by the City Engineer as shown on the plans, to allow for the placing of the sewer invert.

The width of the trench shall be at least twelve (12) inches more than the exterior diameter of the pipes.

The material taken from the trench shall be deposited neatly at the sides in such manner as to obstruct the sides as little as possible, and a clear space of at least two (2) feet next the trench shall be left on the side on which the Engineer places stakes. Great care shall be taken to preserve and not to cover up the stakes set by the Engineer.

-2-

All soft and spongy material shall be removed to a depth of one (1) foot below grade and shall be replaced with clean sand or gravel which shall then be moistened and tamped until it is solid. Passesway six (6) feet wide shall be kept open on lines of intercepting sidewalks and free access must be left to all fire hydrants and water gates.

SHIELDING

Whenever necessary to prevent carrying of the banks or injury to adjacent pipes, the contractor shall, at his own expense brace and sheet the trenches sufficiently to overcome the difficulty to the satisfaction of the City Engineer. If such bracing and sheeting is left permanently in the trench by order of the City Engineer, it shall on refilling, be cut off one foot below the finished grade of the street and shall be paid for by the City but otherwise the contractor will receive no extra compensation for it.

WATER IN TRENCHES

In general all water encountered in trenches must be drained away through sub-drains or pumped or bailed out, and the trenches must be kept dry for pipe laying. In no case shall the sewer be used as a drain for such water. The ends of the sewer pipe must be kept properly blocked during the time that the sewer pipe is not being laid. All necessary precautions shall be taken to prevent entrance of mud, sand or other obstruction materials into the sewer and on completion of the work, any such materials which may have entered must be cleaned out and the sewer left clean and unobstructed.

REFILLING

After a section of the pipe sewer has been laid and the mortar used in the joints has sufficiently set, earth free from stones shall be carefully placed by hand, under and around the pipe, and to the height of one foot above the top of the sewer.

The remainder of the refilling shall be carefully done. Scrapers may be used if desired. The refilling shall be thoroughly tamped according to the directions of the City Engineer. Surplus material not required in refilling the trenches shall be promptly removed by the contractor as the refilling progresses and disposed of by him, and in case of deficiency of material, it shall be supplied by the contractor.

All paving required by the contractor shall be replaced at the expense of the contractor and the surface shall be left in as good a condition as it was originally. The ditch must not be filled until after the wyes are measured.

When existing sewer, water or gas mains are encountered in the work, all necessary precautions shall be taken to prevent injury to them and in case of injury, it shall be made good by the contractor without additional compensation.

SEWER PIPE

All sewer pipe shall be of the finest quality, vitrified clay sewer pipe, of the hub and spigot pattern, of standard thickness and dimensions of hubs.

The dimensions of the hubs shall be sufficient to leave an annular space for cement of at least three-eighths (3/8) inch

thickness for four (4), six (6), eight (8) and ten (10) inch pipes, and one-half (1/2) inch thickness for larger diameters.

All pipes and specialties shall be sound and well burned, with a clear ring, and smooth on the inside and free from blisters, lumps or flakes which are thicker than one-eighth (1/8) the normal thickness of the pipe and whose largest diameters are greater than one-eighth of the inner diameter of said pipe, and all pipe having broken blisters, lumps or flakes of any size shall be rejected unless the pipe can be so laid as to bring all of these defects on the top of the sewer.

Pipes having fire-cracks of any kind extending through the thickness shall be rejected. No pipe shall be used, which, designed to be straight, varies from a straight line more than one-eighth (1/8) inch per foot of length, nor shall there be any variations between any two diameters of a pipe greater than one-twenty-fourth (1/24) of the normal diameter.

No pipe shall be used which has a piece broken from the spigot end deeper than one inch or longer at any point than one-fourth (1/4) the diameter of the pipe, nor which has a piece broken from the bell end if the fracture extends into the body of the pipe, or if such fracture cannot be placed at the top of the sewer. Any pipe which betrays the use of improper or insufficient materials or methods in its manufacture shall be rejected.

PIPE LAYING

In laying the pipe each piece must be set exactly to grade by measuring from the invert to a tightly stretched cord set parallel

to the grade line of the sewer, according to stakes given by the City Engineer.

In making each joint, care must be taken so as to make the joints match exactly, giving a true, smooth floor line. The joints shall be tightly packed full and levelled off with a one (1) to two (2) Portland Cement and sand mortar. The bell shall then be immediately filled up so as to hold the cement in place. Special care must be taken in forming with the joints on the under side of the pipe. The pipe shall be laid with the socket end up hill.

MORTAR

All mortar for brick work shall be composed of one (1) part Portland Cement to three parts sand. All mortar for pipe joints shall be composed of one (1) part Portland Cement to two (2) parts sand. All sand shall be clean, sharp, river sand, free from mud, oil, clay, silt, or organic matter. It shall be thoroughly mixed before being wet.

BRICK

The brick shall be hard, well-burned, equal to a No. 2 paving brick. All soft brick will be rejected.

CEMENT

All cement used shall be Portland Cement and must conform to the following requirements and be subject to the following test, which will be open at all times to the contractor.

- FINENESS. The residue on a 200 mesh screen shall not exceed twenty-two (22) per cent by weight.
- SOUNDNESS. A pat of cement paste about three (3) inches in

-7-

cement factory, each containing not less than ninety-four (94) per cent weight of cement.

SAND AND GRAVEL

The sand shall be clean, sharp river sand, hard and durable, free from mud, oil, or organic matter. The gravel shall be hard and durable, the largest piece of which shall be, in its largest dimension, not greater than two (2) inches.

CONCRETE

The concrete for the floors of manholes and flushtraps shall be composed of one (1) part Portland Cement and two (2) parts sand and four (4) parts screened gravel.

MANHOLES

Manholes shall be constructed in accordance with, and at the locations shown on the plans. Manholes shall have a concrete foundation covering the entire area of the base, said foundation being of the dimensions shown on the detail plan. The base shall be circular in form and shall have an internal diameter of four (4) feet in the clear. This size shall be carried to a point three and one-half (3 1/2) feet below the top of the manhole, and the walls shall then be gradually and uniformly drawn into a circle, six (6) inches below the top of the manhole and having a clear internal diameter of two feet. The walls shall be of brick, eight (8) inches thick and every fourth course shall be laid as headers. The brick shall be thoroughly saturated with water before laying and shall be laid with push joints in full bed or mortar. All joints shall be left full of mortar and inside joints shall be neatly struck. The inside of the

-3-

walls and the floor of the manholes shall be plastered with a one-half (1/2) inch coat of cement mortar composed of one part Portland Cement and two parts screened sand.

Manholes shall be capped with cast iron frames and covers of patterns shown on the plans and weighing not less than three hundred and fifty (350) pounds and set in concrete, as shown on the plan. The casing shall be sound, free from cracks or flaws, and thoroughly cleaned. Ladder rungs of three-quarter (3/4) inch round iron shall be securely bedded in the sidewalls of manhole fifteen (15) inches apart vertically as indicated on the plans, and shall be painted with asphaltum paint.

CONNECTIONS

The contractor shall not allow any drains to be connected with the sewer before completion and acceptance of the same. The contractor shall remove all rubbish or surplus material occasioned by the work, from the work after its completion and before he makes application for the acceptance of the work.

The words "connecting sewers" as herein used shall mean the connecting sewers extending from the main sewer to be constructed as herein provided to the adjacent curb line as shown on the plans and shall be constructed of four inch clay pipe and shall be connected with the main sewer in the street with eight inch by four inch wyes.

FINISH ON STREETS

Extra earth carried from the trenches in streets shall be carefully and really graded over the trenches and the streets left in a