

FEDERAL WORKS AGENCY
WORK PROJECTS ADMINISTRATION

OFFICE OF STATE ADMINISTRATOR

BOISE, IDAHO

DEAN W. MILLER
STATE ADMINISTRATOR

N o v e m b e r 13, 1940

Mr. W. V. Leonard
State Sanitary Engineer
Department of Public Welfare
State House
Boise, Idaho

Re: OP 665-92-2-43
Harrison Water System
Kootenai County

Dear Mr. Leonard:

We are transmitting herewith one set of the plans and specifications for the project above referenced. We would appreciate your approval or comment on the plans submitted.

Very truly yours,

FOR THE STATE ADMINISTRATOR



LEWIS ROBERTS
Director of Operations

RMB:AA
Enc.

PROPORTIONING: The proportion of fine aggregate to coarse aggregate shall depend upon the grading of the two materials, but the amount of fine aggregate shall always be the minimum amount required, which, combined with cement, will produce only sufficient mortar to completely fill the voids in the coarse aggregate and leave a slight excess for finishing, nor shall the coarse aggregate be such as to produce harshness in placing nor honey combing in the structure. When the forms are removed the surface and the corners of the concrete shall be smooth and sound throughout.

For Class "A" concrete the proportions of materials shall be approximately 1 part Portland cement, 2 parts sand and 4 parts gravel or crushed rock, which mixture shall contain not less than 6 sacks of cement to the cubic yard of concrete. Class "B" shall contain approximately 1 part Portland cement, 2½ parts sand and 5 parts gravel or crushed rock with a minimum of 5 sacks of cement per cubic yard.

The fine and coarse aggregates shall be combined in such proportions that the resulting concrete shall have the maximum density. This shall apply most particularly to the concrete reservoir.

CONTROL OF PROPORTIONS: The methods of measuring the aggregates shall be such that the proportions can be closely controlled during the progress of the work. To avoid changes in the consistency, the aggregate shall be obtained from a source which will insure uniform quality and grading.

PORTLAND CEMENT: Portland cement shall conform to the standards as set up by the American Society for Testing Materials, Serial designation C9-26.

FINE AGGREGATE: Fine aggregate shall consist of natural sand having clean, hard, strong, durable, uncoated grains free from injurious amounts of dust, lumps, soft or flaky particles, shale, alkali, organic matter, loam or other deleterious substances. The sand shall be well graded from fine to coarse with 95% passing a $\frac{1}{8}$ " square mesh screen and not more than 5% passing a 100 mesh sieve.

COARSE AGGREGATE: Coarse aggregate shall consist of natural gravel, having hard, clean, durable, strong, uncoated particles free from injurious amounts of soft, friable, thin, elongated or laminated pieces, alkali, organic or other deleterious matter. It shall have not more than 10% finer than a $\frac{3}{8}$ " square screen and at least 95% passing a $1\frac{1}{2}$ " round screen. All coarse aggregate shall be well graded from the finer to the coarser particles.

WATER: Water for use in mixing the concrete shall be obtained from the City water system.

FORMS: Suitable forms shall be constructed, the interior shapes and dimensions of which shall be such that the finished concrete shall be of the form and dimensions shown on the plans. Lumber used in the forms for exposed surfaces and on the interior of all structures shall be shiplap, dressed to a uniform thickness, and shall be free from loose knots or other defects. Each piece shall be securely nailed to each batter post to prevent warping.

Special attention shall be paid to bracing. All forms shall be set and maintained to true lines and grades designated, and shall remain in place 5 days after the concrete is completed, unless the temperature shall have hurried

the setting. Forms shall be carefully constructed so as to prevent, in so far as possible, the leakage of water thru the joints and so as to leave all exposed surfaces of concrete with a smooth and even finish. Batter posts shall be in pairs and set exactly opposite each other.

Spreaders shall be used to maintain the forms at the proper width of opening. Tie wires used to support the batter posts shall be the best grade, soft, annealed iron wire, spaced a distance apart not to exceed 24", and before any concrete is placed in the forms they shall be hammer driven and twisted sufficiently into the batter posts, a distance equal to the diameter of the wire.

MACHINE MIXING: The mixing of the concrete shall be done in a batch mixer of an approved type. It shall be mixed a period of one and one half minutes after all materials are in the drum. The mixer shall be equipped with a suitable charging hopper, a water storage tank and a water measuring device.

During the period of mixing, the drum shall operate at the speed for which it has been designated and preferably not less than 14 revolutions nor more than 20 revolutions a minute. The entire contents of the mixer shall be removed from the drum before the materials for the next succeeding batch are placed therein.

PLACING CONCRETE: The concrete shall be handled from the mixer to the place of final deposit as rapidly as possible by methods which will prevent the segregation or loss of ingredients. It shall be deposited evenly along the walls in truly horizontal layers and under no circumstances will the concrete be allowed to be placed in heaps or piles and then allowed to flow into place. Also, under no circumstances will concrete that has partially hardened be deposited or used in the work. All faces shall be spaded and the mortar flushed to the face of the forms by continuous working. The concrete shall be forced under and around the reinforcing bars without displacing them.

PROTECTION OF CONCRETE: Exposed surfaces of concrete shall be protected from premature drying and shall be kept wet for a period of not less than ten days. No earth pressure or other loading shall be allowed to come upon the concrete, until it is sufficiently set to be not liable to injury.

RETEMPERING: The retempering of concrete or mortar which has partially hardened or set will not be permitted.

TEMPERATURE OF CONCRETE: Concrete, when deposited in the forms, shall have a temperature of between 40 and 120 degrees Fahr. In freezing weather suitable means shall be provided for maintaining the concrete at a temperature of at least 50 degrees Fahr., for not less than 72 hours after pouring, or until the concrete has thoroughly hardened. During freezing weather the water and aggregate shall be heated.

SURFACE FINISH: All faces of the concrete shall be well spaded, rodded and worked to produce as near a natural smooth surface as possible. All upper horizontal surfaces, as floors, etc, shall be formed immediately after the underlying course is completed and before such course takes its initial set. The finish shall be accomplished by placing an excess of concrete in the forms and removing or striking off such excess with a template or straight edge. The surface shall then be thoroughly worked and floated with a wooden float.

ANCHORS TO PIPES: The pipe shall be lagged into the trench and the lagging

The use of mortar finish for exposed surfaces will not be permitted. The upper edges shall be finished by rounding off with a metal edger and jointer.

After the forms are removed the wires shall be cut close to the surface of the concrete and all depressions resulting from the tie wires, together with all holes and rough surfaces shall be carefully pointed with a mortar of sand and cement in the proportions used for the particular section. Plaster coating to finish concrete surfaces will not be permitted.

BONDING NEW CONCRETE TO OLD: In bonding new concrete to old or existing concrete the surface of the old concrete shall be first thoroughly cleaned and roughened. It shall then be washed with a 10% solution of sulphuric acid until the old cement film is removed leaving bare, clean aggregate exposed; and then painted with a cement grout, made up of equal parts of cement and sand, before pouring is commenced.

PRESSURE WATER MAIN PIPE

The 6" pressure water main to be constructed shall be of Transite Cement concrete and asbestos high pressure water pipe unless otherwise specified.

COMPOSITION: The pipe shall be composed of an intimate mixture of Portland cement and clean asbestos fiber, and formed under pressure on a mandrel to provide a dense, homogeneous structure with a smooth interior surface. The mixture of cement and asbestos fiber shall contain no grit, organic fiber or other adulterants.

CLASSES, SIZES AND COUPLINGS: All Transite pipe used shall be class 50, 100 and 150 for pressures from 115 to 346 $\frac{1}{2}$, as designated, in 13 foot lengths. With each length of pipe there shall be furnished one transite Simplex coupling complete with rubber rings suitable for connecting the lengths of pipe together and meeting all the strength requirements for the pipe on which it is to be used.

TESTS: All Transite pipe shall be subjected, before shipment, to a hydrostatic test pressure equal to twice the specified working pressure for each class of pipe. A certified copy of all tests shall be furnished the City of Harrison by the Pipe Company.

REJECTION: Any length of pipe found to be defective in workmanship and/or materials as defined by these specifications shall be rejected.

PIPE FOUNDATIONS: Tamarack wood blocks 2"x 6" x 12" shall be placed under all pipe at the words "blocking" stencilled circumferentially around the pipe by the manufacturer. Before the pipe is lowered into the trench the location of the blocking in the trench shall be tamped, after which the blocks shall be placed on it and further tamped until the proper elevations are secured. In case the trench is too low, earth shall be backfilled or additional blocking shall be placed.

EXPANSION AND CONTRACTION: After the Simplex couplings are assembled, the ends of the pipe within the coupling shall be separated not less than $\frac{3}{8}$ ", to allow for expansion and contraction of the pipe.

ASSEMBLY OF PIPE: The pipe shall be lowered into the trench and Simplex

couplings assembled in accordance with the manufacturer's instructions.

BACKFILL: Selected materials shall be put in the trench and tamped uniformly under the full length of pipe and up to the horizontal diameter. Backfill shall be tamped in layers not in excess of 6 inches. Tamping of backfill shall not be so excessive as to raise the pipe from the wood block supports. Additional backfill of the same selected material shall be used, without tamping, to a depth of one foot above the top of the pipe. The balance of the backfill material may be placed in the trench by hand or by mechanical means. The trench shall be flooded with water sufficient to settle all backfill in place.

JOINT MATERIAL: For connection to cast iron fittings, gate valves, etc. a sulphur base joint compound such as leadite, hydrolite, mineral lead or equal shall be used, which shall be heated and applied according to the manufacturer's specifications.

PIPE FITTINGS: All cast iron and other fittings shall be in strict accordance with the specifications for cast iron fittings, and fittings of other materials as adopted by the American Water Works Association or in strict accordance with the manufacturer's specifications.

METAL REINFORCING: All bar reinforcement shall be manufactured from mild open hearth steel meeting the requirements of billet steel concrete reinforcement bars as given in the Standard Specifications of the American Society for Testing Materials, serial designation A15-14, with amendments thereto. The steel shall be structural grade.

Metal reinforcement shall be protected at all times against mechanical injury and against conditions which will rust or otherwise detrimentally affect the bonding quality of the surface. Only reinforcement bars free from dirt, oil, grease, mill scale and rust shall be used.

The bars shall be accurately bent to the shapes and dimensions shown upon the plans. Where it is necessary to splice the bars, the splices shall be arranged to come at points of low stress and shall be staggered. Unless otherwise shown upon the plans or ordered, splices in the bars shall provide laps of not less than 40 times the nominal diameter of the bars.

Bars shall be held rigidly in the positions indicated upon the plans, by means of suitable wiring and blocking, and no concrete shall be poured until the placing of the steel and the fastening thereof have been checked and approved.

Only competent men and approved appliances shall be employed in the cutting, bending, splicing, and placing of the steel reinforcement bars. Care shall be exercised in the depositing and spading of the concrete to avoid displacement of the bars.

PIPE HAND RAIL: 1½" pipe hand rail shall be installed where shown on the plans and shall be of standard black pipe and fittings flanged to the floor and wall.

WATER PUMP UNIT: The water pumping unit shall consist of an electrically operated POMONA deep well turbine pump with underground discharge suitable and capable of delivering 200 gallons per minute against a static head of

PAINTING: All doors, casings, sash, etc., shall receive two coats of a first grade lead and oil base or equal paint, the first coat of which shall be a primer coat.

All metal work, such as pipe hand rail, exposed piping and pipe fittings within the pump house, shall receive two coats of a suitable metal paint, such as Dixons Industrial Paint or equal.

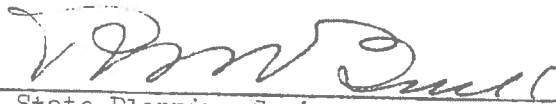
All painting shall be done by hand with brushes, and shall be evenly spread and thoroughly brushed out. All workmanship shall be executed in accordance with the best practices. Surfaces to be painted shall be dry and free from rust, dirt, cement, grease, oil, scale and other foreign matter. No paint shall be applied until the former coat is dry.

DRIVING WELLS: The driving of a ten inch diameter well to a minimum depth of 50 feet shall be done by a reputable well drilling company, in the bottom of the dug well. In case a sufficient supply of water is not obtainable, additional drilling shall be done until an adequate supply of water has been tapped. Standard 9-8/8" steel casing shall be installed if needed.

1600 W. P. A. CERTIFICATION

- .01 These specifications for Idaho Application No. _____ are approved subject to alterations and modifications mutually acceptable to the Sponsors and the W. P. A. only when authorized in writing by the W. P. A. State Office.

APPROVED FOR THE STATE OFFICE:



State Planning Engineer

11 - 13 - 40

Date

State Director of Operations

Date

Photo of plaque on
well house

