July 14, 1924

5-1142

DEPARTMENT OF THE INTERIOR

UNITED STATES INDIAN FIELD SERVICE

HOPI INDIAN AGENCY.

Keams Canon, Arizona,
July 14, 1924.

Mr. Edgar K. Miller, Superintendent,
Keams Canon, Arizona,

Sir:

Relative to the completion of the Hopi School plant as the work stands July 1, 1924, you are advised that the following work remains to be completed:

MESS HALL.

800 sq. ft. of flooring to be laid, cement base to be installed for employes' mess kitchen range, all lower floors to be scraped and oiled; wainscoating to be refinished; plumbing of baths tubs, 2 toilets, 3 sinks on lower floor to be completed; cement floor in children's kitchen, bakery and pantries to be cleaned and painted; electrical fixtures on lower floor to be wired and hung; shelves in pantries; and coat and hat hooks to be installed in all closets upstairs; 2 days' plastering to be completed. 400 gal. hot water tank to be installed in basement, same not yet received.

GIRLS' BUILDING.

Stone Work: Pointing corners where the absence of eaves downspout has erroded the mortar, installing 4 window caps and three window sills.

Foundation: Piers under building having been completed, sub drainage and storm sewer completed June 30, 1924.

Plastering: All plastering remains to be completed in building and toilet and no material on hand.

Carpenter Work: Reflooring entire building; refitting doors and windows; installing nailing strips and metal ceiling; placing new treds on stairs; building new front porch same as on Mess Hall, for which authority has been granted; neither material nor labor for same was estimated for originally, authority

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for material should be obtained; roofing in and completing toilet and repairing wainscoating in building and repairing chimneys.

Plumbing & Heating: All plumbing remains to be completed, no material on hand.

Tin Work: New gutter and downspouts around main building and toilet annex to be installed and flashing of chimneys and ventilator.

Electrical Work: Rewiring partly completed, all fixtures to wire and hang and recheck; all wiring is done in accordance with fire underwriters' regulations. All work is first class no rough or makeshift work being tolerated in any instance, the building will be in better condition than when first completed for the reason that it has a new foundation, proper roof and subdrainage, and plastered with hardwall plaster, the original plaster having been of rotten lime and hair plaster, and not a spoonful of cement having been used in the foundation as originally constructed. The new toilet annex is set on concrete foundation and the stone laid in cement mortar with 10% hydrate lime to make same workable.

Cement Work: Floor in toilet annex and basement steps, floor in furnace room, old toilet and bath room to be completed.

Painting: Painting interior exterior and roof.

BOYS' BUILDING.

The same amount of work remains to be done on the Boys' Building with the exception that foundation piers are to be installed subdrainage and storm sewer has not been completed. Nothing has been done on this building with the exception of completing the stone work on the toilet annex and painting interior and roof.

SCHOOL HOUSE.

Nothing has been done on the school house. Old plaster to remove, furrow strips and metal ceiling to be put up, squaring door and window frames, taking out old eliptical arch over front doors and replacing with square lintel of reinforced concrete, new front porch and steps, foundation piers, subdrainage and storm sewer . Excavating and putting in new foundations, the three additions, construction the same of stone; replastering completely; building stage

in assembly room; moving picture balcony; rewiring; steam heating and plumbing work; new roof gutters; downspouts; reflooring old building; installing floor joists; sub-floor and finish floor in new addition; and painting ~~cistern~~ exterior and roof. There was also authority granted for 18 ft. additional length to be added to the school house assembly room; material and labor were not estimated for this orininally, and authority should be obtained for the purchase of material.

WATER SUPPLY SYSTEM.

The supply comes by gravity from springs approximately 2½ miles up the canon, where there are seven springs giving a combined flow of 12000 gallons per 24 hours, this being the low water period of the year;from about May 15 to August 1 of each year the water decreases, during the fall and winter months the water supply averages about 17000 gallons per 24 hours.

The pipe supply line consists of about 3/4 of one mile of 3 inch standard black wrought iron screw pipe, reducing to 2½ inch of the same material and then to 2 inch, the flow line has been found to be in a very good state of preservation. However, where the line crosses the arroyo about one mile from the school plant the 2½ inch pipe is connected with 45° fittings and run down to approximately 3 ft. above the bed of the arroyo, there reduced to 2 in. pipe and carried across and again connected in to the 2½ in. pipe on the opposite side. This 2 in. line is washed out every year by the flood and then only makeshift repairs made to connect up after the flood. I would suggest that a 5/8 in. galvanized cable be run across the wash and that the 2½ line be run across the top of the wash and suspended from the suspensision cable making a permanent job, the cost of this would not exceed $50.00

SPRINGS.

It appears that the most of the springs have not been properly developed to their main source of supply when the seep or spring was discovered a small basin or well was excavated and rocked up and

a pipe connected from it to the line while this catches considerable water there is also considerable water lost by seepage and absorption coming out at a lower level, the flow line in some instances was found to be air locked, this trouble has just been removed and a check of the flow at the reservoir on July 8 shows that we are now receiving 15020 gallons per 24 hours. There is one spring about 2000 ft. from the school that is giving 11000 gallons per 24 hours, this spring has not been developed, it should be developed and connected to the line. It will require 700 ft. of 2" pipe at a cost of $217.00 including freight from railroad, also 10 sacks of cement at a cost of approximately $16.20 including freight from railroad, total cost of material about $233.20. This spring, during the winter months, would produce approximately 15000 gallons per 24 hours as all springs give from 25% to 50% more water during the winter months, and the other springs could be increased in flow by some work. I would suggest that authority for $800.00 be obtained for work on springs.

There was a new filter, installed in the bed of the arroya about one half mile from the school plant and reservoirs with a small boiler on the bank for the purpose of filtering and catching the flow of the arroyo. This plant will probably catch 10,000 gallons per day for about seven months of the year, the remainder of the time the arroya will probably be dry for the reason that the small springs along the side of the arroya from two to three miles up, do not furnish sufficient water to get down to the filler bed, the water seeping away in the sand and by evaporation. It may be necessary at some time to sink a well near the present reservoir in the bottom of the arroyo at the deepest point, where the protruding rocks of the mesa on both sides close together in the bottom, thus causing the under flow of the water to rise and spread out under the bottom of the present arroya bed, and seep away in the under sands. The writer drove test pipes across the arroya at this point and found nothing but quick sand ranging in depth from 20 to 36 ft. It would be necessary to sink a steel shoe and pump out the

water, walling up for the first 10 or 15 ft. with good building brick and finish out with stone, This well would, no doubt, get plenty of water for several years. Its estimated cost would be $3000.00

It is impractical to try to put pipes in the bottom of the arroyo as there is nothing but quick sand and boulders to fasten them to, and some, tho, not all, of them would wash out every flood season. This has been tried years ago with the result that you can see pieces of pipe sticking out of the banks of the wash in most any direction you may care to look.(See photographs made a part of my report of March 1, 1923).

The school has a small reservoir into which the flow line discharges by gravity and is then pumped into a wooden tank out on a rock ledge, 100 ft. above the school. The reservoir is a semirock and concrete square tank, holding 26,617 gallons of water to the overflow line, while the tank on the ledge is a round wood tank with a capacity of 33000 gallons. Both tanks are in a good state of repair. The concrete reservoir is not of sufficient capacity to hold the water, with the result that there is approximately 50,000 gallons of water going thru the overflow and wasted each week. I would suggest that a concrete reservoir be constructed at the end of the present reservoir, of a capacity of 30,000 gallons, both reservoirs being connected. This would give the school a reserve of water at all times and obviate the shortage at the most critical time. Estimated cost of reservoir $2000.00 including freight. With this arrangement it would be possible to have on hand 89,617 gallons of water.

HIGH PRESSURE WATER LINE TO TANK.

This line is of 4 in. wrought iron screw pipe which has been in use for many years, there are 400 ft. of this pipe that should be replaced. Monday a leak showed up and on excavating down to the line it was found that a hole had rusted thru the line about 3/4 in. in diameter. This would indicate that it would be well to replace this line at this time. Estimated cost of pipe and fillings, including freight, $350.00

FIRE EQUIPMENT.

The main water line to the tank is also the fire line on which the fire hydrants are connected. There are only two hydrants on this line now that fit the standard 2½ in. fire hose. I would recommend the installation of 2 additional fire hydrants on the line, one to be installed at the end in front of the carpenter shop and one to be installed between the school house and boys' building. This fire line should also extend on top of the hospital hill and a standard hudrant installed at each end of the hospital. This would require 4 new hydrants at a cost of $126.00, 500 ft. of standard wrought iron screw pipe and fittings, including freight from railroad at a cost of $450.00, 500 ft. of rubber lined 2½ standard fire hose at a cost of approximately $345.00, including freight from railroad.

POWER HOUSE.

Estimates were sent in for a new power and heating plant during the month of May, but so far I have not heard of their approval or rejection. This matter should be decided at an early date in order to complete the entire job at one time. However, if it is found inconsistent to construct this plant at this time I would suggest the installation of a generator and boiler in the old power house, which could be transferred to a new plant at some future time.

SALARIES & WAGES.

The Hopi School is located approximately 80 miles from the railroad, there ~~are~~ no mechanics in the immediate vicinity that can be obtained. There are ~~more~~ none available in the small towns of Holbrook, Winslow and Gallup of the class of mechanics to do the work at this point, for the reason that nearly all of the work is finish work and the work is of such a nature on these old buildings as to require first class mechanics in every instance. The buildings were found to be in a worse state of repair than was anticipated originally, when the estimates were compiled, as for instance it was found impossible to put the wood wainscoating back on the walls and make a job of it. Likewise in some instances, as much as 3 in. of mortar was required to straighten the walls, consequently the material ~~and~~ or labor as originally estimated was ~~in~~ sufficient to do the work.

The plaster scale of wages in the surrounding towns range from $10 to $14 per day, we are paying $10.00. The carpenters' scale is $1.00 per hour in the towns, we pay 3 men $10.00 the rest $8.00. The plumbers' scale in Tucson, Phoenix and Winslow is $1.50 per hour, we are paying $1.50 per hour. Painters' scale in the above towns cited, range from $8.00 to $10.00 per day, we are paying $8.00 for four and $9.00 for one. Electrican scale is $12.00 in town, we are paying $10.00. Stone masons' $10.00 at every point I can hear from.

Taking the wage scale as a whole and considering the fact that we are 80 miles from the railroad with no convenience whatever for the men except a dormitory for them to room in altogether, and a place to eat; with all these facts before you I think it might be considered that in reality we are below the standard scale of wages for the class of mechanics that we have.

Estimated labor cost to complete the job.

White mechanics	14.100
Indian labor	3.120
Teams	1.000
	18.220

Probable date of completion.

The actual date of completion depends entirely upon the delivery of material. It will require 30 days on each building, thus, September 30 the buildings should be completed. This does not include portable cottages, as it has not as yet been decided whether they are to be frame or stone. I would recommend that they be constructed of stone (see sketches sent in).

SUMMARY.

New porches on dormitories and school house, authority granted, not estimated for originally-----750.00

18 ft. addition on school house, assembly room, authority granted, not estimated for originally----------600.00

$1350.00

Authority should be obtained immediately for the purchase of this material

WATER SYSTEM.

Estimate for consideration and approval by the Office.

Work on springs----------	800.00
New reservoir----------	2000.00
Pipe line, fire hydrants and fire hose-----.	921.00
Labor excavating ditches----------	400.00
1000 ft. of 5"x 6' concrete side walk, the old walk is in extraordinarily bad shape, in fact dangerous at night, in view of the fact that edge of same borders a high terrace wall and a fall from over same might result in serious injury----------	1800.00
	5921.00

See my detailed report of March 1, 1923, showing photograph and estimates for further reference.

Sincerely,
HOPI INDIAN AGENCY,

By

Hugh L. Russell,
Foreman of Construction.