Specifications for the construction of a Government Irrigation Canal Commencing at Yakima River at a point North 28°46' east 1461 feet from the Southwest corner of Section 17, Township 12, North of Range 19 east, in the County of Yakima, State of Washington, and running thence in a southerly direction and thence in a southwesterly direction to a point near the quarter corner on the west side of Section 36, Township 12, North of Range 18 east, all being in the Yakima Indian Reservation in said county and state.

## EXCAVATION.

1. Said canal shall extend from Station 7+52 at the Yakima River to Station 231+07, a distance of 4.233 miles, as shown on profile herewith and made a part hereof, and as staked by the Engineer for the U. S. Government.

2. The bottom width at head gates and R. R. crossing shall be as shown on plan 1, decreasing from 34 feet at Station 9+14 to the standard width of 30 feet at station 13, continuing with said bottom width of 30 feet to Station 231+07, a detailed cross-section of an average section being shown on sheet No.2 of plans.

3. The right of way must be entirely cleared of all brush before excavation begins, and the initial plowing extended a sufficient distance on either side of the center line of canal, to include the base of all levees and embankments.

4. The descending gradient shall be .03 feet per 100 feet as indicated on the profile.

5. Side slopes of both excavation and embankments shall be 1 1/2 horizontal to 1 vertical, and all embankments must be dressed to a level and be of a uniform heighth of seven feet, (7 feet) above the canal grade.

6. Any excess material shall be used in widening the embankments on the lower side of the canal, except where the cut is six feet or more in depth, in which event it must be deposited at a distance of not less than 15 feet from the outer slope line of the canal, and shall be left in a neat and symmetrical shape, the bottom of the canal to be made to a true grade, smooth and even, with no loose or projecting cobble stone therein, and the banks to be brought to a true and finished slope.

7. Where necessary by reason of light cutting that additional material be supplied to build the banks to the required width and heighth the contractor may borrow material from pits to be located by the authorized engineer or agent of Commissioner of Indian Affairs in charge of construction, but the contractor shall if deemed expedient by the said engineer or agent, haul excess material from the canal line, a distance of 150 feet from either side of any one point without compensation for over haul.

8. Excavation and embankment will be paid for in excavation only, and there will be but one classification for all material except that excavated for foundations of headworks at intake. All material necessarily excavated for the latter below the elevation of 79.0 as figured on plans, will be classed as wet excavation.

## HEAD GATES.

9. CEMENT shall be of first quality fresh English Portland, Gillingham and White or other Brand satisfactory to the Commissioner of Indian Affairs or his authorized agent.

10. CONCRETE shall be composed of 1 part Portland Cement, 2 parts clean, sharp sand and four parts broken stone, the latter not to exceed 2 1/2 inches on any edge. The sand and cement to be thoroughly mixed dry, and after wetting, the broken stone to be added, and the whole to be thoroughly worked and mixed together.

Wood forms shall be made of the proper dimensions and set in place in which the concrete shall be deposited in layers of six inches at a time, and to be thoroughly tamped with a heavy iron pestle before another layer is begun. The upper faces of the concrete foot wall shall be plastered over with a coating of mortar 1/2 inch thick composed of equal parts of sand and cement, extra well manipulated.

11. MASONRY shall be of the class known as coursed rubble work composed mostly of stone of from 2 to 3 cubic feet or more in size, and laid in mortar composed of one part Portland cement to 3 parts clean sharp sand, to be thoroughly mixed dry and properly manipulated after wetting. The stone shall be laid with a sufficient number of header courses so as to secure a strong and sufficient bond, each course overlapping the joints of the course below, and all interstices shall be entirely filled with broken stone and cement mortar. No hollow places or cavities will be permitted in any part of the walls, and the masonry must be kept well wetted until the cement is thoroughly set. The face joints of the walls to be well and smoothly pointed with a trowel, using extra rich cement mortar worked in the best manner. The walls shall be entirely covered at their tops with a coat of mortar composed of one part cement to two parts of clean, sharp sand.

12. No lime whatever shall be used in any part of the work, the mortar and concrete shall be made up in small quantities at a time and used immediately, none to be used in the work after it has begun to set, neither shall it be remixed with other cement or worked over, but shall be entirely removed from the work, beyond the possibility of its being used.

13. The backfilling of gravel and earth shall be done as the work progresses, and shall be thoroughly tamped down. In tamping, care must be taken not to loosen nor jar the stones in their beds.

14. TIMBER WORK of the headworks shall be constructed in a thorough and workmanlike manner, and according to detailed plans submitted herewith. The lumber shall be of Puget Sound yellow fir, cut from living timber, and shall be of the grade known as select common, (entirely free from sap wood, injurious knots, wind shakes, or pitch flaws.) The framing and erecting to be done with care by skilled workmen.

Due allowance must be made in floor joints and gate grooves to prevent buckling or binding after the timber becomes submerged.

15. The lower six feet of head gates with the exception of timbers A U and J, shall be given two coats of hot tar, such as is obtained from gas works, and the remaining upper portion of the gates (with exception of floors) to receive two coats of best white lead and linseed oil.

16. The machinery for lifting the two five foot gates is detailed on plans 1, 2, and 3, and it is to be set true and securely factened, so that the gates will work properly in their places.

All parts shall be made to neatly fit theár corresponding parts,and the whole to be level and plumb. See Specification 20.

17. PUMPING. The contractor shall,if necessary,use pumps of sufficient capacity to keep all seepage water out of the foundation excavations of head works, in order that the masonry and concrete may be well and properly laid.

## RAILROAD CROSSING.

18. The furnishing of the material therefor and the construction of the bridge across the Canal for the Northern Pacific railway, including the necessary excavation therefor,under the tracks of the said railway, a distance of 17 feet, is not included in the work herein designated as the U. S. Government will arrange especially with the railway company for this work.

The contractor,however,shall arrange his work so as to harmonize in manner and time with that to be done by the said Northern Pacific Railway Co., and plan 1 shows the approved cross-section of the masonry retaining walls of head works which will join and be connected with the concrete abutments of the railway crossing in the manner indicated on plan 1.

## APPROXIMATE ESTIMATE OF QUANTITIES AND MATERIAL OTHER THAN HARDWARE.

19. Excavation from station 7+52 to station 231+07 = 139000cu.yds

| | | |
|---|---|---|
| Wet excavation as specified | = | 300 " " |
| Lumber, select common, | = | 29000 ft.B.M. |
| Lumber ,select, | = | 2265 ft.B.M. |
| Rubble masonry, | = | 508 cu.Yds |
| Concrete, | = | 51 cu.Yds |
| Rip rap, estimated, | | 300 cu.Yds |

20. The contractor shall bid a stated price for the construction of the entire canal and headworks, (except 17 feet of railway crossing) as detailed in the accompanying maps,plans and profile.

He shall submit a separate price for the construction of the entire canal and headworks, (except 17 feet of railway crossing),without the machinery for lifting the gates,said machinery to be furnished by the Government and put in place by contractor.

20. The contractor shall also submit a price per cubic yard in order to provide for any excess in quantities on the amounts herein estimated as follows:

| | | |
|---|---|---|
| | | per cu.yd |
| Excavation - - - - - - - | -$ | per cu.yd |
| Wet excavation for foundation of head works below grade of 79.00- | -$ | " " " |
| Rip rap, - - - - - - - - | $ | " " " |
| Concrete - - - - - - - - | $ | " " " |
| Masonry - - - - - - - - | $ | " " " |

The prices above detailed shall also be the basis for calculating the amount to be deducted from the stated contract price in event that the actual amount of work done shall be less than the quantities herein estimated.

21. The contractor shall furnish a satisfactory bond in the sum of $20,000. for the faithful performance of the work in a manner satisfactory to the Hon.Commissioner of Indian Affairs or his authorized agent.

22. The contractor shall give his personal attention to the work herein specified and shall be especially careful in the conduct of the work that the railway tracks shall not be obstructed, nor the safety of trains be interfered with, in addition to seeing that the work is properly done.

Any workmen or employee who shall be careless or neglectful in his work,or who shall be guilty of improper conduct while so employed by the contractor shall be discharged upon request of the engineer.

23. At the beginning of each month the work done prior thereto will be measured and valued by the engineer in charge thereof, in accordance with the contract price and the contractor will be paid for such work as follows:

For head gates and works connected therewith,60 per centum of the value thereof until the headworks are completed,when 80 per centum of the value thereof as aforesaid,will be paid.

For excavation and embankment in canal construction 60 per centum of the value thereof as aforesaid will be paid until the entire work is completed and accepted by the Government, when 80 per centum of the total value of the work will be paid.

The remaining balance of 20 per centum will be paid to the contractor upon the expiration of 90 days after the final completion and acceptance of the work; provided that there are no liens or other liabilities on or against the work or contractor for labor, board of men, or teams while employed on the work,or for material or appliances furnished the contractor for the work.

When satisfactory evidence has been furnished to the Commissioner of Indian Affairs, that all such liens or claims have been settled, the entire balance due the contractor will be paid.

24. The contractor must begin work within 40 days of his notification by the Commissioner of Indian Affairs that his contract has been approved.

The head work, and all work connected therewith must be completed by November 15th,1903, and all other work within the terms of the contract by March 15th,1904. A penalty of $15.00 per diem shall be deducted from the contract price of headworks for each and every day after said date of November 15th,1903, during which said work remains uncompleted.

A penalty of $25.00 per diem shall be deducted from the contract price after said date of March 15, 1904, for each and every day during which the balance of the work remains uncompleted.

The contractor shall be responsible for all damages from river floods which may accrue to the canal,or to the property of any individual or company through negligence or improper management on his part.

25. Plans 1, 2, 3 and 4, Profile "A" and Map 2 referred to and accompanying these specifications are made a part hereof.

26. The contractor shall strictly observe the provisions of the Act of Congress approved August 1, 1892,relating to the limitation of the hours of daily services of laborers and mechanics employed upon the public works of the United States and of the District of Columbia, and also the provisions of the Act of Congress approved August 13, 1894, entitled "An Act for the protection of persons furnishing materials and labor for the construction of public works", in the performance of the work.

27. The contractor will be required to employ Indians wherever practicable in the construction of the canal.

or

----------oOo---------

5

8725