

Northern Pacific Railway Company. Engineering Department Records.

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sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

451. BY: 0. SI.

Tacoma Wn July 9th 1912

W. L. parling

St. Paul Minn.

About expense making addition to concrete plant Auburn to make concrete piles. Will it be all right to charge Boint Defiance Line account benefited for construction of plant.

J. C. Breedleve.

1015PM

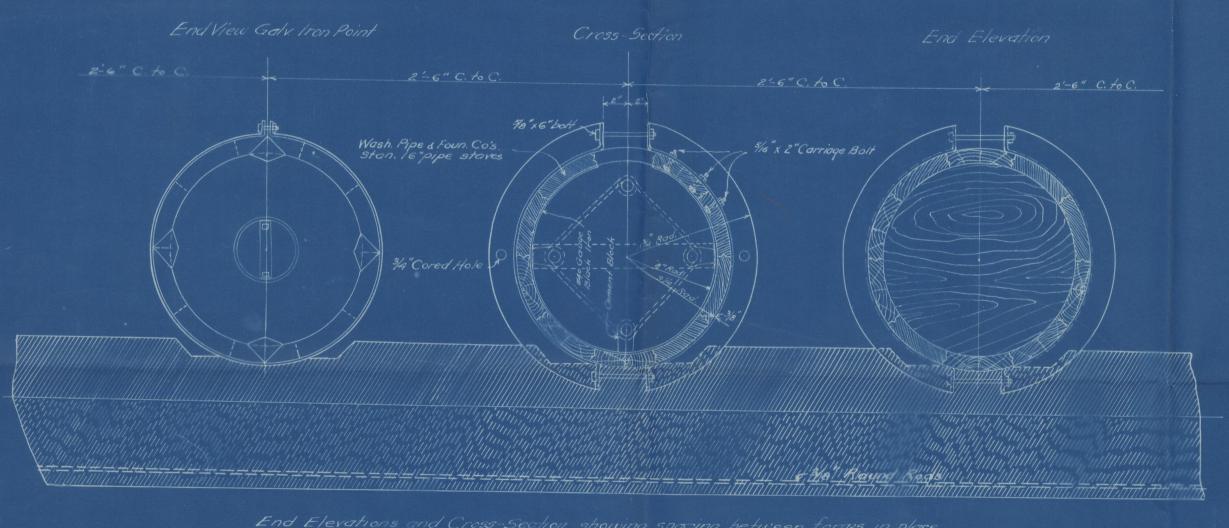
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Northern Pacific Railway
Tacoma Division TacomaTeninoLine

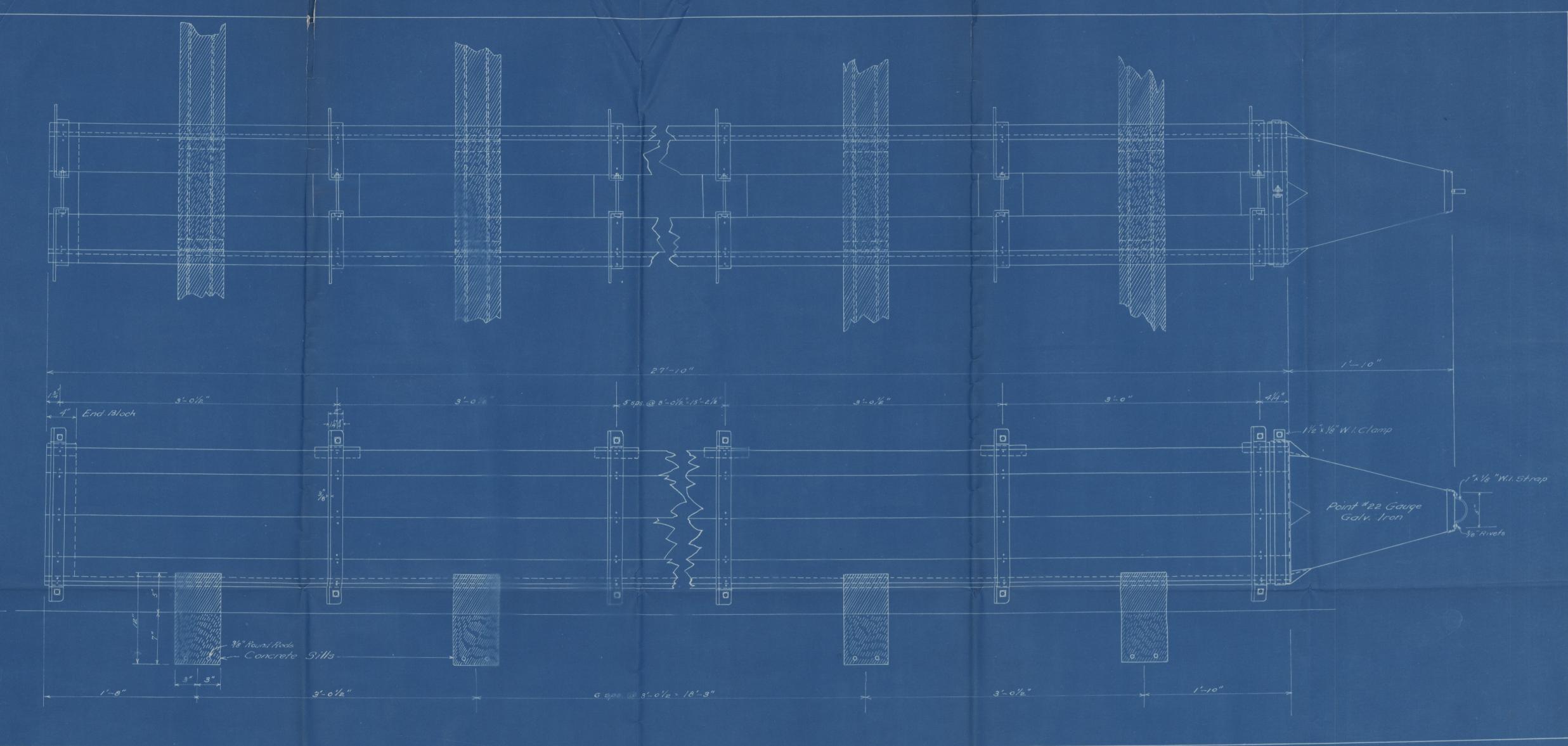
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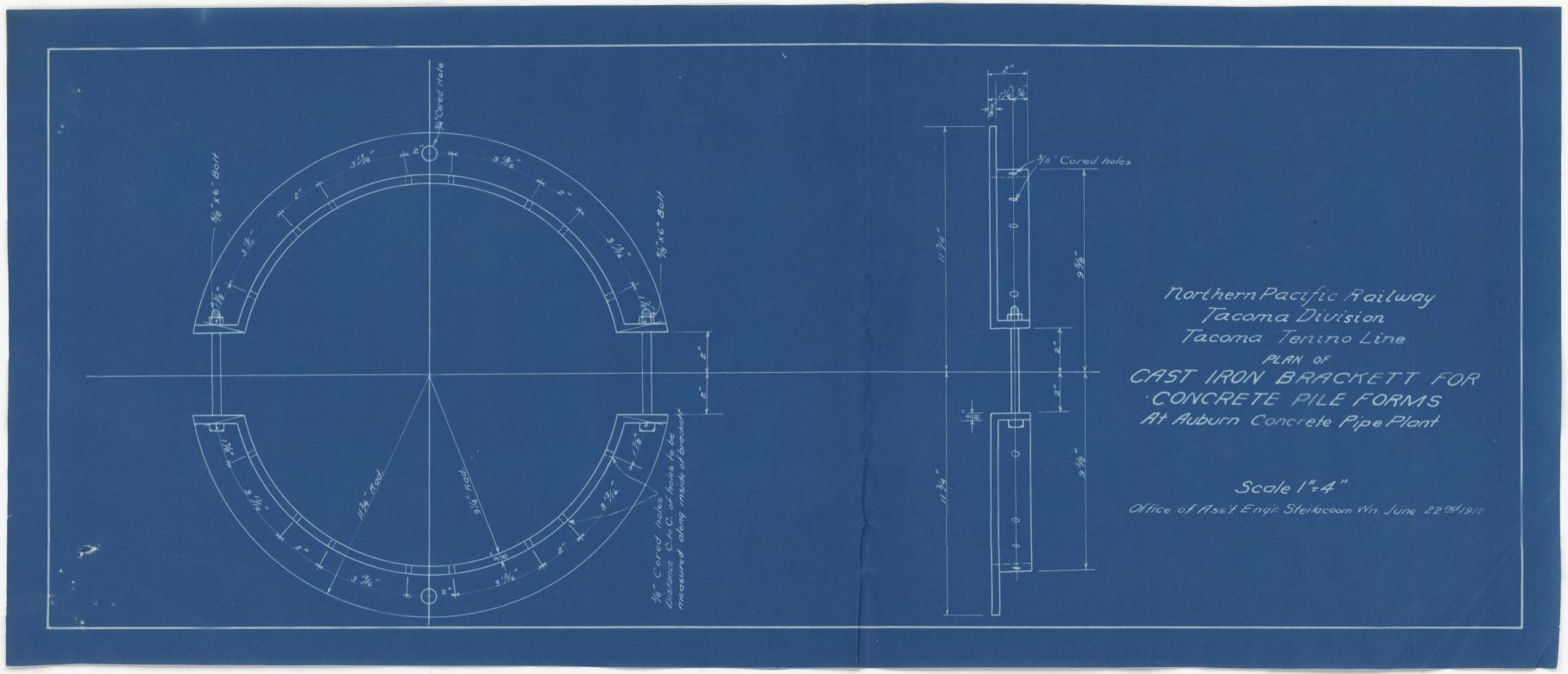
FORMS FOR CONCRETE PILES

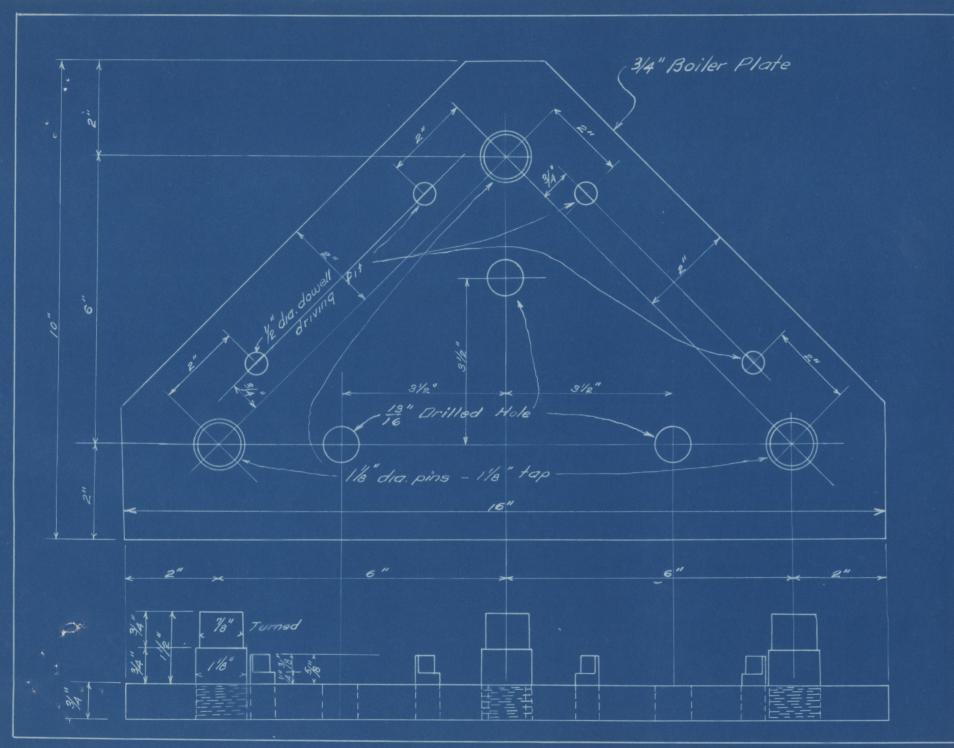
Office of Assistant Engineer, Steilacoom Washington June 21st 1912.

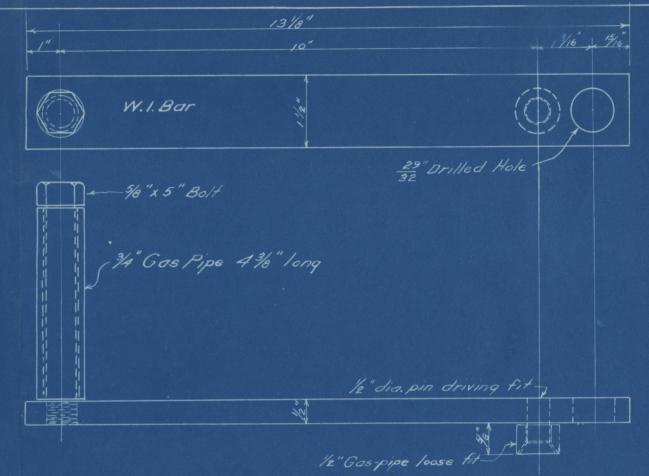












N.P.RY

Tacoma Division

Tacoma-Tenino Line

TEMPLATE AND HANDLE FOR BENDING

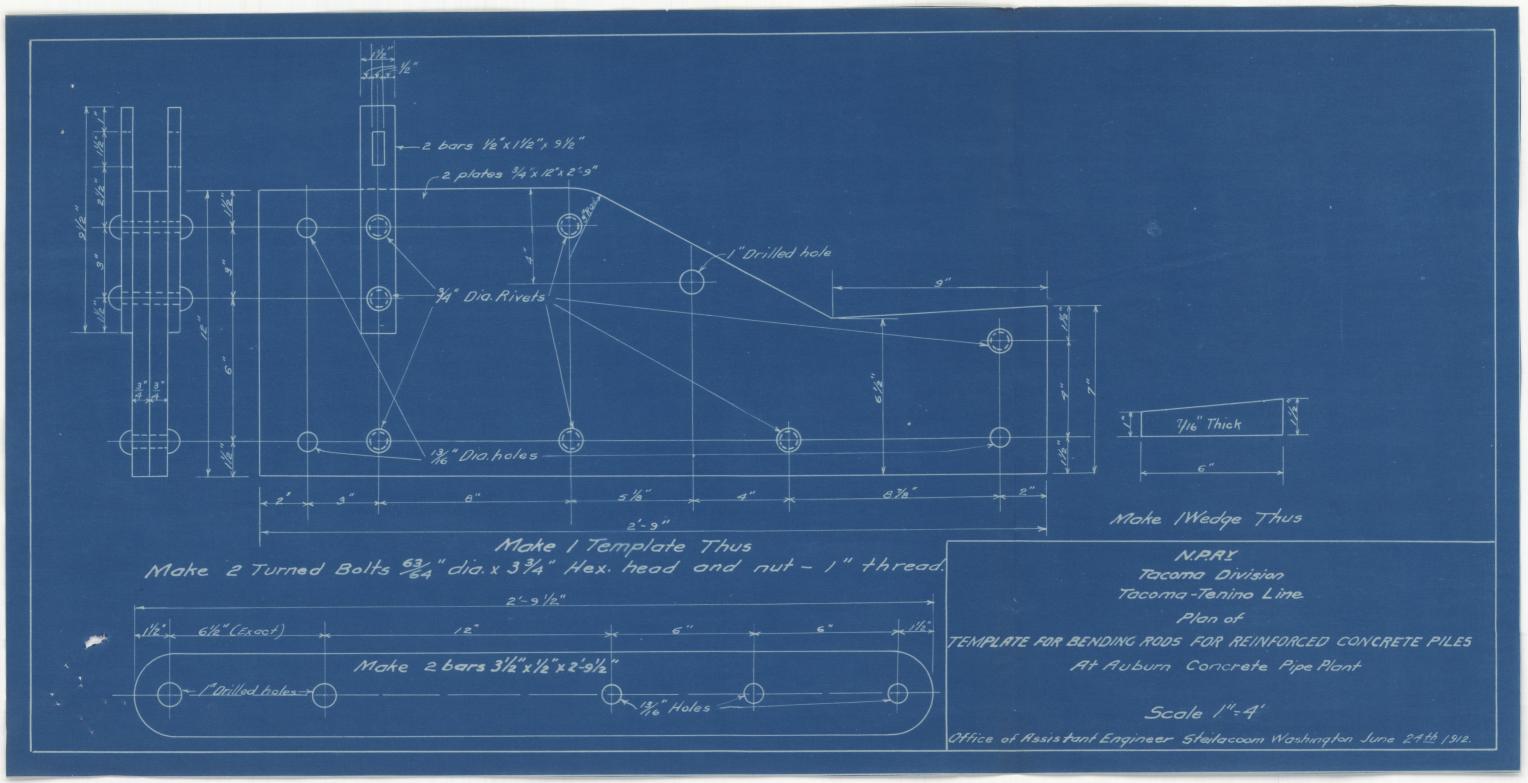
RODS FOR REINFORCED CONCRETE PILES

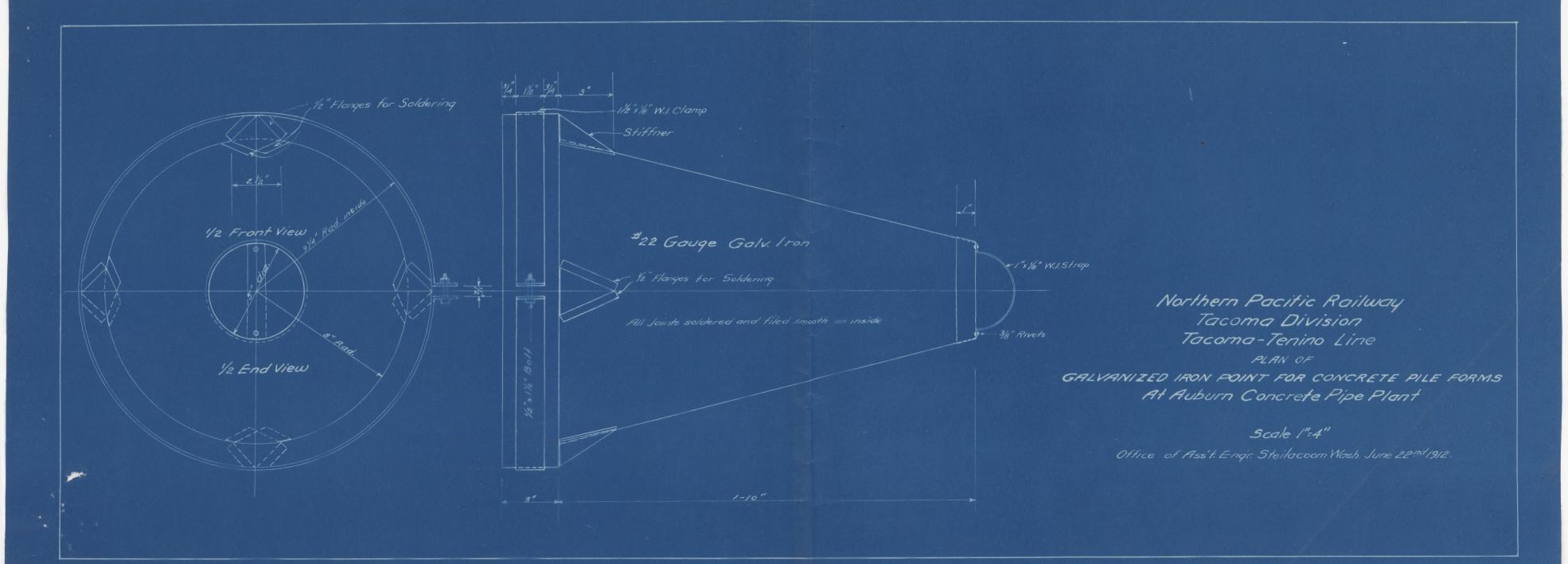
at Auburn Concrete Pipe Plant

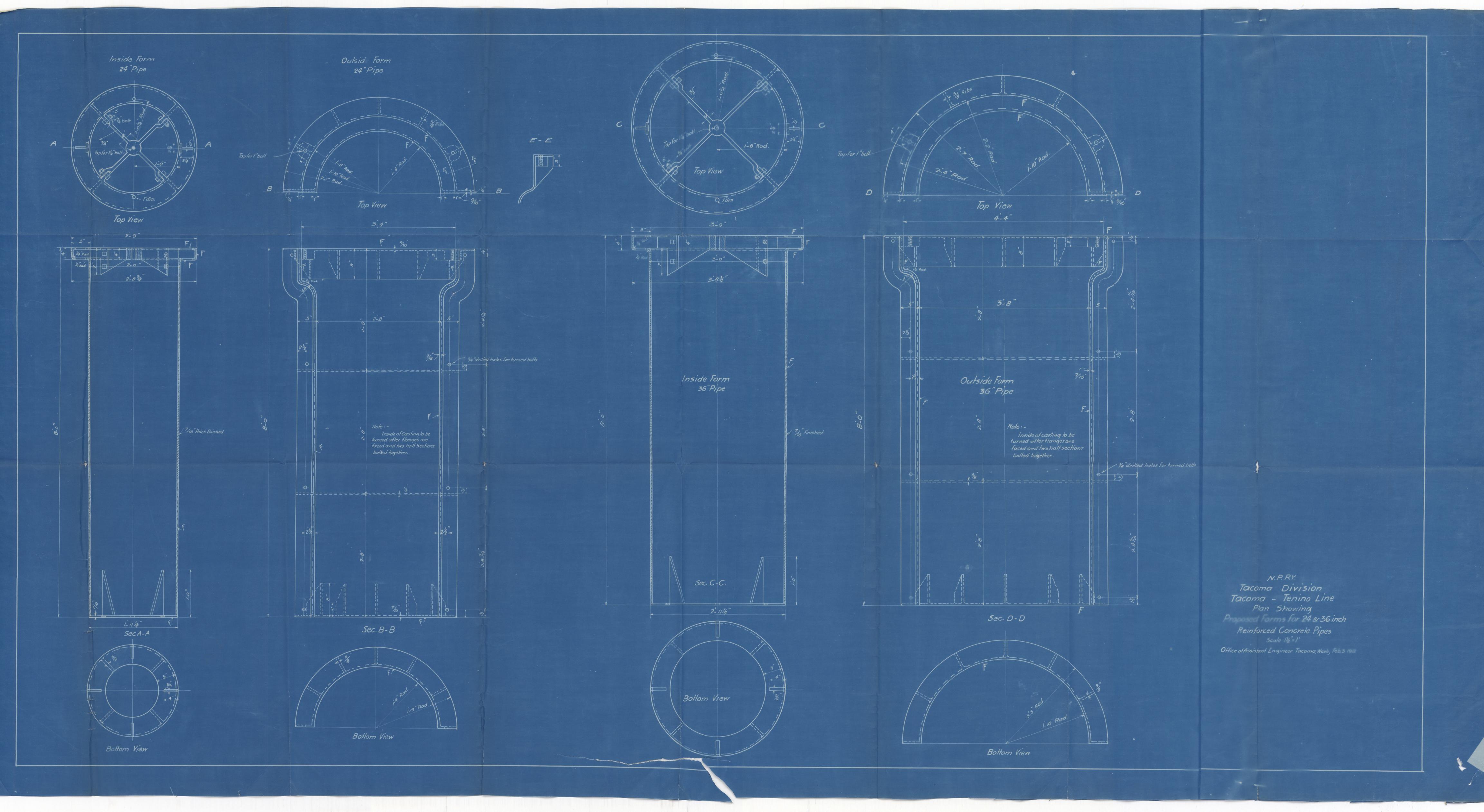
| Piece of Each Required

Scale | "= 2"

Office of Ass't Engr. Steilacoom Wash. June 18th 1912.







Saint Paul, July 13, 1912. Mr. J. C. Breedlove, Assistant Engineer, Tacoma. Dear Sir: Referring to your wire 9th: Yes sir, addition to the concrete plant should be chanred to Point Defiance Line, the account benefitted. As soon as the Point Defiance Line is completed adjustment can be made if the Operating Department care to take it over. Yours truly, Chief Engineer WLD-D Color Kel

Saint Paul, February 16, 1912.

Mr. J. C. Breedlove,

Assistant Engineer,

Tacoma.

Dear Sir:

Replying to your letter of the 12th instant:

Yes sir; the cost of installing the plant for making reinforced concrete pipe should be charged to the Point Defiance Line until taken over by the Operating Department.

Yours truly,

W. L. Darling

Chief Engineer

WLD-D

6-E-1

WeSpot W/1
Tacoma, July 3, 1912.

Mr. W. L. Darling,

Chief Engineer,

St. Paul.

Dear Sir:

Following is cost of making concrete pipe at Auburn during the month of June:

Total payroll \$1556.39, of which amount \$184.49 was spent in extending tracks, leaving \$1371.90 expended in actually making pipe. During the month we made 1504 lineal feet of 24-inch pipe and 1136 lineal feet of 36-inch pipe, with labor cost for 24-inch pipe 45.4 cents per foot and 60.5 cents per foot for 36-inch pipe, as compared with 56.2 cents for 24-inch pipe and 84.3 cents for 36-inch pipe for the previous month.

Yours truly,

JCB-A

Assistant Engineer.

Tacoma, July 3, 1912.

Mr. W. L. Darling,

Chief Engineer, Mis (

Dear Sir:

Answering yours of May 28th and June 6th, I hand you herewith statement showing cost of plant at Auburn concrete pipe plant, cost of company material, cost of cement and total cost of plant to May 31st.

June 1st there was yet to be made about 5600 lineal feet of 24-inch pipe and 4350 lineal feet of 36-inch pipe. Based on past performance, the total cost of the entire output will be approximately as follows:

Total cost of plant and material,	\$18317.68
Labor for 5600 feet of 24-inch pipe @ 50¢,	2800.00
" " 4350 " " 36-inch " @ 75¢,	3272.50
Estimated cost of repairs,	600.00
March, April and May Pay Rolls for pipe,	1764.58
Total,	26754.76
Less value of plant at end of our work,	
figuring 20% depreciation,	8580.00
Total Cost	\$18174.26

This total cost is for 8000 lineal feet of 24inch pipe and 4500 feet of 36-inch pipe, or \$1.32 per foot for the 24-inch pipe and \$1.78 for the 36-inch pipe.

Yours truly,

mounion

Assistant Engineer.

JCB-A

Tacoma-Tenino Line.

Statement showing cost of concrete pipe plant at Auburn to May 31st, 1912.

Cost of Plant:

Engineering,		\$ 467.18	
Tabor,		2631.84	
Material,	PAPER RESERVED	3926.45	
Transportation mer	1, · · · · · · · · · · · · · · · · · · ·	11.65	/
Transportation mat		316.12	
Injuries to person		227.50	
Cast Iron Forms, n		1829.09	
	Labor,	1096.36	
	shop expense	, 219.28	\$10725.47

Cost of Reinforcing Material:

Material,	3036.91
Freight,	1418.62
Foreign Freight,	216.12 4671.65

Cost of Cement:

Material,	2058.06		
Less falue of sacks returned,	630.00	1428.06	
Transportation,	The Table Sage Note of	1493.50	2921.56
ranspor action,		1430.30	2721.00

Total cost to May 31st, \$18317.68.

St. Paul, June 26th, 1912...

Mr. J. C. Breedlove,
Assistant Engineer,
Tacoma, Washington.

Dear Sir: -

Will you please refer to my letter of the 28th of May asking you to furnish me a statement showing just what the charges are on pipe made at Auburn and advise when I may receive this statement.

Yours truly,

Chief Engineer.

REG R

Saint Paul, May 28, 1912.

Mr. J. C. Breedlove.

Assistant Engineer,

Tacoma.

Dear Sir:

I wish you would send me a statement showing just what the charges are on pipe made at Auburn, separating the plant charges so that we can tell just what is charged out to plant; also say what the total cost of forms has been.

Yours truly,

Chief Engineer.

WLD-D

St. Paul, Minnesota. way 27, 1912. HES

Mr. W. L. Darling,

Chief Engineer.

Dear Sir: -

Your favor of the 19th regarding concrete pipe and forms at the Auburn plant.

I note you consider that an improvement has been made, and this being the case I do not see that anything is to be gained by discussing the matter further, especially since it is now too late to change the type of forms.

The facts appear to be rather self-evident, and nothing in Mr. Breedlove's letter of the 18th changes them in any way. For your information, however, I wish to advise that when the plant at Glendive is properly operated the concrete is always well spaded in the forms, that we have had no trouble with reinforcement springing out of shape, and that the output of the plant is not dependent upon the length of time required to take down and set up the forms but upon the length of time which good judgment dictates should elapse before forms are removed ---- needless to say that that is more than 12 hours.

Furthermore, the style of pipe they are making at Auburn has been tried out and discarded by other roads while the elliptical style with structural steel forms is being made at many different plants with uniformly satisfactory results.

Yours truly,

Bridge Engineer.

ADDITIONAL COPY

St. Paul, Minnesota. way 27, 1912. HES

Mr. W. L. Darling,

Chief Engineer.

Dear Sir:-

Your favor of the 19th regarding concrete pipe and forms at the Auburn plant.

I note you consider that an improvement has been made, and this being the case I do not see that anything is to be gained by discussing the matter further, especially since it is now too late to change the type of forms.

The facts appear to be rather self-evident, and nothing in Mr. Breedlove's letter of the 18th changes them in any way. For your information, however, I wish to advise that when the plant at Glendive is properly operated the concrete is always well spaded in the forms, that we have had no trouble with reinforcement springing out of shape, and that the output of the plant is not dependent upon the length of time required to take down and set up the forms but upon the length of time which good judgment dictates should elapse before forms are removed----needless to say that that is more than 12 hours.

Auburn has been tried out and discarded by other roads while the elliptical style with structural steel forms is being made at many different plants with uniformly satisfactory results.

Yours truly,

COPY

At Tacoma, May 19, 1912.

Mr. H. E. Stevens,

Bridge Engineer,

St. Paul.

Dear Sir:

Please note the attached letter from Mr. Breedlove, dated the 18th instant, relative to concrete pipe being made at the Auburn plant.

It seems to me that Mr. Breedlove and Mr. Bell have made a very good improvement, and I cannot understand your criticism. Won't you please advise further.

Yours truly,

WLD-D

Chief Engineer

Enc

Tacoma, May 18, 1912.

Mr. W. L. Darling,
Chief Engineer,
St. Paul.

Dear Sir:

Returning herewith Mr. Stevens! letter of May 7th with criticisms of pipe forms being used at Auburn concrete plant. Taking up Mr. Stevens! objections in their order, I have to advise as follows:

First: His statement that the design is radically different from the one used at Glendive is correct. Our experience at the plant at Auburn also demonstrates clearly that these forms are much better. Pipe is being made round and the reinforcement put in in elliptical form. Mr. Stevens assumes that in bending the reinforcement it comes from the mandrels round, but as a matter of fact this is not the case as it is in the shape of a flattened circle. The flat part is due to the lap of the reinforcing mesh where it is wired together, this lap being eight inches for the 24-inch pipe or slightly over one quarter of the diameter of the reinforcement. Mr. Bell told me that they experienced considerable difficulty at Glendive with their reinforcing and to get it in proper shape it was sprung into position by 3/4 inch pipes, which they used as spacers, and as soon as the pipe was removed the reinforcing sprang back to the original shape, the concrete not being stiff enough to hold it in place. The use of the

the folding of the reinforcement in its true position.

Second: Mr. Stevens says that our forms will not permit of concrete being tamped or spaded in place. It is two that this cannot be done, neither could it be done with forms at the Glendive plant. As you can understand that with the four-inch thickness of concrete, with reinforcing rods in the opening, that it would be absolutely impossible to do any spading.

Third: As to the core forms not permitting of collapsing, and his statement that this means core forms must be withdrawn before concrete is properly set and will result in considerable breakage and poor work; this statement is not correct. To date we have made over 1600 lineal feet, or 200 pieces, of pipe and have had no trouble. You will note, by referring to the plans, that there is \(\frac{1}{4}\)" taper in the inside form and we have had no difficulty whatever in removing form, even after the concrete has set for 24 hours.

Fourth: with reference to his objection that there is no way to tell how the pipe is laid in the field for the reason that the top must be plainly marked and the pipe carefully laid with respect to the top marking and after fill is made there is no way of checking. We are marking the pipe on the inside, as well as the outside, and there is no reason why inspection cannot be made after the pipe is laid to ascertain if it is laid properly. Furthermore, all these

pipes are laid under the inspection of the Resident Engineer on the ground and there is no reason why inspection should not be made. There would be as much likelihood of error in placing the elliptical pipe as there would be in placing the regular pipe.

Fifth: As to evading patents, there is no intention of doing this as I understand that we will have to pay the royalty.

Sixth: As to the expense of design, it is true that the first cost is more than either wood or structural steel but in the long run it will be very much cheaper on account of the fact that the life of cast iron forms is indefinite, while either wood or structural steel will get out of shape in a very short time.

For your further information, I beg to say that we are making two lengths of pipe from each form at Auburn per day, whereas, with the type used at Glendive, the best that can be done is one length of pipe in two days. In other words, we are getting four times the output from our forms as can be gotten from those at Glendive.

Further, after the concrete is poured in pipes at Glendive, there are 44 pieces that have to be moved in taking down and setting up one form. On the forms that we have at Auburn there are only 11 pieces. The time required to remove, clean and set up the interior form at Glendive for three men was about one hour, or with labor at 25 cents per hour the

cost was 75 cents. The time required at Auburn to remove, clean and set up the interior forms is about four minutes for three men, or a cost of 5 cents, as against 75 cents at Glendive. The total cost to take down, clean and set up one form at Glendive was about \$1.15 and at Auburn the same work costs about 25 cents.

I am quite sure that we have not made any mistake in our forms and I will be very glad if you can find time while on the Coast to go to Auburn to see these forms and the pipe that we are getting made. On this date we have four complete 24-inch forms in service and one 36-inch form with temporary inside form. The shops have just shipped one inside cast iron form for 36-inch pipe, which will give us two 36-inch forms with which to make pipe, and they promised to have another form for 36-inch pipe out this week, which will give us three, so that after this week we should be able to get out approximately 64 feet of 24-inch pipe per day and forty feet of 36-inch.

Yours truly,

JCB-A

Assistant Engineer.

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Je. B-Plo untermodorie The

St. Paul, Minnesota. May 7, 1912, HES

Mr. W. L. Darling,

Chief Engineer.

Dear Sir:-

Your memo on the attached file and requisition covering 8,000 lineal feet of \(\frac{1}{4} \)-inch round rods for use at the Auburn concrete pipe plant.

I have looked up on your file the plan of cast steel forms which are being used at the Auburn plant, and it is my opinion that the difficulty which they are experiencing in making the pipe, and which the 4-inch rods are supposed to remedy, is caused by the design of form and pipe which is being used. These designs are radically different from anything we have heretofore u sed, and embody features which in the original design were carefully considered and eliminated. Thepipe is being made round and the reinforcing ring elliptical, instead of making the pipe elliptical and the reinforcing round. When a sheet of expanded metal or reinforcing mesh is bent it tends naturally to take circular form, and if forced into an elliptical shape by means of artificial supports as they have been trying to do on the pipe already manufactured it will spring back into circular form as soon as the supports are withdrawn. This no doubt causes the trouble they are having at Auburn, and which we did not experience at Glendive.

Mr. Darling -p 2. 5/7/12.

The trouble at Auburn is further aggravated by the fact that the design of forms is such that the concrete cannot be effectively tamped or spaded in place. This is a vital defect and I doubt if they will be able to get really good pipe with the forms they are using.

Another contributing cause to the trouble is the fact that the core form as now designed cannot be collapsed:

This means that the core form must be withdrawn before the concrete is thoroughly set, and will doubtless result in considerable breakage and poor work.

Assuming, however, that all these difficulties are overcome, and that a first class article of finished pipe could be secured, the design is still objectionable for the reason that the top must be plainly marked and the entire line of pipe carefully laid with respect to the top marking. After fill is made there is no way of checking up to ascertain if the interior sections of pipe are laid as marked, and the first indication of errors would be the failure of the section, necessitating the heavy expense of digging out the fill in order to remedy. With the elliptical form of pipe it is impossible to lay any section wrong, and the mere inspection of the end section will be sufficient to show whether or not the pipe has been properly laid.

The round pipe does not evade the patents covering

Mr. Darling, page 3. 5/7/12.

the elliptical pipe, as these patents cover the carrying of a single line of reinforcement from the intrados to the extrados of an arch. We will have to pay a royalty of five cents per lineal foot on the pipe manufactured at the Auburn plant the same as we do at Glendive.

The design of forms shown are very expensive to make and are weak structurally after they are made. The interior surface of the outer casing has to be bored out for its entire length after casing is completed and the two halves bolted together, and the case form has to be turned for its full length. It would be interesting to find out what these forms cost and compare same with the cost of a structural steel form which is being manufactured and has been on the market for some little time: This structural steel form is made elliptical in shape, has a collapsible center, and overcomes all objections to the cast iron forms which have been made for Auburn.

I would suggest that you pass the requisition for the round reinforcing steel and let them experiment with it, as it may help some.

Yours truly

Bridge Engineer.

5/19

Saint Paul, June 22, 1912. Mr. J. C. Breedlove. Assistant Engineer, Tacoma. Dear Sir: Replying to your letter of the 18th instant relative to the proposed method of increasing the output of the Auburn concrete plant: I do not believe we should do this work at present. It looks very much as if the scheme was feasible and economical, but I think the extension of the plant should be considered as a whole before it is definitely decided to do the proposed work. Possibly Mr. Bell could show us what the lavout will eventually be when the plant is increased to take care of the necessary piles, slabs for bridges, and other concrete work, and show in that plan the proposed method of increasing his output. Yours truly, Chief Engineer WLD-D

6-E-17

Tacoma, June 18, 1912

Wr. W. L. Darling,
Chief Engineer,
St. Paul.

Dear Sir:

24-inch pipe forms working and three 36-inch pipe forms.

As I have previously advised you, in my talk with you when you were here, we are getting two lengths of lipe from each form per day by using the steaming process. For the month of May the labor cost of making the 24inch pipe was '56 cents per foot and on the 36-inch pipe was 84 cents per foot. The method of operation now consists of placing the form bell end up on the platform and placing the reinforcement and puring the concrete, then steaming the concrete to make it set quickly and removing the outside portion of the form and drawing the inside core.

Mr. Bell has worked up a scheme whereby it seems possible to increase the output to three lengths of pipe for each form per day, instead oftwo as at present. To do this will require the building of a circular molding pit 22 feet in diameter and 8 feet deep, with a turntable in the bottom on which we would place 8 forms, four of the 24-inch and four of the 36-inch, with the bell end down, fixing the center form or core stationary on this patform on a bedplate. The

outside form would have lugs which would fit under the concrete and the scheme would be to remove the outside form and the pipe with one movement of the derrick, leaving the inside form stationary. The saving in time of handling would, I believe, enable us to i crease the output about 50 per cent, or three pieces of pipe per form instead of two per day as at present. I attach hereto estimate of cost to fix the present plant so that this method of construction could be used. It would take probably three weeks to install such additions to the plant. At the end of that time we would have still to make for the Boint Defiance line about 3700 lineal feet of 24-inch pipe and 3200 lineal feet of 36-inch pipe. Assuming that we could increase the output by 50 per cent, which would mean decreasing the cost per lineal foot by 33-1/3 per cent, the saving, based on last month's performance, would be 19 cents per foot on the 24-inch pipe and 28 cents per foot for the 36-inch pipe, or a saving on the pipe to be made after the end of three weeks of \$703.00 for the 24-inch pipe and \$896.00 for the 36-inch pipe, or a total of \$1599.00 as against estimated cost of \$650.00, a saving of about \$950.00.

While we can turn out the pipe with the present arrangement to take care of the Point Defiance line all right, the scheme is, I think, a good one, and will effect some small saving for the Point Defiance line work and a very considerable saving on all future work.

Will youplease advise at your conveneince if it is

all right to go ahead and arrange for the necessary changes to take care of the proposed method of making pipe?

Yours truly,

JCB-A

Justimush.
Assistant Engineer.

NORTHERN PACIFIC RAILWAY COMPANY TACONA-TENINO LINE

ESTIMATED COST OF CHANGING AUBURN CONCRETE PIPE PLANT TO INCREASE OUTPUT:

114 cu.yds. excavation @ 50¢,	\$ 57.00
3000 F.B.M. Timber 0 \$20.00,	60.00
Movable platform,	80.00
Steam Connections to form,	35.00
4 Cast Iron Bases for 24" forms, 250 Lbs. @ 8¢ Lb.	80.00
4 Cast Iron Bases for 36" forms, 330 Lbs. @ 8¢ Lb.,	105.00
. 1800 Lin. Ft. 3/4" Galv. Guy rope @ 4	¢, 72.00
6 Guy tighteners @ \$4.00,	24.00
16 Hinges for forms @ \$3.00,	48:00
Labor placing guy ropes,	28.00
Incidentals,	61.00
Total,	\$650.00

Steilacoom, 6-18-12.

Saint Paul, June 10, 1912. Mr. J. C. Breedlove, Assistant Engineer, Tacoma, Washington. Dear Sir: Replying to your letter of the 6th instant relative to requisition for 50 concrete piles for use at Des Chutes River bridge: Have cancelled requisition. You may go ahead and make this material at the Auburn Concrete Plant, getting the additional platforms, benders, wire cables and blocks necessary. Yours truly, Chief Engineer O'LD-D

Mes. Mono about the Raw Forms Lo you has any spection has Tacona, June 6, Chief Engineer, M. Jewall hardward Poly
St. Paul.

With from Mr. W. L. Darling,

Dear sir: -

With further reference to your message of May 31st concerning my requisition for 50 reinforced concrete piles for use at Des Chutes river bridge:

To make these piles at the Auburn concrete plant it would be necessary to go to the following expense:

10 pile forms, 30 feet long,	@ \$35.00	\$350.00
Moulding platform, 30' x 70',	1/	200.00
Grading for platform,	V	100.00
Two rod benders,	@ \$25.00	50.00
Additional wire cables and block	ks so that	
piles could be handled by pre	sent derrick,	150.00
Incidentals,		50.00
the contract of the second of	Total,	\$900.00

The freight on reinforced concrete piles from Glendive to the Coast is 51 cents per hundred-weight. Assuming that we will need 200 pieces 30 feet long on this work, distributed as follows; 50 pieces at the Des Chutes river, 50 pieces at the Nisqually river and 100 pieces at Chambers Creek bridge, a total of 6000 lineal feet, the freight charges would be \$6120.00.

It would, therefore, ap ear that it would be a decided economy to make the piles here and I would recommend that this be done.

These figures are based on using round reinforced concrete piles instead of the octagonal. The reason for figuring on round piles being that we could use the present derrick and roll them, while if the octagonal form was used it would probably necessitate putting up an additional derrick, or an expenditure of \$1000.00 more than given in the above figures. Mr. Bell advises that the question of round or octagonal piles was thoroughly discussed at the time the Glendive plant was erected, the only reason for adopting the octagonal shape there being on account of kkm a small saving in making the forms. In this case, as noted above, I think it would be a considerable advantage, particularly in ease of handling, to make the piles round.

Will you please advise at your earliest convenience if all right to go ahead and have ten forms made and arrange for necessary platform and other items to make these piles?

The reason for sending in requisition for these piles for the Des Chutes river, to be supplied from Glendive, was that I understood you to say, when here last, that no extension of any kind would be considered at the Auburn plant.

Yours truly.

houndhar Assistant Engineer.



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for outer purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

220 by o sn

Tacoma June 3rd--12

W.L. Darling

StPaul.

Yours 31st about making concrete

piles, am having estimate of cost of forms and platforms made and will advise you by letter in a few days about it.

J.C.Breedlove

526 PM.



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received personal signal of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

St. Paul, May 31, 1912.

T.C.Breedlove

Tacoma

Your requisition 50 concrete piles.

Cannot Mr. Bell make these.

W. L. Darling

Saint Paul, May 7, 1912.

Mr. J. C. Breedlove,

Assistant Engineer,

Tacoma.

Dear Sir:

Please note attached copy of letter from Mr. Stevens, about the concrete pipe. I would like to go over this with you fully when on the Coast next.

Yours truly,

WLD-D

Chief Engineer

Enc

Mr. O. Wakefield:-

Replying to your memo of April 6th, and returning herewith your file relative to cement testing apparatus on SA-2071. This material was shipped by Fairbanks, Morse & Co. from St. Paul, via Northern Express, on April 19th, with the exception of two of the three sections gang molds. These they expect to receive from their Factory at an early date, and immediately upon receipt will reconsign to this Company.

Albarfinde Wax & G. Prest

copy on the star

bb wakefuel Thease borne there Returning herewith Mr. Darling's memo to you Mar. 29th relative to cement testing apparatus on SA-2071. The order for this material was placed yesterday with Fairbanks Morse & Co who advise me that it will take from a week to ten days to get all the material together. They are having some of the parts shipped them from their factory at their cwn expense and state further that the entire ship ent will weigh about 60 lbs and as the Engineering Department seem to be in a rush for this material, will you please advise me whether or not shipment should be made from here via Northern Express. As the matter ncw stands, shipment will go via freight unless otherwise advised. 4-4-12. encl.

Memorandum

Mr. O. C. Wakefield:

Will you please hurry all possible the cement testing apparatus on ED 159 SA 2071. Assistant Engineer Breedlove is wiring asking when he will get delivery.

W. L. Darling

St Page 3-29-12 of purply 17/24

no record

NOR.PAC.RY.
MAR
29
1912
PURCHASING AGENT

All Dille by Mossages must be written in ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of se did not like a light to the sending station must be entered on this blank.

After transmitting telegrams which in the interest to the would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 235, and forming same to Superintendent of Telegraph.

St.Paul, April 3 1912

.C.Breedlove

Tacoma

Your requisition 84 cement testing apparatus. Delivery promised in from one to two weeks.

W. L. Darling



All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily

long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

BY. O. SI.

Sacoma Wn Mar 30th 1912.

W. L. Darling

St. Paul Minn.

Can you yet advise when we will get items on my Req'n. 84 for cement testing labratory.

J.C. Breedlove.

1044PM

Chyll Child

Tacoma, April 22, 1912.

wr. W. L. Darling,

Chief Engineer,

St. Paul.

Dear Sir:

Answering yours of the 15th about 36-inch pipe for the Fairfax line. As I understand from Mr. Cook's letter to you under date of April 19th, all the pipe needed for this line has been received, so nothing further need be done about it.

Yours truly,

J CB-A

St. Paul, April 23rd, 1912..

Mr. A. R. Cook, Prin. Asst. Engr., Tacoma, Washington.

Dear Sir:-

Referring to your wire of the 22nd advising that 60 feet of 36" cast iron pipe would be all that would be needed for the Tacoma Tenino Line under your charge as you had arranged other wise for all the pipe on your requisition 116. I have made requisition and enclose copy, ED 263.

Yours truly,

Chief Engineer.

REG R

Encl.



All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except training) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

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Tacoma Wn April 22nd 1912.

W. L. Darling

St. Paul Minn.

Yours 19th. about 36 inch pipe for Cook, cannot furnish the sixty feet needed.

J.C. Breedlove.

1131PM



All Railway Messages, must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank. After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily

long, operate are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

80 face aprel 9-1912 =

JC Bruklove

toeoma

book can get 357 hur feet 36 mile cost pipe at South Tacoma heeds 60 feet more Hove you cent that amount took pape you can farmed her

Whalling



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

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long, operators are required to attach a copy to form 238, and forward same to Superintendent of Telegraph.

X · W· FO

502 BY: V: FO:

Tacoma.April 22-1912

W.L.Darling

Stpaul

Browsing Re 36 inch culvert Pipe Telegram of 19th Supercedes letter of same date. Can get all but 60 feet of 36 inch Pipe required using cast Iron in Place of Vitrified through Tacoma Store Asking you to send me 60 feet of 36 pcs cancelling 36 inch Vitrified .Will arrange to get all 24 inch pipe from Breedlove using 24 inch in place of 30 inch.

A.R. Cook



All Railway Messages must be written in ink on these blanks, which must not be used for other purpose, and there for parties on trains (except trainmen) enclosed in scaled envelopes. The exact time scut, time received, personal signal of scaling and receiving operators, call of scaling office and name of receiving station must be entered on this blank.

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238 by so T

Tacoma Arril 19-13 W. L. Darling,

StPaul.

Re 36 inch pipe for Point Defiance Line Oldtown, ill to Smelter cannot get any 36 inch vitrified pipe from store But can get and have ordered thru. store at South Tacoma 36 inch cast iron pipe to Amount of 354 lin feet. Please ship me sixty feet 36 inch cast iron pipe cancelling order for 36 inch vitrified pipe.

A.R. Gook. 438 pm

6,2-6



TELEGRAM. All the results of the purposes, and those all signal of sending and receiving operators, and those all signal of sending and receiving operators, of sending office and name of receiving station must be entered in proper spaces in every instance.

After transmitting telegrams which in their udgement would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

NUMBER	REC'D FROM	SENDER	RECEIVER	TIME REC'D	DATE REC'D	TIME FILED	NUMBER	SENT TO	TIME SENT	SENDER	RECEIVER
				M.		M.			M.		NE STATE

FROM

DATED

St. Paul, April 22,1912

TO

A.R.Cook, Tacoma.

AT

Solidify April 19th culvert pipe stating you will need the 36 inch vitrified pipe on requisition.

Do not understand this. Your wire same date advises to cancel order for 36 inch xitatikadxxixa vitrified pipe. Please explain.

W. L. Darling

FORM 1386

WLD-D

At Rail we Me are must be written in ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily

long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

St. Paul, April 18, 1912.

A.R.Cook

Tacoma

Your wire about pipe. We have no 36 inch pipe in stock except what store has. You can find out from Store at Tacoma. If absolutely necessary to furnish wire us and we will send out as soon as possible.

W L.Darling



TELEGRAM.

All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of and receiving operators, call of sending office and name of receiving station must be entered in proper spaces in every instance.

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NUMBER	Receiver TIME REC'D	DATE REC'D TIME FILED	NUMBER SENT TO T	IMESENT SENDER RECEIVER
223	by so C		M. Committee of the com	
FROM	macona April 17	-13 ro W.L	. Darling,	1
DATED		AT	Stran	

Buff re ripe for drainage old town mill to smelter, must have two lines, 410 ft. of 36 inch pipe for present and future city sewer connections. Will arrange to cover thirty inch with two lines of twenty four inch Breedlove cannot furnish any thirty six inch as he has not yet received his forms. Can you mick up any thirty six inch dast iron ripe on line, will see today what I can do with local store lent.

A.R. Cook.



All Railway Messages must be written in ink on these Matter, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegroups which in the product have served the Company's interest as well if sent by train mall, or which appear unnecessarily long, operators are required to attack a copy to form the and forward same to Superintendent of Telegraph.

Cook

St. Paul, April 16, 1912.

Tacoma

Why not use two 24" pipes instead of one 36 inch, Tacoma Mill to Smelter. Breedlove ought to be able to furnish that. The 36 inch costs us \$1.92 and if so why should you recommend paying three dollars. W. L. Darling



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in scaled envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

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321. BY. O. SI.

Tacoma Wn Arril 15th 1912.

W. L. Darling

St. paul Minn.

Breedlove writes will be able to furnish twenty four inch concrete pipe

Tacoma Mill to Smelter but cannot furnish thirty and thirty six inch.

Have a price from Crowe and Company as follows: Thirty inch sasque

grumpish catalan enrapture. Thirty six inch cassandra grumpish per foot,

one, two and four mixture, chicken wire reinforcing. Can commence delivery

on cars Tacoma two weeks after receiving order.

A. R. Gooke.

1036PM

Tacoma, Washington, April 19, 1912,

Mr. W. L. Darling,

Chi ef Engineer.

Dear Sir:

Referring to your letter of the 15th instant to Mr. Breedlove relating to culvert pipe for the Fairfax line change:

My records show that all of the culvert pipe required for the Fairfax line change has been received.

The culvert pipe which we now want is for the Tacoma-Tenino Line along the Bayside in Tacoma. I have arranged so that we will take 24" pipe in place of all sizes excepting the 36", about which I wired you a short time ago. In place of the 30" pipe covered in my requisition will use two lines of 24". The 36" pipe for the locations intended is necessary. I have succeeded in getting the 36" cast iron pipe through Mr. Robson at South Tacoma, but still need the vitrified pipe covered by my requisition for 36" reinforced concrete in place of vitrified, although the vitrified would be sufficient for the purpose.

Yours truly,

ARC-P

Principal Assistant Engineer.

Tacoma, Washington, April 19, 1912.

Mr. J. C. Breedlove,

Assistant Engineer.

Dear Sir:

Referring to previous correspondence re culvert pipe for the Point Defiance Line east of the Tacoma Smelter:

Have arranged to get thirty-six inch pipe through the Store Department and the Chief Engineer.

Yours truly,

ARC-P

Principal Assistant Engineer.

Saint Paul, April 19, 1912. Mr. J. C. Breedlove, Assistant Engineer, Tacoma, Washington. Dear Sir: Replying to your letter of the 16th instant relative to 24" cast pipe: Since the delays have been so serious in getting 30" and 36" forms, it seems to me that you will either have to use wooden forms or temporily use two lengths of 24" for the 36" pipe. The latter is much more preferable than trying to buy cast pipe, but on account of the two 24" pipes being more expensive than the single 36" I believe you can well afford to build some temporary timber forms for 36" pipe until the cast forms can be made. Yours truly, Chief Engineer WLD-D

Tacoma, April 16, 1912.

Mr. W. L. Darling, Chief Engineer,

St. Paul.

Dear Sir:

K

I return herewith Mr. Cook's requisition

No. 116 for 24", 30" and 36" cast iron pipe and 24",

30" and 36" vitrified pipe. As I wired you today, and

stated in my letter to Mr. Cook under date of April

11th, I can furnish the 24" reinforced concrete pipe

to cover both items of cast iron pipe and vitrified

pipe shown on his requisition. Do not have any 30"

forms and, while we will have 36" forms, none have been

received at the plant and so think the best thing to

do would be to arrange for the 36" pipe for Mr. Cook's

work from some other point.

Yours truly,

Monuton
Assistant Engineer.

JCB-A

moorbeg

Sie your wire to motor afree 184



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6-E-1

Tacoma, April 16, 1912. W.L. Darling, St. Paul.

Your message 12th about Cook's requisition 116. See my letter of April 11th to Mr. Cook copy of which was sent you. I can furnish the 24 inch pipe but not the 30 or 36 inch. Do not yet have any 36 inch forms out of South Tacoma. JCB-A J. C. Breedlove.

Supply Agent's Reqn. No.

Division C. A. E. T. # 116.

Sheet

Northern Pacific Railway Company.

Tacoma, Wash., March 6, 1912.

797

To the BURCHASING AGENT,

The following articles are required for the Company's use, and should be delivered

to A. R. Cook, Principal Assistant Engineer, at Tacoma, Washington.

ITEM NUMBER	QUANTITY	DESCRIPTION OF ARTICLES Estimated Cost Cost Supplies will be furnished only upon the written requisition of the heads of Departments, and the officer making the requisition must state fully and minutely where and for what purpose the atticles ordered are to be used. If this is not done the requisition must be returned for the information.	
	430	lin. ft. 24" Cast Iron Pipe	
	60	lin. ft. 30" Cast Iron Pipe	
	360	lin. ft. 36" Cast Iron Pipe Pipe required in connection with Imp. 809 (11) Tacoma-	
	1490	lin. ft. 24" Vitrified Pipe D. S. Tenino Line.	
	230	lin. ft. 30" Vitrified Pipe D. S.	
	432	lin. ft. 36" Vitrified Pipe D. S.	
	11 2	24" 1/8 Bends 30" 1/8 Bends 36" 1/8 Bends	The second second
-	1	6.1	

Approved.

Monday

NiP, Cign Here)
(Sign Here)
(Sign Here)

(Title)

CHIEF ENGINEER

For the President.

Supply Agens.

Division N" " " " 115.

Sheet

Northern Pacific Railway Company.

Tacoma, Wash., March 6, 1912.

191

To the FURCHASING AGENT,

The following articles are required for the Company's use, and should be delivered

to A. R. Cook, Principal Assistant Engineer, at Tacoma, Washington,

ITEM NUMBER	QUANTITY	DESCRIPTION OF ARTICLES	Estimated Cost For What Cost Cost
	430	lin. ft. 24" Cast Iron Pipe	
	69	lin. ft. 30* Cast Iron Pipe	
	360	lin. ft. 36" cast Iron Pipe	Pipe required in connection
	1490	lin. ft. 24" Vitrified Pipe D. S.	with Lap. 809 (11) Tacoma- Tening Line.
	230	lin. ft. 30" Vitrified Pipe D. S.	
	432 11 1 2	lin. ft. 36" Vitrified Pipe D. 85- 24" 1/8 Bends 30" 1/8 Bend 36" 1/8 Bends	FRUCTION COPY

Approved.

(Sign Here)

Principal Assistant Engineer



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long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

520 by v. 3

Tacema April 16,1912.

W.L. Darling.

Stpaul.

Your message 12 th about cooks requisition 116. See my Letter of April 11 th to Mr. Cook copy of which was sent you. I can furnish the 24 inch pipe but not the 30 or 36 inch. Do not yet have any 36 inch forms out of South Macoma.

J.C. Breedlove.



regad All Railway Messages must be circum, ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of sending blace, this name of receiving station must be entered on this blank.

After transmitting telegrams which in their value of the company's interest as well its sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 233, and forward same to Superintendent of Telegraph.

St. Paul. XXXX April 12, 1912.

J.C.Breedlove Tacoma

Solidify March 26th to A.R.Cook regard pipe on his requisition 116. See my letter to you March 25th. My understanding you will furnish all pipe on his requisition both Cast Iron and Vitrified. Please advise.

W. L. Darling

Tacoma, Washington, April 8, Mr. W. L. Darling, Chief Engineer. Dear Sir: Referring to your notation on copy of Mr. Breedlove's letter of March 26th regarding culvert pipe Tacoma-Tenino Line, Old Town Mill to Smelter: I enclose herewith copy of requisition No. 116, and think you must be in error in claiming not to have seen same Please be referred to your message to me dated before. March 21st, your letter of March 25th to Mr. Breedlove, copy to me, and your letter of samedate to me, copy to Mr. Breedlove. Yours truly, A. R. Que W-P Principal Assistant Engineer. Enc

Tacoma, March 26, 1912.

Mr. A. R. Cook,

Prin. Asst. Engineer,

Tacoma.

Dear Sir:

Answering yours of the 25th about your requisition No. 116, cast iron pipe. I only have 55 feet of 24-inch, 84 feet of 30-inch and 162 feet of 36-inch, all of which will be used on the Point Defiance line. Can, therefore, furnish none of the requisition.

Yours truly,

(Sgd) J. C. Breedlove

JCB-A Copy Mr. Darling Assistant Engineer.

Mr. A. R. Cook:
Referring to above:
Have not seen your requisition
No. 116. What does it cover?
W. L. Darling 4/4

5.5 8 2 1

COPY

Tacoma, March 26,1912.

Mr. A. R. Cook,

Prin. Asst. Engineer,

Tacoma.

Dear Sir:

Answering yours of the 25th about your requisition No. 116, cast iron pipe. I only have 55 feet of 24-inch, 84 feet of 30-inch and 162 feet of 36-inch, all of which will be used on the Point Defiance line. Can, therefore, furnish none of the requisition.

Yours truly,

(Sgd) J.C.Breedlove.

JCB-A Copy Mr. Darling. Assistant Engineer.

Mr. J. C. Breedlove,

Assistant Engineer,

Tacoma.

Dear Sir:

I hand you herewith Mr. Cook's requisition for pipe for that portion of the line north of the tunnel. You should certainly be able to furnish this to him in time to be used. The contract is not yet let, and it probably will be several weeks before any pipe will be needed.

Yours truly,

WLD-D

Chief Ungineer.

Cy ARC

The Vitigers pipe own sarling some all to be

Mr. A. R. Cook,

Principal Assistant Engineer,

Tacoma.

Dear Sir:

Referring to your requisition of the 6th instant relative to pipe for Tacoma-Tenino Line:

This I understand will not be needed for a long time, and as there is

Mr. A. R. Cook,

Principal Assistant Engineer,

Tacoma.

Dear Sir:

Referring to your requisition of the 6th instant for pipe for Tacoma-Temino line:

This I understand will not be needed for a long time yet, and there is no reason why Mr. Breedlove cannot furnish it from Auburn. I am advised that one set of forms is now ready and that from now on there will be no delay, because until other forms are made he can put all his work on a certain kind of pipe.

Yours truly,

MID-D

Chief Engineer.

Cy JCB

Mr. A. R. Cook,

Principal Assistant Engineer,

Tacoma.

Dear Sir:

Referring to your requisition of the 6th instant relative to pipe for Tacoma-Tenino Line:

This I understand will not be needed for a long time, and as there is



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223 by sc hn. Tacoma, Mar. 23

W.L. Darling,

STPaul

Buff. re .- cast iron and vitrified pipe old town mill to ruston. Breedlove has 55 feet 24 inch, 72 feet 30 inch, 162 feet 36 inch cast iron pipe. He advises however wishes to keep this pipe for his own work, 2100 feet of vitrified pipe for low fills to take springs from Hillside and deliver in bay outside of smelter track.

A R.Cook ... 441pm



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After transmitting telegrams which in their judgment for the days well the company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy of Fig. 235 and forward ame to Superintendent of Telegraph.

St. Paul. March 21, 1912.

A.R.Cook Tacoma

Your requisition No. 116. You must get cast iron pipe from Breedlove. What is the 2100 feet of vitrified pipe needed for.

W.L. Darling

Supply S	Agent's	Regn. A	Vo)
Division		11 11	116	
Sheet :			66	
	To the	e PURC	CHASING.	AGENT,

Northern Pacific Railway Company.

Tacoma, Wash., March 6, 1912. 191

ITEM NUMBER	QUANTITY	Prin		esistant E		er, at	Estimated Cost	For What Purpose Ordered	Supplies will be turnished only upon the written requisition of the heads of Departments, and the officer making the requisition must state fully and minutely where and for what purpose the articles ordered are to be used. If this is not done the requisition must be returned for the in-
	69 360 1490	lin.	ft. 30" ft. 36" ft. 24"	Cast Iron Cast Iron Cast Iron Vitrified	Pipe Pipe	B. S.		mp.	red in connection 809 (11) Tacoma-
	432 11 1	lin. : 24" l, 30" l,	ft. 36" /8 bends /8 bend /8 bends		pipe	D.S.			
Annrai		00 1/		•11					
Approd		90 1,							(Sign Here.)
Approx.				5					(Sign Here,) (Title)

Eacoma, April 11, 1912.

1912 1912

Mr. A. R. Cook,

Prin. Asst. Engineer,

Tacoma.

Dear Sir:

Answering yours of April 3rd about getting reinforced concrete pipe from Auburn for that portion of the line east of the Smelter tunnel. We have not yet gotten the 36-inch forms from the shops and the Griffin Wheel Company seems to be having allkinds of trouble getting out this size form. I think, therefore, you had better arrange to get the 36-inch pipe from some other point. I will be able to furnish you the 24-inch pipe you will need from the Auburn plant.

You are wrong in your understanding that I have 30-inch forms. I advised you that I will have only 24-inch forms and 36-inch forms and will be able to make only these two sizes. If you cannot use the 24-inch in place of the 30-inch you should arrange to get the 30-inch size from some other point.

Yours truly,

aband) J. O. MARENAOVE

JCB-A Copy Mr. Darling. Assistant Engineer.

Saint Paul, April 8, 1912.

Ir. J. C. Breedlove,

Assistant Engineer,

Tacoma.

Dear Sir:

Replying to your letter of the 3rd instant:

The cement testing apparatus is not yet

ready, but will be sent you by express the latter part

of this week.

Yours truly,

WLD-D

Chief Engineer.

Mr. W. L. Darling,
Chief Engineer,
St. Paul.

Your message this date about my requisition
No. 84 for cement testing apparatus. Porter Bros.,

Your message this date about my requisition to. 84 for cement testing apparatus. Porter Bros., Grant Smith & Co. have two outfits started on concrete culverts, one at Tenino and one at the south end of the Nisqually fill, and it will only be a short time until we will be ready to put in the tunnel portal at the west end of the long tunnel, and it is important that I get this cement testing apparatus as quickly as possible so that I can make some tests other than the crude short time tests which I can make without proper apparatus. Hope you will hurry all possible.

Yours truly,

Massistant Engineer.

JCB-A

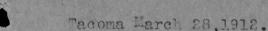


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long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

527 by sc m 1235a



W.L. Darling,

Straul.

See my requisition 84 ED 159, SA 2071. Please advise when we will get delivery on items covering on this requistion and hurry all possible.

J.C. Breedlove.

for Coment Jesting Laborator

Memorandum

Mr. O. C. Wakefield:

Will you please hurry all possible the cement testing apparatus on ED 159 SA 2071. Assistant Engineer Breedlove is wiring asking when he will get delivery.

W. L. Darling

St.Paul 3-29-12



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After transmitting telegrams which in their judgment would have served the Company structed as long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

spul 2-1912

J. C. Brudlove

Hove nothing definite yet as

to delivery items your requestion

& comment testing boborston

Same being rushed

wxwarling

Saint Paul, March 21, 1912. Mr. J. C. Breedlove, Assistant Engineer, Tacoma. Dear Sir: Replying to your letter of the 18th instant: Think we should allow the S. P. & S. \$50.00 for the cement testing machine, and if they will present bill in the usual way will approve it. Yours truly, Chief Engineer. WID-D

Tacoma, March 18, 1912. Mr. W. L. Darling, Chief Engineer, St. Paul. Dear Sir: Please note attached copy of letter from the General Purchasing Agent of the S. P. & S. offering the cement testing machine which Mr. Budd has sent to me for use on the Point Defiance line for \$50.00. This machine originally cost \$250.00. Would recommend purchase at \$50.00. Please advise if all right to accept bill for this amount. Yours truly, JCB-A

SPOKANE, PORTÍAND & SEATTLE RAILWAY COMPANY.

Portland, Oregon, Mar. 13,1912. B-2809

Mr. Breedlove, Asst.Eng., Northern Pacific Rwy., Tacoma, Wash. Dear Sir:-

Referring to Chief Engineer's letter March 11th regarding cement testing outfit.

Please advise if you will purchase same.

If so, will dispose of it for \$50.00.

Yours truly,

(Sgd) F.A.Bushnell

FAB/HH.

General Purchasing Agent

3677



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

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449. BY. O. SI.

Tacoma Wn Mar 13th 1912.

88147

W. L. Darling

St. Paul Minn.

Browsing about tunnel cement, I figure 26,000 barrels required, Mr Bennett says he is unable at present time to even give approximate rate of delivery he will want but thinks perhaps one twelfth every thirty days or possibly a little less.

1050PM

Sher zu

J.C. Breedlove.





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It control has a served the Company's interest as well if sent by train mail, or which appear unnecessarily and forward same to Superintendent of Telegraph. After transmitting telegrams which it their

St. Paul, March 13, 1912.

J.C.Breedlove

long, operators are required to attach a con

Tacoma

Your wire about cement. Cannot wait for you to find out about distribution. Cement going up rapidly, We will make requisition here and send you copy.

W. L. Darling

TELEGRAM, pCOPural properties of the control of the

1

St. Paul, March 11, 1912.

J.C.Breedlove

Tacoma

When will we get requisition for cement for tunnel.

Show dixection delivery on the requisition. Answer.

W. L. Darling



All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank. After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

Tacoma, March 12

W.L. Darling.

STPaul

Will send reqn. for tunnel cement as soon as I can get rate of delivery which Mr Bennet thinks he can take of.

4700 hindling Rustin.

MARIONE EN PARTE P

Saint Paul, March 6, 1912.

Mr. W. L. Darling:-

Replying to your notation of the 29th, and returning Mr. Breedlove's letter showing the proposed layout for the concrete pipe plant at Auburn pit:

In general, I can see no objections to the arrangement. If constructed on lines similar to those proposed, the labor cost should be reduced to a minimum, and
you should be able to get out some cheap pipe.

I assume that the location places the plant in close proximity to the most suitable deposit of gravel and sand to be found in the pit. If this is so, I believe the location is O.K.

W. C. SMITH.

DICTATED.

Northern Pacific Railway Company

Tapoma, February 19, 1912.

Mr. W. L. Darling,

Chief Engineer,

St. Paul.

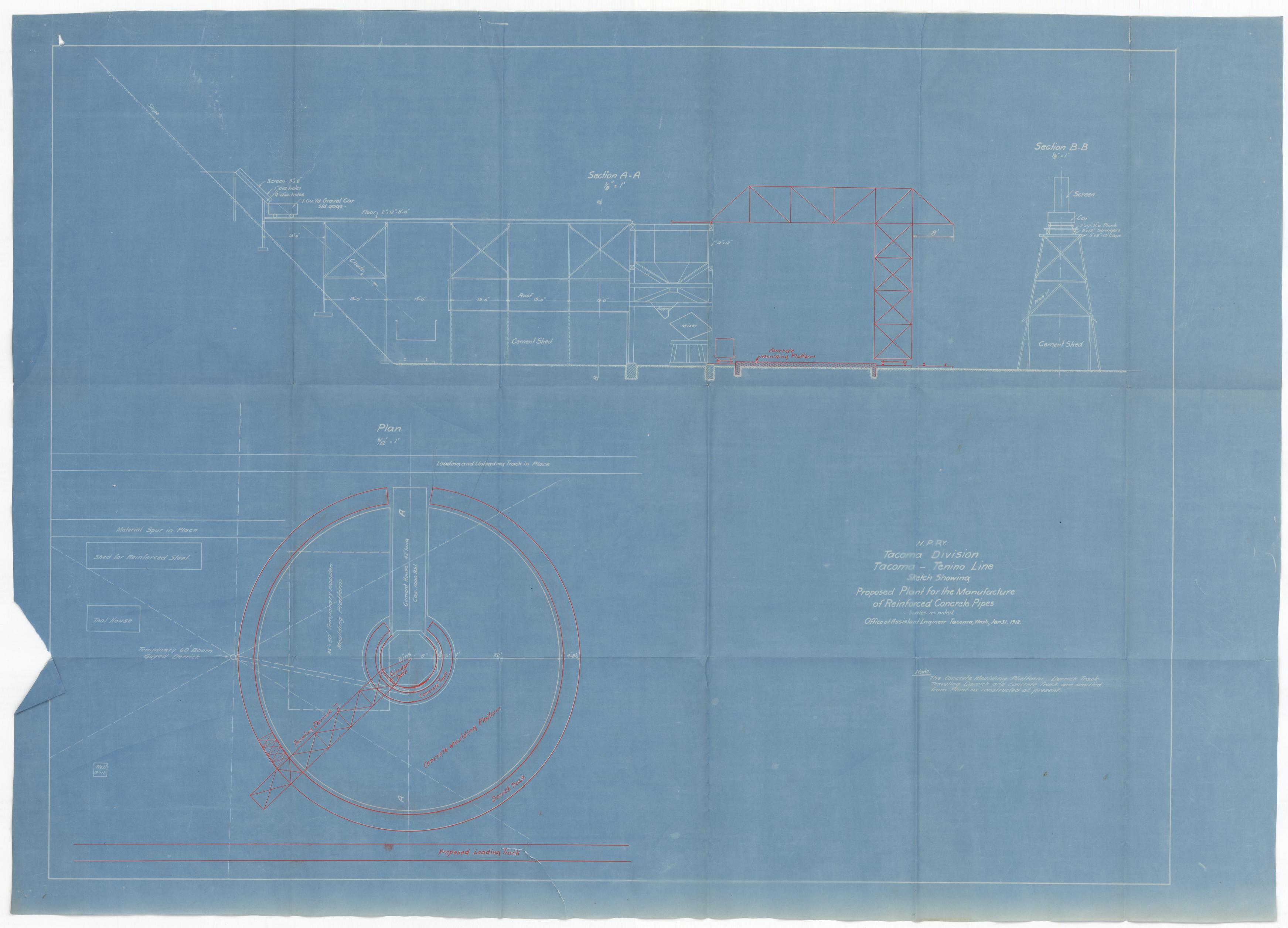
Dear Sir:

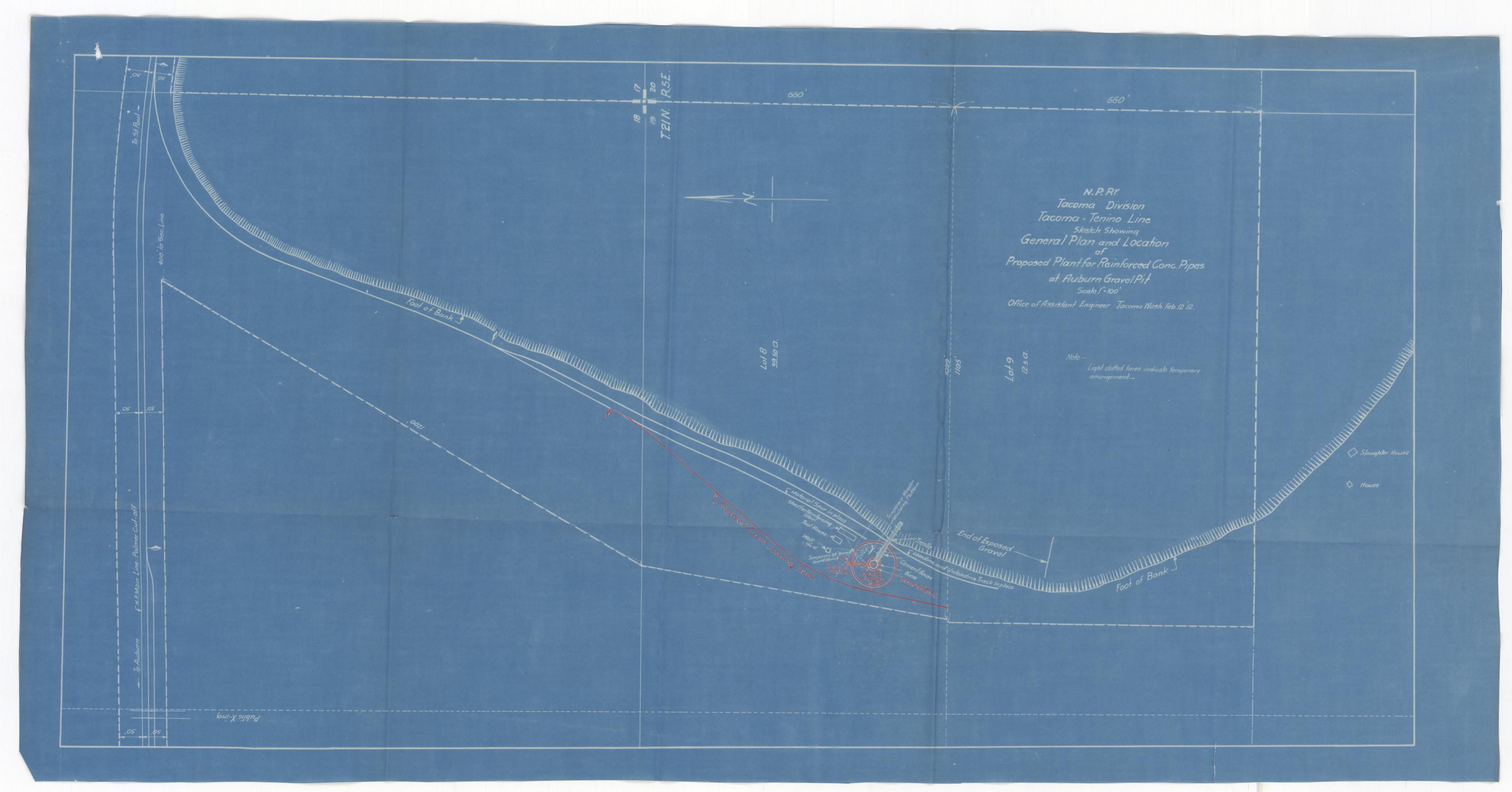
I hand you herewith two blueprints each of plans dated this office Feb. 12, 1912, and Jan. 31, 1912, showing the proposed location of concrete pipe plant at Auburn pit, and the general plan of present and future layout. The future extensions are shown colored in red.

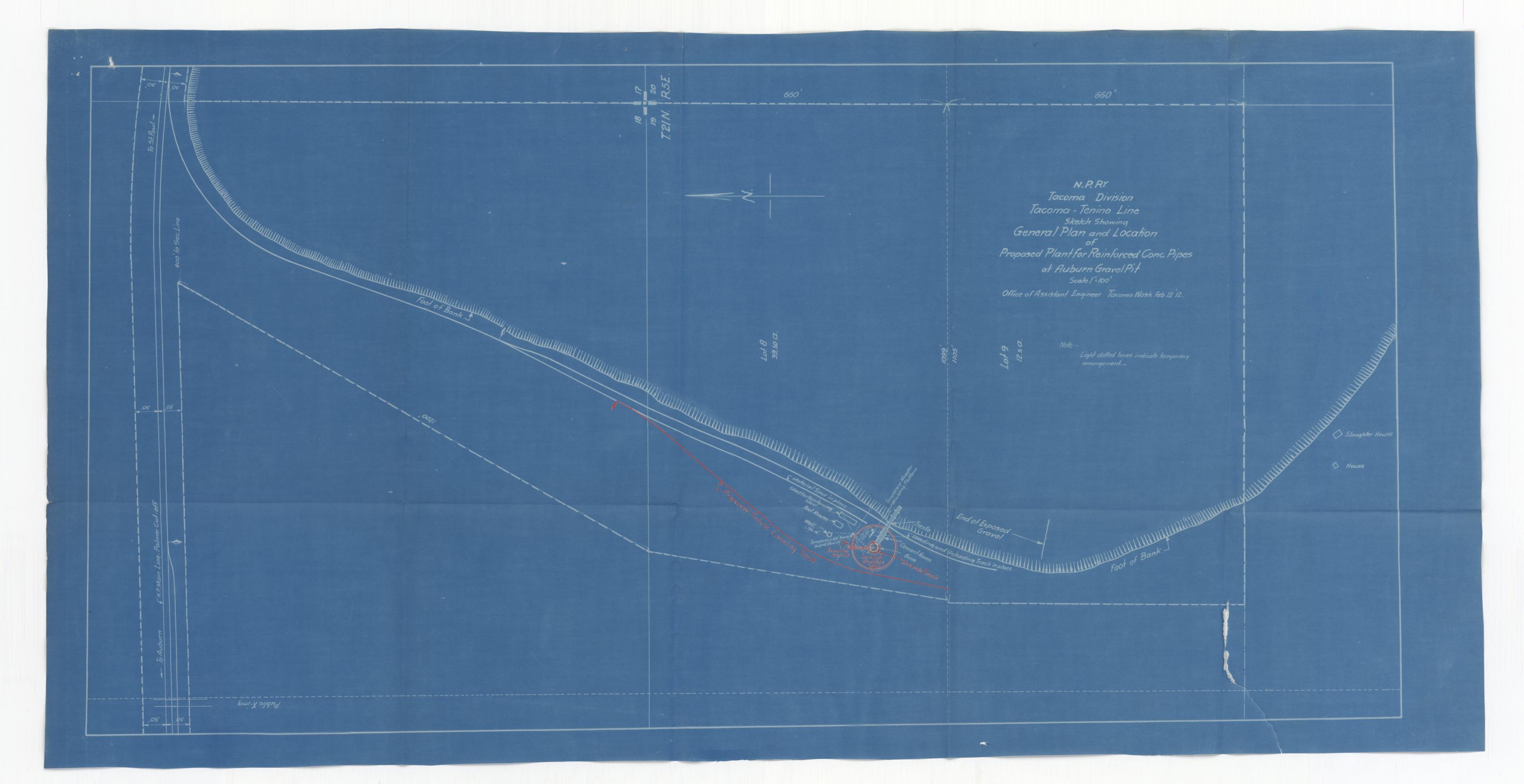
You understand that the plant which we will have will be available for making concrete pipe for use on the Point Defiance work only. Should it be desired, during the process of making this pipe, to make pipe for use of the Operating Department, also concrete slabs and piles, it will be necessary to enlarge the plant to do the additional work. This, however, Ithink you understand. I suggest, however, that matter be taken up with Operating Department, and their needs ascertained, so that in the event that they will want any of the above items, whatever work necessary to do to increase plant may be done now, so that there will be no necessity for delaying their work.

Yours truly,

Assistant Engineer.







At Tacoma, March 2, 1912. Mr. J. C. Breedlove, Assistant Engineer. Dear Sir: Replying to your letter of the 1st instant: I would very much prefer to have you do your own testing of cement. I think it will be possible to borrow the machine used on the Columbia River bridge, which machine is now in posession of the S. P. & S. I suggest you take up with Mr. Budd and see if you cannot rent the machine during construction of the tunnel. I think it is very necessary that the cement be tested accurately, and also for you to know that the cement as tested actually goes into the work. Yours truly, Chief Engineer. WLD-D

Morthern Pacific Railway Company

Tacoma, March 1, 1912.

Mr. W. L. Darling,

Chief Engineer,

st. Paul.



On the Point Defiance line we will have on bridge, tunnel and pipe work, approximately 30,000 barrels of cement, which will have to be tested. The Heinrich Technical Laboratories, of Tacoma, have made an offer to test the cement, in quantities of from 25,000 to 50,000 barrels, at rate of four cents per barrel. Included in this is taking of all samples and expenses incidental to testing, where the cement is delivered at or near Tacoma.

I have gotten figures from the Fairbanks-Morse Company on cost of 1,000-lb. cement testing outfit,

which includes the following items:

- 4 Briquette molds in three-piece gangs,
- 12 individual briquette molds,

 - 1 Vicat needle machine, 1 1,000 briquette machine,
 - 3 cement sieves, Nos. 50,100 and 200,
 - 2 sand sieves, Nos. 20 and 30.

For the above outfit they make a price of \$275.00, delivered in thirty days.

Should we get the outfit at the above expenditure, it would be necessary to fit up some sort of a temporary laboratory to make tests and probably

be necessary to pay a man, account of making the tests, at least \$100.00 per month and expenses. As these tests would probably extend over at least 18 months, the expense for us to do the testing ourselves would be approximately as follows:

Salary of Testing Engineer,	\$1800.00
Expenses,	540.00
Cost of testing outfit,	275.00
Fixing up laboratory,	250.00
	\$2865.00
Total.	\$200000

Assuming that 30,000 barrels will be used on the job, at the figure of the Heinrich Laboratories the cost to us would be \$1200.00.

The Robert W. Hunt Co., with branch office in Seattle, are to submit a bid but have not yet done so. I am quite sure, however, that they will not come under the figure of four cents per barrel. It would, therefore, seem more economical on our part to let a contract with the Heinrich Laboratories to do the testing.

We have two cars of cement now at Auburn, for which I will arrange to have tests made locally. Would like to get matter settled for the handling of the whole job. Would be glad to have you advise me as soon as possible what you think best to do.

Yours truly,

Juston of his

Assistant Engineer.

JCB-A





ADDRESS ALL COMMUNICATIONS TO THE COMPANY.

THE AMERICAN CLAY MACHINERY CO.

MANUFACTURERS OF

CLAY WORKING № SAND-LIME BRICK MACHINERY.

0000

GENERAL OFFICES, BUCYRUS, OHIO. FACTORIES AT BUCYRUS 趣 WILLOUGHBY, OHIO.

BUCYRUS, O., U.S.A.

Feb 21 1912

Northern Pacific Railway company,

Attention, Mr. W. L. Darling, Chief Engineer,

St. Paul, Minn.

Gentlemen:

This will acknowledge receipt of your letter of the 19th and we note that the tile factory referred to is a small plant for making concrete culvert pipe.

We wish to thank you for this information and the promptness in which you replied to our previous letter.

Very truly yours,

HLH/EEB

The American Clay Machinery Co.,

MGR. SALES DEPT.

Partial List of Machines we Build for Clay Workers

Alsip Conveyor System, Cable Conveyor

Auger Brick Machine

Barrows and Trucks

Blowers and Fans

Brick Dies

Brick Setting Machinery

Brick Conveying Machinery

Buffing Machine

Clay Steamers Clay Feeders

Combined Auger Machine and Pug Mill

Conduit Machinery

Conveyors

Crushers

Cutting Tables

Cutting Wire

Drain Tile Machinery

Disintegrators

Dry Cars

Dryers

Dry Pans

Dry Press Brick Machinery

Dump Cars

Elevators

Elevating Platform Cars

Electrical Driven Clay Working Machinery

Engines and Boilers

Fire-Proofing Machinery

Flat Cars

Floor Tile Machinery

Friction Clutch Pulleys

Granulators

Gravity Haulage

Hand Power Presses

Hand Winch

Hoists

Hollow Building Block Machinery

Jacks

Kiln Irons

Molds

Mold Sanders

Paving Brick Machinery

Plunger Machines

Pottery Machinery

Pug Mills

Pulleys, Couplings, Hangers, etc.

Reduction Mills

Represses

Rock Crushers

Roofing Tile Machinery

Rotary Dryers

Runner Brick Press

Sand Dryer

Sand-Lime Brick Machinery

Screens

Sewer Pipe Cutting Tables

Sewer Pipe Dies

Sewer Pipe Presses

Sewer Pipe Trucks

Sizing Machinery

Slip Spray Pump

Soft Mud Brick Machinery

Steam Pump

Steam Trap

Transfer Cars

Turntables

Unloading Device for Pans

Wet Pans

Winding Drums

Winches

THE AMERICAN CLAY MACHINERY CO.

BUCYRUS, OHIO

367) February 19, 1912.

The American Clay Machinery Co.,

Bucyrus, Ohio.

Gentlement

Replying to your letter of the 17th instant:

The tile factory to which you refer is merely
a small plant for making concrete culvert pipe.

Yours truly,

WLD-D

Chief Engineer.

R.C. PENFIELD, Pres't. & Gen'l. Mor. NEW YORK.

L.W.PENFIELD, Vice Prest. & Res.Mgr. R.O.PERROTT, Secretary. WILLOUGHBY, OHIO. BUCYRUS, O.



CLAY WORKING, POTTERY, SAND-LIME BRICK AND CEMENT MACHINERY.

GENERAL OFFICES, BUCYRUS, OHIO. FACTORIES AT BUCYRUS WILLOUGHBY, OHIO.

NEW YORK OFFICE, 50 CHURCH ST. CHICAGO OFFICE, 815 CHAMBER OF COMMERCE. ADDRESS ALL COMMUNICATIONS TO THE COMPANY.

RIGHT

Bugyrus, O., U.S.A.

February 17th, 1912.

W. L. Darling, Chief Engr.,

The Northern Pacific Railroad Co.,

St. Paul, Minn.

Dear Sir:

CABLE ADDRESS

"BRICK" BUCYRUS, O. CODES USED

LIEBER, A.B.C. WESTERN UNION

We are just in receipt of a report to the effect that it is the intention of your Company to erect a tile factory at Auburn, Wash., and as we make every kind of machine and appliance for use about a clay products plant of any kind, we are writing to inquire whether you are now in position to receive bids on the necessary machinery and equipment, kilns, dryers, etc.

In looking through our files we note that we have had some correspondence with Mr. Thomas Cooper, Land Commission of your Company regarding a clay test, and should this be the same proposition we would be pleased to know it, so as to correct our records.

Awaiting your reply, we are,

Yours The American Clay Machinery Co.,

EVERYTHING FOR THE CLAY WORKER COVERS A MULTITUDE OF ABTICLES TO NUMEROUS TO MENTION BUT THE LIST ON REVERSE SIDE MAY SUGGEST SOMETHING OF INTEREST. FULL PARTICULARS ON REQUEST TO US OR ANY OF OUR REPRESENTATIVES. THE AMERICAN CLAY MACHINERY CO.

BUCYRUS, OHIO

Partial List of Machines we Build for Clay Workers

Alsip Conveyor System, Cable Conveyor

Auger Brick Machine

Barrows and Trucks Blowers and Fans

Brick Dies

Brick Setting Machinery

Brick Conveying Machinery

Buffing Machine

Clay Steamers

Clay Feeders

Combined Auger Machine and Pug Mill

Conduit Machinery

Conveyors

Crushers

Cutting Tables Cutting Wire

Drain Tile Machinery

Disintegrators

Dry Cars

Dryers

Dry Pans

Dry Press Brick Machinery

Dump Cars

Elevators

Elevating Platform Cars

Electrical Driven Clay Working Machinery

Engines and Boilers

Fire-Proofing Machinery

Flat Cars

Floor Tile Machinery

Friction Clutch Pulleys

Granulators

Gravity Haulage

Hand Power Presses

Hand Winch

Hollow Building Block Machinery

Jacks

Kiln Irons

Molds

Mold Sanders

Paving Brick Machinery

Plunger Machines

Pottery Machinery

Pug Mills

Pulleys, Couplings, Hangers, etc.

Reduction Mills

Represses

Rock Crushers

Roofing Tile Machinery

Rotary Dryers

Runner Brick Press

Sand Drver

Sand-Lime Brick Machinery

Screens

Sewer Pipe Cutting Tables

Sewer Pipe Dies

Sewer Pipe Presses

Sewer Pipe Trucks

Sizing Machinery

Slip Spray Pump

Soft Mud Brick Machinery

Steam Pump

Steam Trap

Transfer Cars

Turntables

Unloading Device for Pans

Wet Pans

Winding Drums

Winches

THE AMERICAN CLAY MACHINERY CO. BUCYRUS, OHIO

St. Paul, February 19, 1912. Mr. J. C. Breedlove, Assistant Engineer, Tacoma. Dear Sir: Replying to your letter of the 14th instant: The blueprints enclosed for 24 and 36 inch reinforced concrete pipe forms are all right, and in line with what Mr. Bell and I discussed. Yours truly, Chief Engineer. WLD'_D

Northern Pacific Kailway Company

Tacoma, February 14, 1912.

Mr. W. L. Darling,

Chief Engineer,

St. Paul.

Dear Sir:

I hand you herewith two blueprints showing the plans for the 24-inch and 36-inch reinforced concrete pipes. These forms are now being made in the Tacoma shops the Griffin Wheel Company. The plan was made up by Mr. J. W. Bell, and it is my understanding that it is in accordance with his talk with you.

Yours truly,

JCB-A

Assistant Engineer.

3677

St. Paul, February 16, 1912.

Fr. J. C. Breedlove,

Assistant Engineer,

Tacoma.

Dear Sir:

Replying to your letter of the 12th instant:

Yes sir; the cost of installing the plant for making reinforced concrete pipe should be charged to the Point Defiance Line until taken over by the Operating Department.

Yours truly,

WLD-D

Chief Engineer.

Morthern Pacific Railway Company

Tacoma, February 12, 1912.

Mr. W. L. Darling,

Chief Engineer,

St. Paul.

Dear Sir:

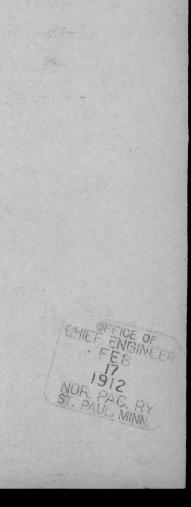
It is my understanding that the cost of installing the plant for making reinforced concrete pipe is to be charged to the Point Defiance line work until such time as we have made all pipe we will need on that line, and it will then be turned wer to the Operating Department and proper credit obtained.

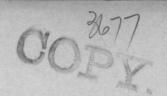
Yours truly,

Juston ton

Assistant Engineer.

JCB-A





Mr. J. F. Horrigan:

will you please hurry to destination 15 rolls of angle mesh netting loaded at Glendive February 14th in NP 27659 for J. C. Breedlove, Auburn. It is very important to get this shipment to destination without delay.

W. L. Darling

St. Paul, 2-15-12.



TELEGRAM, All Railway Messages must be written in ink on these blanks, within must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily

long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

-96 PY N.A

Tacoma Febr 19-1912

W.L.Darling.

St. Paul.

Your message 17th about second hand Hoisting Engine for Concrete plant. We hoisting engine in company stock and found second hand engine in good condition. Mr Crassweller has arranged to nurchase. See my message feby sixth and your reply 7th.

V

J.G. Breedlove. 11opm.



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

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COP

St. Paul, Feb. 17, 1912

J. C. Breedlove

Tacoma

Understand you are making purchase of second hand engine for concrete plant at Auburn. Understood this would be obtained from stock.

W. L. Darling



All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of seeding and receiving operators, call of sending office and hance of receiving station must be entered on this blank.

After transmitting telegrams which in their july slicin, would have served the Company's interest as well lif sent by train mail, or which appear unnecessarily long, operators are required to attack a copy to Roun 28% and law are to Superintendent of Telegraph.

St. Paul, February 17, 1912

J.C.Breedlove

Tacoma

Solomon 16th. We must have requisition in here for concrete mixer for pipe plant at Auburn. Please send promptly and you will get prompt returns.

W.L. Darling



All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for saiding and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which an their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily

359 BY Operator are required to attach a copy to Form 288, and forward same to Superintendent of Telegraph.

Tacoma Wn Feb 16th 1912.

W. L. Darling

St. Paul Minn.

Please have Mr Crassweller's office asked to buy a concrete mixer for concrete pipe plant at Auburn on my requisition No. 21. Unable to get any mixer from company stock on this end and understand none available elsewhere. Must have this promptly in order to get started with plant. Approximate cost 1,000.00 and is included in estimates for the plant totaling \$7500.00.

J.C. Breedlove.

1055 PM



COPY.

St. Paul, February 10, 1912.

Mr. J. C. Breedlove.

Assistant Engineer,

Tacoma.

Dear Sir:

Refefring to your letter of the 6th, in regard to my letter of January 23rd, about 3/8" reinforcing rods for use in connection with the manufacture of reinforced culvert pipe:

Please refer to ED requisition 27, copy of which was furnished you, and in which you will note that the reinforcing rods on hand at Sopenah consist of 1526 pieces 3/8" * 25. This appears to check with the quantities shown in your letter of the 6th.

If any change should be made in the requisition, please advise.

Yours truly,

REG-D

Chief Engineer.

Northern Pacific Railway Company

Tacoma, February 6, 1912.

Mr. W. L. Darling, Chief Engineer,

St. Paul.

Dear Sir:

See your letter of the 23rd of January, about 3/8" inch reinforcing rods available for use in connection with manufacture of reinforced culvert pipe.

In your letter you note 50,000 pounds on hand at Sopenah. This amount is in error, as we have only 18,856 pounds at both Sopenah and Centralia, or 38,150 lineal feet, which checks with amount as shown on your requisition No. 27.

I am arranging to have this sent to Auburn for use in manufacture of this pipe as have no call for this size rod at any other point.

Yours truly,

JCB-A

Assistant Engineer.

hu Dorling. While your beller to our Brushone soys 50000 lbs - The requisition states 1526 fro 3/8 x 25 can be furnished from sopenal which checks with the 38 155 lucie fut hu Budlove has meg

3677



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well it's sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

201 by se 1 425p

Tacoma Pebruary 8,1918.

W.L. Darlibng,

Stpaul.

Your message 7 th about cost concrete pipe plant. Estimated cost including derrick with hoisting engine and boiler cast-iron forms concrete mixer and pump with necessary buildings and platforms and tools seventy four hundred dollars. Will have the plans ready to send you in two or three days.

J.C. Breedlove.



All Railway Messages must be written in parties on trains (except trains new) emily sending and receiving operators, call of sending office and name After transmitting telegrams which in their judgme long, operators are required to attach a copy to Folia 23

fink in these blanks, which must not be used for other purposes, and those for sealed envelopes. The exact time sent, time received, personal signal of must be entered on this blank. Company's interest as well if sent by train mail, or which appear unnecessarily

J.C.Breedlove, Tacoma.

St. Paul. February 8, 1912.

Your letter 3rd and message 6th. Approximate estimate on erection of plant for pipe \$7500.00. Understand from your letter that you are going to put in gravity plant. What is estimated cost. We have no authority to go beyond original estimate. Send plans for approval. OK to make requisition for such material as you need there pending approval of plans.

W. L. Darling



All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending office and name of receiving station must be entered on this blank.

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6 by h hn.

Tacoma Feb.6th

W.L.Darling, STPaul, 1

Find that we will not be able to get from N.P. stock hoisting engine Concrete mixer, Pump or boiler needed for Concrete pipe plant at Auburn. My understanding it will be all right to place the order for these with purchasing agent here, Please advise. Am sending today required to purchasing agent here for lumber, small tools, iron and oil required for the plant.

J.C. Breedlove 211am 7th



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in scaled envelopes. The exact time sent, time received, personal signal of sending office and name of receiving station must be entered on this blank.

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A

St. Paul.

Feb. 2nd, 1912...

COPY.

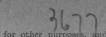
J. C. Breedlove,

Tacoma.

Please have Bell send W C Smith time return with distribution for time worked in January.

W. L. Darling.

REG R





All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending office and name of receiving station in the entered on this blank.

After transmitting telegrams which in their judgment word if avec erred to be on sany's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 23% and its ward sa

FORM 1386

St. Paul, January 29, 1912.

J. C. Breedlove, Tacoma.

Your wire 27th. Blueprint of 24inch and 36 inch forms go to you tonight.

W.L. Darling

Mark spirith shap the

for aspert

See See

TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

• After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

824. BY. Q. SI.

Tacoma Wn Jan 27th 191 .

W.L. Darling

St. Paul Minn.

Mr Bell advises two sets blue prints of form plans for the 24 inch and 36 inch reinforced concrete pipes were to be sent out the next day after he left St. Paul have not yet been received, please hurry and advise when they left St. Paul.

.J.C.Breedlove.

1047PM

In Berghon wie have there nearly laday

347

Northern Pacific Railway Company

Tacoma, Wash., February 3, 1912.

Mr. W. L. Darling, Chief Engineer,

St. Paul, Minn.

near sir:

With further reference to the tools and machinery for concrete pipe plant at Auburn. I have been unable to find any hoisting engine, derricks or pumps that belong to the Company on the Coast. I think perhaps we can get a concrete mixer that is being used now by Mr. Craver on the Seattle Division, but I am not sure and am having the matter looked into. Part of the lumber we have on hand at Centralia yard, and am sending all that can be used to Auburn to start getting up the platforms and bins.

For such items as I cannot get from Company stock, will make requisition and ask Mr. Crassweller to purchase on the Coast, sending you copies of these requisitions.

With reference to the castiron forms, will complete the tracins showing the patterns by Monday, the 5th, and have asked Mr. Nutt to authorize Mr. Mallotte, Superintendent of Shops, to increase his force of pattern makers so as to get these out promptly; and arrange with the Griffin Wheel Company to make the castings as soon as the patterns are completed. Think ten forms for 24" pipe and five or six for the 36" will be sufficient.

JCB-S

Yours truly, Muhalland

FORM 1386



TELEGRAM All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operating are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

308 by sc m 845p

Wacoma Feb 3,1912.

W.L. Darling.

S paul.

Browsing about pipe plant. Have started gang at Auburn Pit Levelling off site and am sending all available lumber from Centralia material. Yard to this point and have today made requisition for balance of lumber required and for small tools and Iron, tracing of Patterns for cast-iron forms will be completed monday and have asked Mr. Nutt to increase force pattern makers at shops to get out quick ly See letter to you this date, which gives complete details.

J.C. Breedlove.



TELEGRAM. All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in scaled envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

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81 Paul 7 ch 3 - 1912

Je Brudlove Tacoma

of pipe plant and what being done towards construction - Hove all

wexalling

Northern Pacific Railway Company

Tacoma, Wash., February 3, 1912.

Mr. W. L. Darling,
Chief Engineer,

St. Paul, Minn.

Dear Sir:

Answering yours of January 23rd further about location and construction of concrete pipe plant on the Coast. I attach hereto copy of my letter of January 29th to Mr. Nutt, and copy of his reply of February 1st, from which you will note he thinks it is alright to put the plant at Auburn, at least such part of it as will be needed for getting out pipe. Mr. Nutt has been away and I have not had an opportunity to talk with him, but I am pretty sure Auburn will be satisfactory as a permanent location, and I will now put in such part as is needed for the Point Defiance plant; permanent plant could be put up later.

I will send you within a few days sketch showing proposed plant and location.

Yours truly,

Assistant Engineer.

JCB-S enc.

COPY At Spokane, February 1, 1912.

Mr. J. C. Breedlove,

Assistant Engineer,

Tacoma, Wash.

Dear Sir:

I have your letter of the 29th with copy
of one from Mr. Darling relative to the location of a plant
which you are going to build somewhere on the Coast for
building re-enforced concrete pipe for the Point Defiance
work.

In view of the statement that you and Ur. Perkins are satisfied that the location at Auburn is satisfactory so far as the building of the pipe for the Point Defiance Line is concerned, I believe it had better be built there rather than at some point in the vicinity of Steilacoom as was first suggested. I am satisfied that we can utilize the plant to good advantage for building re-enforced pipe for maintenance work, whenever you have finished making what pipe you need for the Point Defiance Line, if it is located at Auburn, and when we decide whether to provide a plant for building concrete piles and slabs, we can then determine whether to enlarge this plant you build at Auburn or to locate it somewhere else, depending upon what the prices of materials may be at that time.

Yours truly,

(Sgd) H.C. Nutt.

Copy to Mr I.B. Richards.

Mr. H. C. Nutt,

Fourth Vice President,

Tacoma, Wash.

Dear Sir:

I attach hereto copy of letter from Mr. Darling with reference to the construction of concrete plant at some point on the Coast for making reinforced culvert pipe at present, ultimately for making concrete piles and slabs, also.

I went out to Auburn this morning with Mr. Perkins...
and Mr. mell and looked over the situation at the gravel pit
there, and the location for the present purposes, at least,
seems to be ideal. Mr. Perkins was of the opinion that Auburn
would be preferable to a location further east, on account
of the better quality of the material. So far as item of
freight on cement and on reinforcing steel between the points
is concerned, I believe the same rate applies between eastern
points and the Coast and Pasco, or possibly Pasco would take
a little higher rate. As to the amount of pipe that would be
required east or west of the Cascades for maintenance workp

I am quite anxious to get this plant started promptly, and have told Mr. Bell to go ahead with the design on the basis of placing it at Auburn, where, with approximately 150 foot faceof the pit, we can so arrange our bunkers as to have

Mr. H. C. Nutt -2-

everything work by gravity and minimize the handling of the amount of material necessary.

at the present time in so far as we are interested in maing pipe for the Point Defiance line, and if it is later determined, for maintenance pusposes, to have a plant at some other point, the cost of removal would be much less than the increase in cost of pipe due to longer haule-this applying only, of course, to the Point Defiance work.

I should appreciate it if you would reply as to what you think best to do as early as possible, so that we can get the construction of the plant under way.

Yours truly,

Assistant Engineer.

JCB-S enc



Morthern Pacific Railway Company

Tacoma, Wash., January 27, 1912.

Mr. W. L. Darling,

chief Engineer,

St. Paul, Minn.

Dear Sir:

Answering yours of the 23rd about concrete plant for making concrete pipe for Point Defiance line.

I have talked with Mr. Nutt about this in a general way, and he wanted to investigate the matter more thoroughly before making his recommendation as to the proper location. He suggested both Auburn and Pasco and thought perhaps Pasco would be the best place provided suitable material could be obtained. However, this morning I have talked with Mr. Perkins and he does not think the gravel at Pasco is anywhere near as good as that obtained near Auburn.

As soon as Mr. Bell gets here, Mr. Perkins and myself will go to Auburn and look the matter up and have a further talk with Mr. Nutt, and I will advise you again. So far as the Point Defiance work is concerned, the Auburn location would be the best on account of the short haul on material.

Yours truly,

Assistant Engineer

St. Paul, January 23, 1912.

Mr. J. C. Breedlove,

Asst. Engineer, Tacoma.

Dear Sir:

The President has authorized the construction of the concrete plant at some point on the Coast, and has authorized me to arrange with the Operating Department to select a suitable location to put up the plant, and has suggested that Auburn would be a good place because from that point distribution could be made of pipe north, east and south with a minimum amount of operating inconvenience.

The question arises, however, as to whether the gravel in the pit is suitable, and consequently I wish you, Mr.

Perkins and Mr. Bell would make an early trip to Auburn to examine the conditions there and see if the material is all right; if so, take up with Mr. Nutt and arrange for the location and begin construction of the plant immediately, the plant to be designed so that it will be similar to the one at Glendive, unless there are some suggestions for improvements, the work to be done now to be merely that necessary to get out pipe for the Point Defiance Line, but to be in line with eventual completion of the plant, As the contractors will need pipe within 60 days, it is necessary that work be begun there at once. I understand most of the material should be made or purchased on the coast, and that the engine and boiler are available from

J. C. B. Page 2.

Operating Department stock.

Won't you please get after this as soon as possible and advise me what you all agree upon relative to the Auburn location.

Yours truly

WLD-D

Copy to Mr.Bell

Chief Engineer.

3645

Northern Pacific Railway Company

b

Saint Paul, January 22, 1912,

Mr. W. L. Darling,

Chief Engineer.

Dear Sir:

I have your letter of January 18th about constructing a concreting plant for the purpose of making reinforced concrete pipe to be used for the Point Defiance Line and later on to be used for general work in the State of Washington.

Even discounting the figures submitted by you, it seems very clear that it is economical for the company to establish a plant at some point in the west and you are hereby authorized to arrange with the Operating Department to select a suitable location and put up the plant.

I should think Auburn would be a good place because from that point we could distribute the pipe north, east and south with a minimum amount of inconvenience; also because we have considerable ground there and can get gravel and other material at that point as conveniently as anywhere.

Yours truly,

Emulation .

President.

St. Paul, January 18, 1912.

Mr. Howard Elliott,

President.

Dear Sir:

In connection with the construction of the Point

Defiance Line there will be needed approximately 10410

lineal feet of pipe, which will cost, F. O. B. cars at

Northern Pacific points, \$31,796.00.

The freight will be additional, 16,962.00

Total 48,758.00.

Reinforced concrete pipe can be made on the ground for the same lengths and sizes at a cost of. \$11,880.00

Maintenance and operation of plant, 3,938.00

Freight on steel and cement,

855.00

Total

\$16,673.00

showing a saving of \$24,585.00 after deducting \$7,500 for the cost of the concrete plant.

I hand you herewith a blue print showing the details and method of arriving at the saving, also a letter from Assistant Engineer Bell, who has had charge of the Glendive plant, setting forth the details that go to make up the cost of the proposed plant.

In view of the saving that can be made, I would recommend that this plant be put in at once, so that pipe can

now the plant can begin to deliver material in about eight weeks, and complete the bill in about five months thereafter. The plant would also be available for making pipe for the operated lines on the Coast.

Yours truly,

Chief Engineer.

WID-D

Enc

Mr. Howard Elliott,

President.

Dear Sir:

In connection with the construction of the Point
Defiance Line there will be needed approximately 10410
lineal feet of pipe, which will cost, F. O. B. cars at
Northern Pacific points,

The freight will be additional,

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In view of the saving that can be made, I would recommend that this plant be put in at once, so that pipe can

be furnished as soon as needed. If requisitions are made now the plant can begin to deliver material in about eight weeks, and complete the bill in about five months thereafter. The plant would also be available for making pipe for the operated lines on the Coast.

Yours truly,

Chief Engineer. .

WLD-D

Enc -

Northern Pacific Railway Cowpany

St. Paul, Jan. 18th, 1911...

Mr. W. L. Darling,

Chief Engineer.

Dear Sir: -

Herewith table showing comparison of costs of cast iron and reinforced concrete pipe for the Tacoma-Tenino Line.

The cost of the concrete plant is based on using second hand machinery and cast iron or steel forms. Estimate for the plant follows:

26 C I or steel forms	\$2600.00
Cement house,	160.00
Derrick	1200.00
Mixing Plant,	1400.00
Moulding Platform,	500.00
Tools and Tool House,	500.00
Water supply	200.00
Tracks	540.00
Incidentals,	\$7500.00

This plant can be erected in about six weeks and first pipe shipped two weeks after plant is completed.

Yours truly,

Provisses

Comparison of costs of cast iron and reinforced concrete pipe for Tacma-Tenino Lime.

Cina Ti	nool De	00 at 0	I P at \$30		Reinforced concrete pipe				Freight		
Size Lineal Pipe Require		Pipe	Fre ight	Total	Per Lin Ft.		Plant Mtce & Per Lin Ft	Operation Total	en Steel	TOTA	_
24" Dia	6530	\$15388	\$8206	\$23594	\$1.00	\$6530	.34	\$2220	\$425	\$9175	1.40
36" "	3770	15607	8324	23931	1.37	5165	.44	1659	415	7239	1.92
10	110	801	432	1233	1.68	185	.54	59	15	259	
Totals, 10		\$31796	\$16962	\$48758		11880		\$3938	\$855	\$16673	

Total cost of C. I. Pipe including freight \$48758

Total cost of Reinf creed concrete pipe including freight,	16673
Difference in cost, Less cost of concrete plant,	\$32085 7500
Net saving using concrete pipe,	\$24585
Total cost of C I P without freight " " Conc pipe " " Difference in cost,	\$31796 15818 \$15979
Less cost of concrete plant, Net saving using concrete pipe.	7500 \$ 8478

St . Paul, Minn., Jan. 18th, 1912...

Morthern Pacific Railways Company

Mr. W. L. Daneni, your Company

Charles Charles Company

Mr. W. L. Daneni, your Company

Charles Charles Company

Mr. W. L. Daneni, your Charles Company

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Mr. W. L. Daneni, your Charles Char Morane mid her sul. Che marania Draw Dir: -Formung is statement of amount of Cart how pipe for RI- Defence have to companion y cost as between Case bour and Concrete size Pipe. lengthe Estemal) 3150 1530 6180 rija Pyra. cost per hu. 7/- - Cost per Ci fts

and hom

consider paper

malure tot Everile pipe 48" 11.76 ----2.35 --- 9.41 36" 5.94 ----24" -1.94 4.00 ~ - -3.28 ---- 1.50 1.78 swing on A Defrance work 48"- 120 th x 9.41 = 1129.20 36"-4680 " × 4.00 = 18720,00 24'- 6180 " × 1.78 = 11004.40 30853.60 un tree had no date in cost of 30" pape so have figured the 30" as 36"

Morthern Pacific Kailway Company

trught on cost how paper per the fl es as pollows. to court 3.48 per H 1. 88 1.56 24" -1.04

Think I legt Similar Halemen on your deck -

This accounts your continue

St. Paul, January 17, 1912.

Mr. J. C. Breedlove,

Assistant Engineer,

Tacoma, Washington.

Dear Sir:

I will arrange with Mr. J. W. Bell to go out to you as Engineer in charge of the timber sea wall at \$150 per month and board.

I will try to get authority from Mr. Elliott to put in the concrete plant, although I am somewhat doubtful as to whether it will be allowed for the reason that practically all we save will be Northern Pacific transportation charges. You failed to leave the information which you promised me about the economy in the use of the concrete pipe, but as I remember it there could be saved about \$20,000, less \$7,500 for the cost of the plant, or about \$12,500 all told, most all of which is represented in the cast pipe by Northern Pacific transportation charges. If it is concluded to make the pipe Mr. Bell will have his information and requisitions all ready so there will be no delay.

Yours truly,

All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

Tacoma Wn Jan 30th 1912.

W.L. Darling

St. Paul Minn.

Browsing will have eastings for concrete pipe forms made here.

J.C. Breedlove.

1058PM



TELEGRAM

All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

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St. Paul, January 30, 1912.

J. C. Breedlove Tacoma.

Your wire 27th, about concrete pipe.

We have no requisition here for castings. Cannot you arrange to have them made and make necessary requisition to follow. Think they should be made there, and inform suggested by Mr. Bell.

W. L. Darling



TELEGRAM - All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for sending and seceiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mall, or which appear unnecessarily

long, operators are required to attach a copy to Form 228, and forward same to Superintendent of Telegraphs.

325. BY. 0. SI.

Tacoma Wn Jan 27th 1912.

W.L. Darling

St. Paul Minn.



About forms for concrete pipe, find we can have castings made here at the shops and think can get out enough in about two weeks to start the plant, each form will cost in the neighborhood of one hundred dollars, probably take about twenty forms to have the amount of pipe we want, recommend we heave patters made and try out this style of form, the forms to be made as Mr Bell talked to you.

J.C. Breedlove.

1049PM



All Railway to get ust be reitten in ink on these blanks, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and hame if the sending attion must be entered on this blank.

After transmitting telegrams which in their junction, the property of the company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

FORM 1386

St. Paul, January 27, 1912.

J. C. Breedlove

Tacoma

Bell left here night of January 23rd.

. W. L. Darling



TELEGRAM. * All Railway Mussages must be written in mk or those plants, which must not be used for other purposes, and those for sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as wellif sent by train mail, or which appear unnecessarily

long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

86 by sc f

Tacoma Jan 26-12 W.L. Darling,

StPaul.

When will Mr. Bell be here, see your letter 23rd.

J.C. Breedlove. 1202 pm

NI

St. Paul, January 24, 1912. Mr. J. C. Breedlove. Assistant Engineer, Tacoma, Washington. Dear Sir: Referring to your message of the 22d: We received statement mailed from Billings about savings on concrete pipe for the Point Defiance Line. Yours truly, Chief Engineer. WI.D-D



All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in scaled envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank.

After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 238, and forward same to Superintendent of Telegraph.

179 by Dc f

Tacoma Jan 23-13 W.L. Darling,

StPaul.

See your letter 17th about Concrete pipe sent you statement from Billings on which you will note a saving of Concrete nine over cast iron pipe amounting to thirty thousand dollars, did you not get this statement?

J.C. Breedlove. 440 pm

Mr. Elliott:

The attached requisition is for material for concrete pipe to be made for the Point Defiance Line.

W. L. Darling.

St. Paul, 1-23-12.

Assistant Engineer,

Tacoma, Washington.

Dear Sir:

There is about 50,000 pounds of reinforcing steel 3/8" now stored at Sopenah that can be used in the concrete pipe to be made on the Coast for the Point Defiance Line. This is slightly greater weight than will be needed, as provided in the design, being in excess about 28%, making the pipe cost 3.5 cents more per foot, or a total excess for the 4,000 of pipe of about \$140.00. The freight on this excess weight of steel would amount to about \$275.00, so that unless there is a place where it can be used to advantage now I think we should use it for the reinforced pipe, especially as it may avoid serious delays in waiting for other material to reach there.

Yours truly,

WLD-D

Chief Engineer.