Northern Pacific Railway Company. Engineering Department Records.

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Version 3
August 20, 2018

NORTHERN PACIFIC RAILWAY COMPANY,

Engineering Department.

File No. 1253

SUBJECT: Contract

with A.Guthrie & Co., July 11,1903;

track laying and ballasting, Auburn

toBlack River Jct. 2nd. track.

FromJuly 11th 1903

To

1253

COPY.

1253

A. GUTHRIE & CO.,

St.Paul, Minn.,

1904.

May 31, For labor performed during the month of May, 1904, Auburn to Black River Jct., 2nd Track, as per Estimate #10 and Final, certified to by A.R.Cook, Asst.Engineer, under terms of contracts dated April 14th,1903, and July 11th,1903.

ESTIMATE #10 AND FINAL.

EARTH EXCAVATION:TRAIN HAUL:	152,625 Cu.Yds.	@	.12	18,315.00
EARTH DELIVERED C.& P.S.RR.	5,298 "	@	.11	582.78
EARTH DELIVERED SUPT.PAC.DIVN.	160 "	@	.12	19.20
BALLAST:	23,862 "	@	.40	9,544.80
TRACK LAYING:	12.0651 Miles,	@	350.00	4,222.79
EXTRA WORK PER FORCE ACCOUNT:				4,505.13
				$37,189.70

Less previous payments:

E.D.No. 1409,	Aud.No.	5,443.56	
E.D.No. 1642,	Aud.No.	4,759.59	
E.D.No. 1943,	Aud.No.	5,317.14	
E.D.No. 2228,	Aud.No.	5,229.45	
E.D.No. 2681,	Aud.No.	3,126.10	
E.D.No. 2981,	Aud.No.	1,997.91	
E.D.No. 145,	Aud.No.	2,384.21	
E.D.No. 356,	Aud.No.	290.20	
E.D.No. 526,	Aud.No.	$ 2,036.03	31,584.19

Amount of this voucher;- $5,605.51

WORK COMPLETED MAY 18TH, 1904.
PAYMENT DUE JUNE 18TH, 1904.

COPY.

A. GUTHRIE & CO.,

(Sheet #2)

1904.

May 31,	Amount brought forward:-		$5,605.51
CHARGE:-			
Open Accounts,			
File 624, ('02), Aubum to B.R.Jct.2nd Tr.,			
Grading,		1,075.06	
Track Laying & Surfacing,		245.50	
Ballast,		775.60	
Open Accounts,			
A.Guthrie & Co., A/C.Contract,		3,509.35	$5,605 .51

COPY

1253

EJP

At Seattle, November 24, 1903.

Mr. A. R. Cook,

Assistant Engineer,

Seattle, Wash.

Dear Sir:-

It will be proper to estimate the quantities of ballast on double track as per your profile.

Yours truly,

Acting Chief Engineer.

Form 255 TW

Northern Pacific Railway Company.

OFFICE OF CHIEF ENGINEER N.P.R.R.
NOV. 17 1903
ST. PAUL, MINN.

A[illegible]

x Seattle, Wash., Nov. 13th, 1903.

E.J.Pearson, Esq.
Acting Chief Engineer,
St. Paul, Minn.

Dear Sir:-

I am sending to you to-day, under another cover, by Northern Pacific Express, profile of second track Auburn to Black River, showing depth of ballast in the several sections as constructed.

Yours truly,

A.R. Cook

Asst. Engineer.

Drawing Index of Bridges
Rebuilt on Rock River Div
Beloit Yard
Scale 100 Ft. = 1 Inch

COPY 1253

EJP

October 27, 1903.

Mr. A. R. Cook,

Assistant Engineer,

Seattle, Wash.

Dear Sir:-

In regard to your advice that Grant Smith claims understanding that one foot of gravel below the ties should be allowed as ballast. This matter was referred to Mr. Darling by whom the contract was made, and his reply of the 7th of October is as follows:

"Referring to yours favor of 1st instant: I believe the specifications for ballast cover everything on connection with Grant Smith's contract for hauling gravel for double track between Auburn and Black River. There was nothing mentioned about the number of inches to be put under the ties. My idea was that there would be considerable widening to be done from that pit, and that there was also quite a large amount of embankment to be made, in which case there should be practically no gravel under the ties, except where embankments were made out of earth from the sides, in which case there was to be from eight to ten inches under the ties, depending upon local conditions."

Please send me a profile of the new double track showing at each station the bottom line of the ballast as figured, also the bottom line of the tie, and the yardage of ballast on such basis as the same has been computed. This profile shoul show about one-tenth foot per space vertically, and where there is a long stretch of track where ballast runs just the same such section can be reduced to two or three spaces in length, providing there are explanatory notations that show the commencement and termination of such section and its length.

Yours truly,

Acting Chief Engineer.

Mr. Weston:

According to these figures of Cooks 1330 yards per mile at 40 cents is $532 per mile, deducting 12 cents, leaving 28 cents for surfacing, the amount per mile is $372. Please give me some figures showing the cost of Surfacing similar classes of track for comparison.

E.J.P. 10/18/03.

Do not know as I can cite a similar class of track - Some of our contracts for new construction have included following prices for surfacing

Seattle Belt Line	312		
Cerini Br 1st 14 mi.	450 from side	Lapwai Br	200
	250 R Hauled		10/29
Green Riv Br Extn	250		
Sykesville Br Extn	250		
Ruby Valley Extn	225		
Oberon Br	200		

Note letter from Mr Crockett Date Nov 10-02 in file attached showing cost work between Blk Rix + also done by Co. forces RAH

Form 1386

NORTHERN PACIFIC — YELLOWSTONE PARK LINE

TELEGRAM.

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NUMBER	Rec'd From	SENDER	RECEIVER	TIME REC'D	DATE REC'D	TIME FILED	NUMBER	SENT TO	TIME SENT	SENDER	RECEIVER
1082	M & E	ff		613 P M.		M.			M.		

FROM Seattle TO Pearson

DATED Oct 16/03 AT

Drawing misunderstood 1 mile of 15th ballast for 2nd track on gravel dump three tenths raise 1330. Cu yards to mile earth dump 2925 yards to Mile

Cook

1330 × 28 / 640 / 1060 / 2660 / 37240 / 5320

Form 1386

TELEGRAM.

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				M.		M.			M.		

FROM St.Paul, Oct. 16, 1903. TO A. R. Cook,

DATED AT Seattle, Wash.

Yours 15th. Why do you figure one foot of ballast under tie on double track? See Darling's instructions to Nancarrow. You also have my instructions in addition that ballast should be figured from level of top of embankment on which track is laid and ballast distributed. On basis of these instructions what will estimate for ballast average per mile in cubic yards?

E. J. Pearson.

Form 1386

TELEGRAM.

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NUMBER	REC'D FROM	SENDER	RECEIVER	TIME REC'D	DATE REC'D	TIME FILED	NUMBER	SENT TO	TIME SENT	SENDER	RECEIVER
		1123	HN	CO VI ____M.		____M.			____M.		

FROM

DATED Seattle Oct 15-03

TO

AT E J Pearson

Browsing one foot of ballast under tie equal to 2925 Cu yards per mile.

A R Cook

1125-P

Form 1386

TELEGRAM.

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				____M.		____M.			____M.		

FROM St.Paul, Oct. 15, 1903. TO A. R. Cook,

DATED AT Seattle, Wash.

On basis you are following in making estimate of material delivered under the ballast specifications on double track work about what will your estimate in yards average per mile?

E. J. Pearson.

Mr. Weston:

If no reply in a couple days ask for it.

E.J.P.

Form 290 TW

Northern Pacific Railway Company.

Seattle, Wash. October 6th. 1903.

E. J. Pearson, Esq.,

Acting Chief Engineer,

Seattle, Wash.

Dear Sir:-

Since talking with you about the depth of ballast on the Second Track work, where bank was built of gravel, I have had another talk with Grant Smith in relation to the matter. He still insists that one foot of ballast was the understanding when he took the work, but that he was desirous of dealing fair. I told him that I had repeated our former conversation to you and that you agreed with me as to what should constitute ballast on a gravel bank. I did not tell him that anything had been done towards confirming his statements. I think that when the contract for the track laying and ballast was let to Guthrie & Co. that it was the intention to put up all of the bank from the side by borrow. But when it was found that the ground for borrow pits would cost so much, Mr. Henry released us from the grading contract with him and Guthrie & Co. were given the contract at the same price per yard that they were to have for the filling of the tracks over the tide lands at Seattle. See Mr. Darling's letter dated July 7th. to A. Guthrie & Co.

Yours truly. D. R. Cook
asst. Eng.

FORM 4455.

The Chicago, Rock Island & Pacific Railway Co.
Choctaw, Oklahoma & Gulf Railroad Co.
St. Louis, Kansas City & Colorado R.R. Co.

Office of Chief Engineer.

W. L. Darling,
Chief Engineer.

OFFICE OF CHIEF ENGINEER N.P.R.Y.
OCT 9 1903
ST. PAUL, MINN.

Chicago, Oct. 7, 1903.

Mr. E. J. Pearson,
Act.Chf.Engr., Northern Pacific Ry.,
St. Paul, Minn.

Dear Sir:-

Referring to your favor of 1st inst:

I believe the specifications for ballast cover everything in connection with Grant Smith's contract for hauling gravel for double track between Auburn and Black River. There was nothing mentioned about the number of inches to be put under the ties. My idea was that there would be considerable widening to be done from that pit, and that there was also quite a large amount of embankment to be made, in which case there should be practically no gravel under the ties, except where embankments were made out of earth from the sides, in which case there was to be from eight to ten inches under the ties, depending upon local conditions.

Yours truly,

W. L. Darling

Chief Engineer.

COPY.

EJP

At Seattle, October 1st, 1903.

Mr. W. L. Darling,

Chief Engineer, C.R.J & P.Ry.,

Chicago, Ill.

Dear Sir:-

Contractor Grant Smith building double track between Auburn and Black River claims that it is his understanding that allowance should be made for a foot of ballast under the tie, and it was on that basis he made his bid for ballasting. If he had not been given to understand that ballast would be allowed accordingly, he would have bid on some other basis, namely, per mile. Contrary to the above, I understand that your instructions to Mr. Nancarrow were to the effect that where the embankment was constructed of gravel it should be built just high enough to enable the laying of the track, thus reducing the ballast to a minimum, practically only that needed for the actual surfacing.

It will assist in the handling of this matter if you will be kind enough to favor me with such information regarding the above as you can.

Yours truly,

Acting Chief Engineer.

Form 290 TW

Northern Pacific Railway Company.

OFFICE OF CHIEF ENGINEER N.P.R.R. SEP 28 1903 ST. PAUL, MINN.

Seattle, Wash. Sept. 24th. 1903.

E. J . Pearson, Esq.

Acting Chief Engr.

St. Paul, Minn.

Dear Sir:-

Mr. Grant Smith has taken up the matter of ballest with me. I had instructed the Res. Engineers to have filling done so that when banks were of solid gravel three tenths should be allowed for surfacing. Mr. Smith says that it was understood that there was to be one foot of ballest throughout otherwise would have made bid on mile basis.

Yours truly,

A. P. Cook

Assistant Engineer.

COPY. 1253

WLD-M

August 6th, 1903.

Mr. H. E. Nancarrow,

Assistant Engineer,

Seattle, Wash.

Dear Sir:-

Arrangements have been made with the Operating Department to furnish Guthrie & Company with N. P. shovel No. 2, which is now stored at South Tacoma.

Mr. Guthrie, some time ago, asked me if the Railway Company could furnish them with a shovel when they got ready to ballast second track between Auburn and Black River Junction, and I have since made arrangements with Mr. Gilbert, so that when they call for the shovel it will be furnished.

Please bear in mind that when they begin ballasting to keep track of material used as bank widening and that as ballast, because their contract for ballasting calls for a price of 40 cents per yard, while for bank widening it is but 12 cents. My idea of that second track work was that all material was fit for ballasting, and that you would carry the bank close to the bottom of ties, so as to materially reduce the amount of ballast to be used, and merely use enough for tamping.

Yours truly,

W. J. DARLING.

Chief Engineer.

1253

RAW-F. August 6th,1903.

Mr. R. H. Relf,

Assistant Secretary.

Dear Sir:-

Referring to yours of August 5th. Mr.Guthrie requested to be excused from furnishing bond with this contract and this was agreed to by the President.

You are correct in the general understanding that unless the contract calls for a bond the Railway Company is satisfied to waive it.

Yours truly,

Chief Engineer.

Northern Pacific Railway Company.

Office of the Assistant Secretary.

R. H. RELF.
ASSISTANT SECRETARY.

St. Paul, Minn. August 5, 1903.

OFFICE OF CHIEF ENGINEER N.P.R.R.
AUG 6 1903
ST. PAUL, MINN.

Mr. W. L. Darling,

Chief Engineer.

Dear Sir:-

Referring to agreement dated July 11, 1903, with A. Guthrie & Company for track laying and ballasting for second track between Black River Junction and Auburn. I note that the contract does not provide for a bond. Am I correct in understanding that in this instance and in others, where no provision for furnishing bond is mentioned in the contract; the Railway company is satisfied to waive bond?

Yours truly,

R. H. Relf

RHR-PH. Assistant Secretary.

1253

RAW-F. July 28th,1903.

Mr. H. E. Nancarrow,

Assistant Engineer, Seattle,Wash.

Dear Sir:-

Herewith for your files copy of contract,dated July 11th, with A. Guthrie & Co. for track laying and ballasting for second track between Black River Junction and Auburn.

Yours truly,

Chief Engineer.

Enclosure.

Sent to accounting office RAW 7/29

RAW-F. July 28th,1903.

Mr. H. A. Gray,

Comptroller.

Dear Sir:-

I enclose herewith for your file one original copy of contract with A.Guthrie & Co.,dated July 11th,1903, for track laying and ballasting for second track between Black River Junction and Auburn.

Yours truly,

Chief Engineer.

Enclosure.

RAW-F. July 28th,1903.

A. Guthrie & Co.,

St.Paul,Minn.,

Dear Si rs:-

I enclose herewith for your files one original copy of contract with your firm dated July 11th, covering track laying and ballasting for second track between Black River Junction and Auburn.

Yours truly,

Chief Engineer.

Enclosure.

COPY

July 28th,1903.

Mr. R. H. Relf:-

Herewith copy of contract with A. Guthrie & Co. for track laying and ballasting for second track between Black River Juct. and Auburn, requested in your memorandum of the 27th.

W.L.Darling.

Encl.

Northern Pacific Railway Company.

Office of the Assistant Secretary.

R. H. RELF,
ASSISTANT SECRETARY.

St. Paul, Minn. July 27, 1903.

Mr. W. L. Darling:

The attached contract to you for deilvery. Please let me have a copy of this at your early convenience for New York report.

R H R

Form 1386

10-30-02 1000M E R

TELEGRAM.

NORTHERN PACIFIC RAILWAY COMPANY

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46	Wheo			106p M.		M.			M.		

FROM Seattle TO W S Darling

DATED June 24 1903 AT

Let me have copy of Guthrie Contract for Laying track & Ballasting second track Auburn to Black River

H C Nancarrow

Mr Darling
Sent to
before execution
by Guthrie has
signed 7/25 RMW

COPY.

WLD-M

July 25th, 1903.

Mr. C. S. Mellen,

President.

Dear Sir:-

I hand you herewith copy of contract with Guthrie & Company for laying, surfacing and ballasting second track between Black River and Auburn.

While the price for track laying is higher by $50. per mile than we have paid heretofore, yet from the fact that it is to be laid with 85# steel, and there is but a small patch of it -- 12 miles -- would recommend the contract be executed.

Yours truly,

(Signed) W. L. DARLING.

Chief Engineer.

Enc.

A. GUTHRIE & CO.
RAILROAD CONTRACTORS,
NATIONAL GERMAN AMERICAN BANK BLDG.

FORM 12

CHIEF ENGINEER'S OFFICE
JUL 18 1903
ST. PAUL, MINN.

July 18,1903.

ST. PAUL, MINN.

Mr. W.L.Darling,

Chief Engineer N.P.Ry., C I T Y.

Dear Sir:-

Am afraid the time is not quite sufficent to complete the track laying and surfacing, on the double track. Will, of course, git it done at the earliest moment practicable, but have no idea it can be accomplished in time named in contract.

Yours truly,

A. Guthrie & Co.

Mr Darling
Shall I change date to
if so to what time
RAW
7/18

Mr Darling
Will you forward to
me Melleu for
Execution
RAW
7/23

Form 1386

NORTHERN PACIFIC — YELLOWSTONE PARK LINE

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 in proper spaces in every instance.

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				____M.		____M.			____M.	COPY	

FROM — DATED: July 22nd,1903.

TO: H.E.Nancarrow,

AT: Seattle,Wash.

Will have the Agent at Auburn instructed regarding rates with Guthrie as per his contract.

W.L.Darling.

RAW-F. July 22nd,1903.

Mr. J. M. Hannaford,

Second Vice President.

Dear Sir:-

A contract has been awarded to A. Guthrie & Co. for track laying and ballasting for second track between Black River Junction and Auburn.

Under the terms of this contract special freight rates will be granted as follows;-

"The Railway Company will furnish transportation at the rate of one-half cent per ton per mile for materi al required in the work and contractor's outfit with minimum of twenty-five cents per ton and twenty-five cents for single shipments. Bulky articles filling car to visible capacity to take minimum car load weight. Live stock will be billed at actual weight with usual commercial minimum. The Railway Company will charge full tariff rates for transportation of supplies, including powder, fuel and lumber".

Shipments will be consigned as follows;-

To Northern Pacific Railway Company,
Care H.E.Nancarrow, Assistant Engineer,
Auburn or Black River Junction,
(Or intermedi ate points)
For A. Guthrie & Co., Contractors.

Will you please see that Agents are properly notified and I wish you would kindly wire the Agent at Auburn.

Yours truly,

(Signed) W. L. DARLING.

Chief Engineer.

Copy to H.E.Nancarrow, Asst.Engr.
Copy to H.A.Gray, Comptroller.

Form 1386

TELEGRAM.

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	548 HN	W Jr		____M.		____M.			____M.		

FROM Seattle July 21 1903 TO W L Darling

DATED AT

Pls have Agent at Auburn advised as to Special rates for Guthrie as per his contract

H E Nancarrow

1130 P

Form 1386

TELEGRAM.

10-30-02 1000M E R

NORTHERN PACIFIC RAILWAY COMPANY

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121				1056 M.		M.			M.		

FROM Seattle TO M Darling

DATED July 21 1903 AT

Browning Guthrie and Co can lay track and complete ballasting Sept 15th

H E Nancarrow

Rec'd Work Train Sept 15

Form 1386

NORTHERN PACIFIC YELLOWSTONE PARK LINE

TELEGRAM.

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				____M.		____M.			____M.	COPY	

FROM July 21st,1903. TO H.E.Nancarrow,

DATED AT Seattle,Wash.

What time can I put in Guthrie's contract for completing track laying and ballasting on second track.

W.L.Darling.

RAW-F. July 16th,1903.

A. Guthrie & Co.,

Natl.Germ.Am.Bank Bldg.,City.

Dear Sir:-

I beg to hand you herewith for execution contract, in duplicate, covering track laying and ballasting for second track work between Black River Junction and Auburn in accordance with your proposal dated July 11th.

Yours truly,

Chief Engineer.

Enclosure.

A. GUTHRIE & CO.
RAILROAD CONTRACTORS,
NATIONAL GERMAN AMERICAN BANK BLDG.

FORM 12

OFFICE OF CHIEF ENGINEER N.P.R.R.
JUL 13 1903
ST. PAUL, MINN.

ST. PAUL, MINN. July 11, 1903.

Mr. W.L.Darling,

Chief Engineer N.P.Ry., C I T Y.

Dear Sir:-

Will lay the track and do the ballasting, on track that we are now grading, from Auburn Pit, on same terms as the Hope Revision, viz;- three hundred and fifty dollars per mile for track laying, and forty cents per cubic yard for ballasting, according to your standard specifications.

Yours truly,

A. Guthrie & Co

7/14

COPY.

WLD-M

July 11, 1903.

A. Guthrie & Company,

Natl. Ger. Am. Bank Bldg.,

City.

Gentlemen:-

Will you please let me have bid as soon as practicable for laying second track between Auburn and Black River Junction.

Yours truly,

(Signed) W. L. DARLING.

Chief Engineer.

Form 1386

NORTHERN PACIFIC YELLOWSTONE PARK LINE

TELEGRAM.

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164	HN CN	N		____M.		____M.			____M.		

FROM Seattle July 14th 1903 TO W L Darling

DATED AT

Solomon 13th, Yes Smith will start track laying for Second track this week want four outfit cars kitchen dining and two bunk cars I will ask Albee for these will you confirm

H W Nancarrow

1140 A M

Form 1386

1169

TELEGRAM.

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				M.		M.			M.		

FROM St.Paul, July 13, 1903. TO H. E. Nancarrow,

DATED AT Seattle, Wash.

Have arranged with Guthrie to lay track and do ballasting between Auburn and Black River. Presume he will get at it at once.

W. L. Darling.

WLD-M

Form 1336

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 in proper spaces in every instance.

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

NUMBER	RCVD FROM	SENDER	RECEIVER	TIME REC'D	DATE REC'D	TIME FILED	NUMBER	SENT TO	TIME SENT	SENDER	RECEIVER
	226	HN	CN	N	____M.		____M.			____M.		

FROM Seattle DATED July 10th 911th 1903 TO W L Darling AT

Mr Efolliot now here says can put track laying outfit on second track at once He is wiring Guthrie to make price with you

H E Nancarrow

1111 A M

Form 1386

TELEGRAM.

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NUMBER	RECD FROM	SENDER	RECEIVER	TIME REC'D	DATE REC'D	TIME FILED	NUMBER	SENT TO	TIME SENT	SENDER	RECEIVER
	235	HN	CN	N							
				____M.		____M.			____M.		

FROM Seattle July 10th-11th-1903 TO W L Darling

DATED AT

Can start track laying between Auburn and Kent now after that portion is done drop crew back on Ballasting while bringing banks up between Kent and Black River

H.E.Nancarrow.

1121 A M

6-03 500 StP

Form 109A. General Contract.

This Agreement, Made the Eleventh (11th) day of July A. D. 1903.

Date.

by and between

A. Guthrie and Company, of St.Paul, Minnesota parties of the first part, and

Parties.

The Northern Pacific Railway Company, a corporation of the State of Wisconsin party of the second part.

WITNESSETH:

Covenant.

That the said parties of the first part, in consideration of the agreements herein, by the said party of the second part, do hereby agree to furnish all labor, services and material for, and construct, complete and finish, in the most thorough, workmanlike and substantial manner, in every respect to the satisfaction and approval of the Chief Engineer of the said party of the second part, in the manner and within the time hereinafter specified, and according to the specifications hereto annexed and made part of this contract, track laying and ballasting for second track between Black River Junction and Auburn in the State of Washington.

Locality.

Date of completion.

The work is to be commenced immediately and completed on or before the Fifteenth (15th) day of September, A.D.,1903.

Sub-contracts.

Comply with instructions.

Remedy faulty work.

The parties of the first part further agree: (a) that the work shall be performed under their personal supervision and that this contract or any interest therein shall not be assigned, nor said work, or any part thereof, be sub-contracted without the written consent of the Chief Engineer or the party of the second part to each and every such assignment or sub-contract; (b) that they will in all things conform to, and comply with, the instructions of the said Engineer and his duly appointed assistants; (c) that all imperfect or insufficient work or material shall be immediately remedied when pointed out, and shall be made good and sufficient at their sole cost and expense to the satisfaction of the said engineers and any omission by the engineers to disapprove, or reject, any insufficient or imperfect work

or material at the time of any monthly or other estimate, shall not be deemed an acceptance of such work or material; and the Chief Engineer shall have the power and it shall be his duty, at any time, to have any defective work or material taken out, and rebuilt or replaced, at the expense of the parties of the first part; (d) that they will not bring, or permit to be brought onto the said line of railroad, or anywhere on or near the said work, any spirituous or other intoxicating liquors; and that if any foreman, laborer or other employe of theirs shall, in the opinion of the Engineer in charge of the work, be intemperate, disorderly, incompetent, wilfully negligent or dishonest in performance of his duties under this contract, he shall, on direction of the said Engineer, be forthwith discharged; and they shall not employ, or permit to remain about the work, any person who may have been discharged for any of said causes, or discharged from any other part of said railroad; (e) that no extra work or material is to be allowed or paid for, excepting only in performance of a previous order in writing of the Engineer in charge of the work, and that any and all claims for extra work or material must be presented to the said Engineer for allowance at the close of the month in which the work shall have been done or materials furnished, otherwise all claim therefor shall be deemed absolutely waived; (f) that they will carry on and prosecute the said work in all its several parts and branches, in such manner, and at such times, and at such points or places as the Engineer in charge of the work shall from time to time direct.

No liquors.

Disorderly workmen.

Extra work and bills therefor.

Work when and where directed

Arbitration.

It is mutually agreed, that to prevent disputes or misunderstandings in relation to any of the stipulations and provisions contained in this agreement, or the true intent and meaning thereof, or the manner of performance thereof by either of the parties, and for the speedy settlement of such as may occur, the Chief Engineer of the party of the second part shall be, and he hereby is made and constituted the umpire to decide all such questions and matters; he shall also decide the amount and quantity, character and kind of work done and materials furnished by the parties of the first part, including all extra work and material; and his decision shall be final and shall be binding and conclusive, to all intents and purposes, and in all places, on the said parties hereto.

Covenant to pay.

The party of the second part agrees to pay to the parties of the first part, on the full completion of all the work embraced in this contract, in the manner, and within the time herein specified, and on the approval and acceptance thereof by said Chief Engineer, the following sums and prices, viz.:—

Prices for work.

Track Laying, Three Hundred and Fifty Dollars ($350.00) per mile.

Ballasting, Forty Cents (.40) per cubic yard in place.

"The Railway Company will furnish transportation at the rate of one-half cent per ton per mile for material required in the work and contractor's outfit with minimum of twenty-five cents per ton and twenty-five cents for single shipments. Bulky articles filling car to visible capacity to take minimum car load weight. Live stock will be billed at actual weight with usual commercial minimum. The Railway Company will charge full tariff rates for transportation of supplies, including powder, fuel and lumber. The Railway Company will also furnish transportation for men employed on the work at the rate of one cent per mile"

Price for extra work.

FOR EXTRA WORK, or work done under written orders of the Chief Engineer or Engineer in charge of the work, for which prices are not named herein, the parties of the first part shall be paid the actual cost to them of such work, and ten (10) per cent additional upon the cost of labor for use of tools, superintendence and their profit.

Estimates. Payments.

Approximate estimates of the work done are to be made at the end of each calendar month by the said Chief Engineer, or his assistants, and payments thereon are to be made on or about the twentieth day of the next ensuing month, less all previous payments, and less (10) per centum of the amount of each and every such monthly estimate; which percentage shall be retained by the party of the second part until the complete performance of this contract, as security for such performance.

Retained percentage.

Stopping work

Whenever in the opinion of the party of the second part it shall be necessary or expedient for it that the said work, or any portion of it, should be stopped, or that the force employed thereon should be diminished, the party of the second part will have the right and power to stop said work, or diminish said force, and the parties of the first part shall have no claim for damage by reason thereof; but they shall stop the work, or reduce the force as the party of the second part may in writing direct; which writing shall be signed by the Chief Engineer, and shall be delivered to the parties of the first part, or one of them, or in case of their absence, to some person on the work representing them, at least five (5) days prior to such required stoppage of work, or reduction of force.

Accelerating work.

If, at any time during the existence of this contract, the parties of the first part shall not, in the opinion of the Chief Engineer, be progressing with the work as fast as necessary, or with sufficient force to insure its progress and completion within the contract time, he shall have the power to direct the parties of the first part to put on such additional force and means, as in his judgment shall complete the work, within the specified time; and on the refusal, failure or omission of the parties of the first part to comply with such directions, the said Engineer shall have the power and authority to declare this contract abandoned by the parties of the first part; and in such case the amount of moneys which may then remain unpaid, and would otherwise be payable to the parties of the first part under this contract, including the percentage retained on all monthly estimates, shall be kept, retained and appropriated by the party of the second part, until the work is completed; and the party of the second part may employ such force and means as in its judgment shall be necessary to complete said work, and the cost and expense thereof shall be charged to the parties of the first part.

Retained percentage forfeited.

Contractors to pay all laborers.

The parties of the first part will promptly pay all laborers and others in their employ, as their pay falls due and promptly pay as they fall due all bills for material and supplies going into the work, and in the event of their failure at any time to do so, the party of the second part may retain from all subsequent estimates, such amounts of money as the Chief Engineer may deem sufficient and necessary to pay, each month, the laborers and all others employed on or about said work and the said supply and material bills. Before final settlement is made under this contract, the parties of the first part shall produce and furnish satisfactory evidence to the party of the second part, that the said road and structures are free and clear from all liens for labor, work or materials, and that no claim then exists out of which a lien may grow.

Contractors to keep laborers under control.

The parties of the first part agree that they, their agent, laborers, and all others in their employ, or under their control, will take and use all due care that no public or private property, growing crops, meadows, fences, ditches, farm or other improvements be injured in the prosecution of the work; and if any injury or damage to, or loss or destruction of, any property be done or occasioned by any act of the parties of the first part, their agents, laborers, or employes, or if loss or damage be occasioned by right-of-way fires, the damage shall be paid by the parties of the first part. In case, when the final estimate is made there shall be any unsatisfied claim for such damage the party of the second part may deduct from the moneys then due, or to become due, a sum equal to the amount so claimed, together with the estimated cost of adjusting the same; which sum the said party of the second part may retain until all such claims are determined by legal proceedings or otherwise, when the amounts so ascertained shall be paid to the claimants, and the remainder, if any, to the parties of the first part.

Retention of claims from final estimate

Temporary suspension.

In case there be any stoppage of the work, or if its progress be materially delayed by reason of, or from want of location or staking out the line of work, or securing the right of way, or from any neglect of any of the engineers, agents, or employes of the party of the second part, the time for completing the work shall be extended for a period equal to the time of such stoppage or delay; the parties of the first part shall have no further or other claim therefor, or from anything arising therefrom, or caused thereby. The parties of the first part must make their claim for such extension in writing, to the Engineer in

Extension of time.

charge of the work at the time of such stoppage or delay, therein stating the occasion and nature thereof; and failing so to do, their right or claim to such extension shall be deemed waived.

Total suspension.

In case of a total suspension of all work under this contract, without any fault, default, failure, collusion, or procurement of the parties of the first part, for a longer period than ninety (90) days, unless such suspension shall have been caused by the winter season or protracted rigor of weather, it shall be the duty of the said Engineer, or his assistants, to make a final estimate of all work done, and make a return thereof to the party of the second part, when the amount found by said Engineer to be then due for work done, except as herein otherwise provided, shall be paid to the parties of the first part.

Insurance.

Any damage by fire that may occur to buildings or structures during construction must be made good by the parties of the first part, who must keep such structures fully insured until such time as such structures have been fully completed and accepted by the party of the second part. The cost of insurance shall be divided equally between the parties, the policies to be written in the name of both parties, loss payable as their interests may appear, the policy or policies to be deposited with the Chief Engineer of the party of the second part. The operation of a portion of the track before the entire completion of the road and its appurtenant structures is not to be considered as an acceptance by the party of the second part.

Final estimate.

When, in the opinion of the Chief Engineer, this contract, shall have been completely performed, he shall so certify in writing and give a final estimate of the work done by the parties of the first part, and a statement of the amount due and unpaid them therefor; and the party of the second part shall, within thirty (30) days thereafter, pay the full amount which shall be so found due, including the percentage retained on former estimates as aforesaid, except as in this contract is otherwise provided. The parties of the first part will before final payment execute, acknowledge and deliver to the party of the second part, under their several hands and seals, a valid release and discharge of and from any and all claims and demands for, and in respect of all matters and things growing out of, or connected with, this contract, or the subject matter thereof.

Time of payment of final estimate and retained percentage.

Release.

Execution.

IN WITNESS WHEREOF, The parties of the first part have hereunto set their hands and seals, and the party of the second part has caused these presents to be executed by its duly authorized officer the day first above named, in duplicate originals.

Witnesses as to
Parties of First Part.

E. Widmann

F. W. Noyes

A. Guthrie & Co. (SEAL)

_____ (SEAL)

Witnesses as to
Party of Second Part.

_____

_____

NORTHERN PACIFIC RAILWAY COMPANY,

By _____

LOG AND TIMBER CULVERTS.

215. Timber for log and timber culverts must be sound, and the variety and quality must be satisfactory to the Engineer.

216. Log culverts will be made of sound, straight, green logs, from which all bark must be removed, not less than ten inches in diameter at the small end, and of nearly uniform diameter throughout each course.

217. After the foundation for the culvert is prepared, mud-sills will be laid not more than five feet apart, on which the first course of side wall timbers shall rest. The mud-sills will be flattened on top and bottom sides to a thickness of not less than twelve inches, and at the ends where the side walls are joined to the sills will be boxed down three inches, so as to give a close fit.

218. The timbers will be drift bolted to the mud-sills with iron drift bolts ¾ inch square by 16 inches, driven into holes ¾ inch in diameter.

219. The walls will be made by piling the logs one upon another, the larger logs to be in the lower courses, with the top invariably laid down stream. After flattening the logs on the upper and lower sides to even thickness throughout, and thoroughly pinning or drift bolting them together, all knots and other projections into the opening of the culvert are to be carefully cut away. At the ends of the culvert the layers of logs will be drawn in as they rise above the bottom to conform to the slope of the embankment. Where practicable each log will extend the entire length of the culvert. The logs will be so laid as to leave the full size of the inside of the culvert clear for passage of water, and the inside walls shall be vertical. If drift bolted, each course of logs will be well bolted to the one beneath it with three-fourths by sixteen inch iron drift bolts, spaced not more than five feet apart; and where logs join, a drift bolt shall be driven on each side of the joint. All drift bolts will be countersunk to such a depth that one-half the bolt shall be in the upper timber and the other half in the lower.

220. The bottom of log culverts may be formed of logs laid close together across direction of current not less than nine (9) inches in diameter at small end, extending on each side one (1) foot beyond outside of side wall, or be paved to the top of the mud-sills with angular rock, where it can be obtained from the adjacent cuttings; otherwise with large boulders. This paving will be classified as riprap in place.

221. The covering of these culverts will be round logs not less than fourteen inches in diameter, flattened for a distance of eighteen inches at each end to a face of not less than eight inches; at least one log in four secured to the top course of the side walls with three-fourths by sixteen inch iron drift bolts. At intervals of five feet one of the top logs shall be boxed down on the side walls three inches to a close fit. The hollows between the covering logs must be filled with poles or brush.

222. Material in log culverts will be estimated by the lineal foot, and the length of the timbers only will be considered, without regard to varying size or thickness.

223. Timber culverts will be made of sound hewed or sawed timber, in accordance with the standard plans. They will be estimated and paid for by board measure.

224. Log or timber culverts will not be used except when it is practicable to build or place within them stone or brick structures or drain pipes of ample size to carry the water.

225. In cases where the embankment is six feet high or less, a single span of pile bridge with timber bulkheads will be used, and will be built according to the standard plans.

CROSS TIES.

226. Cross ties will be made from such varieties of timber as may be designated by the Engineer; usually from white oak, red fir or tamarac. They must be cut only from live, sound and thrifty trees, must be free from rotten knots and all indications of decay; also from splits and shakes.

227. Ties must be exactly eight feet long, with ends sawed square. They must be hewn or sawed straight and true on two parallel faces to a uniform thickness of seven inches. Those less than seven inches or more than seven and one-half inches in thickness will not be received.

228. The minimum width of face for hewn ties will be seven inches, exclusive of bark. The minimum width of sawed ties will be nine inches, provided they are sawed on four sides. If they are sawed on two opposite sides only the width will be the same as for hewn ties. The above minimum dimensions are absolute and will be insisted upon.

229. No split ties will be accepted.

230. Ties must be piled on skids in rows or tiers containing 1,000 ties or less, with small ends of all ties in each tier piled one way. When they are piled in adjacent tiers an open space of not less than three feet must be left between them. They must be piled at points where they can be conveniently loaded; that is, at or near grade.

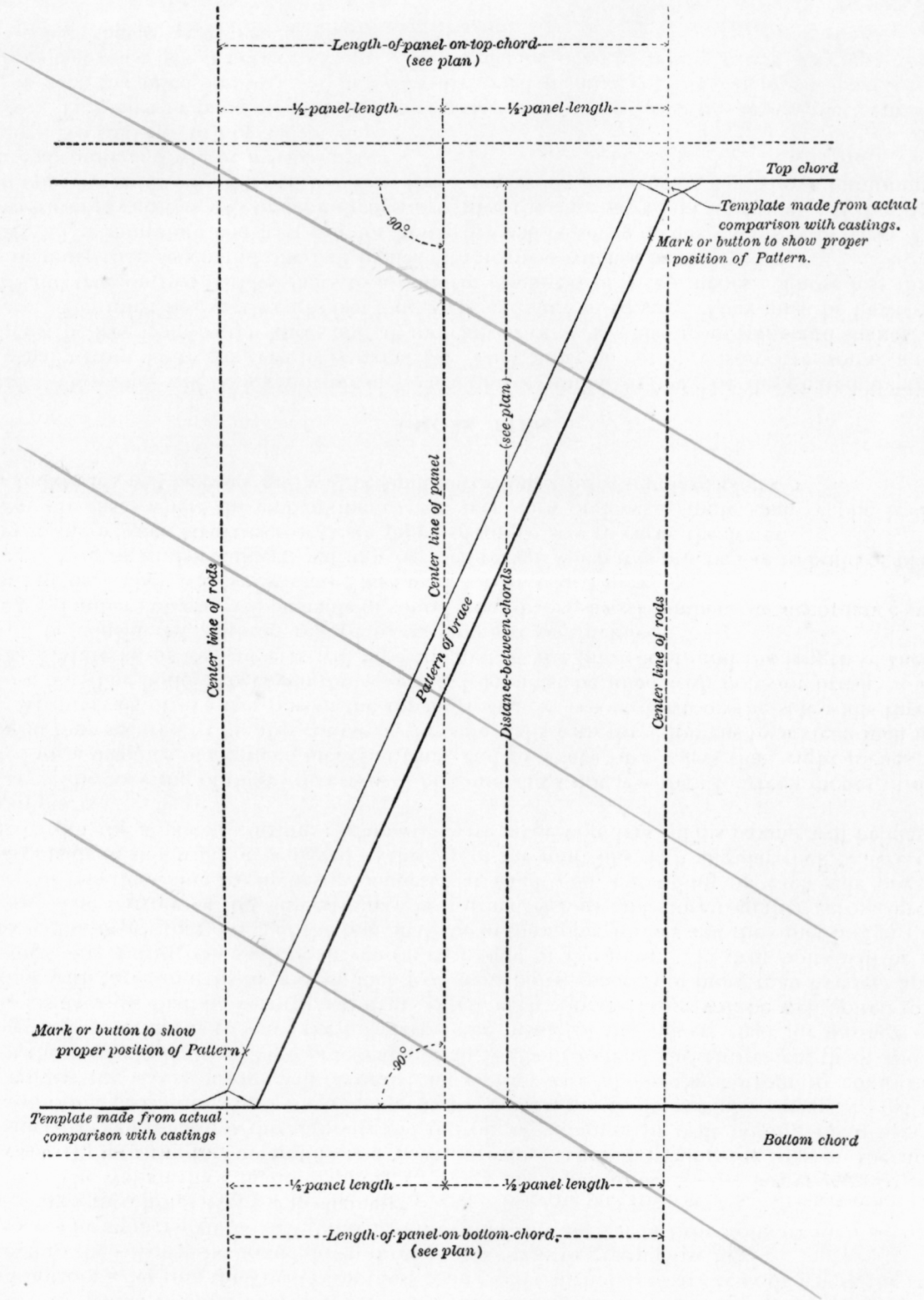
TRACK LAYING.

231. Track laying will include all the work of laying the main track, sidings, or other permanent tracks, frogs, switches, rail braces, tie plates, crossings, etc., laying and spiking the plank of road crossings wherever required, and trimming down or filling up the surface of the roadbed to bring it to the true grade. Also setting all track markers and signs.

232. When the material of which the roadbed is made is fit for ballast, it will be finished to the proper elevation for the bottoms of the ties, and if, at the time the track is laid, it is lower or higher, it must be brought to the proper elevation before the ties are distributed. When material is unfit for ballast, the roadbed will be finished to an elevation four inches below the bottoms of the ties or subgrade, and the track must be brought to the true grade in ballasting.

233. Track laying must conform with the standard specifications of the Railway Company. (Form 140.)

SKETCH SHOWING MANNER OF MAKING BRACE PATTERN.



234. Only such sidings or spur tracks, and such lengths thereof, as may be ordered by the Engineer will be estimated and paid for. This will include tracks required at material yards, but will not include spurs in gravel pits, nor temporary spurs laid for the accommodation of boarding cars. The price paid for such work will be held to include the taking up and removal of material at the close of the work.

SURFACING AND BALLASTING.

235. When material of which roadbed is made is suitable for ballast, the track will be surfaced from the sides, otherwise the material generally will be hauled, in which case it will be classified as ballast. The Company will furnish the train and train crew, and the contractor must load, unload and spread the ballast and put it under track.

236. Ballast will be paid for by the cubic yard. Borrow pits from which ballast is obtained must be cross sectioned, and the amount removed therefrom measured in excavation. No waste of ballast upon banks will be permitted. Deficiencies in grading which are rectified at the time of ballasting, by the use of train hauled material, will be paid for as earth excavation.

237. Surfacing and ballasting must conform to the standard specifications of the Railway Company. (Form 140.)

238. All road and surface ditches will be left clear and free, so open and extended as to conduct water freely and quickly from the roadbed; and all side ditches must be left unobstructed.

239. The side slopes and ditches must be left neat and smooth, and free from all rubbish, materials and obstructions. Material for filling or ballasting must not be taken from the slopes of embankments. This will be insisted upon.

240. The surfacing or ballasting must be kept up with the track laying. All new track must be brought to surface and tamped up before it is run over. Rails that are damaged by reason of neglect on the part of the contractor to comply with these requirements will be replaced at his expense.

241. When the surfacing or ballasting is completed, the track must be in perfect line, surface and gauge, and must be so maintained by the contractor until it is accepted by the Company for operation. This contemplates a second adjustment of the track to line and grade, after it has settled under traffic. The line will not be accepted until it is fully completed.

242. Track laying and surfacing will be estimated by the lineal mile of 5,280 feet. Sidings will be estimated between head blocks of switches. Where ballasting is done by train, surfacing will not be estimated.

243. All track work will be closely inspected, and inferior work will not be paid for by the Company.

244. All crossing, flanger, station, tank and other signs, mile and clearance posts, are to be set by the contractor as directed by the Engineer, and will be considered a part of the track laying and surfacing; and the expense of setting will be held to be included in the price paid for track laying.

FENCES.

245. Fences must be built according to the standard plans. Farm gates must be provided wherever necessary.

246. Posts must be set plumb, firmly planted, and no variation in height above the ground line exceeding 3 inches will be allowed. Where ground surface is irregular, in sharp depressions, or on ridges, additional fence posts must be used. Posts in depressions must be properly anchored, and where fence is constructed through overflow bottoms, a cross-piece shall be spiked to the bottom of each post in such a manner as to prevent its floating up. Corners and posts at openings must be properly stayed by struts. The price paid for fencing shall include the construction and placing of the necessary farm gates and cattle guards.

BUILDINGS.

247. All buildings must be constructed according to the standard plans.

248. *Excavations.* Grading for building sites other than excavations for cellars, trenches, foundations, etc., incidental to plans, will be paid for by the cubic yard, under the classification of and at the prices that apply to grading. The price paid for excavation of trenches for water pipes and drains will include the back filling of the same, for which no further allowance shall be made.

249. *Drains.* Drains will usually be of first quality of vitrified tile, with the dimensions shown by the standard plans. They must be carefully laid on a true grade, with a fall of at least one inch in 50 feet, and more if the elevation of the outlet will permit. They must be jointed with hydraulic cement, and must be scraped smooth inside as laid. They must be provided with all necessary traps, bends and connections, and be left in perfect working order.

250. *Foundation Walls.* Foundation walls will generally be classified under the head of concrete, second-class rubble masonry (see paragraph 128) laid with cement mortar, hydraulic lime mortar, or lime mortar, as directed by the Engineer.

251. *Brick Work.* Bricks used in buildings must be of standard size, well and neatly moulded and thoroughly burned. Care must be taken to exclude salmon brick, or bricks which are imperfectly burned. The stock of bricks must be assorted, and those of perfect shape, quality and uniform color must be used in face of wall.

252. Bricks for paving and other special purposes must be selected with especial reference to the purpose for which they are intended to be used.

253. All bricks must be thoroughly wet before laying.

254. In general, bricks in the walls of buildings above the water table, boiler settings and chimneys will be laid in lime mortar. (See paragraph 240.)

255. Bricks in pits or foundations, below the elevation of the water table, and not exposed to an undue amount of moisture, will be laid in hydraulic lime mortar. (See paragraph 241.)

256. Bricks for floor arches and other masonry which is exposed to water will be laid in cement mortar. (See paragraph 242.)

257. Bricks in walls will generally be laid in common bond; five stretcher courses to one header course. The Engineer may require a more thorough bond when he deems it necessary.

258. All bricks must be laid in full mortar beds, and all joints must be completely filled.

259. Particular care must be taken to secure straight, level bed joints of moderate uniform thickness. All joints must be cut and struck as the work proceeds.

260. Arches must be turned upon proper and substantial centers, which should be slacked away as soon as the mortar has set.

261. Hollow walls must be tied together every fifth course with bricks not over three feet apart. Care must be taken to leave air vents in such cases.

262. Anchors, hinge castings, lookouts, nailing strips, etc., must be properly and neatly jointed into the brick work.

263. Where the interior of brick walls is to be lathed and plastered, build in a lath to which to nail furring strip every fifth joint.

264. Scaffolding must be furnished by the contractor, and must be thoroughly and strongly built.

265. Brick paving will be understood to be bricks set on edge, bedded in cement mortar and grouted.

266. Chimney flues will be constructed as shown by the plans. Especial pains must be taken to secure full mortar joints. They must be thoroughly plastered on the inside and troweled to a smooth finish.

267. Thimbles must be provided as shown by the plans.

268. *Mortar.* Lime mortar will be composed of fresh lime and sand, in the proportion of one part of the former to about four of the latter. The proportions of lime and sand may be varied to suit the nature of the lime used, and the product must in all cases be satisfactory to the Engineer.

269. Hydraulic lime mortar will be composed of one part of hydraulic cement, two parts of lime and six parts of sand. The cement must be thoroughly mixed with three parts of sand in a dry state. The slacked lime must then be added gradually, the remaining five parts of sand worked into the mortar thus formed, and the whole mass worked to the proper condition for use.

270. Cement mortar will be made of American Portland cement and sand, in the proportion of one part of cement to three parts of sand. These ingredients must be measured. They must be thoroughly mixed while dry and then wet and worked to the proper consistency.

271. The proportion of ingredients as mentioned above may be changed by the order of the Engineer, if the mortar thus made is not satisfactory to him.

272. All mortar will be made in small quantities, as required for use, and none shall be used after it has commenced to set.

273. Cement and lime not required for immediate use must be protected from moisture; and any deterioration in its quality from this cause, and loss resulting therefrom, will be charged to the contractor.

274. Clean, sharp sand, thoroughly screened, shall be furnished for all work.

275. Fresh water must be used for making mortar, and all mortar must be prepared on clean plank beds.

276. *Plaster.* Two coats of cement plaster of an approved brand shall be used.

277. The first coat of plaster must extend behind the wainscoting, if any, through the floor, and must fill out all spaces between frames of timber, etc. After the first coat has dried, put on white hard finish or float finish as will be directed and trowel to a true and glossy surface.

278. After carpenters are through plasterers must patch up all defects.

279. *Timber.* Timber must be sound, free from wanes, shakes and large, black or unsound knots. It must be of the quality specified by the standard plans, and when this specification does not agree with the grades of the local markets, it will be understood that it must be suitable for the purpose for which it is intended.

280. All timber will be subject to the inspection and acceptance of the Engineer.

281. Timber having defects which impair its strength must be excluded from all work where it will be subjected to a considerable load.

282. Where sizes are given they will be understood to mean the dimensions of the timber as it comes from the saw, without reference to the diminution in size caused by dressing, unless an exception is noted upon the plans.

283. All timber and workmanship is subject to inspection before and after it is put into the work, and the Engineer may order any part of the structure, which in material or workmanship does not correspond with the terms of these specifications, removed, and substitution made in proper manner, at the expense of the contractor.

284. *Mill Work.* All material used for making window sash, frames, and work of this description, must be made of first quality white pine, excepting such portions of window or other frames as will not be exposed which may be of common lumber.

285. All timber used for these purposes must be thoroughly dried and seasoned. All inferior finish shall be kiln dried lumber, free from imperfections. Stair railings, balusters, treads, risers, stringers, mouldings and wainscotings must be made of material specified by the plans.

286. All finish shall be put up in the best manner, smoothed by hand, and left free from machine and tool marks.

319. Construct air spaces carefully in accordance with the plans. Leave a two by four opening on the south side, provided with three doors, all to be hinged.

320. Sheeting and battens must be in accordance with the plans.

321. Provide inside and outside ladders as shown by the plans.

PUMP HOUSES.

322. Particular attention must be paid to the location of pump houses, so that it will be convenient to supply them with fuel from the cars. They will be built in accordance with the standard plans.

WATER PIPES.

323. All wrought iron pipes with screw ends must be laid on true grade so that they can be thoroughly drained. Threads must be treated with red lead before uniting. They must be screwed together as far as practicable.

CAST IRON PIPES.

324. Cast iron pipes must be laid on true grade so that they can be thoroughly drained. All changes in direction are to be made with curved pipes and connection with proper branches delivering in direction of drainage.

325. Joints in cast iron pipes shall be made by calking in hemp packing, and shall then be run with molten lead and thoroughly calked.

326. Joints of lead pipe with iron pipe shall be made by calking in a brass ferule and making connection between lead pipe and ferrule by a wiped joint.

327. Joints between lead pipes must be wiped.

MATERIAL.

328. Unless otherwise provided, it will be understood that the Railroad Company is to furnish to the contractor all the material required for track, bridges and buildings, with the exceptions hereafter noted, on board cars at point of divergence from the main line of the branch railroad to be constructed, or at points along the line of road to be constructed, but not necessarily alongside the roadbed; or, in the case of buildings and structures erected under contract, upon lines already constructed, delivery will be made on board cars at the site of such buildings or structures, or as near as practicable thereto.

329. The exceptions above referred to are the stone for rubble masonry,—and other masonry, unless otherwise specified in the contract,—gravel, concrete stone and sand for mortar, etc., logs for log culverts and log crib work, all of which will be furnished by the contractor, unless otherwise specified by the contract.

330. The contractor will be required to receive and receipt for all material immediately on arrival, and will thereafter be held responsible for its safe keeping until its incorporation in the work. Storehouses or other structures required to shelter the material will be provided by the contractor at his own expense, and the material of the Railroad Company will not be used for this or any purpose other than that for which it is intended.

331. The contractor will be required to handle all material at his own expense, including unloading and loading in cars, and all material must be unloaded from cars within three days after its arrival, unless special authority to the contrary is given by the Engineer.

332. Whenever cross ties, piles, timber or other material is delivered along the line of the road, the contractors must do the hauling required to put it in place, including loading in cars when necessary.

TRAIN SERVICE.

333. The Railroad Company will furnish the necessary engines, cars (except iron cars and boarding cars) and train crews required for the work of track laying, ballasting and hauling of material, but the amount and kind to be furnished will be at the discretion of the Railroad Company. The train service will be controlled by the Engineer or such person as he may designate.

GENERAL.

334. It is distinctly understood that the quantities of work estimated are approximate only, and the Railroad Company reserves the right to have built only such kinds and quantities and according to such plans as the nature or economy of the work, in the opinion of the Engineer, may require.

335. The contractor, at his own cost, must provide all wagon roads to reach and carry on the work; he must also provide all tools of every description and all supplies required for the prosecution of the work.

336. Any omission to disapprove of work at the time of making any monthly or other estimate, will not be construed as an acceptance of any defective work, and the contractor must remove and rebuild, or make good at his own cost, any work which the Engineer may consider to be defectively executed.

337. It is expressly understood that all work of any character performed for the Railroad Company, under these specifications, must be satisfactory to the Engineer in charge of the work, and to the Chief Engineer.

338. The price paid for buildings, water tanks, turn tables, depots, section houses, and other standard structures, will be held to include the foundations, according to these plans; and it will be understood that the specifications for concrete, rubble masonry, etc., and the prices which govern such work, are intended to cover additional work of the same character which may be required and is not shown upon the plans.

287. Unless especially agreed to the contrary, it will be understood that interior wood work is to be painted, unless finish is hard wood, in which case it shall be filled with oil, rubbed and finished with a hard finish.

288. When not otherwise specified, all sash will be glazed with second quality American glass, S. S.

289. Contractor must properly protect all frames, sash and doors, not used immediately, from the action of the rain and sun. All mill work, except such as is required for inside work, and mouldings, shall receive one priming coat before shipping. This will not apply to the frames shipped knocked down, which will receive their priming coat after they are fastened together and before they are put into the work.

290. All door and window frames must be carefully squared before they are put into the work, and stayed to keep them in proper position.

291. *Iron.* Castings must be made of the best quality of tough grey iron, neatly moulded, free from sand holes, flaws or other imperfections. Particular care must be taken, especially in cored work, to have the holes required by rods, bolts, etc., large enough to admit these without battering the threads.

292. Rod iron must be of good quality of merchant iron. If an enlargement of the diameter of the rods for screw ends is called for, such enlargement is to be secured by upsetting, not by welding. An exception may be made in the case of suspension rods for large doors and other work in which the rods are not subjected to considerable strain.

293. All turn buckles and other forged work to be well and neatly made.

294. *Carpenter Work.* All framing is to be done in a neat and workmanlike manner, to give close joints, and thoroughly nailed and spiked. All joists and studding must be sized. Studding must be doubled around openings, with double headers and trusses above openings. All corners and angles must be made solid.

295. Joists must be stiffened by bridging cut in at proper intervals.

296. Roof boards must be nailed to rafters at every intersection, to avoid warping and injury to the roof covering.

297. Buildings which are to be plastered will be lathed with best dry pine lath. Laths will break joints every fifth lath, and shall be nailed with threepenny coarse lath nails, leaving a three-sixteenth inch crack on side walls and one-quarter inch crack on ceilings. No vertical laths shall be put on for the purpose of piecing out.

298. In case of the omission of any essential parts upon the plans, such omissions must be supplied in workmanlike manner; and flimsy, shiftless work will not be permitted.

299. Matched flooring must be blind nailed, and smoothed by hand.

300. Siding will be firmly nailed to each stud. Drop siding and clapboards must be neatly jointed and blind nailed.

301. Where floors are double, a layer of No. 2 roofing felt must be put in between upper and lower courses.

302. The top floor must not be laid before the plastering is finished.

303. The building must be cleared of all rubbish and swept before it is plastered. All refuse, chips, shavings, etc., must be collected and disopsed of by burning, or otherwise; and the interior of the building, as well as the grounds around it, must be left free from all litter.

304. Hardware, locks, knobs, window fastenings, etc., are to be neatly put into place, and must be of suitable quality and satisfactory to the Engineer.

305. *Painting.* All wood work that is exposed to the weather (excepting rough work), shall receive priming coat and two finishing coats, in colors corresponding to the Company's standard.

306. Body work will be finished in dark red. Trimmings and sashes in dark green. Doors will be finished in solid body colors. No trimming paint on panels.

307. All knot holes and cracks must be puttied, and knots or pitchy places filed with shellac before painting.

308. Interior work must be finished with two coats of paint; standard colors.

309. Shingle roofs will be finished with two coats of paint; standard colors.

WATER TANKS.

310. Water tanks are to be built according to the standard plans. Posts must be cut to the proper height and sized to receive cast iron caps. Caps must be sized to fit the casting. Timber caps should be bored to receive dowel.

311. Lay rail joists on caps as shown on standard plan.

312. The edges of bottom planks are to be accurately jointed, to insure perfect contact, and be well clamped and cut to proper circle.

313. The floor must be well doweled and joists white leaded.

314. Staves are to be carefully jointed, to secure perfect contact, and should be put together with white lead joints and three tiers of dowels. The chime is to be accurately fitted to the bottom. Staves are to be surfaced on both sides.

315. Put on the third band first; then commence at the bottom and put the bands in regular order. Divide the lugs equally around the tub and screw up to fair bearing.

316. Bands must be watched when filling tub to prevent breaking on account of swelling of timber.

317. Ceil as shown by plan:

318. Valve to be so placed that bolt holes will take in two center planks and have one-eighth inch rubber gasket under it. The intake pipe is to be extended up twelve inches above tank floor and to have a three inch inlet valve. Outlet valve to be placed twelve inches above tank bottom.