

Butte, Mont., June 1, 1915.

Mr. G. Ranney, Paymaster,
Chicago, Illinois.

Dear Sir:

Herewith list of May CG's paid out of my Working fund. Please have check drawn in my favor to reimburse the account:

CG #6406	E. W. Allen	# 3	\$174.80
7	Cornelius Michaelson	10	71.40
8	John Rasmussen	11	70.85
9	M. J. Swassing	12	51.57
10	S. F. Cleveland	13	55.91
11	J. L. Bussele	14	73.10
12	G. D. Richards	18	53.30
13	Wm. Russel	19	37.95
14	Hebbert Thompson	63	44.30
CG #6445	Eli Doltich	69	21.85
46	Joe Bradovich	70	21.95
47	W. S. Knight	72	47.35
54	Ed Davis	88	10.05
55	Mike Cutich	89	14.80
56	Chas Kline	90	71.50
51	John Burdock	78	21.00
22	J. C. Farnsworth	4	193.75
23	L. L. Ohishauson	9	93.70
24	Wm Steindorf	10	78.70
25	Wm Parks	13	149.45
26	Louis Pearson	14	154.50
27	R. Farnsworth	15	153.25
28	Al Walls	16	151.00
29	Leonard Lilly	17	154.80
30	Jack Crowley	18	161.00
31	Wm. Robinson	19	155.30
32	J. O. Smith	20	144.50
33	A. Schneider	21	145.05
34	C. I. Taylor	22	65.85
35	John Rennison	26	58.08
36	G. A. Bahler	27	57.63
37	C. E. Paris	28	56.91
38	John Smith	31	54.81
39	Thos. Turner	39	19.45
40	Jas. McGuire	40	13.60
41	P. S. Anspach	58	47.90
42	R. W. Tate	65	45.95
43	J. H. Detsch	66	45.75
CG 6444	Mike Yock	67	28.75

(For'd)

#2--G.R.--6/1/15

CG #6448	H. Logaredt	73	\$49.70
49	G. Anderson	74	47.50
50	Joe Nemcavitch	77	16.00
52	G. E. Lilly	82	70.85
53	Ely Petrick	87	9.70
57	F. Purdy	92	13.75
58	B. C. Osgood	93	22.15
59	Ed Davis	94	7.65
60	Robt. Bouslion	95	5.90
61	Mike Yock	96	8.25
62	W. R. Jacks	97	1.85
63	Its Saberg	98	4.15
CB #6464	C. Keller	99	<u>4.90</u>
	TOTAL		\$3,333.71

Yours truly,

FAC-WLE

Electrical Engineer.

42201

June 1, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

The following is a report on the progress of substation construction for the week ending May 28th:-

TWO DOT: Concrete in all building walls complete; back-filling on outside of building complete. Forms for Motor Generator foundations being built. Excavation for bungalow foundations complete. Crew building forms for walls.

SUMMIT: Concrete in all building walls complete. Back-filling outside of building done. Brick and steel unloaded. Bungalow foundations excavated; floors and foundation walls concreted.

JOSEPHINE: Walls for building complete. Back-filling in progress. Excavating for bungalows complete and footings poured. Forms for foundation walls about completed.

EUSTIS: Brick work complete except fire-wall around transformer room. Foundations excavated, footing poured and forms for four room bungalow built.

PIEDMONT: Brick work complete. Forms for Motor Generator foundations 50% done. Foundation for five room bungalow complete. Walls for four room bungalow 60% complete.

JANNEY: Brick work 80% done. Forms for Motor Generator foundation 50% done. Foundations for four room bungalow complete. Excavating for five room bungalow done.

MOREL: Brick work for substation 75% complete. Foundations for bungalows practically complete.

Work delayed somewhat by rain.

Yours truly,

FAC-WLS

Chief Electrical Engineer.

June 1, 1915.

Continental Oil Co.,
Butte, Montana.

Dear Sirs:

Herewith Bill Lading covering return of
empty oil barrels #168 and #320.

Please give us credit for same.

Yours truly,

FAC-wls

Electrical Engineer.

June 1, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Our records show that we shipped 9300
Feeder insulators #9404 and 8290 Signal insulators
#9403 in St. P. Car #32084 to Butte.

Yours truly,

RAC-WLS

Electrical Engineer.

Butte, Mont., June 1, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Herewith Bill of Lading covering shipment of 9300 Feeder Insulators, No. 9404, and 5290 Signal Insulators, No. 9403 to Montana Power Company at Butte in St. Paul Car No. 82084.

These were the defective insulators furnished by the Ohio Brass Company on Requisition #138.

Please arrange to give us credit for the sale of these insulators. Bill for labor handling same will be sent to you in a few days.

Yours truly,

RAC-WLS

° Electrical Engineer.

Butte, Mont., June 3, 1915.

Mr. W. M. Harvey,
Auditor Mat'l Accts.,
Chicago, Illinois.

Dear Sir:

Replying to yours of the 28th inst., File JHK, the corrected statement of differences between your balance sheet and mine received and I have the following comments to make thereon:

Item #1

Following is statement of invoices charged to us in November, 1914, and you will see that they foot \$2163.01, and not \$2180.87. I cannot see where the difference comes in:

Statement # 26	Inv. #50046	Amount \$ 71.74
" # 61	" #51060	" 213.78
" 182	" #52821	" 60.84
" 409*	" #55669	" 1816.65
	TOTAL.....	\$2163.01

*** Marked Final.

Items #2 and #3

I am attaching copies of the bills in question.

Items #4 and #5

These are in December accounts.

Items #6

This is entered twice and I am making reverse entry which will appear on next balance sheet.

Items #8 and #16

I do not find these in our record of vouchers issued from this office. All other vouchers of this kind have been made by Mr. Wouding and charged to our Stock of Material, copies of same being sent us. In this instance I presume copies did not reach us, and we have not, therefore, been able to take them into our accounts. If

#2--W.M.H.--6/3/15

you will send us duplicates of these J.J.M. Vouchers, I will include such in my next balance sheet.

Item #7

This will be found in December accounts.

Item #9 and #10

These are accepted and will be shown in next balance sheet.

Item #11

Miscoula Division Bill #85 for \$24.29 will be found in November accounts.

Items #12 and #13

These will be accepted, although we cannot distribute same unless you will be kind enough to send us a copy of the detailed statement sent you, and from which these bills were made. I cannot find that copies were retained in this office at the time they were made.

Items #14, #15, #18 and #19

These will be found in December accounts, and Item #17 in November accounts.

Hoping that this will clear the matter, I remain,

Yours truly,

WDS-WLS

Electrical Engineer.

Butte, Mont., June 3, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Enclosed herewith please find blue print "American
Steel & Wire Co., C-3049" showing proposed bond type C.P.G.
which I have approved as per your request.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 3, 1915.

Mr. F. Urban, Insp.,
C/o Ohio Brass Co.,
Mansfield, Ohio.

Dear Sir:

Replying to your letter of the 26th, as regards wedge grips, these should certainly be tested up to full breaking strength of 4/0 Hard Drawn grooved trolley wire.

As regards inspection of bonds, your method of procedure is satisfactory, and we desire to dissect only enough bond terminals to feel sure that we are getting a good job of welding, and do not care to go to extraordinary expense.

Yours truly,

RE-WLS

Electrical Engineer.

Butte, Mont., June 3, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

Referring to yours of the 1st with attached report from Electrician Lund, on interruption to service of Great Falls locomotive, due to lightning. Will you please have Mr. Lund examine all of the lightning arresters on poles to see whether Resistance Rods which are mounted in pits below the Main Arrester are intact, as sometimes a lightning discharge shatters these Resistance Rods, and if so, it generally indicates a Short Circuited Air Gap in the Arrester which will in turn cause short circuit on D. C. end of Motor Generator Set and blow the Circuit Breaker.

I assume from Mr. Lund's report that the D.C. Circuit Breaker was blown six times between 4:00 PM and 5:30 PM. Will you please have him report in regard to this as well as the lightning arrester resistance rods, and also if possible advise just where the trouble occurred on the 6600 volt side.

In connection with the Pole Arresters, he should at the same time examine the cans for punctures. If the cans are punctured, the arrester should be removed from the pole. If the cans are not punctured and rods are destroyed, the rods should be replaced, preferably when current is off the line, as in case of short circuited air gap, replacement of rod would be a dangerous operation.

Will you please obtain a full report of the above, advising me and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

cc--Harry W. Lund,
Great Falls.

Your Ref. 109-1511

42303

June 4, 1915.

Mr. B. F. Howard, E. E.,
Mountain States Tel. & Tel. Co.,
1421 Champa St., Denver, Colo.

Dear Sir:

I have your letter of June 1st, and would be glad to give you any information you require which can be of assistance to you in connection with your investigations.

It seems to me, however, that as stated by Mr. Wade, the only way that you can get an accurate idea is to map out our lines from beginning to end. Their distance from the track varies and they very frequently leave our Right of Way. There are a number of track crossings and general conditions are such that the only suggestion we could make, if you wish to pursue your investigations vigorously, is that you study the situation right on the ground, and we will be glad to give you any assistance we can in this connection. Detail construction Drawings of our poles and cross arms it certainly seems to us would not be of any assistance to you.

Very truly yours,

RB-WLS

Electrical Engineer.

#2803

June 4, 1915.

Mr. B. F. Howard, E. E.,
Mountain States Tel. & Tel. Co.,
1431 Champa St., Denver, Colo.

Dear Sir:

I have your letter of June 1st, and would be glad to give you any information you require which can be of assistance to you in connection with your investigations.

It seems to me, however, that as stated by Mr. Wade, the only way that you could get an accurate idea would be to study our lines from beginning to end. Their distance from, and height above the track varies, they quite frequently leave our Right of Way, and in general the conditions are such that no particular drawings of standard arrangement of poles and cross arms which we have would be of value to you.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 4, 1915.

Mr. R. Wende, Insp.,
Lombard, Mont.

Dear Sir:

Referring to yours of the 26th in regard to discrepancy between framing length on stake and as shown on transmission profile.

In general, the framing length shown on profile should be followed, unless local conditions show it to be wrong, as in some cases framing height has been changed in the office and not in the field.

Please continue to advise me, however, promptly as to any such discrepancies, so that we can check profile in the office.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., June 4, 1915.

R. Wende, Inspct:

G. F. Soule, Inspct:

Herewith attached find revised blue prints of Drawings ED-#147 and #150, showing overhead construction at passing tracks, both standard and at substation locations.

Please destroy prints which you now have, and which men under your direction, have, and install the work according to the revised print.

You will note that tunnel type disk insulators are to be used for span insulation between tracks, and that on ED-#147 insulation has been removed from spans and cut into trolley and messenger.

These changes will be self-explanatory when the revised drawings are compared with those you now have.

Yours truly,

REV-WLS

Assistant Engineer.

June 4, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Herewith attached find revised blue prints of Drawings ED-#147 and #150, showing overhead construction at Passing Tracks.

By comparison with old prints you will find that Tunnel Type Disk insulators have been substituted for X-strains for span insulation between tracks and that span insulation on #147 has been transferred to trolley and messenger wire.

Copies of this revised print have been furnished to Inspectors Soule and Wende, and if necessary we will furnish you with additional copies.

Yours truly,

RE-WLS

Electrical Engineer.

June 4, 1915.

Mr. F. R. Nicholas,
Assistant Engineer,
Drummond, Montana.

Dear Sir:

Referring to your letter of June 3rd, I regret to say it is not practicable to change the location of the Cold Creek substation.

In the first place our contract with the Montana Power Company calls for a power tap at or near Garrison, and in the second place, it is impossible to shift any substation location even a comparatively small distance without entailing a great increase in the amount of copper required, or without very materially affecting the size of the substation apparatus.

I do not quite see why the Montana Power Company would be more apt to supply lines and power to Drummond with our substation located there, than with it at its present location. The transmission line which is on our Right of Way will be owned by the Railway Company, and our contract prohibits our taking power from this line for any other than Railway needs.

You should explain to the Drummond people that the substation locations are by no means arbitrarily chosen, and that their location is such as to give a minimum first and operating cost to the Railway Company.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 4, 1915.

Mr. H. S. Hertzog, Insp.,
Room #549, Bldg. #5,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

In looking over some of your reports I find I did not reply to the last paragraph of your report of May 10th. You asked whether you were to send Mr. DeVoy regular progress reports or only requests for information on mechanical features. You will please submit your progress reports to me and I will see to forwarding to Mr. DeVoy copies of such reports as he is interested in.

I have your letter of May 25th regarding tests on Circuit Breaker, and am glad to know that these are coming on so well.

Yours truly,

RB-WLS

Electrical Engineer.

June 4, 1915.

F. M. Locke Co.,
Victor, N. Y.

Dear Sirs:

I have noticed your advertisement in the Electrical World, Vol. 65, No. 22, regarding use of Boro-Porcelain for Suspension Insulators.

I would be interested to know your recommendations as to the make-up of the swing of insulators for 100,000 volt, sixty-cycle circuit with hardware for cable of approximately .47 inches diameter.

Also will you kindly let me have outline dimensions. I would be glad to receive this information promptly.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 4, 1915.

Mr. W. M. Harvey,
Auditor Nat'l Accts.,
Chicago, Illinois.

Dear Sir:

I return herewith Supt. Murphy's Bills #29,
#30 and #31 for the month of April.

Will you kindly have details of these
various bills furnished this office. For instance,
on Bill #29 we have wages for Trainmen, but we know
nothing about the work these men were performing.
Also Bills #30 and #31 have reference to various
sections. We do not know the location of the section
in question, and until we have this information we
will be unable to properly charge out the items.

Yours truly,

FAC-WLS

Electrical Engineer.

#2202

June 4, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to our letter of May 22nd, we are sending you herewith layouts of the seven substations and bungalows, showing suggested colors to be applied to the latter.

We have shown all the sets of bungalows as differently colored as the number of available stains will allow, but of course it is impossible to accurately reproduce by means of water colors on paper the effects which the stains will give when applied to the wood. For this reason we are also sending you actual paint samples, and we have numbered each drawing in such a way that you will be able to identify the particular samples which apply to each set of bungalows.

If our plans are satisfactory, will you kindly approve and put through Requisitions RE-41044-5-6-7-8-9. Also please request the Purchasing Agent to give this prompt attention and urge shipments to be made quickly as possible.

Yours truly,

RE-WLS

Electrical Engineer.

#2203

June 5, 1915.

Mr. B. F. Howard, E. E.,
Mountain States Tel. & Tel. Co.,
1431 Champa St., Denver, Colo.

Dear Sir:

I have your letter of June 1st, and would be glad to give you any information you require which can be of assistance to you in connection with your investigations.

It seems to me, however, that as stated by Mr. Wade, the only way that you could get an accurate idea would be to study our lines from beginning to end. Their distance from, and height above the track varies, they quite frequently leave our Right of Way, and in general the conditions are such that no particular drawings of standard arrangement of poles and cross arms which we have would be of value to you.

With regard to our substations, they will, for the Harlowton--Deer Lodge portion, be located at Two Dot, Summit, Josephine, Eustis, Piedmont, Janney and Morel. The rated capacity to be measured in each substation except Janney and Piedmont will be 4,000 kw. In Janney and Piedmont the rated capacity will be 4,500 kw. The machines, however, are guaranteed to stand an over-load of 200 per cent for five minutes.

Kindly let us know if there is any further detailed information we can give you.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 5, 1915

Mr. P. E. Vanderville,
Bond Inspector,
% A. E. Long, Three Forks.

Dear Sir:

Yours 3rd received and have wired the Purchasing Agent in regard to tools not delivered, also staples.

As regards terminals for frog bonding, you will find these on your requisitions as separate terminals. These, together with the general bonds have been telegraphed for.

Drilling for bonds is to be done without lubricant of any kind, at least to start with.

Am placing order for hand torches at once, also cheese cloth.

Yours truly,

REW-WLS

Assistant Engineer.

Butte, Mont., June 5, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

The Chic Brass Company advise that they are dipping ends of bonds which are tinned for separate terminals into melted paraffine to a depth of $1\frac{1}{2}$ to 2 inches above the tinning.

This is done after the cable end is tinned and is to prevent corrosion due to soldering paste creeping up on the cable by capillary attraction.

Will you please take this up at once with other manufacturers, supplying this type of bond, arranging with them to do the same thing if it is not too late.

Yours truly,

RE-WLS

Electrical Engineer.

Butte, Mont., June 5, 1915.

Mr. F. G. Ranney, Treas.,
Chicago, Illinois.

Dear Sir:

Please reimburse my account on account of
CG's paid out of my Working Fund:

CG #6212	J. C. Farnsworth	#19	\$25.00
" #6213	Wm. Parks	#20	11.50
" #6214	Louis Pearson	#21	11.50
" #6215	R. Farnsworth	#22	11.50
" #6216	A. Walls	#23	11.75
" #6217	Leonard Lilly	#24	18.50
" #6219	Wm. Robinson	#26	31.50
" #6220	J. O. Smith	#27	18.50
" #6221	A. Schneider	#28	9.40
" #6222	G. E. Lilly	#29	18.75
" #6223	Chas. Kline	#30	11.75
" #6224	C. S. Taylor	#31	6.10
" #6225	G. F. Bohler	#33	8.64
# #6226	John Smith	#35	8.20
" #6227	B. C. Osgood	#36	8.25
" #6228	Robert Boustron	#38	2.50
" #6229	Mike York	#39	6.15
" #6218	Jack Crowley	#25	<u>26.50</u>
TOTAL.....			\$245.99

Yours truly,

June 5, 1918.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Attached is a request for one two-cylinder gas car.

When we start substation work on the Deer Lodge--Avery end, the Inspector at Primrose substation will have to look after the loading of gravel at the Frenchtown pit. It will therefore be necessary for him to have a gas car in order to get back and forth quickly. In this way we will save the price of an Inspector at the gravel pit.

I trust this will meet with your approval.

Yours truly,

FAC-WLS
Encl.

Electrical Engineer.

June 5, 1915.

#2204

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your telegram of the 4th regarding delivery of poles for the West end, it seemed advisable for us to write you in detail regarding our plans for that Section, so that we could be sure that we understood your wishes in the matter. The plans stated in the following were jointly decided upon by the Montana Power Company and ourselves, based on the completion of the work by the end of next year.

We now have a pole erecting gang working between Finlen and Deer Lodge. This gang, with favorable conditions which are expected, will finish its work east of Deer Lodge on or about July 1st. It will then immediately be started working West from Deer Lodge, and there will be ample trolley and transmission line staked to enable it to keep right on working. From four to six weeks later we figure we will be able to release another pole erecting gang on the East end, and will then shift this probably to Missoula, working east from the latter place, to meet the first gang above mentioned, the staking of transmission and trolley in the meantime being so arranged that this program may be followed.

In the Fall we will have still other gangs available from the East end for the erection of poles and with these erecting gangs started as stated, we figure there should be no difficulty in getting all of the poles set up on schedule time, and without the formation of new gangs or the equipping of new Work Trains.

The main point is that we find it takes from four to six weeks to get a gang properly trained in erecting poles, and with the schedule set it seemed entirely feasible to us to use on the West end only the experienced men which we had trained up on the East end.

Of course we figure on the work going ahead on the West end just the way it now is on the East end. That

#2--C.A.G.--6/5/15 (2204)

is, later on some gangs will be erecting trolley wire while even toward the end there would possibly be other gangs still erecting poles.

Consequently, if we have all the poles coming along just as soon as possible, instead of to correspond with the operations of our erecting gangs, we will not only have to provide further engineering parties merely to stake so that the poles may be distributed, but we will have some of these poles lying on the ground many months before they will be needed.

We figure, that with the work handled as stated above, one trolley staking party and our one experienced transmission party can much more than keep ahead of the operations of the pole erecting gangs, and we will particularly, as far as the transmission party is concerned, be enabled to avail ourselves of the services on the whole work of those men whom we have spent a great deal of time in training on the East end.

I would like to know if the above program is in line with your wishes, and if so, will you kindly authorize Mr. Wilder to follow our instructions regarding shipments of poles as previously requested.

Yours truly,

RB-WLS

Electrical Engineer.

#2205

Butte, Mont., June 5, 1915.

Mr. G. F. West,
Car Service Agent,
Seattle, Washington.

Dear Sir:

Replying to yours of the 1st in regard to cars for loading poles, will say that we do not consider it advisable to cut down the surplus of loaded cars on hand and go on the assumption that the pole distribution crew is going to be laid off. We prefer to assume that it is going to be kept busy.

As regards the use of Hart Convertible or H. & B. cars for this loading, please note that all poles are put off the side of the car, and that the use of cars other than flats is very undesirable.

We would prefer to continue on this basis until absolute necessity requires the use of cars other than flats.

Yours truly,

RB-WLS

Electrical Engineer.

2206

June 7, 1915.

Mr. H. H. Field,
General Solicitor,
Chicago, Illinois.

Dear Sir:

In addition to those already submitted, I am sending you application for transmission line location on Government Lands in Gallatin, Broadwater, Silver Bow and Meagher Counties, Montana, and described in Exhibit I-2 in quadruplicate, with maps of location and copies of Field Notes as follows:

- Exhibits J-4 and K-4: Covering location in Gallatin County, dated April, 1915.
- Exhibits J-5 and K-5: Covering location in Broadwater County, dated April, 1915.
- Exhibits J-6 and K-6: Covering location in Silver Bow County, dated April, 1915.
- Exhibits J-7 and K-7: Covering location in Gallatin and Meagher Counties, dated April, 1915.
- Exhibits J-8 and K-8: Covering location in Meagher County, dated May, 1915.
- Exhibits J-9 and K-9: Covering locations in Gallatin County, dated April, 1915.

The above Exhibits "J" consist of two tracings and one blue print, and Exhibits "K" consist of copies of Field Notes in triplicate.

In addition to the above, there are enclosed one extra copy of Exhibit I-2 and one of each Exhibit K for the records of Secretary Adams. Blue prints of maps will be forwarded to Secretary Adams after they have been properly executed and returned to this office.

Will you please have all these Exhibits properly executed and the Company seal affixed, returning them to me so that I can obtain Vandykes of maps and thereafter forward them to the Receiver of the Department of the Interior at Helena from this office.

Yours truly,

June 7, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

If consistent, I would be pleased to receive Northern Pacific Annual passes for the following employees:

M. Curtis,.....Draftsman
G. F. Soule,.....Inspector
M. E. Buck, Supt. in charge of Montana
Power Company's forces. ,

These men have work on the Division between Deer Lodge and Harlowton in addition to the work between Deer Lodge and Avery, and as the number of passenger trains west of Deer Lodge is limited, it would help a great deal in getting over the work if we could get the N. P. Annual passes made good in Montana and Idaho.

Yours truly,

FAC-WLS

Electrical Engineer.

June 7, 1915.

St. Maries Hospital Assn.,
White Building,
Seattle, Washington.

Dear Sirs:

Referring to your letter of June 5th regarding work between Deer Lodge and Avery.

I requested location of your surgeons on this territory on account of having some engineering parties in that vicinity at the present time and these parties are likely to need the services of a doctor any time.

Actual construction work on this territory will probably commence about the 1st of July. We will, however, have a pole unloading crew starting out of Deer Lodge about June 15th. About August 1st we expect to commence the construction of seven substations located as follows:

Stetson, East Portal, Drexel, Tarkio, Primavera, Ravenna and Gold Creek.

Yours very truly,

FAC-WLS

Electrical Engineer.

Butte, Mont., June 7, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

I am sending you under separate cover sample of pole guying hook received on Requisition RB-4250.

You will note that this hook is broken off as if it were a poor quality of cast metal instead of rolled metal, and in placing future orders, will you please take this matter up with the bidders, as it is very essential to have a good quality of metal in these hooks which are used for heavy guy work.

Our Inspector reports that in some cases these hooks break off when the upper end is struck by hand axe in driving lag screw into pole.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 8, 1915.

Mr. G. F. Wilder,
East Purchasing Agt.,
Seattle, Washington.

Dear Sir:

Herewith copy of Requisition RB-#1105 covering preliminary order for cross arms for use between Deer Lodge and Avery.

Confirming telegram to you today, I have asked Mr. Goodnow to give you authority by wire to proceed at once with order, so as to rush delivery pending your receipt of signed requisition from Chicago.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

Butte, Mont., June 8, 1915.

Mr. E. Murray,
Asst. Engr B & B.,
Miles City, Mont.

Dear Sir:

Referring to your letter of June 4th, I would thank you to send me a print of Standard Type of Warning Signal. Of course I know the construction of the usual span across the track with pendants attached, but this would interfere with pantograph operation, and if you have in mind any form of warning signal which would not be subject to this objection, we would be very much interested to hear from you in connection with same, as we have this matter up also in connection with our Main Line electrification.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 8, 1915.

Mr. H. S. Hertzog,
C. M. & St. P. Inspr.,
549 Building #5, G.E.Co.,
Schenectady, N. Y.

Dear Sir:

Referring to your report of June 2nd, I would say that it would be best to make up a separate report for such information as is of the more private nature that you refer to, because I often send out the extra copy which you send me of your regular reports.

Yours truly,

RB-WLS

Electrical Engineer.

June 8, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I have your letter of June 1st enclosing letter from Dist. Master Mechanic Hamilton relative to a position for Mr. F. Valiton who desires employment as a substation operator.

I have written you another letter today regarding the general matter of organization of an operating force, and when I hear from you with regard to this other letter, I will be able to decide what to do with applications such as the one above mentioned.

Yours truly,

RB-WLS

Electrical Engineer.

#2208

June 8, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am handing you herewith Requisitions #1086-7-8 and 9, covering lighting fixtures for the substations Deer Lodge to Harlowton.

The general system of fixtures consists of the use of lights mounted on plain goose-neck pipe brackets suitably spaced around the walls of the rooms and of ceiling fixtures suspended from the rafters.

The type of lighting and of fixtures called for in the requisitions I have used in other places and found to be entirely satisfactory. If you care to look over the material called for yourself, Mr. Jennings, I am sure, would be able to very quickly get you the catalogs and point out the parts called for.

If satisfactory, kindly put through the requisitions.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

June 8, 1915.

#2307

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am enclosing herewith Requisition RB-#1105 covering preliminary order for cross arms for use between Deer Lodge and Avery, in order to start the work.

I wired you today asking that you instruct Mr. Wilder by wire to proceed at once with this order on the basis of copy of requisition being sent him today direct, pending his receiving signed requisition from Chicago.

This in order to save time. We will complete the order for cross arms as soon as classification of trolley and transmission work has reached the proper stage.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

42209

June 8, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Please note copy attached of Mr. G. J.
Bunting's letter of May 29th.

The last correspondence we have had on
this matter is your letter of February 23rd in
which you state that the matter was being held up
by the Auditing Department, but would be straight-
ened out within a short time.

Kindly let me know if you wish me to do
anything at this time in this connection.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

48210

June 8, 1915.

Mr. A. H. Armstrong,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

Referring to your letter of June 2nd regarding substation apparatus for the West end, I wired you yesterday as per the following:

"West end substation capacity per your telegram. Gold Creek, Priores, two Railway switches, space for one Power Company switch. Ravenna, Tashic like Lucie. Stetson two Railway switches. East Portal two Power Company switches, three Railway switches, two of which for two Railway lines to Stetson. Drexel one Railway switch. Signal panel for Stetson feeding West and Drexel East and West. Sending you switch sketch."

As regards power taps, the idea is to arrange Gold Creek and Priores substations so that when the exact locations of the Power Taps is decided upon a Power Company oil switch may be installed.

With regard to transmission lines, the two lines running from East Portal to Stetson will be Railway Company lines, not power Company lines. For the present we may install only one of these lines, but we call for the apparatus to be furnished for two lines.

To make the whole matter more clear I am sending you herewith a print of Drawing ED-4282, copies of which have also been furnished Mr. Johnson.

Regarding the use of three 2,000 k.w. units at East Portal and Stetson, there is some doubt, judging from the load curves which we have plotted, as to whether three 2,000 k.w. units would not be more capacity than we would ever require, and therefore give us a poor load factor. However, it seems safest to provide the

52--A.H.A.--6/9/15 (2210)

larger capacity, so that we can take care of the switching at Avery and also take care of any future proposition with regard to the extension of the electrification West of Avery.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

cc--V.A.W.
H.S.H.

#2811

June 8, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your note of the 30th on my letter of May 27th regarding repair parts for Main Line locomotives, I inform from your note that you consider the Motive Power Department should investigate for themselves what parts they think should be carried on hand, and I will see that they get a copy of the list which the General Electric Company sent me if they do not already have this list.

I am also getting lists of spare parts for the substation apparatus, and this brings up the question of Operating organization. Is it the intention to have the Motive Power Department take care of the maintenance of the trolley and transmission lines, together with the substations? If so, they should be conferred with about this time so that they may have all arrangements made when the proper time comes, not only with regard to employment of men, but with regard to such matters as spare parts and general maintenance.

I would like to have your general ideas in regard to this matter, so that if you wish me to take care of the matter of the organization for maintenance, I can make the necessary recommendations and preparations.

Yours truly,

RB-WLS

Electrical Engineer.

#2212

June 8, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your letters of May 13th and June 2nd with regard to electric power for the Gallatin Valley Railway, on receipt of your letter I saw Mr. Kerr, Mr. Hebgen being ill and at home.

Mr. Kerr informed me that while the flour mills which you refer to pay only one cent for their power, they have a load factor somewhere in the neighborhood of sixty per cent, and that this would account for the difference in rate. I did not discuss the matter any further at the time with Mr. Kerr as I was shortly to go over to Bozeman. When I went to Bozeman I had a general talk with Mr. Busch and the local Montana Power Company representative, and I understood from the latter that he had been requested by the Montana Power Company to investigate the matter of our rate and was making a report to Mr. Kerr.

I cannot hardly make further reference to this report to Mr. Kerr at this time on account of the manner in which the information was given me, but I will again broach the matter to the Montana Power Company as soon as possible, and advise you further.

Yours truly,

RB-WLS

Electrical Engineer.

42213

June 8, 1915.

Mr. J. C. Mill,
Signal Engineer,
Milwaukee Shops.

Dear Sir:

I have your letter of June 4th, reference No. 151-A. I also received the message you refer to, last Saturday and replied thereto on the same date.

It would seem out of the question to change the size of the wire, as same is, I believe, practically all on the ground and a number of miles has already been strung.

With regard to the use of 3300 instead of 2300 volts, the proper way to get the higher voltage would have been to use transformer taps in our main power transformers, but unfortunately it is too late to make this change. The only way to get the higher voltage will be by the use of a transformer stepping up from 2300 to 3300 volts, or the use of a Motor Generator Set giving 3300 volts. Of course the M. G. Set possesses the advantage that you may, if you so desire, put on a regulator and hold the signal primary voltage absolutely constant. We would also have to secure authority for making the change if you decided that it had to be made, and I would furthermore have to do this at the earliest possible moment, as it means changing the conduit layout in our substations and ordering new switchboard motor generator as well as changing present drawings and plans.

With reference to the questions you ask, kindly note as follows:

\$1--(a) Voltage Available: Without going into separate transformers this would be 2300 volts.

(b) Regulation: It is impossible to give any exact figures for regulation, inasmuch as the synchronous motors of our M. G. sets are compounded, under certain conditions drawing leading current from the line and under other conditions drawing lagging current from the line. The general tendency of this, however, is to hold the voltage constant, and besides this, taps are provided in the transformers.

#2--J.C.M.--6/8/15 (2213)

You will remember that this matter was thoroughly discussed in our conference in Butte and it was decided that there would probably be no trouble on account of regulation, and in any event the only thing we could do was to prove the fact by actual trial.

#2-- The A. C. power at adjacent substations is asynchronous, so that the power can be fed into the signal system from two substations at the same time. You will remember that you figured your transmission line normally to feed from both ends, and arrangements were made accordingly. See your diagrams.

#3-- The power at any one substation may be off in case of break-down, and arrangements were made in the substations so that the line could be fed from one end only, or you could, without difficulty, tie the two lines together at the dead substation. We understood you figured your line so as to allow for this kind of feeding. You would, of course, get the same effect by opening one of your line switches near a substation.

#4-- Answered above.

Yours truly,

RB-WLS

Electrical Engineer.

cc--L.W. Smith

Butte, Mont., June 9, 1915.

Mr. H. S. Hertzog,
C. M. & St. P. Inspr.,
549 Building #5, G.E.Co.,
Schenectady, N. Y.

Dear Sir:

I have yours of June 5th regarding results of tests on 1900 k.w. transformers and am glad to know that the transformers came out so well.

You speak of not requiring heat runs on the remaining transformers. While the heating may be well within the specifications, one of the great advantages of the heat run is the development of any trouble in insulation or connections, and I think we at least ought to make a heat run on each transformer of sufficient time to make sure there is no mechanical or electrical defect.

Will you please arrange accordingly.

Yours truly,

RB-WLS

Electrical Engineer.

#2215

June 9, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring again to the matter of copper for the West end, the following are the estimated amounts required. I am sending you this information now as additional to that given you in my telegram of yesterday regarding commencement of delivery of copper in October:

2/0 Hemp Core Transmission Wire.....	711 Miles
500,000 C. M. Feeder.....	249 "
4/0 Trolley.....	508 "
4/0 Negative and Positive Feed Taps.....	234 "
No. 4 Signal Wire.....	48 "
No. 8 Power Limiting Wires.....	413 "

These figures are based upon present plans with regard to the running of the transmission lines, and of course are apt to be modified on basis of detailed survey, but inasmuch as I do not suppose you will order all the drawing of the wire at once, the figures can be modified later as progress of the work shows advisable.

With regard to trolley wire, we have assumed the tracks as they now exist, that is, we have not allowed for any extensions.

I would suggest, in accordance with my telegram, to deliver one-fourth of the copper of each kind in October, a second one-fourth in January of next year, a third one-fourth in April and a fourth one-fourth in July of next year. If you find it advisable to string the deliveries out further, you may do so, but in any event the last one-fourth should be on hand by about the last part of August, 1916. The above is of course based on program of handling the work as outlined in my letter of June 5th.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Montana.
June 9th, 1915.

Mr. C.A. Goodnow,
Asst. to the President,
Chicago, Ill.

Dear Sir:-

The following is a report on the progress of sub-
station construction for the week ending June 5th.

TWO DOT SUBSTATION:

Walls complete. Crew backfilling and building
forms for M.G. foundation; also unloading brick. Excavation
for bungalow foundations complete and forms for walls being
built.

SUMMIT SUBSTATION:

Brick masonry set to window sills. Foundation
for five room bungalow complete. Wall forms for four room
bungalow about complete.

JOSEPHINE SUBSTATION:

Concrete walls for building complete. Brick
masonry will start Tuesday next. Bungalow foundations ex-
cavated and forms built for concrete.

EUSTIS SUBSTATION:

Brick masonry complete and steel roof trusses in
place. Forms for the M.G. foundation and concrete roof being
built. Foundations for four room bungalow complete. Ready
to pour concrete for five room bungalow.

PIEDMONT SUBSTATION:

Brick masonry complete. Roof trusses in place.
Forms for M.G. foundation and concrete roof being built.
Foundations for bungalows practically complete.

JANNEY SUBSTATION:

Brick masonry 85% complete. Roof trusses in place.
Foundation for four room bungalow complete. Excavation for
five room bungalow complete.

C.A.C. -3- 6/9/15.

MOREL SUBSTATION:

Brick masonry 90% complete. Roof trusses in place. Foundations for bungalows practically complete.

Progress slow on account of incessant rains.

Yours truly,

FAO.

Electrical Engineer.

cc-HEE
ESJ
HSH

WLS ✓

C.A.C. -3- 3/9/15.

MOREL SUBSTATION:

Brick masonry 90% complete. Roof trusses in place. Foundations for bungalows practically complete.

Progress slow on account of incessant rains.

Yours truly,

FAC.

Electrical Engineer.

cc-HBE
ESJ
HSH

#2214

June 9, 1915.

Montana Power Company,
Butte, Montana.

Dear Sirs:

I am handing you herewith copy of a letter received from Mr. Murphy regarding displacement of track on account of use of dynamite by our diggers.

Of course this is a very important matter and we ought to get after it at once. I do not know what proof there is that the condition of the track is due to our blasting, but would suggest you take the matter up with the foreman. It seems to me that he should be able to use a charge moderate enough to prevent displacement of the track, but if the track should be accidentally displaced, it seems the best plan would be to notify the Dispatcher as suggested by Mr. Murphy. Kindly advise the action you take in this matter.

Yours truly,

RB-WLS

Electrical Engineer.

June 9, 1915.

Mr. F. R. Nicholas,
Assistant Engineer,
Drummond, Montana.

Dear Sir:

This will introduce Mr. O. N. Lennes, who is anxious and willing to get work of any kind in connection with our work, and who, while somewhat defective in English, is no doubt very thoroughly fitted as regards technical education.

We are sending him to you with the idea of your having a talk with him and determining as to whether you think you could make use of him primarily in connection with routine drafting and possibly later working him into the better class of work in your office.

After talking with him and trying him out with some of the work you have in hand in your drafting room, please let me know what you think of him.

Yours truly,

REW-WLS

Assistant Engineer.

Butte, June 9, 1915.

Mr. H. S. Hertzog,
C. M. & St. P. Inspr.,
549 Building #5, G.E.Co.,
Schenectady, N. Y.

Dear Sir:

I have yours of June 4th regarding commutation
of locomotive motor and I should say that, based on your
further explanation, the commutation is satisfactory.

Yours truly,

RB-WLS

Electrical Engineer.

42350

June 10, 1915.

Mr. E. I. Holland,
Mgr. Great Falls Branch,
Montana Power Company,
Great Falls, Mont.

Dear Sir:

We are advised that tower car for maintenance of our terminal electrification at Great Falls has been fitted with raising device for platform.

Will you please have Mr. Todd look over this tower and see if it is satisfactory for doing the work which he has in hand, and advise us immediately so that we can arrange for Work Train service.

Yours truly,

RB-7LS

Electrical Engineer.

cc--M.P. Co.--Butte

Butte, Mont., June 10, 1915.

Mr. A. H. Crowder, Insp.,
Butte, Montana.

Dear Sir:

Confirming conversation, beginning today you will be expected to look after transmission work between Deer Lodge and Two Dot, except that the actual erection of poles and placing of guys and anchors will remain under the direct supervision of Inspectors Soule and Wende and men under their direction.

Your duties will principally consist of looking over the line ahead of pole erecting crews, checking profile against line as staked, for errors, and desirable changes, reporting any and all changes proposed or made in writing to me at this office, so that our records can be changed correspondingly.

You will also in a general way check the pole setting after done, especially where special construction is involved and keep proper track of all transmission wire stringing.

In addition to the above you will arrange to keep in touch with transmission material in stock at Three Forks and at the various pole erecting camps and wire stringing camps, so as to keep track of needs for the work and see to it that stock is properly distributed among the different camps where any apparent shortages exist. While going over the line you can incidentally look out for material left on the work so that we can take proper steps to have any such material picked up and taken care of.

Copies of this letter to Messrs. Soule and Wende who are now relieved of further responsibility in connection with transmission wire stringing, but who will, however, be expected to co-operate in regard to pole setting and other matters as well as anything in connection with wire stringing which they may incidentally know. Also copy to the Montana Power Company for their information.

Yours truly,

REW-WLS

Assistant Engineer.

cc--M.P.Co.
C.F.S.*R.Wende

42816

June 10, 1915.

Mr. W. J. Davis, Jr.,
General Electric Co.,
San Francisco, Calif.

Dear Sir:

A few months ago we received an application for a position in our Electrification Department from Mr. Fred T. Mumma, 721 - 28th Street, Sacramento, California, but at the time we had no vacancies open. We now, however, wish to secure the services of a first-rate man to take care of the inspection of the installation of our substation equipment.

Our standard substations consist of two and three synchronous motor generator sets of 2,000 k.w. capacity each, fed from transformers reducing from a line voltage of 100,000. There are a number of special features connected with the apparatus, such as that of re-generation and a man should possess not only a good knowledge of construction methods, but also have a good technical education and suitable testing experience.

The electrical portion of the installation work will be done under contract, and the man therefore who acts as inspector should also possess tact enough to get what he wants without causing discord.

Mr. Mumma has given you as one of his references, and I would appreciate very much your giving me your full and candid opinion of Mr. Mumma's personal and electrical qualifications for filling the position above described. If you can cover the matter in a telegram, will you kindly do so, wiring at my expense, as the matter must be settled promptly.

Yours very truly,

RB-WLS

Electrical Engineer.

June 11, 1915.

Mr. V. H. Greisser,
Chief Electrical Engr.,
Washington Water Power Co.,
Spokane, Washington.

Dear Sir:

A few weeks ago we received an application for a position in our Electrification Department from Mr. A. W. Thompson at Long Lake, Washington, but at the time we had no vacancy in which we could place him. We now, however, wish to secure the services of a first-rate man to take care of the inspection of the installation of our substation equipment.

Our standard substations consist of two and three synchronous motor generator sets of 2,000 k.w. capacity each, fed from transformers reducing from a line voltage of 100,000. There are a number of special features connected with the apparatus, such as that of re-generation and a man should possess not only a good knowledge of construction methods, but also have a good technical education and suitable testing experience.

The electrical portion of the installation work will be done under contract, and the man therefore who acts as Inspector should also possess tact enough to get what he wants without causing discord.

Mr. Thompson has given you as one of his references, and I would appreciate very much your giving me your full and candid opinion of Mr. Thompson's personal and electrical qualifications for filling the position above named at your early convenience.

Yours very truly,

RB-WLS

Electrical Engineer.

June 11, 1915.

Mr. L. G. Billings,
Penwell Hotel,
Missoula, Mont.

Dear Sir:

Referring to yours of the 8th in regard to a position on survey party, Mr. F. R. Nicholas who is now camped at Drummond is in charge of transmission party and if suitable to your convenience, you might get in touch with him sometime, giving him your experience and placing your name on file with him for future reference.

We have no openings just now that I know of.

Yours truly,

REW-wls

Assistant Engineer.

June 11, 1915.

Mr. Joseph Muggli, Cashier,
Ringling State Bank,
Ringling, Montana.

Dear Sir:

Referring to yours of June 10th in which you ask us whether we will furnish current for lighting and other small uses at Ringling, I regret to say that we would be unable to furnish this power for the reason that our contract with the Power Company requires that the power be used exclusively for Milwaukee Railway purposes.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 12, 1915.

Mr. C. E. Cassford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

I have a letter from C. H. Arnold, General Foreman Falls Yard, Great Falls, and one from Supt. Whiting, complaining that engine and train crew were furnished Great Falls Street Railway employees on May 30th for certain work which they are to do on the overhead construction there and that the Street Railway men refused to use the tower on account of their not being able to raise and lower the platform.

It was advised later that the top of tower is 18 ft. six inches over top of rail and the average height of trolley wire is 34 ft. from rail. Upon taking this matter up with Mr. Todd, Line Supt. of the Street Railway Company he informs me that on one occasion they were unable to use the tower on account of line being energized and the fact that it was raining and that they cannot use the tower in its present form on account of having to work on cross spans much higher than the trolley wire, necessitating the services of two men to make use of a special wrench with a three foot arm. Mr. Todd also states that Mr. Lund informed him that the tower platform is arranged for raising and lowering, and that it only requires a drum or winch which has been ordered.

If the latter statement is true, it seems very desirable to have the tower platform adjusted as we are desirous of getting this work completed and of closing the construction accounts.

I would like advice as soon as possible as to how long it will be before the drum is received and if considerable time is to be required, think we can arrange to handle the platform with counter weights, as all of our main line tower cars are worked in this way and are giving satisfactory results. Will you please have me advised early as possible.

Yours truly,

RE-WLS
cc--C. L. Whiting
C. H. Arnold

Electrical Engineer.

#2220

Butte, Mont., June 12, 1915.

Mr. F. N. Webster,
Right of Way Agt.,
Butte, Montana.

Dear Sir:

We find that there is a privately owned telephone line, partly with one wire and partly with two wires on bracket pins carried on very small poles, the whole line being in rather bad state of repair, located along our Right of Way between Harlowton and a point east of Summit. Generally speaking this line is immediately outside of our Right of Way fence. In a number of localities however, it is on our Right of Way and such localities are generally indicated by location of transmission line, same being outside of this telephone line.

I understand that the present owner of this telephone line lives at White Sulphur Springs and in view of the proximity of our transmission line, there will probably be serious interference with the operation of the telephone line in question when our transmission line is energized. As the transmission line stops at Two Dot, we are concerned with the telephone line only between Two Dot and point where it leaves our Right of Way East of Summit.

Will you please see me in regard to this, as after talking the matter over thoroughly with you I would like for you to arrange to see the owner and take up the question of properly disposing of the telephone line.

Yours truly,

RB-WLS

Electrical Engineer.

#2219

June 13, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Regarding cost of Bozeman power, I again took this matter up with Mr. Kerr, and he advised me that he could do nothing definite in connection with it, and that he would like it to hang over until Mr. Hebgen's return next month.

I understand Mr. Hebgen's condition is very much improved since he has been away, and his return to health is now simply a matter of regaining his strength.

Yours truly,

RB-WLS

Electrical Engineer.

#2218

June 18, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

No doubt you have noticed from our Progress Reports that for the past several weeks we have not been making nearly as good time in the erection of our poles as we did before this period. This is due to the very great and unusual amount of snow and rain we have had.

We could get in only nine hours of brick work at Janney last week and yesterday ten inches of snow fell there. If this condition keeps up much longer it may be necessary for us to increase the number of our crews in order to get the work carried out according to our present plans.

I am enclosing a clipping from the Butte Daily Post of yesterday evening which may be of interest to you.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

Butte, Mont., June 14, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

I have your letter of June 8th in regard to rail bonds, and wish to call your attention to several points in this connection as follows:

You state that deliveries were delayed on account of your being obliged to have the factories make up samples by hand and submit them to me for approval before proceeding with the order. Please note that specifications which went forward from this office on April 20th stated, paragraph #2, page #2, that the bidder should submit with his proposal, samples, drawings or other information, and in view of the fact that there is nothing special as regards design of the bonds which we are buying, it would seem that such drawings as were needed could have been gotten up by various manufacturers within a few days. The above applies to your second paragraph.

You state in paragraph three that order for bonds was given manufacturers verbally on April 27th. I find, however, that drawings submitted by the American Steel & Wire Company were not received here until May 24th. As regards the O. B. Company proceeding to make up their dies and bonds without awaiting approval of design, it would seem reasonable to assume that in view of a definite schedule of shipment having been given, that the various bidders would have been called upon for a statement on delivery and that the one or ones who were to proceed first with manufacturing would have been required to start on the production of bonds according to the schedule, instead of proceeding to manufacture bonds which were not mentioned in the schedule on account of their not being needed until after the work had been in progress for an appreciable time. The above applies to your paragraph four.

As regards blue print submitted by American Steel & Wire Company, this was received here May 24th and upon its receipt we found that they had disregarded our specifications as to design of separate terminal, proposing an off-set terminal instead of straight terminal as called for.

42--J.T.C.--6/14/15

As regards General Electric sample this was delayed in transit for a week or more and they, together with others should have proceeded on basis of blue prints furnished me after order was placed as permitted under specifications.

I have already answered your last paragraph in my advice of several days since, stating that both express and freight shipments would have to be started at once, and that we would notify you when to discontinue express shipments as soon as we had a sufficient supply on hand and definite data as to freight shipments.

Yours truly,

RB-WLS

Electrical Engineer.

cc--C.A.G.

Butte, Mont., June 14, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to yours of the 10th in regard to our preparing a new print of ED-#310 showing socket drilling $1/32$ " larger than provided in terminal submitted by the American Steel & Wire Company, I will say that our original ED-#310 omitted this drilling intentionally, inasmuch as we require this drilling to be such as to accommodate tinned 250,000 C. M. cable and that at the same time the socket opening be tinned.

We found upon investigation of several manufacturers that they do not show this drilling in their catalogs of terminals and I presume the reason is that they use the same terminal for several different sizes of cable, drilling them to suit the needs.

In future orders the drilling should be specified to comply with the above requirements.

Yours truly,

RE-WLS

Electrical Engineer.

Butte, Mont., June 14, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to yours of June 11th in regard to sample broken guy hook sent you which was furnished on Requisition #250.

We did not intend to imply, that these hooks were made of cast metal or that we desired them made of cast metal. The fracture in the sample has the appearance of cast metal or a very poor quality of rolled metal, the latter from which these hooks were supposed to have been made.

What we desire is that you impress upon the Manufacturers the necessity for making these hooks of a very good quality of rolled metal, as they form a part of the very important pole guy system, and should provide a good factor of safety.

Yours truly,

RE-WLS

Electrical Engineer.

Butte, Mont., June 14, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to question of #2403 and #2404 Porcelain insulators for signal and feeder work, our records show that the status of orders is as follows:

No. 2403 Signal Insulators:

Total ordered Requisition #138.....	5,500
" " " #249.....	10,100
" " " #488.....	5,520

TOTAL.....21,120

Received to date	18,980
Delivered to Montana Power Co.....	5,298
Received for our use.....	13,682

Due to complete our Requisitions... 7,438

No. 2404 Feeder Insulators:

Ordered Requisition #138	9,000
" " " #249	8,000

Received to Date.....	20,730
Delivered to Montana Power Co.....	2,117

Received for our use.....11,613

Number due to complete our Requisitions to date..... 5,387

Will you please have this checked up with the Ohio Brass Company at once, advising if their records agree with ours, having them complete requisitions as soon as possible.

Yours truly,

RB-WLS

Electrical Engineer.

cc--F. Urbar

#2223

June 14, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Herewith please find requisition No. 1142 for small Porcelain X-Strain Insulators for use between Deer Lodge and Avery, this being a preliminary order in order to start the work, requirements for completion to be covered by a later requisition.

Yours truly,

RB-WLS

Electrical Engineer.

42225

June 14, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

Referring to the question of overhead crossings with the Butte Street Railway at Montana Street, Butte, and the B. A. & P. Ry. at Rucker and Silver Bow, please note that we have decided to use crossing made up in the field at Silver Bow and Rucker as suggested by you, and that we will use standard line cut-out switches at these two points. The switches are to be connected to track switches by bell cranks and pipe, therefore you will have nothing special to furnish for these two crossings.

As regards Montana Street crossing, it is assumed that we will make use of two cut-out switches, one for 600 volts and one for 3,000 volts interlocked with the crossing gate, practically as outlined on your Drg. #1149420, together with an all metal crossing designed for both wheel and pantograph operation, and involving the installation of 3,000 volt section insulators in Street Railway Wire on either side of crossing good for wheel operation, two 8 degree overhead frogs leading the Street Railway and Clark Hill wires into one wire at crossing, and two 600 volt section insulators installed in either Clark Hill or Street Railway wire outside of the frogs.

At the same time the scheme involves the installation of four air-breaks in our overhead contact system, two on either side of crossing and these spaced so as to include two locomotive units with pantographs up in the so-called neutral zone provided by air-breaks.

I understand from your correspondence that you consider it perfectly feasible to design interlocking mechanism for use in connection with crossing gate and in order to avoid trouble in this respect I am sending you two blue prints of drawing ED-3328, giving detailed dimensions of this crossing gate and its mechanism, so that you can make sure to have interlocking design so as to suit.

42--E.S.J.--6/14/15 (42225)

You will note that the clearances between arm and housing are somewhat limited, especially on account of belt ends and heads, but that the limits imposed by the latter can be decreased by the substitution of carriage bolts with heads towards the housing. In this same connection please note that the gate arms are somewhat warped and therefore it will be necessary to figure on liberal clearance.

From the small side plan you will note that the maximum distance from face of housing to face of pole which co-incides with edge of curb is 31 inches.

We are today placing requisition covering special material needed for Montana Street crossing on the assumption that you have developed a crossing that will fill the requirements and that the interlocking mechanism is applicable to the gate as shown. As soon as your engineers have gone into this matter thoroughly I would like full advise from you as to their conclusions with detailed drawings showing proposed mechanism and of metal crossing.

Enclosed please find photographs showing several different views of the gate which may be of service to you in connection with the blue prints.

Yours truly,

RB-WLS

Electrical Engineer.

cc--V.A.W.**H.S.H.

#2224

Butte, Mont., June 14, 1915.

Mr. G. F. Wilder,
Asst. Pur. Agent,
Seattle, Wash.

Dear Sir:

Replying to yours of the 11th in regard to four ft. and eight ft. timber ordered for anchor slugs, will say that what we require is timber of the above lengths with a minimum diameter of 9 inches if round and the timber must be sound and free from rot.

As to the use of 9" x 9" fir timber, or No. 1 Cedar hewn ties, either of these would take care of our requirements. We do not, however, care to pay a higher price than is required for round cedar sticks, as the latter will answer our requirements if they fulfill the specifications given above.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 14, 1915.

Mr. A. E. Long, Stkr.,
Three Forks, Mont.

Dear Sir:

Referring to your list of material under date of the 7th, will say that we are ordering 5/8" bolts with the exception of 5/8 x 7" carriage bolts, 5/8" round washers, 5/8 and 1/2" lag screws from Deer Lodge shops. We have ordered staples from Seattle and #9 and #12 soft wire locally in Butte.

Attachment castings, clevises and rock eye-bolts have been rushed by wire from Chicago, and 5/8 x 13 ft. 3 in. guy rods are coming from Chicago rush. No. 9404 feeder insulators are coming by express. Feeder clamps for 700,000 C. M. Cable should be on the job. Try Ferguson.

As regards tie marking nails, when these are exhausted use common wire nails, instructing Foremen to use them instead of tie marking nails.

We probably have sufficient three ft. arms in the camps to take care of the needs and I am looking up ten ft. six in. cross arms at Deer Lodge.

Yours truly,

REW-wls

Assistant Engineer.

June 15, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

The enclosed are prints of transmission line profile covering changes in the line due to location of substations at Two Det, Summit and Morel. There is also a print covering the change on account of the private road near Deer Park.

Please have additional poles distributed at these points if it is found necessary.

Prints covering changes at other substations will be forwarded to you when drawings have been completed, which should be within a few days.

Yours very truly,

RB-wls

Electrical Engineer.

June 13, 1915.

Mr. A. B. Van Dusen,
The University of Minnesota,
Minneapolis, Minn.

Dear Sir:

I have your letter of June 10th which crossed mine of June 9th.

I had some conversation with Mr. Goodnow regarding your coming with us, and also received from him a letter on the matter dated June 3rd, of which I enclose a copy.

On basis of Mr. Goodnow's letter, I assumed that the entire matter was settled, and that you would be with us about July 15th.

Regarding salary, when we had our first conference I mentioned a salary of \$75.00, which I understood you to agree was satisfactory. Unless I hear from you otherwise, I will assume that you will be with us July 15th, as we are desirous that you come early as possible. Kindly advise.

Yours truly,

RE-WLS

Electrical Engineer.

cc--C.A.G.

Butte, Mont., June 15, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to question of #9403 and #9404 Porcelain insulators for Signal and Feeder work, our records show that the status of orders is as follows:

#9403 Signal Insulators:

Total ordered Requisition #138.....	5,500
" " " #249.....	10,100
" " " #498.....	<u>5,520</u>

TOTAL.....21,120

Received to date.....18,840

Delivered to Montana Power Co..... 5,398

Received for our use.....14,542

Due to complete our requisitions..... 6,578

#9404 Feeder Insulators:

Ordered Requisition #138..... 9,000

Rec'd a/c duplicate req'n #138 a/c
first shipment unsatisfactory..... 9,000

Ordered Requisition #249..... 8,000

TOTAL.....26,000

Received to Date.....20,730

Delivered to M. P. Co..... 9,117

Required for our use according to our
requisitions.....17,000

Received for our use.....11,613

Due to complete our requisitions..... 5,387

Will you please have this checked up with the Ohio Brass Company at once, advising if their records agree with ours, having them complete requisitions as soon as possible.

Yours truly,

RB-WLS
cc--F. Urban

Electrical Engineer.

#2174.

Butte, Montana.
June 15th, 1915.

Mr. C. A. Goodnow,
Asst. to the President,
Chicago, Ill.

Dear Sir:-

The following is a report of the progress of substation construction for the week ending June 12th:

TWO DOT SUBSTATION:

Same as last week. Crew unloading brick.

SUMMIT SUBSTATION:

Brick masonry 10% complete. Foundation for four room bungalow complete. Forms for five room bungalow about complete.

JOSEPHINE SUBSTATION:

Brick masonry complete. Bungalow foundations complete.

EUSTIS SUBSTATION:

Brick masonry complete. Concrete roof placed on M.G. room. Travelling crane erected. Forms for concrete roof on transformer room two-thirds done. Foundation for four room bungalow complete. Forms for concrete walls for five room bungalow complete.

PIEDMONT SUBSTATION:

Brick masonry complete. Concrete roof over M.G. room completed. M.G. foundations concreted. Foundations for bungalows practically complete.

JANNEY SUBSTATION:

Brick masonry 90% complete. M.G. foundations 75% complete. Crew also erected roof trusses and unloaded crane. Four room bungalow foundation complete. Excavation for five room bungalow foundation complete.

MOREL SUBSTATION:

Brick masonry practically complete. Steel for roof in place. Forms for concrete roof being built. Travelling crane unloaded and moved into building. Bungalow foundations practically complete.

Yours truly,

cc-HBE
HSH
ESJ

WLS ✓

FAC. Electrical Engineer.
P.S. Work delayed on account of rain and snow.

Butte, Montana.
June 15th, 1915.

Mr. A. E. Manchester,
Supt. of Motive Power,
Milwaukee Shops, Wis.

Dear Sir:-

Referring to engine roundhouses now used for steam engines, and located on the territory to be electrified. Will you kindly advise me if your Department has in mind the making of the necessary changes in these roundhouses, so that they will accommodate electric locomotives. With respect to three locations, I would like to know about this as soon as possible; namely, Harlowton, Three Forks and Piedmont. We have wired up to the turntable at each one of these locations and have made a rather cursory examination of the buildings to see what changes should be made to adapt the buildings for the electric locomotives.

Of course, the trolley wires in the buildings should be so arranged that the current to them may be readily shut off. This can be accomplished by a switch located outside the building and connecting the outside trolley wire to that running in the roundhouse. The latter trolley wire may be of a height which will correspond to the minimum operating position of the pantograph, or it may be made the standard trolley wire height. The former figure is 17 feet as you will note by reference to drawing WR-1229, Engineering Department. They accommodate this height and take the wire, say, a distance of about 25 feet into the building. It would merely be necessary to raise the sill of the door about 18 inches, thus allowing for the 17 feet height of wire and 12 inches for supporting insulators. In addition to this the building will have to be lengthened out, say, 25 feet to make up for the difference in length between a Mallet engine and an electric. The other alternative, that is, making the trolley wire a standard height of 24'2" would involve an increase in height of building, considering the present lowest point of same, or about 9 feet. This assumes the roof raised at all points the same amount, that is, the roof simply lifted up in the air. With this height of trolley wire, it is safe for one to get on the roof of the locomotive, for instance, to inspect the pantograph if the latter had been lowered.

A.E.M. Page #2. 6/15/15.

I am simply going into this matter in this manner enough to give you an idea of the changes which will have to be made in the present construction of the roundhouses, and the number of stalls which would have to be changed. It is a matter which will have to be given careful consideration. It would seem that at Three Forks it would be necessary to enlarge only one stall, or possibly two, as Three Forks in electrical operation would not be a terminal point, and it would be seldom necessary to house the locomotive there.

I understand that your Department will take care of the necessary facilities for handling locomotives at Deer Lodge, and you probably also have in mind the taking care of the roundhouses, but in case my Department is to do any work in this connection, I would like to know about it as soon as possible. Kindly advise.

Yours truly,

RB.
cc-CAG.

Electrical Engineer.

Mr. Goodnow:- Have you any comments?

RB.

June 15, 1915.

Mr. C. C. Widener,
City Engineer,
Bozeman, Mont.

Dear Sir:

I received a telegram from Mr. Busch this morning saying that you desired the return of the catalogs that you let me take some time ago in connection with the Bozeman lighting.

I am returning the catalogs and correspondence today, and wish to apologise for my delay in this connection. I had several trips to make out of town just after I returned from Bozeman and the matter entirely slipped my mind.

I regret this very much and hope that your being deprived of the catalogs has not caused you great inconvenience. I wish to thank you for their use.

Yours very truly,

RB-WLS

Electrical Engineer.

June 16, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I would like to know how you feel about the securing of permits for our men to ride on the Olympian in connection with their work.

Of course we endeavor to make our use of this train as limited as possible, but there are a great many times when it seems to me it is to our advantage to use the train.

Mr. Barrett tells me that he has been requested to keep down the number of these permits as much as possible, but that if he had some assurance from you that might be used as his authority, he would be glad to favor us with the permits. If, therefore, you feel that it is proper, I would be glad to have you write me a letter which will serve to give Mr. Barrett the authority he desires, leaving the matter to my personal judgment as to when the requests for the permits should be made.

Yours truly,

RB-WLS

Electrical Engineer.

June 16, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your note on my letter of June 5th asking for a gas car for use of an Inspector at Frenchtown gravel pit, this Inspector will have to make probably a trip to the pit twice a day, so that he would have to be away from the substation in the morning and also in the afternoon, and this would require him to be on the road about two hours a day if he used a hand speeder. With a power speeder the time lost could be cut in half and we would also have a machine available which, when not in use by the Inspector, would come in very handy for men in the office to use in passing from one substation to another.

I do not want to be persistent about this matter, but if, with the further information given herein, you feel justified in letting us have the car I would be glad to have you put the requisition through.

Yours truly,

RB-WLS

Electrical Engineer.

June 16, 1915.

Mr. F. H. Valitch,
Box #202, Deer Lodge,
Montana.

Dear Sir:

I have your letter of June 10th in regard to a position in one of our substations as operator.

We have not yet begun to get together our operating forces, but will be glad to give your application consideration at the proper time. We naturally desire to give preference to those who have already been connected with the Road.

In the meantime, I would suggest that sometime in the near future you stop in my office in Butte and talk the matter over with me. Inasmuch as it looks as though our substation apparatus would not arrive here until the latter part of August or first part of September, we will not for sometime have installation crews started.

Yours very truly,

RB-WLS

Electrical Engineer.

42230

June 16, 1918.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Please find herewith Requisition RB-41145 covering material for Montana Street crossing. This involves the manufacture of very special apparatus, concerning which we have gone into detail with the General Electric Company.

The total amount involved is in the neighborhood of \$1,300.00, and if satisfactory I would ask you to kindly put through the requisition.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

82331

Butte, Mont., June 16, 1918.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

I received your letter of June 15th with Mr. Lund's letter to Mr. Arnold of June 2nd. I note from Mr. Lund's letter that he is of the opinion that if the Warning Signals were made of light hose there would be no trouble with pantograph operation.

What we desired however, was that Mr. Lund make experiments in this connection, so as to make sure that there would be no difficulty. It would be very easy for Mr. Lund to make these experiments by simply hanging a few strips of hose from one of the span wires and then running the locomotive into them under considerable speed and noting the action. This I should think ought to be done before Mr. Murray goes to the considerable expense of installing the material which he has in mind in connection with which we are still waiting for information from him.

Will you kindly have Mr. Lund make experiments suggested. Kindly note, also, that I am sending copy of this to Mr. Murray.

Yours truly,

RB-WLS

Electrical Engineer.

cc--C. L. W.
E. Murray
C. H. Arnold

June 17, 1915.

Mr. Wm. Fitzgerald,
C/o Penwell Hotel,
Missoula, Mont.

Dear Sir:

Replying to yours of the 14th inst. in regard to being transferred from Mr. Smith's to Mr. Nicholas' party.

It is not our practice to make such transfers until newly employed men in this Department have been tried out for a reasonable length of time. You can readily see that we cannot afford to adopt this practice as a regular thing, as the result would be disorganization of our forces throughout.

Yours truly,

REW-WLS

Assistant Engineer.

cc--F.R.N.
R.W.SMITH

June 17, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

I understand that you have Enameled Sheet Metal Danger Signs for attachment to poles and other structures carrying high voltage wires.

If consistent will you please let me have a sample of this sign, name of manufacturer and cost and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 17, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to yours of the 12th with attached letter from American Steel & Wire Company in regard to production of their rail bonds, while this matter has been covered by previous correspondence, I note that in the last paragraph of their letter the A.S. & W. Co. indicate that they feel they should have been permitted to proceed with the manufacture of the bonds on the basis of our specifications and blue print ED-#310.

As stated in specifications, it would have been satisfactory for them to proceed after submitting a detailed drawing showing what they proposed to furnish and as called for in the specifications.

Our drawing ED-#310 is more or less conventional, and was made rather to show method of application than details of bonds as proposed by various manufacturers. They should have proceeded at once to get out such a drawing and have it forwarded to this office, for approval, and could have in that way avoided the delay in starting production.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 17, 1915.

G. F. Soule, Inspr:

R. Wende, Inspr:

It has been decided that to begin with at least, cut-out switches in feeder and air-breaks in trolley wire, will not be installed at tunnels under 1200 ft. in length.

Local conditions may vary this rule where a Passing track is close to a tunnel. If, however, the tunnel is included in the section controlled by cut-out switches in such cases, the cut-out arrangement will apply to the Passing track rather than to the tunnel.

Please note that Tunnel No. 12, about one mile west of Penfield is 1175 ft. long, and Bearnouth Tunnel is 1176 ft. long. These two tunnels will be treated as 1200 ft. tunnels and provided with cut-out switches.

The 1200 ft. rule can be applied strictly to the remainder of tunnels in electrification territory.

Yours truly,

REW-WLS

Assistant Engineer.

cc--M.P.Co.

Butte, Mont., June 17, 1915.

Mr. G. F. Soule, Inspct

Mr. R. Wende, Inspct

It has been decided that to begin with at least, out-out switches in Feeder and Air-breaks in trolley wire will not be installed at tunnels under 1200 ft. in length.

Local conditions may vary this rule where a Passing track is close to a tunnel. If, however, the tunnel is included in the section controlled by cut-out switches in such cases, the cut-out arrangement will apply to the Passing track rather than to the tunnel.

Please note that Tunnel No. 13, about one mile west of Penfield is 1175 ft. long, and Bearmouth Tunnel is 1176 ft. long. These two tunnels will be treated as 1200 ft. tunnels, and provided with cut-out switches.

The 1200 ft. rule can be applied strictly to the remainder of tunnels in electrification territory.

Please be governed accordingly, regardless of provision that has been made for section switches and air breaks at such locations.

Yours truly,

REW-wls

Assistant Engineer.

cc--N. P. Co.

42233

June 17, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to water supply systems for sub-stations, we now have wells at Morel and Piedmont, and have arranged for a spring at Janney.

The attached requisitions #1161 and #1162 cover water supply systems complete for handling this water, and delivering it under pressure to the different buildings. The outfits referred to in the requisitions have been determined upon after careful study and after taking the matter up with the manufacturers, and we believe they will be about the best we can secure for the purpose. The two outfits covered by Requisition #1161 are quoted to us at \$245.00 each and the outfit covered by Requisition #1162 at \$225.00. In this connection we are sending you a copy of the A. Y. McDonald Mfg. Company's letter of June 9th. If satisfactory will you kindly put through the requisitions.

We are at present endeavoring to get water supply in the shape of wells at Eustis and Josephine and expect to get some result one way or another within a short time.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

42234

Butte, Mont., June 17, 1915.

Mr. J. C. Hill,
Signal Engineer,
Milwaukee Shops.

Dear Sir:

Following our conversation in which you stated that in certain territory between Deer Lodge and Harlowton it would not be necessary to off-set feeder wire at Signal locations, as you could arrange your signals so as to avoid this, please advise just what will be necessary in this respect between Deer Lodge and Avery. In other words, if we can do away with off-setting feeder for the entire territory, or if we will have to off-set feeder in present automatic territory and omit the off-setting in other territory.

I would like this information as soon as possible and at the same time please note that we expect to take up pole setting at Deer Lodge, working west, not later than July 1st, and expect to start a second crew probably at Missoula working east not later than August 1st. Therefore, if feeder is to be off-set, you will have to provide locations for signals so as to take care of this program.

Yours truly,

RB-WLS

Electrical Engineer.

cc--L.W.S.

June 17, 1915.

42235

The Montana Power Co.,
Butte, Mont.

Dear Sirs:

It has been decided to raise the voltage on Primary Signal wires from 2300 to 4400, and on this account to locate the No. 4 Primary Signal wires on outside pins of Feeder Arm instead of on two-pin arm.

The No. 8 Power Limiting wires when installed, will be located on two-pin arms originally intended for Signal wires in present signal territory, and on outside pins of Feeder Arms in territory not at present to be covered by signals.

Where No. 4 Signal wires have already been installed on two-pin arms, it will be necessary to raise them to outside pins on feeder arms.

Yours truly,

HB-WLS

Electrical Engineer.

cc--G. F. S.
R. Wendt

June 17, 1915.

42236

Montana Power Company,
Butte, Montana.

Dear Sirs :

Our contract with the B.A. & P. Railway for overhead work on joint section between Colorado Junction and Silver Bow Canyon requires them to furnish us with Daily Reports made out on Standard forms which you are using.

Mr. Lesson states he will send his Time-keeper to your office to obtain a supply of blanks and get instructions in regard to making out these reports so that our records on this particular work will be uniform with those for other portions of the work.

Yours truly,

RB-WLS

Electrical Engineer.

cc--C. A. Lemmon,
Chief Engr.,
B.A. & P. Ry.

42237

June 17, 1915.

Mr. F. J. Taylor, Div. Engr.,
Northern Pacific Railway,
Livingston, Montana.

Dear Sir:

Following our conversation and correspondence in connection with our getting up a map showing location of our poles, anchors and other attachments in connection with trolley and transmission work, which are not covered by regular map such as is made when a considerable strip is desired for trolley or transmission poles, I find that your Mr. McConnell has gone over the territory between Deer Lodge and Three Forks very thoroughly and has listed all such encroachments with reference to your mile posts.

I thought possibly your Company might intend having these encroachments located on your maps from his notes and if so, that this might serve, as any work we would do would be a duplication of this, and in order to fulfill your requirements it would be necessary for us to obtain your Right of Way maps, using them as a basis for our map.

If you see fit, will you please take this matter up with your telegraph department and advise me what their plans are in this connection, and if we can arrange to obtain blue prints of maps if your Company is going to make them up.

Will you kindly advise in regard to this at your convenience and oblige.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 17, 1915.

Mr. A. E. Long, Stkr.,
Three Forks, Mont.

Dear Sir:

In order to avoid shortage of material on the work, it is necessary that this office have information as soon as possible in regard to any shortages at your storehouse.

Furthermore, on account of the system used for disbursing material to various camps, that is individual foremen placing orders direct with the storehouse, it is impossible for us, to know just how much material is in the field at any time, and how this material is distributed between different camps according to their individual needs.

In future, therefore, when any item of material begins to approach a shortage at the store room, you should at once get in touch with the various camps, find out quantity of this particular item they have in stock and your report to this office should include what you have on hand and what the various camps have on hand at that time. We can then determine as to whether it is necessary to order additional material or arrange for the transfer of material between camps.

In cases where material is exhausted both at storehouse and in all camps as with rock eye-bolts recently, and we are having this material rushed by telegraph, you must arrange to notify this office either by telephone or telegraph immediately upon receipt of such material, as sometimes information is delayed from Chicago office in regard to shipment and we may continue to telegraph them without cause.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., June 18, 1915.

Mr. J. W. Ross,
Chief Dispatcher,
Three Forks.

Dear Sir:

Will you kindly take up with the Operator at Summit and try to have our messages come through a little more promptly from that station.

On the 15th of this month there was a message delivered to the Operator at 6:30 P.M., addressed to me at this office and this message did not reach here until 1:20 P.M. of the following day. Likewise another message sent at 6:00 P.M. on the 16th to me did not reach this office until 5:00 P.M. on the 17th.

These messages are Progress Reports from one of our camps located at Summit, and it is very necessary for us to secure them promptly because the information in them has to be sent to Chicago every day for the previous days work.

If you will kindly take this matter up and see if you can secure a little better service for us we will appreciate your doing so.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 18, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

Referring to yours of the 15th and 16th in regard to tower cars. I note that you have shipped tower #85584 to me at Butte. Unless otherwise instructed in future, please ship additional towers completed for use in this district to Three Forks.

In yours of the 15th you state that according to your records you still have eight more tower cars to build in order to complete our orders. My records show that we have placed written orders with you for tower cars as follows:

March 3rd	4
" 11th	4
" 12th	4
May 28th	1
June 13th	<u>4</u>

Making a total of seventeen towers ordered.

If eight are still to come according to your records, it would seem that you are including the four cars which were spoken of a week or two since, but for which no written order has been given. Please advise at once dates and numbers of tower cars on your records so that we can straighten this matter out.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 18, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Attention: Mr. Jennings

Referring to yours of the 14th with attached from the General Electric Company under date of the 9th, explaining why their production of rail bonds has been held up.

You state that the General Electric Company's letter agrees with your statement to me of June 9th. I will again call your attention to the fact that my telegram to you stated that bidders were to furnish information called for in specifications, which permitted their furnishing detailed drawings or samples of bonds proposed.

Your assumption that a sample was necessary seems to be responsible for all these delays.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 18, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

I understand that a certain amount of new 90# rail is to be laid in vicinity of Cedric. In connection with our bonding work, will you please advise me exact location, giving the east and west limits of this section to be re-laid, and as nearly as possible when the work will be done.

Yours truly,

RB-WLS

Electrical Engineer.

June 18, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

We are having pantograph mounted on box car at Three Forks for use in adjusting trolley wire when being built.

On account of the high cost of this pantograph, and having only one, will you please instruct your foremen to see to it that great care is used to avoid damage to same. When not in actual use pantograph frame should be tied down with rope on both sides.

Will you please instruct your foremen accordingly.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 18, 1915.

Mr. F. R. Nicholas,
Assistant Engineer,
Drummond, Montana.

Dear Sir:

Referring to transmission profiles sent in, please note the following questionable points which check up, giving me your advice in regard to them as early as possible so that profiles can be completed ready for construction and distribution:

Station 710 - 00, marked ED-#21 guy. Should be ED-#112 with side guy on account of cold curve. Next anchor point 735 - 70.

Station 759 - 70, marked ED-#19, should be ED-#21 with guy as angle figures less than three degrees.

Stations 1049 - 00,
1052 - 00,
1074 - 00,
1096 - 80, -- Make all of these 48 ft. 6 in. framing height. Take care of siding extension.

Station 663 - 00, marked ED-#19, should be ED-21 with guy. Angle one degree fifty-four minutes only.

Station 1702 - 40, marked ED-#21, angle six degrees, thirty four minutes. Should be ED-#20.

Station 1225 - 19, marked ED-#20, should be ED-#21 with guy. Angle one degree twenty-three minutes only.

Station 71 - 00, marked ED-#113, should be ED-#112 with side guy. Angle three degrees, eight minutes.

Station 988 - 80; It seems doubtful as to whether this pole is high enough to avoid picking up insulators, and also from profile it seems feasible to omit this pole, changing 985 - 00 from ED-#21 to ED-#33. How about this?

#2--F.R.N.--6/18/15

Please check all of these up and advise soon as possible if corrections should be made as noted, and if not, just why.

Where poles are marked for side guys due to special conditions, it will be well to put size of guy on, as this will be of value in connection with field work.

Yours truly,

REW-wls

Assistant Engineer.

42238

June 18, 1915.

The Mountain States Tel. & Tel. Co.,
Butte, Montana.

Dear Sirs:

Attention: Mr. Hobson

I have correspondence between Mr. Barrett and Mr. Earling in regard to Right of Way maps desired by your Company in connection with crossings made by your lines over our tracks. This correspondence states that the understanding is that you desire Vandyke prints of our maps.

As your lines cross our tracks at widely separated points, it would not seem that you would require a continuous map of our Right of Way in connection with these crossings where we are jointly concerned, and as it is necessary for you to make up special layouts for all crossings, using our map for data only, it would seem that a blue print at each crossing location would answer your purpose. The above is based on my understanding of your requirements.

Will you please advise me for just what purpose maps are required and just what is required, as there does not seem to be a clear understanding, and considerable expense would be involved in getting out either blue prints or Van Dykes unless the crossing locations only are covered.

Yours very truly,

RB-WLS

Electrical Engineer.

42239

June 18, 1915.

The Butte, Anaconda & Pac. Ry.,
Anaconda, Montana.

Gentlemen:

Attention: Mr. C. A. Lemmon

Attached herewith please find lists of material shipped to me at Butte for your use in making changes between Colorado Junction and Silver Bow Canyon, shipment being made in cars as shown.

These cars are now in Butte and the cable will be shipped from Three Forks Saturday in Car #81593 and possibly an additional car if needed.

Will you please arrange to have this material checked in when transferred to your cars and advise me as to any discrepancies that may develop. I will furnish you with statement of feeder and strand when shipment is made.

In this connection I think it is very desirable for all concerned that you arrange so that a Daily Report of material used will be made in addition to the regular Daily Labor Report. This does not involve much time when kept up to date, and is of great value in keeping track of material.

In this connection, while it is our intention to furnish all material used from our storehouse and other sources, it may be desirable for you to furnish a few small items during the progress of the work. We would like, however, for you to instruct your foreman to take the matter up direct with this office or through you as you may prefer if any material is needed or furnished from your storehouse.

Yours truly,

RB-WLS

Electrical Engineer.

cc--E. F. S.

#2230

June 16, 1915.

Mr. E. H. Barrett,
Asst General Supt.,
Butte, Montana.

Dear Sir:

We have taken up the work of bonding track rails and it is of the greatest importance that all Section Foremen in territory involved be given instructions at once as to the necessity for using extreme care in working around these bonds, particularly where they are exposed.

It is a common thing for Section men to catch a bond cable between spiking hammer and spike head or angle bar and cross tie, and in some cases one or more strands are broken or cut, whereas with the proper care this can be avoided.

These exposed bonds will be fastened to cross ties with staples and if it is necessary to draw the staples, they should be replaced by the section men.

Our Bonding Inspector, Mr. Vanderville will explain these matters to the Section Foremen as he comes in contact with them, but I would ask that you issue written instructions through the proper channels so that these men will have some authoritative orders in the matter.

Yours truly,

RB-WLS

Electrical Engineer.

#2241

June 18, 1915.

Mr. E. W. Adams, Sec'y,
Milwaukee, Wis.

Dear Sir:

Referring to rights which we are obtaining from the Northern Pacific for transmission line locations on their property, and for trolley pole and anchor locations, up to this time we have considered that such items as trolley and transmission anchors, stubs and isolated pole locations will be covered by general agreement which we are to make with the N.P. Company and such matters have not been referred to either Mr. Webster or yourself as they came up. In all cases where transmission line locations are of such extent as to require a map being made up by Locating Engineer, we have referred such maps to Mr. Webster with copies to you, assuming you would take care of such rights.

Will you please advise if such method of handling all N. P. Rights is satisfactory to you.

Yours very truly,

RB-WLS

Electrical Engineer.

442242

June 18, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

In view of copper having been stolen in the past and the ease of transporting rail bonds, we should have some definite scheme decided upon and rigidly enforced for taking care of bonds on the work.

While you may have taken care of this, it would seem necessary to keep distribution of bonds right with the installation and to have someone detailed to check bonds disbursed and returned to camp at the end of each days work.

Will you please advise what arrangements you are making in this connection.

Yours truly,

RB-WLS

Electrical Engineer.

cc--P.E.V.

Butte, Mont., June 18, 1915.

Mr. P. E. Vanderville,
Bonding Inspector,
Three Forks, Mont.

Dear Sir:

Attached herewith find list showing rail classification Deer Lodge to Eustis. This in connection with Employees' Timetable and investigation in the field should take care of your needs in this line.

Mr. Barrett advises that a section of rail in the neighborhood of Cedric is to be re-laid, that the Frictionless rail will probably be re-laid and that rail smaller than 85 $\frac{1}{2}$ in yards and passing tracks will probably be relaid, at least within such time as to make it bad policy to do bonding at the present time.

It will be well, therefore, to omit bonding the above class of rail as it is encountered, keeping an accurate account of the number of joints omitted and where they are located, so that we will know at any time just what work has been left behind us, and also the type of rail involved.

Yours truly,

REW-wls

Assistant Engineer.

cc--M. P. Co.

June 19, 1915.

Mr. C. A. Lemson, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

St. Paul Car No. 68332 was shipped from
Three Forks on the 17th inst., to Butte Yards, and
contains 21,120 ft. in four reels of 4/0 B & S
hard drawn 19 strand copper wire.

This is for use on trolley work west of
Colorado Junction.

Yours very truly,

MC-WLS

Electrical Engineer.

cc—G.F.S.

June 19, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am sending you herewith requisition #1164 for another gas car, same to be used by Inspector on trolley and transmission lines in the heavy grades east and west of Summit.

Mr. Miller who looks after this inspection has been using a hand speeder in localities where grades are lighter, but on account of the heavier grades in the territory he is now approaching and in view of the considerable territory which he is required to cover, there is no doubt but what a car would be a very profitable investment. If consistent, I would be pleased to have you put through the requisition.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 19, 1915.

G. F. Soule, Inspri:

R. Wende, Inspri:

Referring to my recent letter in regard to off-setting feeder at signal locations, Signal Engineer Mill was in this office today and advised that in all our future work we can dispense with off-setting arms at Signal locations. Please therefore be governed accordingly.

Referring to sections where off-set arms have been installed on account of signals and feeder has not been strung, Mr. Beckwith desires that such off-set arms be replaced with standard arms. This can be taken care of when feeder is strung or at some other time if more convenient and more economical. This supersedes letter of recent date on this subject, specifying certain territory for off-set arms and other territory for standard construction.

REV-WLS

Assistant Engineer.

cc--M.P.Co.

#2175.

Butte, Montana.
June 19th, 1916.

Mr. E. S. Johnson,
General Electric Company,
Schenectady, N.Y.

Dear Sir:-

I have received shipping notices covering material in cars B&O 193907, NYC. 100595 and UP 73522. I find it difficult, if not impossible, to check the cable items from the information I have.

On your conduit lists you show that items are made up from drawings K-1635433 to K-1635434 inclusive. We have not received these drawings, and it appears that we should have them in order to check up and identify the items. I think also it would be well for you to show on your shipping notices, especially in connection with the cable, for what use the items are intended. If we are furnished with the prints mentioned which show how the items are made up and for what purpose each is to be used, it would only be necessary to show the item number. In any event the shipping notice should have some information which would enable us to readily determine for what purpose each item of cable is to be used.

Yours truly,

FBW.
cc-VAN
HSH
HEW

Electrical Engineer.

WLS

Butte, Mont., June 21, 1915.

Mr. G. Ranney, Paymaster,
Chicago, Illinois.

Dear Sir:

Will you kindly arrange to have our payroll forwarded direct to my office instead of to the Agent at Butte.

We recently received our payroll for the month of May from the Agent and it was badly mixed up. It would save us much uncertainty and labor if this was forwarded direct to me. Please so arrange in the future.

Yours truly,

FAC-WLS

Electrical Engineer.

June 21, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Herewith please find Requisition RB-1174 for five double steel bunks to be used by the party making transmission line survey west of Deer Lodge.

When the party started out sometime ago we purchased wooden cots. These have all fallen to pieces, and are not very comfortable to sleep on. I am, therefore, making requisition for five double steel bunks.

If you approve, will you please have shipment of the bunks hurried all possible.

Yours truly,

FAC-WLS
Encl.

Electrical Engineer.

Butte, Mont., June 22, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

I am sending you today requisition for cars to be furnished Inspectors Soule and Wende to be used by them on the work.

Mr. Soule will call and explain to you in detail more fully in regard to the equipping of these cars, which are intended to be used as living quarters for the two above named Inspectors while they are on line. It is not necessary, however, for you to put off work on the cars until Mr. Soule arrives as he will take care of some minor details only.

Kindly get these cars ready as soon as is convenient, and advise me when they are ready to be put into service.

Yours truly,

RB-WLS

Electrical Engineer.

42244

June 22, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Herewith statements of Unadjusted Material charges covering work between Harlowton and Three Forks, Deer Lodge and Avery, and the work done on the extension of the electrification at Great Falls, which was later abandoned.

In order to clear the Auditor's accounts of these unadjusted charges I am making application for an A.F.E. An estimate of the cost of the work for the two former sections will be furnished later.

Yours truly,

FAC-WLS

Electrical Engineer.

cc--W.M.H.

42245

June 23, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

I have yours of June 17th relative to Warning Signal for low clearance bridges, tunnels, etc., and am glad to note that you are asking your engineer's to consider this matter further, as it would not seem to me from the correspondence attached to your letter that any tests have been made which would conclusively show that the regular type of warning signal could not be used for pantograph operation.

We cannot see how any visual signal would be more conspicuous than a bridge or tunnel itself. Of course at night a lamp signal would help, but this would involve undesirable connections to the trolley circuit or the running of our primary signal wires in districts where they are not, at least for the present, exist.

We have to settle this matter promptly and if you can make any tests on your test trap which will help us in the matter, I would be greatly obliged.

Yours truly,

RG-WLS

Electrical Engineer.

cc--V.A.W.
H.S.E.

43245

June 22, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

I have yours of June 17th relative to Warning Signal for low clearance bridges, tunnels, etc., and am glad to note that you are asking your engineers to consider this matter further, as it would not seem to me from the correspondence attached to your letter that any tests have been made which would conclusively show that the regular type of warning signal could not be used for pantograph operation.

We cannot see how any visual signal would be more conspicuous than a bridge or tunnel itself. Of course at night a lamp signal would help, but this would involve undesirable connections to the trolley circuit or the running of our Primary signal wires in districts where they will not, at least for the present, be installed.

We have to settle this matter promptly, and if you can make any tests on your test trap which will help us in the matter, I would be greatly obliged.

Yours truly,

RB-WLS

Electrical Engineer.

cc--V.A.W.
H.S.H.

52246

June 22, 1915.

Mr. H. A. Gallwey, Gen'l Mgr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

The proposition contained in your letter of June 10th regarding making of changes in your present overhead construction and doing other work necessary to adapt this construction for our joint use is satisfactory to us and is hereby accepted.

Yours very truly,

RB-WLS

Electrical Engineer.

cc--C. A. G.

42247

June 22, 1915.

Mr. H. B. Earling,
Vice President,
Seattle, Wash.

Dear Sir:

Referring to your note on the letter to you by Mr. George Kidd, General Manager of the B. C. Electric Railway Co., Ltd., I do not know whether Mr. Goodnow will consider that our arrangements with the Montana Power Company will allow us to properly furnish the information requested or not, and I have, therefore, written Mr. Goodnow regarding the matter.

Yours very truly,

RB-WLS

Electrical Engineer.

cc--C.A.G.

42348

June 22, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am handing you herewith a letter referred to me by Mr. H. B. Earling and addressed to him by Mr. George Kidd, General Manager of the B. C. Electric Railway Co., Ltd., and I am also sending you a copy of my letter of even date to Mr. Earling in the same connection.

I do not know how you will look at this matter. Possibly you will consider it advisable to merely tell Mr. Kidd that our work is being done under contract by the Montana Power Company, and that we have no agreement with any Labor Unions. You may, however, consider it proper to give Mr. Kidd information as to the rates of pay which are mentioned in our contract with the Power Company. If so, the replies to the questions would be as shown on the attached sheet.

Yours truly,

RB-WLS

Electrical Engineer.

42349

June 22, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your letter of June 14th regarding galvanized conduit, this conduit is also made black, without galvanizing, but as most of that required in the substations will be in concrete which will be, for a time at least, wet, and considering the comparatively small amount involved I think it would be very poor policy to consider anything but the use of galvanized material.

Yours truly,

RB-WLS

Electrical Engineer.

#2252

Butte, Mont., June 23, 1915.

Mr. G. F. Wilder,
Asst Purchasing Agt.,
Chicago, Illinois.

Dear Sir:

I have your letter of June 19th in which you state that we do not seem to get the idea which you are trying to convey in regard to Anchor slugs, and that what you asked us to say was what the maximum diameter might be.

In this connection please note the first sentence of the first paragraph of our letter of June 19th which says that we do not care to have the slugs over 12 inches in diameter.

However, to eliminate any further questions as to just what is wanted, I am attaching hereto a specification which I believe you will find will cover all of the information previously given and will be perfectly clear. If you find that any points come up which we have not covered, kindly so advise us.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

#2253

June 23, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Attached is requisition RB-41166 for seven Section Insulators which we will need in the district west of Butte where we have joint use with the B.A. & P.

These insulators may be purchased from either the General Electric Co. or the Ohio Brass Company.

The second item on the requisition is for out-out switches for the district between Three Forks and Harlowton. Similar switches have already been furnished for the district between Three Forks and Deer Lodge.

Yours truly,

RB-WLS

Electrical Engineer.

cc--J.T.C.

#2253

June 23, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Attached is requisition RB-#1166 for seven Section Insulators which we will need in the district west of Butte where we have joint use with the B.A. & P.

These insulators may be purchased from either the General Electric Co. or the Ohio Brass Company.

The second item on the requisition is for cut-out switches for the district between Three Forks and Harlowton. Similar switches have already been furnished for the district between Three Forks and Deer Lodge.

Yours truly,

RB-WLS

Electrical Engineer.

cc--J.T.C.

#2254

June 24, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

We received yesterday reports from Camp #4, covering the entire interval between June 4th and June 21st. Can you arrange to have these come to us a little more promptly?

We would also like to call attention to certain points in connection with the distribution of charges on some of these reports. For instance:-

June 6th.--Banking poles we think, should be charged against erection of poles instead of against stringing of wire, and the cost of clearing the Right of Way should be kept separate.

June 8th.--Straightening poles should be charged against pole erection instead of against Stringing Wire.

June 9th.--Pulling of guys should be charged against guys, and changing of cross-arms should be charged against framing.

June 15th.--Changing slug holes should be charged against Account No. 2, for holes, and against Account No. 4 for guys.

Will you kindly straighten out Camp #4 regarding this?

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 24, 1915.

Mr. F. Rush, M. M.,
Tacoma, Wash.

Dear Sir:

Please advise just when the General Electric Instructor who accompanied the Great Falls locomotive was released. The only information I have on this subject was your telegram, a copy of which is attached. This stated Mr. Brooks was released April 10th. I just received a bill from the General Electric covering this man's time and expenses, and as nearly as I can judge from it he was retained in Great Falls up to and including April 16th. Will you kindly let me have further advice on the subject soon, in order that I may pass the bill for voucher.

Yours truly,

RAC-WLS

Electrical Engineer.

June 24, 1915.

#2255

Mr. A. O. Austin,
Ohio Brass Company,
Mansfield, Ohio.

Dear Sir:

Have you any data as to the durability of the galvanizing of the tap on heads of suspension insulator disks?

I have indirect information from one Company which, by the way is using a large number of your insulators, to the effect that the action of electric current is such as to destroy the galvanizing in a comparatively short time. I have not observed this effect myself and would be glad to know if you have.

An early reply will be appreciated.

Yours very truly,

RB-WLS

Electrical Engineer.

#2258

June 24, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Attached is Voucher RB-#235 for \$250.00 covering our office quarters for July.

You will notice that we have secured two additional rooms at a price of \$57.50 per month.

After going over the matter thoroughly we found it impossible to get along without some additional room, and have therefore made this arrangement.

Yours truly,

FAC-WLS

Electrical Engineer.

June 24, 1915.

Mr. J. P. Jollyman, Elec. Engr.,
Pacific Gas & Electric Co.,
San Francisco, California.

Dear Sir:

Referring to the matter of galvanizing of fittings and parts used in connection with suspension disk insulators, I have received indirect information from one large user that he finds that the galvanizing of the head of the disk is an unwarranted expense, as apparently on account of some electrical action the galvanizing soon disappears.

I would thank you very much to let me know if your experience has indicated that there is undue deterioration of the galvanizing of suspension insulator parts on your high voltage lines.

Very truly yours,

RB-WLS

Electrical Engineer.

June 24, 1915.

Mr. V. H. Greisner,
Chief Electrical Engr.,
Washington Water Power Co.,
Spokane, Washington.

Dear Sir:

Referring to the matter of galvanizing of fittings and parts used in connection with suspension disk insulators, I have received indirect information from one large user that he finds that the galvanizing of the head of the disk is an unwarranted expense, as apparently on account of some electrical action the galvanizing soon disappears.

I would thank you very much to let me know if your experience has indicated that there is undue deterioration of the galvanizing of suspension insulator parts on your high voltage lines.

Very truly yours,

RB-WLS

Electrical Engineer.

June 25, 1915.

Great Western Power Co.,
San Francisco, Calif.

Dear Sirs:

Attention: Mr. Beardsley,
Elec. Engineer.

Referring to the matter of galvanizing of fittings and parts used in connection with suspension disk insulators, I have received indirect information from one large user that he finds that the galvanizing of the head of the disk is an unwarranted expense, as apparently on account of some electrical action, the galvanizing soon disappears.

I would thank you very much to let me know if your experience has indicated that there is undue deterioration of the galvanizing of suspension insulator parts on your high voltage lines.

Very truly yours,

RB-WLS

Electrical Engineer.

Butte, Mont., June 25, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to telegram this date requesting additional shipment pole guy hooks and shims by baggage express, Requisition #1057, the reason for these rush shipments is that two additional crews have been unexpectedly started on the East end, and our original plans assumed that material for Deer Lodge-Avery section would be on hand for supplying East end needs as such needs developed.

In view of the conditions, I trust that you will be able to forward the remaining hardware and strand on Requisition #1057 by freight very promptly and that you will arrange to trace all such shipments to destination.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 25, 1915.

Mr. Mace Butler,
C. O. A. E. Long,
Three Forks, Mont.

Dear Sir:

Please arrange to go to Deer Lodge on Tuesday morning to take over the work at that point. There is considerable material moving that way now, and you should be on the ground and prepare to take care of it until the storehouse is completed. You can also get your tracks lined up and other facilities arranged for.

Especially bear in mind that we will need a door cut through the fence in order to load the S. M. Strand in back of Yard, and proper track for spotting out derrick car to load strand and copper wire.

You will consult Mr. Kelly in regard to some of these matters. You may arrange to pay your laborers 80¢ per hour. At first you will only need a few until the work gets under way. You should also arrange to get a good foreman and later on you will have to have some help in the office. You may pay these men 25¢ per hour.

Please advise promptly what stationery and other items you may need to take up the work. I am also advising Mr. Kelly regarding your arrival in Deer Lodge.

Yours truly,

FAC-WLS

Electrical Engineer.

Butte, Mont., June 25, 1915.

Mr. J. T. Kelly, Stkr.,
Deer Lodge, Mont.

Dear Sir:

Mr. Mace Butler will come to Deer Lodge on Tuesday morning to take up the work of handling the material at that point for our Department.

Please give Mr. Butler any assistance or information that will be of help to him in carrying on the work.

At first he will not require much help, but later on it may be necessary for him to have a crew of 12 or 15 men to handle material as it arrives. We will arrange to pay common labor 20¢ per hour. I do not think that this will interfere with your help in any way.

From time to time Mr. Butler will call on you for various items of material. It will be satisfactory for you to furnish him with same, and we will cover by regular requisition in this office. Of course he understands he is not to do this unless it is necessary.

Yours truly,

FAC-WLS

Electrical Engineer.

cc--M.B.

Butte, Mont., June 25, 1915.

Mr. E. Vanderville,
Bond Inspector,
Three Forks.

Dear Sir:

Following conversation yesterday on telephone in regard to use of scrap trolley wire for making up bonds of special lengths, such as cross bonds and those to go around track frogs, please note that our requisition for 4/0 strand is based on the assumption that we will use scrap trolley for practically all such work, and therefore it will be necessary for you to not only keep in touch with this material, such as may be on hand at Three Forks, but also at the trolley wire stringing camps and on all work trains engaged in trolley work.

You stated that six ft. lengths were not available for use, whereas our understanding is that the greater part of special bonding at Yards, Passing tracks, etc. will be done by cross bonds between track rails, this doing away with the greater percentage of frog bonds.

In order to avoid interference with the installation of such bonds as the work proceeds, it will be necessary for you to keep in close touch with the amount of scrap trolley available in connection with the needs for this special work, and keep this office advised if there is indication of shortage of trolley wire.

As regards the annealing of this wire, this is something that can be taken care of by ordinary labor, as it of course involves the use of a wood fire only at some convenient place. I would like to have a report from you on this subject as soon as you have matters lined up.

You of course understand that our express shipments of bonds are supposed to continue until we notify the Purchasing Agent that we have sufficient on hand to take care of our needs, together with what will follow by freight. I will depend on you, therefore, to advise me just when express shipments have reached the point where we can take the matter up with the Purchasing Agent by telegraph in regard to freight shipments, and put a stop to this expense as soon as possible.

Sheet #2--E.V.--6/26/15

In regard to bonding tracks at Deer Lodge Yard, it would be well for you to take this matter up with Supt. Murphy before leaving Three Forks, and determine as to whether we will leave small rail unbonded at that Yard in view of contemplated replacement with 85# rail, and advise me the result of your conversation.

Yours truly,

REW-WLS

Assistant Engineer.

#2259

June 25, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I have arranged to secure the services of
Mr. Mace Butler as Storekeeper at Deer Lodge.

Mr. Butler has been working in one of our
substation crews. His rate will be, \$75.00 per month.

If consistent please furnish me with
Annual transportation good on lines in Montana and
Idaho for Mr. Butler. From time to time it will be
necessary for him to go out on the road to look up
material and other things.

Yours truly,

FAC-WLS

Electrical Engineer.

#2260

June 25, 1915.

Mr. Geo. Freeman, Receiver,
U. S. Land Office,
Helena, Montana.

Dear Sir:

In connection with the application of this Company for Right of Way for a Transmission Line across Public Lands within your District, I am sending you under separate cover the following papers, tracings, blue prints, etc. covering desired locations in Gallatin, Broadwater, Silver Bow and Meagher Counties, Montana:

Exhibit I-2	(In quadruplicate)
" K-4	(In triplicate)
" K-5	"
" K-6	"
" K-7	"
" K-8	" "
" K-9	"

Exhibit J-4	(Including two tracings and two blue prints each)
" J-5	"
" J-6	"
" J-7	"
" J-8	"
" J-9	"

Will you please put forward these documents and maps for examination and approval, advising me when they go forward and oblige.

Yours very truly,

RE-WLS

Electrical Engineer.

cc--E. W. Adams

42261

June 23, 1915.

Mr. C. A. Lemmon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

Following your request this morning, I find that the Catalog number of the new style G. E. Flexible Pull-off made up with pipe arm and special ear, is #165703. The Catalog numbers for channel iron struts together with J-bolts are as follows:

14 Inch,	--	Catalog No.	129473
17 "	---	"	No. 129473
20 "	---	"	No. 129474.

The length of strut suitable for pole spacing is given on Blue Print ES-443058, copy of which I enclose. You will note that pole spacing is different from your standard. I do not believe, however, that this difference is sufficient to change the length of struts which you would select for your work. In this connection, we have always found it desirable to order a reasonable amount of channel section and J-bolts, so as to be able to make up special strut lengths in the field.

At overhead switches, instead of using angle iron for spacing wires in connection with ears fitted with cap screws, we are using what the General Electric Company calls "Pull-off Link (non-adjustable) with Pipe Strut", Drg. K-1127967. As made up, the ears are eight inches apart, and these are being used at points where, on the B.A. & P. work, wires were four inches apart.

Where similar spaces are required with greater distance between wires, when using a spacer made up of one-half inch galvanized pipe together with what the G.E. Co. calls "Two Link Castings" or "Pull-off Link Brackets with Ears", their Drg. Number for castings and ears is #1,155,588. For this latter work, we are buying the castings and ears from the G. E. Co., and the pipe locally, as it is only a matter of cutting it off with a hack-saw to suitable length. Please advise if any additional information is desired.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 26, 1915.

Mr. E. Vanderville,
Bonding Inspector,
Three Forks, Mont.

Dear Sir:

Referring to your inquiry in regard to your time allowance for the month of May.

I have looked this matter up and find that your time began on May 27th when you returned from your trip to the Coast, our position in the matter being that your first trip was made for a conference and you were to be prepared to remain on the job if everything was satisfactory, and that time consumed on your trip was on account of personal business and before you entered our employ. We did, however, allow you expenses for your first trip here and assumed that you understood the matter in this way.

Please advise if anything transpired during your first visit here or in correspondence to lead you to believe that you would be on the payroll from the time that you first arrived.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 26, 1915.

Mr. E. Murray,
Asst Engr B & B.,
Miles City, Mont.

Dear Sir:

Replying to yours of the 21st in regard to time for making repairs to roof of Tunnel No. 11 just west of Donald, I will say that we have already installed fixtures for supporting our wires and have drawn in feeder. We have yet to install trolley wires and signal cable.

Sometime will elapse, however, before this work is done, and we are not in a position now to say just when. If you can give me an idea of the length of time required for your work, we will be in a better position to discuss the matter, as it may be possible for you to clean up your work before trolley is installed. Will you please so advise.

Yours truly,

RB-WLS

Electrical Engineer.

#2262

June 26, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

I am enclosing herewith print of Drg. ED-4331, showing the substation layout at Josephine, which was asked for by your Mr. Cochran.

In regard to the location of your poles on the north side of the track, we would like to have you keep at least 15 or 20 ft. north of our trolley poles for appearance sake. These trolley pole locations can be identified on the ground, either by the stakes or by the holes which may be dug for them.

I am also enclosing Drg. #509 which shows the entrance of your lines to this substation.

As understood with Mr. Cochran, we will supply you with two 80 ft. poles and three strings of insulators with their hardware, while you are to supply your own standard dead-end cross arms together with their hardware and secure necessary rights for the guys.

If you will take up with Mr. Soule in regard to having the two long poles unloaded at Josephine he will see that the matter is properly taken care of.

Yours truly,

RB-WLS

Electrical Engineer.

June 26, 1915.

42363

Mr. E. H. Barrett,
Asst Gen'l Supt.,
Butte, Montana.

Dear Sir:

We have obtained rights for and located on the property of Mr. James Murray, at a point about one mile east of Josephine, eight anchors for transmission line. In making settlement with Mr. Murray, Mr. Webster agreed to fence in each of these anchors. This means a triangular piece of fence including the Right of Way enclosing each anchor and guy, and in the opinion of Mr. Webster will require about three posts for each anchor.

Mr. Murray of course objects to our removing the section of Right of Way fence involved, and the object in fencing is to protect his stock from injury.

If consistent, will you please arrange with the Roadway Department to install this fence, taking this matter up with our Inspector, Mr. Wende, to whom I am sending a copy of this letter, and he will point out the location of the anchors to the Section Foreman.

Please advise if this arrangement can be made.

Yours truly,

RB-WLS

Electrical Engineer.

cc--R. Wende

42264

June 26, 1915.

Mr. E. H. Barrett,
Asst Gen'l Supt.,
Butte, Montana.

Dear Sir:

After stringing trolley and messenger by Coal Dock and Water Tank at Piedmont, we find that water spout and coal chute do not properly clear these wires.

While I may be mistaken, I am under the impression that Mr. Murray decided that it would not be necessary to make changes at water tanks and coal docks.

Will you please take this matter up with him and if necessary, arrange to have necessary changes made to provide clearance so that our trolley and messenger wires can be properly built in place. Please advise.

Yours truly,

RB-WLS

Electrical Engineer.

cc—G.F.Soule

#2265

June 26, 1915.

Mr. E. I. Holland, Mgr.,
Great Falls Branch,
Montana Power Company,
Great Falls, Montana.

Dear Sir:

Replying to yours of the 24th in regard to tower car and Work Train service for adjusting overhead work on Great Falls Terminal electrification, it would seem that the height of tower platform would be limited by height of trolley wire, 24 ft. 2 inches, and therefore the height of 28 to 30 ft. mentioned by you as desirable would be impracticable unless temporary platform were arranged on top of fixed tower platform. Furthermore, it is customary to make temporary arrangements for extraordinary heights.

Will you please, therefore, have Mr. Todd rig up temporary extension on tower platform to take care of his needs. I have wired Mr. Whiting asking him to furnish you work Train Service, and will have Mr. Arnold keep in touch with you so that work can be done to suit the needs of all concerned.

Will you please advise for my information when work is started and also when it is completed and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

cc--M.P.Co.--Butte

Butte, Mont., June 26, 1915.

Mr. G. E. Ceseford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

Again referring to the number of tower cars yet to be completed, in looking over our records I can find only seventeen towers ordered as shown on my letter to you of June 18th, whereas it would seem that your records would indicate a total of 31 towers to be built.

Will you please advise in detail just what your records show for tower cars ordered, giving dates, number of towers for each order and if possible show requisition numbers on which these were ordered.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 26, 1915.

Mr. W. L. Slater,
Pole Inspector,
Santa, Idaho.

Dear Sir:

Referring to your letter of the 24th regarding shipment of poles as per my letter of the 23rd.

While in a general way we want to follow the instructions I gave you, yet it will not be necessary to adhere to these real close. What we are trying to do is to give shipping directions on the poles as fast as we can make our survey and ascertain requirements.

It will be alright for you to ship eight cars of 50's, making 488 poles instead of 460. You may also ship the complete order of 100 55 ft. poles, and also the other lengths, making straight loads as far as possible, allowing the mixed poles to come in one load if it can be so arranged.

In this way you will be able to clean up the shipments at Santa. In the near future we will be able to give more shipping directions on odd length poles.

Yours truly,

FAC-WLS

Electrical Engineer.

Butte, Mont., June 26, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois

Dear Sir:

Replying to yours of the 21st with attached letter from American Steel & Wire Company in regard to short lengths of 500,000 and 700,000 C. M. Cable on hand, which they wish us to accept.

We can arrange to accept 500,000 C. M. 27 Wire Cable as follows:

1 Piece 850 ft. long, 1302#
1 " 1280 ft. long, 1933#
1 " 720 ft. long, 1185#

The remaining lengths of 500,000 are too short for our use, as well as the one piece of 700,000 C. M.

If more than one of these short lengths are shipped on one reel, please have them marked so as to show contents plainly, and at the same time advise us, giving reel number so that we can follow it up upon delivery.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 26, 1915.

Mr. F. R. Nicholas,
Asst Engineer,
Clinton, Montana.

Dear Sir:

Inspector Wende reports five transmission poles on tangent stretch just west of Summit badly out of line.

As this discrepancy was discovered only after the poles were erected, considerable expense is involved in bringing them into alignment. The indications are that these stakes were set by off-set measurements from the track rather than by transit, and the lay of the ground is such that if off-set measurements were used and chain not properly broken, the discrepancy may be accounted for in this way.

While of course it is good judgment in some cases to locate such poles by measurement, it is at the same time necessary to have extreme care used in making measurements. Please advise what your practice is in this regard.

Yours truly,

REW-WLS

Assistant Engineer.

Butte, Mont., June 26, 1915.

Mr. R. W. Smith,
Missoula, Mont.

Dear Sir:

Referring to yours of the 23rd in which you request additional data on overhead construction and additional information as to track alignment.

As regards stations including curves and locating head-blocks and bridges, also long stations and approximate location of substations;--while no doubt all of the above data would be of some incidental service to you, you will appreciate that if we furnish you such data it will involve a tremendous amount of work in this office, and I cannot see just what particular use you will make of such information as applied to curves, head-blocks and bridges, also long stations, as you are necessarily governed by the track as you find it and the curvature of rail as determined by the eye. My understanding is that station numbers are marked on track rail, which should give you necessary information in connection with new top of rail profile, and I would like advice as to use you intend making of information before spending the money and time required for getting it out.

As regards locations of substations, we are unable to give you these, and corrections will have to be made later if necessary, at such points.

I am sending you today under separate cover top of rail profile, Bonner west, and will forward you alignment classification from Missoula west soon.

Yours truly,

REW-WLS

Assistant Engineer.

Butte, Mont., June 28, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

I am sending you today steel tape which was originally 200 ft. long, but which has been broken in several places, and I wish you would see if you can repair this so that we may have a chain when finished 150 ft. long.

You will notice that the figures on the tape denoting the feet are worn off, and I would like you to put some new babbitt or some hard solder on the tape, using your judgment as to which will wear the better, and re-stencil it.

I am enclosing herewith copy of requisition covering necessary expense in connection with this work. We would also like a loop placed on the blank end of the chain, similar to the one now on the other end.

Yours truly,

RB-WLS

Electrical Engineer.

#2266

June 28, 1915.

Mr. A. I. Bouffler,
St. Maries Hospital Assn.,
White Bldg., Seattle.

Dear Sir:

I am sending you herewith three copies of contract form drawn by the Montana Power Company to cover hospital arrangements with the St. Maries Hospital Association and to comply with the rules and regulations of the State Accident Board under the New Compensation Act.

If this contract meets with your approval, will you kindly have same executed and returned to the Montana Power Company for their execution also, after which one copy should be retained by your office, one copy by the Montana Power Company and the third copy goes to the State Board at Helena for file.

Mr. Rogers, Counsel for the A.C.M. Company advises that this form is in accordance with the demands of the State Board and that it cannot be changed. This is also the same form as the various Companies are making with other Hospital Associations in this vicinity. I am attaching copy of contract between the St. Maries Academy and Interstate Lumber Company for your inspection.

Mr. Rogers deemed it advisable to make the ten percent additional payment to be paid by the Montana Power Company and the last clause in the old contract between the St. Maries Hospital Association and the Montana Power Company a subject of special contract. This has been done and same is also respectfully submitted for your approval.

It will not be necessary to have a copy of this latter document filed with the Hospital Contract at Helena. We are also retaining copies of this in Butte in case your representative comes here to close the matter.

In case you agree with the terms of the contract, you might wire us your approval and we will take care of the matter promptly as possible. It seems there has been a great deal of delay in getting the correct information as to the requirements of the State Board. As the matter now stands I suppose there will have to be a new contract drawn for the

services rendered to the Montana Power Company's employees when they take up the work in Idaho as you will see this supersedes your former contract. It will be sometime, however, before the work in Idaho is taken up, that is between East Portal and Avery, and you will therefore be able to take up the matter directly with the Montana Power Company regarding this portion of the work.

I believe you understand that the employees of this Department are not affected by this new Act, as they come under the Classification concerning Inter-state Corporations.

Yours very truly,

FAC-WLS

Electrical Engineer.

cc--M.P.Co.

At Butte, June 29, 1915.

Mr. F. M. Barkwell,
Attorney, C. M. & St. P. Ry.,
Seattle, Washington.

Dear Sir:

I have signed the Leudinghaus deeds, but
as they do not have the approval of the General
Attorney I wish you would see that his signature is
attached before delivery.

Truly yours,

CAG-WLS
Encl.

Asst to the President.

Butte, Mont., June 29, 1915.

Mr. R. W. Smith,
Missoula, Mont.

Dear Sir:

Following your letters of the 27th, I am enclosing pass for Wm. Fitzgerald, Missoula to Butte, which please turn over to him and release him soon as you can place Mr. A. B. Jones in his position. As soon as Fitzgerald is released notify this office immediately as to when his time should stop and when Jones' time should begin. No further action is necessary on your part.

Referring to your proposed trip over this section with a part of your men Sunday and Monday, we are not in a position to furnish gasoline car, and on account of the nature of a good part of the country it is very undesirable to use speeders, and while I think this a good move on your part, it will be necessary for you to use your pass for this purpose.

I will advise you later as to additional data which you have asked for in regard to staking.

Yours truly,

REW-WLS
Encl.

Assistant Engineer.

Butte, Mont., June 29, 1915.

Mr. E. O. Reeder,
Asst. Chief Engr.,
Seattle, Wash.

Dear Sir:

The Mountain States Telephone & Telegraph Company have requested us to furnish them with Vandyke prints of our Right of Way from Harlowton to Avery, with the understanding that they will pay for the Vandykes. While Mr. Goodnow has approved this, before proceeding to get out these prints, I would like to know just what they will cost so I may advise the Telephone Company.

Will you please advise me as soon as possible just what the cost will be and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 29, 1915.

Mr. E. Vanderville,
Bonding Inspector,
Three Forks, Mont.

Dear Sir:

Storekeeper Long advises that he has received two Calumet track drills which are badly in need of repairs.

If you have not already done so, please advise at once just what repairs are needed to these drills, and the cause for repairs.

I prefer for you to furnish us such information as you are more familiar with the machines and have a man on the job who can tell exactly what is needed. Without such information we are in doubt as to whether they should be sent to Deer Lodge Shops or whether it is necessary to hold them for spare parts to be obtained from Manufacturers.

As soon as the above information is obtained we will take steps towards having repairs made as it is necessary for us to keep all machines in good condition.

Yours truly,

REW-WLS

Assistant Engineer.

cc--A.E.L.

Butte, Mont., June 29, 1915.

Mr. F. E. Willard, Supt.,
Missoula, Mont.

Dear Sir:

We expect to start track bonding at Deer Lodge at an early date.

At most yards on this Division it is intended to replace light rail with 85 $\frac{1}{2}$ rail, and the bonding of light rail is being held pending replacement.

Will you please advise soon as possible just what the plans are in regard to light rail in Deer Lodge Yard, as we cannot afford, of course, to bond such rail if it is to be taken up in the near future.

Our present plans contemplate bonding of passing tracks, one track into the turn-table and one track to scrap bins.

Yours truly,

RB-7LS

Electrical Engineer.

42267

June 29, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Regarding the employment of Mr. C. F. Healy in this Department, immediately on receipt of your last communication I got in touch with Mr. Reeder's office with regard to Mr. Healy's coming here and am just in receipt of a reply by Mr. Reeder.

You will note from Mr. Healy's letter attached to Mr. Reeder's that Mr. Healy has accepted a position with the State Highway Department and is, therefore, obliged to decline accepting a position with us.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

June 30, 1915.

Mr. V. A. Wolcott,
General Electric Co.,
Butte, Montana.

Dear Sir:

Referring to yours of the 18th in regard to collapsible hangers furnished for tunnel work, and based on our drawing ED-429.

I notice that the sketch furnished by the Factory shows three lengths of hangers, 8", 9 $\frac{1}{2}$ " and 11 $\frac{1}{2}$ ". This of course refers to extended length of hanger.

Our requisition #140 called for 600 hangers for 100 45 ft. sections, and our Storekeeper reports having received only 400, these being the 9 $\frac{1}{2}$ " and 11 $\frac{1}{2}$ " inch lengths.

Will you please take this matter up at once with the Factory and advise if they contemplate our using the standard 8 inch loop hanger at the center, and if so, if they have furnished 300 such hangers for use in connection with the collapsible hangers of greater length.

We would like this advice as soon as possible, as our trolley work will reach one of the tunnels in the near future.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 30, 1915.

Mr. P. E. Vanderville,
Bonding Inspector,
Willow Creek, Mont.

Dear Sir:

Referring to your report of the 28th in regard to track drill being struck by Train #33, in making such reports be careful to give the dates so that our records will be complete.

In addition to this I would like to know how far the Flagman was from the gang when this occurred and just what arrangements have been made with Flagmen in regard to protection. In other words, are these Flagmen working under instructions and direction of the Operating Department whose payrolls they are on, and just how far are they from Bonding gang normally.

The distance of these Flagmen from the Gang must of course be controlled by local conditions. If they are working under the direction of the Bond Foremen, it is of course up to him to see to it that proper precautions are taken, and if they are under the direction of the Operating Department they should of course be governed by instructions by Superintendent's Office.

In any event, care should be taken to be in a position to clear the track a reasonable time before arrival of regular trains. Let me have all the facts in this connection soon as possible.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., June 30, 1915.

Mr. A. N. Crowder, Insp.,
Three Forks, Mont.

Dear Sir:

Please advise if changes in wire height have been made in Jefferson River Canyon as decided upon. This involved change in location of ground wire and occupying ground wire position with one of the phase wires. If not, when is it intended to do this work.

Confirming conversation yesterday I note that a number of poles are raked with the line. You will have to caution Foremen about this, as it can be easily protected by a running inspection of the line from one side.

It will be well to take this up with Dickson the first time you see him.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., June 30, 1915.

A. E. Long, Stkr.,
Three Forks.

Dear Sir:

Urban reports that shipments of Locke Strain insulators will be started by express tomorrow, and continue for sometime thereafter.

These are to replace the larger size OB X Strain insulators used in trolley work, and distribution to pole erecting and stringing camps should be made as fast as they arrive, the number given to each camp being determined by Wende and Soule.

This is very important as completion of backbone and head guy work is being held up pending their arrival.

Please notify this office promptly upon arrival of each shipment, so that we can keep in touch with the matter.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., June 30, 1915.

Mr. R. Wende, Insp.,
Deer Park, Mont.

Dear Sir:

I noticed, during a recent trip over the East end, a small one or two-wire telephone line close to our Right of Way fence west of Summit.

Please investigate as soon as convenient and let me know just where this line starts along side our Right of Way fence, where it stops, ownership, and if transmission line is on same side of track for any distance, and if so, how much.

Confirming conversation please arrange to have surplus length of trolley bracket over-support rods cut off when it can be done to best economy. I refer to threaded end of rod which can be cut off with bolt cutters where it projects back of pole.

It will be well to obtain guy guards from Three Forks stock and have them put on guys around stations using care to install them only where guys are liable to be dangerous to trainmen and others using the Right of Way.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., June 30, 1915.

Mr. C. R. Strong,
c/o Camp #2,
Morel, Mont.

Dear Sir:

In passing through Sinclair I thought I saw one of our trolley or feeder reel cars coupled to Outfit Train at that point on the East end. Please look into this and let me know if this is one of our cars and ascertain if the outfit people know anything about it, giving me car number.

At point near Dalney it looks as if there was not going to be sufficient clearance between trolley guy and transmission wire. Investigate this and report your findings.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., June 30, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

Confirming conversation in regard to gravel washing plant in Sixteen Mile, one of our trolley poles comes very close to set out track at this point, or just east, and it will be necessary to throw the track a short distance away from pole in order to obtain proper clearance.

Will you please have this investigated and taken care of as soon as possible, so as to avoid possibility of accident.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., June 30, 1915.

Mr. Mace Butler, Stkr.,
Electrification Dept.,
Deer Lodge, Mont.

Dear Sir:

As you know, we will be receiving another
slugs at Deer Lodge. These slugs will be similar to
those furnished at Three Forks.

I wish you would see if it could not be
arranged to rig up a boring machine operated by air.
In this way we would be able to handle these slugs
without using labor. You could load them with your
own force.

Please let me hear from you on this subject
soon.

Yours truly,

FAC-WLS

Electrical Engineer.

#2272

July 1, 1913.

Mr. E. A. Patterson,
Supt. Telegraph,
Milwaukee, Wis.

Dear Sir:

Would it not be possible to do something to our private telephone line between Deer Lodge and Harlowton to make this line more reliable?

As it is, the line is out of service a considerable percentage of the time and its value to us is greatly lessened thereby.

If these wires are the ones which are to be used to connect the various substations with the Dispatcher's office after we get to operating they will certainly have to be more reliable than they are now and it would seem that this is the proper time to get them in reliable shape.

We would like to know what you think of the circuit as a whole, and what it would cost to make it satisfactory. Will you kindly give us this advice as soon as possible.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 1, 1915.

Mr. P. E. Vanderville,
Sending Inspector,
Willow Creek, Mont.

Dear Sir:

Referring to your letter of the 30th ult.
in regard to two drilling machines now at Three Forks
storehouse for repairs.

I note that one of these machines simply
requires removal of broken set-screw. This can cer-
tainly be done at the Three Forks Engine House and it
is possible that the other machine with broken back
hinge brace can be repaired at the same point. In
any event this should be investigated before the
machines are sent to Deer Lodge.

If the second machine cannot be repaired at
Three Forks, Storekeeper Long to whom a copy of this
letter is going, will please arrange to forward it to
Deer Lodge at once, notifying this office so that we
may take care of the matter.

For your information in the future in this
connection, it is of course desirable to have such
repairs made at point most convenient to your work,
and such small repairs as the removal of a set screw
could certainly be done at Three Forks when you are
nearer that point. When your work is at Donald or on
Deer Lodge and it will of course be best to send to
Deer Lodge, taking care however in all cases to mark
on tag the point and camp from which machine is sent
and notify this office immediately as to shipment and
just what repairs are to be made so that we can
arrange for repairs and return of machines.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., July 1, 1915.

Mr. F. R. Nicholas,
Assistant Engineer,
Clinton, Montana.

Dear Sir:

Replying to yours of the 24th in regard to changes and corrections in transmission construction, I will say that upon investigating the question of using ED-#112 construction at Station 71 - 00 and as regards the use of this construction in general, I find that my letter of the 18th was in error, and that ED-#112 should be used only for tangent work.

The reason for this is that we must have not less than three ft. clearance between jumper and face of pole, and from reference to drawing you will see that this type on tangent provides only three ft. Please be governed accordingly in the future and we will leave Station 71 - 00 for ED-#112 as you had it.

As regards Station 663, while your contention has its merits as regards uniformity in appearance we have already made a number of changes from curve to tangent construction for these light angles, and we will therefore make this construction ED-#21 instead of 19 and you can follow this standard in the future.

Station 710 - 00: This construction will have to be ED-#112 instead of #113 as noted above. Change is made on account of cold curve.

Station 988 - 90: We will omit this pole and change 985 - 00 to ED-#23. The length of section over track is immaterial as long as the construction used is proper as regards mechanical and electrical characteristics.

I understand from your letter that the remainder of the points brought up are thoroughly understood.

Yours truly,

REW-wls

Assistant Engineer.

#2271

July 1, 1916.

Mr. E. H. Barrett,
Asst. Gen'l Supt.,
Butte, Montana.

Dear Sir:

In connection with ordering rail bonds for use between Deer Lodge and Avery, it will be necessary for us to get complete data on types of rail and joints now on the track, and plans in regard to renewal, both on Main Line and Yard tracks.

Will you please arrange to have me furnished with this information, or advise with whom I should take the matter up.

Yours truly,

RB-WLS

Electrical Engineer.

#2270

July 1, 1915.

Mr. E. H. Barrett,
Asst Gen'l Supt.,
Butte, Montana.

Dear Sir:

Referring to letter from Asst Engineer Mussen
in regard to proposed line change two miles east of
Two Dot, Stations 1680 to 1686 - 37.

Will you please advise as soon as possible as
to whether this change will be during our construction
period.

Yours truly,

RB-WLS

Electrical Engineer.

cc--R. Wende

Butte, Mont., July 1, 1915.

Mr. P. E. Vanderville,
Bonding Inspector,
Willow Creek, Mont.

Dear Sir:

The Montana Power Company's local office informs us that you wish us to arrange with Foreman Tracey to ship you scrap trolley wire in lengths not less than 31 ft.

While it may be possible that you now have no use for shorter lengths, in order to avoid any misunderstanding, I would like to confirm our conversation to the effect that we can use lengths down to about six ft. which are suitable for cross bonding and which we propose using in Yards, instead of bonding around all frogs.

In addition it will be best for you to take care of these scrap trolley shipments from the trolley stringing crews yourself, if necessary going there in order to avoid any misunderstanding and save time in this office.

I would suggest in this connection that you arrange for these shipments to be made in as large quantities as is feasible on account of liability of losing track of them in transit.

Yours truly,

REW-wls

Assistant Engineer.

#2269

July 1, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

While Mr. Soule may have the following points in mind in connection with the work in general, I wish to bring them up, as a matter of record for Mr. Buck, and am sending an extra copy which you may hand Mr. Soule if you see fit:

1st--An apparent general shortage of Linemen on the work: This in connection with a shortage which has existed on Eastern end, in transmission stringing crew under Mr. Dixon, and organization of additional crew for stringing feeder and trolley east of Three Forks. This latter crew should be, according to our layout from Mr. Buck, gotten together and put to work as soon as possible; also in connection with probable loss of men around July 4th, as this usually occurs.

2nd--Tools: We understood that we were amply supplied with tools for additional crews contemplated for East end. We have already found a serious shortage in connection with Foreman Dixon's work, and should take up at once as to requirements for new Feeder and Trolley crew, so as to be prepared, not only for this gang but for replacements for all crews on the East end. In addition tools should be anticipated now for Feeder and Trolley crews to be placed on work West of Deer Lodge, as no doubt none of our equipment now in use on the East end will be available.

3rd--Outfit Cars: According to my records of outfit cars now on hand or under order were intended for bonding and other crews to be organized. We have recently taken eleven bunk cars for pole setting and trolley crews in order to cut down the number of men per car, and it would seem that contemplated outfits have been robbed for this purpose. If so, we should immediately place orders with Deer Lodge shops for an equal number of bunk cars and any others needed. This is especially necessary to anticipate as Master Mechanic Cessford advises that the number of suitable cars on hand for bunk cars is limited and it may require sometime to get them together. In addition to

#2--Montana Power Co.--7/1/15

the above, I understand that Foreman Tracey is badly in need of two more bunk cars in addition to the extra ones already given him. This is of course something for Scule to investigate.

4th--Empty Reels: We would like, if possible to improve on the return of empty reels from the work to Three Forks. The Manufacturers require that empty reels be returned within a certain time if we are to obtain credit for them. I note quite an accumulation of wires at Donald and in addition, that they are liberally distributed at other points along the line, both for transmission and feeder work. It would seem that when a car containing feeder and transmission wire is empty, that all empties on hand could be shipped to Three Forks on the same car, and that transmission and distribution crews could possibly collect empty reels on such days as they distribute and return them to Three Forks. Will you kindly have this looked into and this matter expedited if possible.

5th--Owing to conditions, it was desirable to move Camp #2 out of Butte as soon as possible, and on that account Brick Yard spur near Colorado Junction and Meat House spur at the South Butte Yard were not taken care of. These should be kept in mind, and poles erected so that trolley stringing crew can complete them upon their arrival.

6th--I note a number of broken feeder pins on the line, and in the West end of Sapping Yard a feeder pin or insulator braced to pole with a stick. This needs to be taken care of in the most economical way.

7th--It has been necessary to pull up the trolley bracket over-support rods so that the rods project a considerable distance back of the pole. Will you please arrange to have these bracket rods cut off with bolt cutters at a time most suitable to working conditions.

8th--I note in some places with off-set feeder arms for signals, that signal wire is mounted on pin in short end of arm. Clearance from pole in such locations is questionable and should be investigated, the intention being to bore an extra hole at center of arm and not use the pin in question.

9th--I believe Camp #1 has a number of channels for tunnel construction, and possibly other special material for this tunnel work. All such material available should

#3--Montana Power Co.--7/1/15

be returned to Three Forks storeroom for use on the East end. In this connection one of the tunnel suspensions in Tunnel #13 is hanging from one end. This is noticeable from the Train end and should be re-hung as soon as possible.

All of the above is of course in the line of general information in connection with the work, and I will bring such matters to your attention from time to time with copies to Mr. Soule as the occasion demands during Mr. Buck's illness.

Yours truly,

RB-WLS

Electrical Engineer.

oo

#2268

July 1, 1915.

Mr. C. A. Lemmon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

Mr. Soule informs me that you are proceeding to replace wood strain insulators in joint spans with Porcelain Strain insulators taken from our stock.

You will recall that the original plan was to leave the wood strains in place, reinforcing them with one Porcelain insulator in tandem, and therefore our stock will have to be increased to take care of your needs.

Will you please give me, as soon as possible, a rough idea of the number of such insulators and whether of one size or both, so that I can cover this by requisition. I presume the best way to take care of the total number used would be to make an actual count after work is completed.

Yours truly,

RB-WLS

Electrical Engineer.

#3274

July 2, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

I am handing you herewith copies of communications from Supt. Murphy.

I presume that the trouble is that this gang is a new one and has not yet grown entirely aware of the very great importance of properly flagging and securing line-ups in connection with the use of gas cars.

Will you kindly take this matter up vigorously with the gang in question and see that they take proper precautions to avoid such accidents in the future.

Yours truly,

RB-WLS

Electrical Engineer.

July 2, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

I have your letter of the 28th regarding accident to gas car in charge of Mr. McGinley, and I have taken the matter up with the Montana Power Company.

The men who had the accident are a part of a new gang and it may be that it would do no harm to have Mr. Wilkins visit this gang and give them instructions in regard to handling of these gas cars.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 3, 1915.

Mr. F. R. Nicholas,
Assistant Engineer,
Clinton, Montana.

Dear Sir:

Referring to profile just received, I
note approximate profile ground between Stations
2000 and 2021.

I presume this approximation is due to
not going through wheat field with levels.

Please advise in regard to this promptly
as any doubt in regard to this profile should be
cleared up and profile made up correctly.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., July 3, 1916.

Mr. F. N. Webster,
Right of Way Agent,
Butte, Montana.

Dear Sir:

Herewith attached find maps of transmission location on Private property in vicinity of Ozan and from Ozan to Bearmouth.

You will note that on the former there are two locations shown for line.

Will you please investigate approximate cost for Right of Way for the two alternate locations as soon as possible and advise, so that we can determine relative economical location between "A" and "T" together with re-location of Continental Telegraph line.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 3, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to my Requisition #273 for trolley Overhead Fittings, will you please push delivery on the following items being furnished by the General Electric Company:

Items #11, #12, #15, #19 and #20.

The O. B. Company should complete delivery on their orders on this same requisition, including Catenary Hangers of the following lengths:

12", 14", 16-1/2" and 19".

In addition, Items #4 and #5.

Will you please take these matters up with the respective Companies at once, as we must have a reasonable supply of all items on hand when trolley work is started East of Three Forks, and this is contemplated at an early date.

Yours truly,

RB-WLS

Electrical Engineer.

#2276

Butte, Mont., July 3, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

In finishing up trolley wire we find in many places on tangent track, Main Line, that the track rails are not properly surfaced, and this fact of course applies generally to Yard and Passing Tracks.

It will be of great help if you can arrange to have Section Crews give this matter attention ahead of the trolley finishing crew. We will probably start the finishing crew at Three Forks to work West in the immediate future, and anything you can have done along the above lines beginning at Three Forks will be greatly appreciated.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 3, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to reels which are being furnished for both Copper and Galvanized Strand, we have found that such reels as are provided with square holes and bushed with cast iron plates are giving serious trouble on the work on account of the cast iron bushings being fastened to reel too insecurely with $3/8$ inch lag screws.

On all future shipments will you please arrange with Manufacturers to either bolt the bushings to the reel flanges or to furnish square bushings extending through the reel and made of two pieces bolted together with round hole in center of proper size.

Yours truly,

RB-WLS

Electrical Engineer.

#2275

Butte, Mont., July 3, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

A trolley pole at Sappington Industry Track has been burned off at butt by cinders which are being dumped there for fill.

In connection with such work, both for the present and future, wherever cinders are used for fills in electrified territory, in order to avoid burning off poles it will be necessary to fill around poles from butt to top of fill for a distance of not less than 4 ft. around the pole with some material other than cinders, even if cinders are not hot when dumped, as there is always chemical action which at some indefinite time is liable to burn the pole off.

Will you please arrange to have poles in cinder fill at Sappington protected by gravel or dirt as above indicated, and issue instructions so that this will be taken care of in the future, and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 6, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Ill.

Dear Sir:

File RM-49154

Referring to your letter of the 30th regarding the return of Shovels ordered on Requisitions #606 and #473, we returned the shovels exactly as we received them, except that a number of the bundles of shovels were broken when received. These were bound up before they were returned. The shovels were also stored under cover while we held them awaiting your instructions.

The damage to them was largely due to the manner in which they were packed for shipment.

We are unable to use these shovels on our work in any way. It may be that you could turn them over to Mr. Patterson, but I doubt if he can use them as we recently secured a large surplus from him.

Yours truly,

RAC-wls

Electrical Engineer.

ELECTRIFICATION DEPARTMENT

Data on Bonds

Butte, July 6, 1915.

* * * * *

- April 20th -- Forwarded Requisition #819 dated April 19th. Wrote C.A.G., carbon copy to J.T.C., that we would begin bonding June 1st, and would require express shipments.
- " 21st -- Wired C.A.G. items later included in Requisition #849 and dated April 24th.
- May 5th -- J. T. C. acknowledged advice that we proposed starting bonding June 1st, and asked for shipping instructions.
- " 5th -- Wired J.T.C. schedule shipment as per attached copy of telegram.
- " 27th -- J.T.C. was wired to let all bonds come subject to Field inspection.
- June 3rd -- Wired J.T.C., copy C.A.G., calling attention to delay in shipments bonds. Work held up.
- " 4th -- J. T. C. wires O. B. only Company manufacturing.
- " 4th -- J. T. C. " manufacturing held up account no approval Manufacturer's samples and specifications.
- " 8th -- Wired J.T.C. no advice in connection schedule of shipments. 35 inch bonds shipped first. 37 inch bonds called for first.
- " 9th -- J.T.C. wires G. E. starting express shipments and will continue these until sufficient on the way. Asked how many express shipments should be made.
- " 9th -- J.T.C. writes asking when stop express shipments.
- " 10th -- J.T.C. wires what express shipments should be made.
- " 11th -- Wired J.T.C. start express shipments at once 500 per day, continue until sufficient express shipments received and definite advise received as to freight shipments. Will advise when to discontinue express shipments.
- " 14th -- Wrote J.T.C. confirming wire of 11th, and giving details.
- " 17th -- to June 22nd: Various correspondence in regard Manufacturers submitting samples for approval.
- " 18th -- Wired J.T.C. no over-size pins received.
- " 22nd -- Wired J.T.C. rush taper pins.
- " 29th -- Wired J.T.C. starting second crew to use 480 37" bonds per day. Put all Mfgs. Give status production and shipments.

Sheet #2--Data on Bonds--7/6/15

July 1st -- J.T.C. wires 20,000 - 37 inch bonds shipped.

- " 2nd -- Wired J T C asking if shipments were made by frt or express?
- " 3d -- Large crew using 37 inch bonds use up all on hand.
- " 3d -- (Rec'd July 5th) J T C wires 37 inch bonds shipped is 10800 only, instead of 20,000.

3000 A S & W, no date, no method shipment.
Will resume express shipments Schenectady and Worcester,
500 per day, both places.
Nothing said about Elec Service Supplies Co.

GENERAL

No advice given J T C as to discontinuing express shipments.
Small order 37 inch bonds placed with O.B. who were first
to manufacture and nearest to work!
No compliance schedule requirements.
No express deliveries from all manufacturers simultaneously
so as to accumulate stock by express and discontinue express
shipments, idea being to start freight shipments together
with express shipments soon as production facilities of all
manufacturers would allow.

BONDS RECEIVED TO JULY 6, 1915:

5428	-	37	inch	bonds
15120	-	35	"	"
325	-	40	"	"
900	-	42	"	"
365	-	50	"	"

ABOVE BONDS RECEIVED FROM:

Elec. Service Sup. Co.	1000	-	37	inch	bonds
Ohio Brass Co. (Complete Order)	4425	-	37	"	"
" " "	15120	-	35	"	"
Amer. Steel & Wire Co.	325	-	40	"	"
" " "	900	-	42	"	"
" " "	365	-	50	"	"

July 6, 1915.

Mr. F. M. Kerr,
The Montana Power Co.,
Butte, Montana.

Dear Sir:

I hand you herewith copy of a letter by Mr. Frazier our Special Agent, who is keeping watch on distributed copper, bonds, etc.

If you desire details as to the reason why Mr. Frazier wished to get in communication with Mr. Blow, I will have Mr. Frazier stop in at your office.

In any event, I think it would be advisable to get at the bottom of Mr. Frazier's complaint regarding the holding up of the check. Will you kindly have this looked into.

Yours very truly,

RB-WLS
Encl.

Electrical Engineer.

Butte, Mont., July 6, 1915.

Mr. R. Beeuwkes,
Electrical Engineer,
Butte, Montana.

Dear Sir:

I am writing you in regard to a Mr. C. W. Blow who was working for Mr. Ferguson. I am trying to get Mr. Blow and I asked Mr. Ferguson to stop Blow's check. He told me that he would have his Timekeeper, Mr. Randall, call at the General Office, Butte, and have the check stopped, and it was not done. The Timekeeper, Mr. Randall, says he was not told by Mr. Ferguson, and Blow has gotten his check and gone, and we were not notified.

I took the matter up with Mr. Ferguson and he told me that he had told Randall to have check held and that we wanted Mr. Blow. Now we are not getting the proper help from this Camp.

Yours very truly,

LBF-wls

Special Agent.

Butte, Mont., July 6, 1915.

Mr. W. L. Slater,
Pole Inspector,
Santa, Idaho.

Dear Sir:

I have yours of July 2nd. We were aware that you knew just what was required in the way of anchor slugs, but Mr. Wilder had been continually asking for information as to one point or another, about which we thought we had already informed him, so that we decided that it was best to get out a set of specifications and combine all the information in one paper.

Mr. Wilder, I believe, wanted this information in order to get prices from different Manufacturers.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 7, 1915.

Mr. E. Murray,
Asst Engr B & B,
Miles City, Mont.

Dear Sir:

Referring to your letter of July 2nd regarding Warning Signals, the ticklers ought to be of non-conducting material, as otherwise they might accidentally be in contact with a trainman and live wire parts at the same time.

In this connection I send you a report by Mr. C. H. Arnold, Gen'l Foreman at Falls Yard who has been doing some experimenting for me in regard to these signals. It would seem for Great Falls, at least, that we will be able to get up some form of signal that will be merely a modification of the present Warning Signal.

Yours truly,

RB-WLS

Electrical Engineer.

#2287

Butte, Mont., July 7, 1915.

Mr. F. N. Webster,
Right of Way Agt.,
Butte, Montana.

Dear Sir:

We want to get the additional lot at Two Dot between the southerly bungalow and livery stable. We should arrange to take all of the ground from the Street back to the East line, which represents the boundary of our present property.

Mr. Goodnow feels that, considering the benefits which the town is deriving from our installation, we should be able to get this lot for something in the neighborhood of \$50.00. If the amount asked is very different from this, I would ask you to kindly secure an option and advise me before closing the matter.

Yours truly,

RB-WLS

Electrical Engineer.

July 7, 1915.

Mr. C. H. Quereau,
Supt. of Electric Equip't,
N. Y. C. & H. R. Ry. Co.,
Grand Central Terminal, New York.

Dear Sir:

Owing to my having been out on the line a great deal lately, I have been unable before to reply to your letter of June 21st regarding Mr. Paul Traeger.

We already have in mind men to take care of our inspection and maintenance work, but in case we can use another man, I will be glad to consider using Mr. Traeger.

I thank you for mentioning him to me. As to the first paragraph of your letter, I certainly do remember you very well, and trust you are well and prosperous.

Yours very truly,

RB-FLS

Electrical Engineer.

July 7, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am sending you herewith copies of our
Inspector, Mr. Hartzog's reports of July 3rd re-
garding progress in work on the locomotives, both
at the American Locomotive Company's shops and at
the Eric Works of the General Electric Company.

These reports for your information.

Yours truly,

RB-WLS

Electrical Engineer.

cc--A. E. H.

Butte, Mont., July 7, 1915.

Mr. H. S. Hertzog,
C M & St P Inspr.,
#549 Bldg. #5, G. E. Co.,
Schenectady, N. Y.

Dear Sir:

I have been away from the office a large part of the time lately, and have not been able before to give your reports the attention required.

With regard to your report of June 12th, I agree with you that you will not get a clear idea of the operation of the pantograph as far as its swaying goes, with this pantograph mounted on an ordinary car, and it will be the least loss of time for you to wait until the pantograph is mounted on regular locomotive.

With regard to the last paragraph of your report in which you ask if I have any special instructions to give you regarding the assembling of apparatus in the cabs, I have nothing particular in mind in this connection. If there are any special points about which you desire a decision, kindly so advise me.

Referring to your report of June 12th regarding repair parts, the idea is for our Motive Power Department to handle the securing of repair parts for the locomotives, and to take care of the arrangements for repair facilities at the terminals. Mr. Manchester, Supt. of the Motive Power Department wrote me recently that he was getting up his data in this connection, and was going to send it to us to look over. If any special points come up about which I would like to have your opinion, I will so advise you. In the meantime you should continue to secure all the information you can which will be useful in connection with the making of repairs, as I believe that about the time the first locomotive is shipped I will have you come out here,—later probably turning you over to the Motive Power Department. Of course, sometime before this, I will send a man to work with you at Schenectady whom you can instruct to take care of the future work at the General Electric Company's shops. This arrangement has not been definitely decided upon, however, and you should, therefore, say nothing about it, but I believe it will work out.

Sheet #2--H.S.H.--7/7/15

As regards repair parts for the substation apparatus, The Electrification Department will take care of these.

Referring to your report of June 19th, inasmuch as I understand D. C. Circuit Breakers have been satisfactorily developed, there will be no reason why this and other panels should not be shipped together with the rest of the switchboard. If my understanding is incorrect, kindly advise me promptly.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 7, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

We are sending you under separate cover a sample open link, and would ask that you obtain from local manufacturers price on a similar link in lots of 100 or more, to be made of malleable iron or mild steel, so that rivets can be headed, and to have an inside opening of 1-3/4 inches side, by three inches long, instead of dimensions of the sample.

The size of stock in the link to be same as sample, or 5/8 inch diameter if practicable to make up the link in that way.

Will you please let us hear from you on this as soon as convenient, as we may want to use these links on the line West of Deer Lodge.

Yours truly,

RB-WLS

Electrical Engineer.

#2286

July 7, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Without knowing just what your requirements are at the present time, I wish to suggest the possible advisability of having pole setting crew on the East end and on the West end, at proper time take care of the clearing and burning of brush, and timber along transmission line, instead of leaving this work to be done by Stringing Crews.

This is suggested for investigation on your part.

Yours truly,

RB-WLS

Electrical Engineer.

#2285

July 7, 1915.

Mr. C. A. Lemmon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

Your Foreman Lee advises that he needs a certain number of pole shoes for brackets, and a certain number of two-pin cross-arms.

Will you please advise just how many of each are required, so we can arrange for delivery.

Yours truly,

RB-WLS

Electrical Engineer.

#2284

July 7, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

In addition to the tracks already provided with poles for electrification at Deer Lodge Shops it has been decided to electrify one additional track leading to scrap bins back of the shops.

Please keep this in mind so that necessary poles can be set when Foreman Smith reaches Deer Lodge.

Yours truly,

RB-WLS

Electrical Engineer.

cc--G. F. S.

#2283

July 7, 1915.

The Ohio Brass Company,
Mansfield, Ohio.

Dear Sirs:

Attention: Mr. F. L. Wolf,
Chief Chemist.

Acknowledging your letter of the 3rd in regard to tests on sherardized catenary hangers and sherardizing in general, calling attention to the presence of minute articles of free iron on sherardizing surface, causing a certain amount of rust, I will say that I do not consider that the rusting in question is liable to cause serious trouble with the catenary fittings, although it is very undesirable on account of the possible effect on other material with which these fittings come in contact, as experience would seem to indicate that all sherardized material is more or less subject to this same fault in the present stage of the art.

Yours truly,

RB-WLS

Electrical Engineer.

#2282

July 7, 1915.

Mr. W. F. McIntyre,
Division Const. Engr.,
Mountain States Tel. & Tel. Co.,
Helena, Montana.

Dear Sir:

Referring to yours of June 7th with specifications and blue prints covering proposed changes in your lines on account of our trolley and transmission wires, there are two points which I wish to bring to your immediate attention:

1st,--Proposed Change in Janney Cut-off, your N-3019, which calls for putting your wires underground, whereas at this point we have dead-end or factor of safety construction on both sides of your line. In view of this fact, we do not see the necessity for your wires going underground, as this type of construction has been acceptable to you in other localities.

2nd,--As regards proposed change at Pipestone Tunnel, your N-3018 for which no map is furnished, and for which no estimated cost is given. You state that location is to be changed in order to place your lines beyond falling distance of our transmission line. It would seem that such a change would be necessary only at one point, and as you do not give the facts, I would like to know just how much of your line is involved in this change, and also a map, if you have it, showing the present relative location of your lines and our transmission line.

There are one or two other matters which I would like to take up with you later, but they do not involve any change in your proposed construction. Please advise in regard to the points brought up.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 7, 1915.

Mr. R. W. Smith,
Huson, Mont.

Dear Sir:

Yours 3rd in regard to change in Feeder location at Primrose in order to clear water tank and industrial at Frenchtown.

Please advise promptly station numbers for feeder crossing as located, so that we can correct our records.

We now find that location for substation at Primrose given you is in error. We hope, however, to get proper locations for all substations on the West end within a week and will forward them to you so that you can take care of pole locations at such points in the future.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., July 7, 1915.

Mr. F. R. Nicholas,
Assistant Engineer,
Clinton, Montana.

Dear Sir:

Referring to yours of the 2nd in which you state that you estimate that you will arrive at Missoula with Transmission Survey about August 1st with your present facilities.

In view of this, it is highly desirable that you look over the territory West of Missoula at least as far as St. Regis, and after having done so, come to this office so that we can talk the entire matter over and reach a decision as to the desirability of organizing a second party at some future time.

Please advise in advance when you will be ready to come to the office with necessary information.

Yours truly,

REW-wls

Assistant Engineer.

#3261

July 7, 1915.

Mr. E. H. Barrett,
Asst Gen'l Supt.,
Butte, Montana.

Dear Sir:

Referring to yours of the 3rd in regard to proposed re-placement of rail between the end of the Old Basin Creek bridge to the eastern switch in outer Butte Yard, our bonding plans are somewhat upset on account of shortage of bonds, and while we do not contemplate bonding in the territory you have in mind in the very near future, will you please advise as soon as possible just when this rail will be changed, so that we can make our plans accordingly.

Copy of this letter to Bonding Inspector Vanderville and The Montana Power Company for their information, as it will be necessary to omit bonding until rail is changed.

Yours truly,

RB-WLS

Electrical Engineer.

cc--M.P.Co.,
P.E.V.

Butte, Mont., July 7, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

Enclosed herewith please find report from Bonding
Inspector P. E. Vanderville covering striking of Track Drill
used in bonding by Train #33 on June 28th. Copy to Montana
Power Company for their information.

Yours truly,

RB-WLS

Electrical Engineer.

cc--M.P.Co.

Butte, Mont., July 7, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

Replying to your wire of the 3rd in regard to collision between Gas Car and Work Train in charge of Conductor O'Brien on that date at point about one and one-half miles West of Penfield, I enclose herewith report from Transmission Line Inspector A. H. Crowder covering this accident.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 7, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to yours of the 1st in regard to 15 dozen 7/8 inch Twist Drills for bonding, as per telegram to you today, I find that my wire of June 29th was in error, as your EO-#8508 covered Twist Drills ordered for use with Electric Drills, whereas we should have referred to your Invoice #25663 covering BLK-#116, Cleveland Twist Drills which we are using with the track drills.

These latter drills have proven very satisfactory on the work, and it is our intention to use them unless something develops on the work.

Yours truly,

RB-WLS

Electrical Engineer.

#2281

July 7, 1915.

Mountain States Tel. & Tel. Co.,
Butte, Montana.

Dear Sirs:

Attention: Mr. Hobson

Referring to the matter of Vandyke Prints of our Right of Way from Harlowton to Avery, Assistant Chief Engineer Reeder advises that these prints will cost about \$440.00, and incidentally that while he has the tracings from Finlen to Avery, the tracings from Finlen to Harlowton are in Chicago in connection with valuation work.

Please advise if, in view of the cost, you now wish these prints, bearing in mind that the prints from Finlen to Harlowton will probably be delayed on account of tracings being in Chicago.

Yours truly,

RB-WLS

Electrical Engineer.

42279

July 7, 1915.

Mr. E. W. Adams, Sec'y,
Milwaukee, Wis.

Dear Sir:

We find that there is some question about our Right of Way limits at Jefferson Island.

The Station Plat shows the Right of Way line 100 ft. from center line of Main Track on South side, whereas our stock pens and industry lots are outside this line and a second line following the fence is shown 210 ft. from center line track.

Owing to the above conditions our transmission line was located and is built adjacent to the 210 ft. line, and on this account we would like to have this Right of Way question settled, especially in view of a change about to be made by the Mountain States Telephone & Telegraph Company at this point, the expense of which will have to be borne by us if we do not own the wider strip of land.

Will you please advise just what property we own at the point in question as soon as possible, so that we can arrange if necessary to protect our interests.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 7, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to yours of the 3rd in regard to credit for reels returned to American Steel & Wire Company at Waukegan, and deductions on account of condition of reels and missing arbor hole plates, will say that it will be satisfactory to accept credit on basis submitted by them.

The arbor hole plates were taken from reels in question in order to fit up other reels which did not have such plates, and in this connection I presume you have taken up with all Manufacturers as requested the question of either bolting arbor hole plates to reel flanges or fitting them with solid wood bushings.

For your information will say that our storekeepers now have instructions to report condition of empty reels when shipped so that we can advise you at the same time.

Yours truly,

RB-WLS

Electrical Engineer.

43378

July 7, 1915.

Mr. C. C. Beck, Asst Gen'l Sales Agt.,
Ohio Brass Company,
Mansfield, Ohio.

Dear Sir:

Acknowledging yours of June 30th in regard to X-strain insulators, the report given you by your Mr. Bolus upon his return from Butte is in error in that I informed Mr. Bolus that while we had approximately 7700 medium X-strain insulators, Cat. #11629, it would be necessary for us to continue using these strains for back buys, cross spans and other points where the strain is not excessive, in order to keep our work going, and that it would be our desire to exchange such of these as were left when we were properly fitted with substitute strains, instead of exchanging the entire number.

Will you please, therefore, correct this matter with your Mr. Johnson.

Referring to the new insulator which you are designing and preparing to make up, our using them is entirely dependent upon approval of the design under test and their cost, and our understanding with Mr. Bolus was that he would send samples by express immediately upon completion and test in the works, so that we could investigate them in the field.

It would seem, therefore, more desirable from every standpoint, for you to express us twenty of the new design, so that we can test them here before shipping as many as 500, as we have already placed an order for 3000 of the Locke insulators in order to keep our work going.

Please advise at once if this matter is thoroughly understood and suspend any further action other than sending us samples of the new design until such samples have been received and tested here.

Yours truly,

RB-WLS

Electrical Engineer.

cc--J.T.C.
F. Urban

Butte, Mont., July 7, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

The American Steel & Wire Company and
Electric Service Supplies Company are shipping from
150 to 175 bonds per box, making a package which is
expensive to handle on the work.

Will you please take up with them at once
and arrange so that they will ship not more than
100 bonds per box and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 7, 1915.

A. E. Long, Stkr.,
Three Forks.

M. Butler, Stkr.,
Deer Lodge.

Hereafter in making return shipments of empty reels, it will be necessary for you to advise this office fully in regard to condition of reels when loaded for return shipment, this to include broken flanges, missing lagging and center castings if reels were originally fitted with the latter.

All of these points of course affect the credit allowed us and we should be in a position to advise the Purchasing Agent in this regard when shipment is made.

Yours truly,

REV-wls

Electrical Engineer.

#2277

July 7, 1915.

The Montana Powder Co.,
Butte, Montana.

Dear Sirs:

Following the tests made comparing Dupont and Illinois Powder Company's dynamite of same strength, and indicating that there is no difference in the two powders, despite report made by Foreman to the contrary, Purchasing Agent is now asking as to whether we desire the considerable quantity of Illinois Powder Company's dynamite we now have on hand re-placed with that of different strength.

Will you please advise as soon as possible the amount of this powder on hand at the present time, estimated quantity required to complete work between Three Forks and Harlowton, assuming that we will use Illinois Powder for this purpose, so that we can advise Purchasing Agent as to re-placement, bearing in mind that considerable time will elapse before any great quantity of powder is used between Deer Lodge and Avery, and that powder now on hand may become unfit for use on this account. This of course is no fault of the Powder Company, but we may be able to make an arrangement so that we can return this powder and secure a re-place shipment for that needed on West end.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 7, 1915.

Mr. J. C. Hill,
Signal Engineer,
Milwaukee, Wis.

Dear Sir:

This is to acknowledge yours of July 2nd File #151-A, stating that it is satisfactory to disregard setting feeder cross arms at signal locations between Harlowton and Haugan, but that between Haugan and Avery, present Semaphore Signals will be left at their present locations, and it will be necessary to off-set feeder arms in the latter territory.

Yours truly,

RB-WLS

Electrical Engineer.

cc--G.F.S.

Butte, Mont., July 7, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Ill.

Dear Sir:

Referring to the question of quality of powder furnished by the Illinois Powder Company for this work, and report made by Foreman in employ of the Montana Power Company, copy of which I sent you June 12th.

We have had a test made of this powder in comparison with that furnished by the Dupont Company in the presence of Mr. Shoemaker of the Illinois Company, Foremen Mickey, Gilbert, Guire and Inspectors Soule and Wende, and I attach herewith a report from Mr. Soule who is now acting in Mr. Buck's place during his illness, and from this you will see that there is no choice between the two powders.

Our attitude in the matter has of course been based on report furnished by the Montana Power Company and we can of course now be governed by report of July 6th signed by Mr. Soule.

Mr. Shoemaker will no doubt take this matter up with you fully upon his arrival in Chicago.

Yours truly,

RB-WLS

Electrical Engineer.

cc--M.P.Co.

Butte, Mont., July 7, 1915.

Mr. C. L. Whiting, Supt.,
Lewistown, Mont.

Dear Sir:

Replying to yours of the 2nd in regard to Work Train being ordered through Mr. Cessford's office for use on Overhead Work at Great Falls, will say that I had no intention of going around your office in this matter, as I assumed that Mr. Cessford would arrange with Mr. Arnold to take the matter up with your office when the Work Train was required, and thought it would be better to handle the matter in this way, as Mr. Arnold was furnishing the tower car and has a man on his pay roll who is supposed to look after the overhead work.

In future we will take these matters up direct with you as called for in your letter of above date.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 7, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Under separate cover I am sending you one battery box furnished with No. 36 F. M. Company Gas Car on Requisition #1029, Car Number 05071.

When this car was received the battery would only work on one side. We used it a few days and the battery gave out entirely. We took it to Repair Shop but they advised us that nothing could be done for same. It therefore become necessary for us to buy a new battery at a cost of \$5.00, as we could not afford to have the car idle.

Will you kindly have the Company furnish us with a new battery box, or make us an allowance for the purchase of the new box.

Yours truly,

FAC-wls

Electrical Engineer.

Butte, Mont., July 7, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

We are sending you under separate cover a sample open link, and would ask that you obtain from local manufacturers price on a similar link in lots of 100 or more, to be made of malleable iron or mild steel, so that rivets can be headed, and to have an inside opening of 1-3/4 inches side, by three inches long, instead of dimensions of the sample.

The size of stock in the link to be same as sample, or 5/8 inch diameter if practicable to make up the link in that way.

Will you please let us hear from you on this as soon as convenient, as we may want to use these links on the line West of Deer Lodge.

Yours truly,

RB-WLS

Electrical Engineer.

FTM
GHJ
WMY
FEP
HWG

Butte, Mont., July 1915.

Herewith shipping notice on LS&MS Car #69039 and MC #88328, containing material from the General Electric Company for the various substations. I am sending the shipping notice to Mr. Young who will check and remove the material for Two Dot. He in turn will place the shipping notice in an envelope and send the car on to the next substation. The Inspector who receives it will check the contents for his substation, using the shipping notice enclosed in the car. These cars will go to Two Dot first.

F.B.W.

July 9, 1915.

Mr. F. M. Kerr,
The Montana Power Co.,
Butte, Montana.

Dear Sir:

I hand you herewith a copy of letter by Mr. Frazier, our Special Agent, who is keeping watch on distributed copper, bonds, etc.

If you are not acquainted with the details as to why Mr. Frazier wished to connect with Mr. Blow, I will have Mr. Frazier stop in at your office.

In any event, I think it would be advisable to get at the bottom of Mr. Frazier's complaint, and would ask you to kindly have this looked into.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

Butte, Mont., July 8, 1915.

Mr. R. W. Smith,
Huson, Mont.

Dear Sir:

When you were in the office were you notified of change in spacing of poles on curves up to two degrees and thirty minutes?

This change means that all curves up to and including one degree and thirty minutes are to have a pole spacing of 150 ft., and for curves from one degree and thirty minutes up to and including two degrees and thirty minutes, the pole spacing of 135 ft. for single track work will apply.

In the future, stake all curves according to this layout. Span work of two tracks or more should have pole spacing same as we have been doing in the past.

Yours truly,

REW-wls

Assistant Engineer.

July 8, 1915.

Mr. A. W. Thompson,
C/o Washington Water Power Co.,
Long Lake, Washington.

Dear Sir:

I have your letter of July 1st and would say that the position of Substation Inspector has just been filled, but I will be glad to bear you in mind in case any other opening in connection with our electrification work develops.

Yours very truly,

RB-WLS

Electrical Engineer.

July 8, 1915.

Mr. W. J. Davis, Jr.,
General Electric Co.,
Rialto Building,
San Francisco, Calif.

Dear Sir:

I have your letter of July 1st regarding
Mr. Mamma, and would say that the latter is now on
our rolls, and promises to be a valuable man to us.

I thank you for letting me have your rec-
ommendation of him.

Yours very truly,

RB-WLS

Electrical Engineer.

#2289

July 8, 1915.

Mr. A. O. Austin, Chief Engr.,
Ohio Insulator Company,
Barberton, Ohio.

Dear Sir:

I have your letter of June 30th regarding galvanizing and sherardizing of parts of high tension insulators, and thank you for giving us this information.

There is one matter which is not quite clear to me, and that is why you particularly refer to the effects of the rust in connection with insulators used in the strain position. I would be inclined to think that much more rust would form on the insulators when hung in a vertical position, because then the rust from the heads would tend to blow down over the upper surface of the disk. When the insulators are used in a strain position, it seems to me a large part of the rust ought merely to fall off to the ground.

Another point, as far as sherardizing is concerned, is that although the oxidizing of the small iron particles does not represent deterioration of the sherardization, the formation of this rust is just as objectionable as improper galvanizing, because rust in either case has the same effect as far as cutting down insulation is concerned. In other words, it seems to me that where the presence of these iron particles cannot be prevented, sherardizing should not be used on hardware used in connection with insulation of any sort, but sherardizing will be satisfactory on trolley hardware where the sherardizing is done merely to prevent deterioration of the steel underneath, or if used in connection with insulators, galvanizing is the proper thing.

Yours very truly,

RB-WLS

Electrical Engineer.

42288

July 8, 1915.

Mr. H. H. Cochrane,
Montana Power Company,
Butte, Montana.

Dear Sir:

Referring to your letter of June 30th regarding construction of your line to Josephine, the sketch looks alright to us excepting as to the exact location of the poles. We have indicated these locations in pencil, and if you see no objections we would be glad to have you correct the tracing and send us a new print.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 9, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Mont.

Dear Sir:

Mr. Nicholas, our Locating Engineer, now stationed at Clinton, is in need of another bunk car.

Will you please arrange to have a good car fitted up with windows, screens and screen doors. We will use portable steel bunks. The car should also be fumigated before you allow it to go forward.

I am very anxious to have this car as soon as possible, in order to be able to increase our Location party.

Please give the matter your prompt attention and advise when I may expect this car. Regular requisition will follow.

Yours truly,

FAC-wls

Electrical Engineer.

July 9, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Sometime ago I called your attention to the fact that we wanted to keep the cost of stringing and building the one-trolley work separate from the two-trolley work.

To date this has not been done. Will you please see that this is done in the future. As you know, we have two trolley wires to erect on Main Line and on side tracks there is only one.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 9, 1916.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

We now have men wiring the substations and bungalows. Will you please have them separate their time between the work on the substations and the four-room and five-room bungalows.

The charge for wiring the substations will be to Account "#30, B-2", as shown on the Classification of Expenditures, of which you have a copy. The work of wiring substation bungalows will be charged to Account "#35, A", and you should also designate whether it is the work on the four-room or five-room bungalow.

Where the men are laying conduit for machine foundations, their time should be kept separate and charged to Account "#46, A-4". Later it may be that you will supply materials for some of this work. If so, it should be charged to the corresponding accounts.

Yours truly,

FAC-WLS

Electrical Engineer.

Butte, Mont., July 9, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

I return herewith your May Bill C-#41 covering labor expended in your office in connection with electrification work.

Will you kindly advise what the nature of the work done was. As you know, it is necessary to give the details of this labor in our Material Reports.

I suppose some of this labor was for clearing up after pole erecting gangs, but the bill does not explain itself. It may be that some of it is chargeable to substations as I notice some of the work was done at Eustis, Janney, Piedmont and other points where we have substations.

Will you please give complete details on this bill.

Yours truly,

FAC-WLS
Encl.

Electrical Engineer.

42291

July 10, 1915.

Mr. J. C. Mill,
Signal Engineer,
Milwaukee Shops.

Dear Sir:

It has been decided to locate a substation
at Avery instead of Stetson.

In view of the small amount of Signal Work
at Avery, please advise at once what revision, in
your opinion, should be made for the Signal Appara-
tus at Avery substation, especially as regards capacity.

Yours truly,

RB-VLS

Electrical Engineer.

cc--L.W.S.

Butte, Mont., July 10, 1915.

Mr. R. W. Smith,
Alverton, Mont.

Dear Sir:

In view of the fact that stakes which you are placing for trolley poles will be in the ground for sometime before they are used, they should be driven to within about four or five inches from top of ground.

I notice many of these stakes already driven are being disturbed by Section men and in order to preserve as many as possible it will be necessary to drive them as stated above.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., July 10, 1915.

Mr. F. E. Willard, Supt.,
Missoula, Montana.

Dear Sir:

We now have two parties placing stakes along Right of Way for both trolley and transmission lines. Our experience in the past shows that Section men, when replacing ties, cutting grass, and doing other work on the Right of Way, are in the habit of knocking these stakes out, in some cases leaving them out entirely, and in other places replacing them out of their proper locations.

As it is very expensive to locate these stakes, it is liable to involve considerable financial loss if they are disturbed.

Will you please have proper instructions issued, so that stakes will not be disturbed by Section men, and others working on the Right of Way. Necessarily a large part of these stakes will have to remain in place for a considerable time before they are used by our Construction forces.

Yours truly,

RB-WLS

Electrical Engineer.

#2293

July 10, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to the matter of the private telephone line between Two Dot and Summit, which is just outside of our Right of Way fence, and for five miles is on our Right of Way, is my understanding correct that you were going to take up with the Legal Department as to what obligations we were under to remove this line.

I believe you had decided to do this first, but afterwards I pointed out to you the situation which would develop in case the line were not moved and one of our transmission lines should fall on the telephone line. This might cause damage enough, either to persons or property, to pay for the removal of the line several times over. On this basis, are we to proceed with removing the line at the smallest expense possible, or have you the matter up with the Legal Department?

Yours truly,

RB-WLS

Electrical Engineer.

July 10, 1915.

Mr. C. A. Goodnow,
Assistant to the Pres.,
Chicago, Illinois.

Dear Sir:

Construction men will be working around the substations for several months to come, and it does not seem advisable for us to attempt to plant any grass until next year. Is this satisfactory?

Yours truly,

RB-WLS

Electrical Engineer.

July 10, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Confirming conversation with Mr. Buck, we will arrange for suitable boarding car equipment at the various substations, excepting Piedmont, this equipment to consist merely of cars needed to enable the Western Commissary Company to provide meals.

As far as the bunking of the men is concerned, we understand that you will provide tents at the various sites.

Mr. Walker is getting in touch with the Western Commissary Company, and will take their representative over to see you in connection with arranging for the boarding details.

Yours truly,

RB-WLS

Electrical Engineer.

#2292

July 10, 1915.

Mr. M. H. Clapp, Supt. Telegraph,
Northern Pacific Railway Co.,
St. Paul, Minnesota.

Dear Sir:

You will remember you were to give me a final figure as to the cost of transferring your Telegraph lines to the other side of your track in the vicinity of Willow Creek, Montana.

We do not expect it will be very long before we put trial current on the line, and I would like to get the matter of re-location of your telegraph lines settled as soon as possible. Will you kindly advise me promptly in this connection.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 10, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

With further reference to delivery of bonds, and in order that you may have a clear understanding as to the needs in this line in order to complete the work at the specified date, I wish to go into this matter more fully, so that we can make definite arrangements with the Montana Power Company for doing the work.

Our original plans called for starting this work June 1st, with three weeks supply of bonds on hand at that date, and for a later big delivery on June 15th. Deliveries asked for originally were based on using four bonding crews which we assumed necessary to complete the work within the required time, if proper allowance were made for unavoidable delays due to weather and other causes.

You are of course familiar with the present status of bond deliveries, but we have as yet not received advice as to the total daily production capacity of the four Manufacturing concerns involved, the Ohio Brass Company being negligible as regards 37 inch bonds which make up the greater portion of the order, and we are not, therefore, prepared to lay out definite plans with the Montana Power Company.

Our estimates go to show that if we had three efficient crews in service today, that with reasonable weather and other conditions, we might be able to complete the work in time. This is based on an average advance of 1 1/2 miles per day for each crew, or about 400 bonds per day for each crew, making an estimated daily consumption of 1200 bonds. With bonds in hand and rates of shipment now contemplated, it would seem that express shipments would be continued indefinitely.

In view of the above facts, will you please obtain definite information at once from all Manufacturers as to their daily production capacity, and give us what

#2--J.T.C.--7/10/15

you consider a proper schedule of shipment from the various concerns with the method of shipment, whether of freight or express, so that we can prepare to put on the third bonding crew at the earliest possible moment and feel that they will be supplied with bonds, discontinuing express shipments as soon as possible.

This matter is very urgent, and I would like early advice.

Yours truly,

RB-WLS

Electrical Engineer.

July 19, 1915.

Mr. E. W. Adams, Sec'y,
Milwaukee, Wis.

Dear Sir:

Replying to your letter of the 15th in which you advise you have no record of my having received the maps, etc, I am enclosing herewith copy of my letter of June 25th, addressed to Mr. Geo. Freeman, Receiver, U. S. Land Office at Helena, which contains a list of maps, prints, etc. forwarded to Mr. Freeman.

You will also note that a copy of this letter was directed to you at that time, and we are unable to understand why it did not reach you.

Yours truly,

REW-WLS

Electrical Engineer.

#2294

July 19, 1915.

Mr. Otto C. Schulz,
Springs Exchange,
White Sulphur Springs, Mont.

Dear Sir:

Referring to your letter of July 13th regarding your private telephone line, we have up with our officials the matter of moving this line and will communicate further with you in connection with this matter as soon as possible.

Yours very truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 21, 1915.

Mr. F. R. Nicholas,
Assistant Engineer,
Clinton, Montana.

Dear Sir:

Hereafter in making maps for locations on private property, please have actual number of poles involved shown on the map.

I refer to types of construction involving two poles, as in order to avoid trouble with property owners it is necessary in many cases to settle with them for the actual number of poles, and unless care is taken to indicate two poles at such points, Mr. Webster is not in a position to make proper settlement, and we are liable to later have undesirable claims on the part of property owners. This has already occurred in a number of cases, and can be avoided by taking the precautions mentioned above.

Yours truly,

REW-wls

Assistant Engineer.

42301

July 20, 1915.

Mr. E. H. Barrett,
Asst Gen'l Supt.,
Butte, Montana.

Dear Sir:

Following conversation in your office yesterday with Roadmaster Nick, I have instructed our Bonding Inspector that he is to proceed with bonding all electrified tracks at passing tracks and yards, disregarding replacement with 85# steel. At the same time he is to proceed on the Main Line with the understanding that Mr. Nick will keep in touch with the location of Bonding Crews and advise him as to whether it is necessary to omit certain sections between Butte and Cedric until certain rail re-placements can be made.

Yours truly,

RE-WLS

Electrical Engineer.

cc--P.E.V.

Butte, Mont., July 30, 1915.

Mr. G. E. Cassford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

We are using the Calumet track drilling machines for our rail bending, and at the present time have about twelve of these drills out of commission for various reasons, at the storehouse in Three Forks. Our Storekeeper at that point has taken up with the Local Roundhouse Foreman there the question of repairing these drills, and the Foreman advises that he is not properly equipped to handle the repairs.

It is impracticable for us to repair these drills on the work and it seems necessary to make some arrangements so that while the work is being done in the territory convenient to Three Forks, repairs can be made at that point.

Will you please arrange to send a competent man to Three Forks to look over the machines, determine the nature of the repairs in general, determine the best method of arranging for these repairs, and incidentally go to one of the bending crews and offer any suggestions that may be of value as to the lubrication and general handling of the machines.

In this connection we are using a type of drill socket with which the bit is held by set screw, and considerable trouble has been experienced with these set screws. This point should be particularly investigated, together with the main thrust bearings which are ball bearing, and which have been giving trouble on account of breakage of balls and thrust collars.

If feasible, will you please have this taken up at once and advise me as to results, as it is very necessary that we keep all machines in good repair at all times.

Yours truly,

RB-FLS

Electrical Engineer.

cc--M.P.C.
P.E.V.

Butte, Mont., July 20, 1915.

Mr. F. N. Webster,
Right of Way Agt.,
Butte, Montana.

Dear Sir:

Herewith map showing alternate locations for transmission line in vicinity of Bearmouth, and at your early convenience will you please determine relative costs for pole locations on the two locations, so that we can determine which one to adopt.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 30, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to your wire of the 15th in regard to my furnishing definite specifications for reels and arbor holes for each kind of cable to be furnished for electrification work, I will say that I do not consider it desirable or advisable to attempt to draw up such specifications, as all the large manufacturers have their standards and we do not care to go into this matter any further than as covered by our specifications for copper wire and strand which are going forward with our requisition for the West end. In these specifications we called for reels to be substantially built and to have arbor holes to comfortably take two inch arbors.

We have already gone into this matter of reels pretty thoroughly and as regards quality of reels we have had no trouble except with the Indiana Steel & Wire Company. As regards size of arbor holes, some reels were furnished with arbor holes seven inches square. These were presumably taken care of by having fitted with cast iron bushings. We found, however, that such bushings were attached to the reels with 3/8" lag screws driven into the wood, and we experienced trouble on account of the bushings giving away and becoming loose on the work. Following this, I requested you under date of July 3rd to have the Manufacturers either bolt these bushings to the reel flanges, or furnish square bushing or boxing made of wood with round hole in center of proper size. If it is impracticable to bolt the bushings to the reels, they can be more securely fastened with lag screws.

It does not seem practicable to go into any more detail in regard to arbor holes and details of construction for the reels, as the Manufacturer should be best qualified to take care of these matters.

In this connection I beg to hand you copy of letter from our Storekeeper covering condition of reels received from the Detroit Copper and Brass Rolling Mills.

Yours truly,

RE-WLS

Electrical Engineer.

July 20, 1915.

#2300

Mr. R. W. Harwood, Pres.,
Willow Creek Tel. Co.,
Willow Creek, Mont.

Dear Sir:

I have your letter addressed to Mr. M. E. Buck of the Montana Power Company, which I presume is intended to be in reply to mine to you of May 20th.

Since receipt of your letter of May 5th to our Agent at Willow Creek, I have been trying to find out which one, if any, of the Montana Power Company's construction crews disturbed your wires, and up to this time I have been unable to get any information on the subject.

If you will refer to my letter of May 20th, you will find that I requested you to advise just what wires were removed by their employes as claimed and when it was done.

We of course have no intention to disturb any lines in operation and crossing our tracks under contract. At the same time, however, I have a copy of the contract made with your Company under date of August 31, 1909, and beg to quote you as follows from paragraph #2, sub-division "b":-

"That the aforesaid poles and wires shall be placed, erected, and maintained in a safe and workmanlike manner and to the satisfaction of the said Superintendent of Telegraph of the Railway Company, and shall be used only in transmitting telephone or telegraph messages; and if at any time the Railway Company shall elect to change the grade of all or any part of its premises upon which the aforesaid telephone or telegraph lines are constructed, then, and in every such case, the Licensee shall at once, at its sole cost, alter and change its said lines so as to conform to the change required by the Railway Company."

From this you will note that it is distinctly specified that if at any time the Railway Company makes changes in its property where your lines are located, that

#3--R.W.H.--7/20/15

it devolves upon you at once at your cost to alter and change your lines so as to conform with changes required by the Railway Company. In view of the plain wording of the contract, of which I presume you have a copy, it would certainly seem to devolve upon you to make the necessary changes in your lines and that such changes should be made to the satisfaction of the Railway Company.

In the meantime, I would thank you very much if you would advise just when your wires were disturbed, how many circuits and wires are involved and in just what class of work the crew was engaged in who disturbed your wires.

Yours truly,

RE-7LS

Electrical Engineer.

Butte, Mont., July 20, 1915.

Mr. L. W. Smith,
Asst Signal Engr.,
Tacoma, Washington.

Dear Sir:

Replying to yours of June 28th and July 10th, asking for estimated cost of material and labor for providing primary signal wires, I wired you today as per the enclosed copy, and to explain further will say that this cost includes two No. 4 copper wires at 19½ cents per pound for copper, necessary tie wire, cross arm pins, insulators and the difference in cost between two-pin arm and four-pin feeder arm. It also assumes the work being done by Telephone Department or a labor cost equivalent to their standards. The details of estimate are as follows:

Copper	\$	149.00
Insulators		4.60
Difference in cost between X-arms		6.10
Pins		1.04
Track crossing (allowance for)		2.35
Tie wire		4.00
Add 10%		<u>16.71</u>
TOTAL Mat'l per Mile.....		\$163.50
Estimated cost Labor		<u>44.00</u>
TOTAL ESTIMATED COST PER MILE....		\$227.50

You will note, therefore, according to the above, an estimated cost in round figures of \$230.00 per mile for labor and material.

Yours truly,

RB-WLS

Electrical Engineer.

42229

July 20, 1915.

Mr. E. O. Reader,
Asst Chief Engineer,
Seattle, Washington.

Dear Sir:

Replying to yours of the 17th in regard to repairs to Pipestone Tunnel, I enclose herewith copy of letter to Mr. Goodnow on this subject which is self-explanatory.

As regards soft concrete in this Tunnel, Construction Foreman reports that considerable soft concrete was found in the eastern half of the tunnel, and in the roof; also that at several places in this same section, pockets were found over the arch, and that in some cases drills were lost in these pockets and that considerable water was discharged from them.

Yours truly,

RB-WLS

Electrical Engineer.

#2298

July 20, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Enclosed herewith please find copies of letters from Asst Chief Engineer Reader, in regard to contemplated repairs to lining of Pipestone Pass Tunnel, and in which he requests that we defer further electrification work in the tunnel until the repairs are completed.

In view of the limited time for the completion of our work, it is very undesirable that we leave any work undone as we go along the line.

Inasmuch as we have already installed the suspension attachments for trolley and feeder and have the feeder in place, I would prefer to proceed with trolley work, as our trolley crews will be ready to string wire through this tunnel at a very early date and I cannot see how the position of the trolley wire would seriously interfere with tunnel repairs as long as the feeder and suspension attachments are already in place.

Please advise your wishes in this matter.

Yours truly,

RB-WLS

Electrical Engineer.

cc--E.O.R.

#2297

Butte, Mont., July 20, 1915.

Mr. E. Murray,
Asst Engr B & B.,
Killee City, Mont.

Dear Sir:

Referring to yours of the 5th to Mr. Barrett which has been referred to me, I note that you are preparing to make necessary changes in coal chutes in electrified territory, so as to clear trolley and messenger wires, and that you are under the impression that water spouts will not interfere.

While it is possible that trolley and messenger wires will clear water spout, it seems questionable as to whether they will not interfere with pantograph when in their raised position.

Will you please have this matter investigated and advise.

Yours truly,

RB-WLS

Electrical Engineer.

cc--E.H.B.

Butte, Mont., July 20, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Confirming my wire yesterday, I am making requisition for ball bearings for Calumet track drills used in bonding, these ball bearings to include balls, cages and two thrust collars for each.

Five or six of these bearings have broken down, and while we are having an investigation made to determine whether this is due to poor lubrication or other faulty care on the work, it is necessary for us to have these repair parts quickly in order to keep the full set of drills in repair.

I requested also in my wire that we be furnished with several copies of complete list of parts for these drills, as early as possible, so that we can avoid error in placing orders for spare parts.

Yours truly,

RE-WLS

Electrical Engineer.

Butte, Mont., July 20, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to yours of the 15th and your wire of the 12th in regard to 7/8" track drills for bonding will say that our Inspector and Bond Foreman report that the Carbon drills furnished are satisfactory and unless something further develops, we will continue to use them.

In view of the two dozen high speed drills having been shipped on our last order for fifteen dozen we will make use of the high speed drills in order to avoid expense and complications resulting from exchanges with manufacturers and possibility of using high speed drills with electric drills.

Yours truly,

RB-WLS

Electrical Engineer.

42296

July 20, 1915.

The Western Commissary Co.,
Butte, Montana.

Dear Sirs:

Locating Engineer F. H. Nicholas, now camped at Clinton reports that for a considerable period of time the quality of food furnished his camp, in the way of butter, coffee and canned goods was of an inferior quality. Also during this same period that he was not furnished a reasonable amount of fresh vegetables.

While at the present time his food is satisfactory, I wish to bring this to your attention, so that you can see to it that the present standard of food is maintained.

Yours very truly,

RB-WLS

Electrical Engineer.

#295

July 20, 1915.

Mr. W. F. McIntyre,
Div. Construction Engr.,
The Mountain States Tel. & Tel. Co.,
Helena, Montana.

Dear Sir:

Again referring to proposed changes in your lines on account of our transmission and trolley work, particularly of proposed change at Jefferson Island, where a portion of your line is over-built by our transmission line, I find upon further investigation that we own the land upon which our transmission line is located, and it would seem, therefore, that your Company should pay for the change at this point.

Please have this investigated and advise.

Yours very truly,

RB-WLS

Electrical Engineer.

#2309

July 31, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

With regard to telephone communication between substations, my understanding is that the Lead Dispatcher's wire will be brought into the various substations and that the Lead Dispatcher will work with the Train Dispatcher in the giving of train orders and starting and stopping of substation machinery.

It was further my idea that the present private telephone line which we now use for construction purposes could also be looped in to the substations and that this line could be used for maintenance work and for communicating with the substations regarding matters not directly pertaining to the train operation.

On this basis I wrote Mr. Patterson some time ago and pointed out to him that if this private line was to be used for the purpose above described it would have to be made more satisfactory than it has been, and I asked what changes would be involved to secure this result.

Mr. Patterson advises me, however, that it was his understanding that the private line would be turned back to the Telegraph Department when we were through with it. I would, therefore, like to get your idea as to whether you wish to figure on bringing only the Dispatcher's circuit into the substations for the present, or whether you wish to arrange so that we can either permanently keep the private line we have been using, or arrange for an additional line.

I have also had up with Mr. Patterson the matter of a telephone line for construction purposes West of Deer Lodge. Mr. Patterson states that there

#2--C.A.G.--7/21/15

are no wires we can use for this purpose, and that the building of a circuit would cost about \$24,000.

It is going to be pretty unsatisfactory to not have a construction telephone circuit, but it is a question whether we would be justified in going to the expense of paying \$24,000 for a line, unless you consider that we should have a second line connecting the substations together, for which purpose the construction line could later be used.

Kindly advise your views in this matter.

Yours truly,

RB-TLS

Electrical Engineer.

cc--E.A.P.

July 21, 1915.

42308

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

I understand that you would let me have, as soon as possible, the prices on repair material for substations.

Please let me know when you expect to furnish this information.

Yours truly,

HE-118

Electrical Engineer.

cc--V.A.W.
H.C.H.

Butte, Mont., July 31, 1915.

Mr. J. T. Creeker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to your wire of the 15th in regard to my furnishing definite specifications for reels and arbor holes for each kind of cable to be furnished for the electrification work, I wish to say that it does not seem advisable or desirable to draw up very detailed specifications covering these points, as all large manufacturers have their own and different standards.

We have, however, in general, covered this matter in our specifications for copper conductor for the West end which are going forward with our requisition.

What we want is a reel with a substantial and practical bushing which will not tear loose or break in the field. We would prefer a solid or built-up wooden bushing, square on the outside with a round arbor hole in the center. If metal bushings are used, they are to be securely bolted to the flanges of the reel.

In this connection I beg to hand you copy of letter from our Storekeeper covering condition of reels received from the Detroit Copper and Brass Rolling Mills.

Yours truly,

RE-WLS

Electrical Engineer.

July 21, 1915.

AGENT--G. N. Express Co.,
Three Forks, Mont.

Dear Sir:

My Storekeeper, Mr. Long at Three Forks
advisee me that you are holding several express
shipments of bonds, pending payment of express
charges.

Will you kindly arrange to turn these bonds
over to Mr. Long, sending Expense Bills for these
charges to my office, and I will arrange for the
relief of same. I do not understand why there should
be any delay in handling this matter, as there is no
question but what we can take care of such charges.

Yours truly,

RE-WLS

Electrical Engineer.

42807

July 31, 1913.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

In accordance with your instructions I have gone into the matter of re-arrangement of round houses at Harlorton, Three Forks, Butte and Deer Lodge, so as to adapt these buildings for the housing of electric locomotives, and the changes which are proposed are outlined in detail in a letter of July 15th by Mr. Rusch to Mr. Manchester, of which I enclose you a copy. You will note that in general the following changes are proposed:

Harlorton:

The five present 105 ft. stalls to be lengthened to 130 ft., one pit only to be extended, the extended portion to be made of more convenient depth for inspection.

Three Forks:

One stall to be lengthened to 130 ft. Pit not to be extended.

Placid:

Round house to be extended to 130 ft. Pits not extended.

Butte Yard:

The present three stalls to be extended. I talked with Mr. Barrett about extending the Butte Yard Round house instead of erecting a new building at Alley and he is of the opinion that for the present at least it would be advisable to figure on the extension of the present South Butte Round house. This will be comparatively inexpensive and a new building, if desired, can be put up later when a period of operation will have enabled us to arrive at a more definite knowledge of the requirements.

Sheet 43--C.A.C.--7/21/15
Roundhouse Alterations.

Dear Lodge:

Six stalls of the present round house in connection with which the local conditions permit of ready extension to be extended as well as their pits. The depth of the present pit to be left as it is, but the extensions to be deepened to permit of more convenient inspection.

In addition to the extension of the round houses, there will be additional building changes required at Deer Lodge in order to provide for repair facilities. You will note that, in this connection, Mr. Rusch proposes to erect a new inspection shed on the North end of the present Round house, this shed to contain two full length pits, and proposes to add on another bay to the present machine shop.

You informed me on the next to your last trip West that the Native Power Department would take care of the arrangement of these facilities, ordering the necessary tools, frames, etc. I thought best to call to your attention, however, that you might prefer to have us take care of the building work, that is the erection of the new inspection shed and of the repair shop extension, inasmuch as we will have building gangs on hand ready to take care of the Round houses.

Will you kindly wire me about this, so at present we are going ahead with the preparation of the Round house plans and would like to take care of the additional work referred to at the same time. Of course when the plans are ready we will submit them to the Native Power Department and others interested, but I would like either Mr. Manchester to whom I am sending a copy of this letter or yourself to wire me at once if any of the arrangements described above, or outlined in Mr. Rusch's letter do not meet with approval.

Yours truly,

RE-WLS
Encl.

Electrical Engineer.

cc--A. E. N.
E. E. B.
F. Rusch

#2308

July 21, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sir:

Referring to conversation had with Mr. Buck a day or two ago, I am handing you herewith copy of letter by Mr. Murphy, dated July 16th regarding two horses and two men who the trainmen seem to claim were negligent in their exercise of care to avoid an accident.

I understand that you are investigating this case as well as that referred to in Mr. Murphy's letter to you of July 10th, and would be pleased to have a copy of any correspondence or reports you may make in connection with these or similar complaints which come from the Operating Department.

As per conversation it seems to me very important that our records should clearly show the results of investigation of all cases of this kind.

Yours truly,

RB-WLS

Electrical Engineer.

42305

July 21, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

Referring to yours of July 16th regarding Warning Signals for low clearance bridges, I was in hopes that you could, as discussed in previous correspondence, make some actual test on your test tracks with pantograph running at high speed, in order to at least determine whether there was any use going ahead on the basis that we might be able to use some material for pendants which would permit the use of regular type of warning signals.

If you cannot make such tests in Schenectady, we will have to try to make some arrangements here as this is a matter which we will have to have attended to by the time electrical operation goes into effect. I would greatly appreciate prompt advice in the matter from you.

. Yours truly,

RB-WLS

Electrical Engineer.

cc--V.A.W.
H.S.H.

#2304

July 21, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Confirming conversation with Mr. Buck, will you kindly see that the bonding gangs working in the Automatic Signal territory collect all of the old Signal bonds which they remove, and take these back to one point where they can be destroyed or kept together.

We have had several cases of these old removed signal bonds being thrown across telegraph wires, and if they are allowed to lay on the Right of Way or just outside of it, they will be thrown across our trolley wires also, and cause a great deal of trouble.

Will you kindly see that this request is strictly carried out.

Yours truly,

RB-WLS

Electrical Engineer.

42303

July 21, 1916.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Confirming conversation with Mr. Buck will you please arrange between Dear Lodge and Avery to place spare poles where transmission line is located on private property, or off the right of way at suitable points along such cut-offs at sometime during the progress of construction.

Arrangements should be made to place spare poles at ends of such cut-offs between Dear Lodge and Two Dot, as it does not seem advisable to go to the expense of tearing these poles on the cut-offs at this time.

Yours truly,

RR-718

Electrical Engineer.

cc--G.F.S.
R. Wende

48302

July 21, 1915.

Mr. E. H. Barrett,
Asst Gen'l Supt.,
Butte, Montana.

Dear Sir:

After our conversation yesterday in regard to provision for Industry Tracks, I found that new rail profile made up by Engineer Musson for territory between Deer Lodge and Avery shows Industry Tracks 1200 ft. long at various stations, and gives station numbers for head-blocks.

I presume it will be proper to have our Staking Crews follow this profile as regards Industry Tracks, provided they show the length of 1200 ft.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 31, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to yours of the 8th, I have arranged with the Three Forks storekeeper to send you sample of expansion bolt shield used for tunnel work, Drg. ED-4158, and trust you have received it by this time.

We do not consider it desirable to show this shield on the drawing, as it is a standard product and the design does not originate with this Company.

Yours truly,

ED-WLS

Electrical Engineer.

July 23, 1913.

#2312

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to the attached regarding car for Mr. Soule, the sketch referred to was simply a rough pencil sketch showing two $7/8$ inch partitions.

The hot water tank referred to consists merely of a tin can used with a caboose stove for heating water for washing, and the total make-up of the car amounts to about \$85.00. These cars at the time of receipt of your letter had been about made up.

Yours truly,

RB-WLS

Electrical Engineer.

#2314

July 23, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to yours of July 19th regarding attached requisition RE-51290, the local purchase refers to the 64 ft. of galvanized pipe which, as the pipe which we had ordered from Chicago had not arrived, we were obliged to purchase locally in order to keep the bungalows going.

Yours truly,

RE-51290

Electrical Engineer.

#2313

July 23, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

In connection with bonds for the west end, I understood you to say on your last trip here that the Electric Railway Improvement Company was to be given a chance to install some of their bonds.

On all previous experimental installations done by the Railway Improvement Company, a continuous encountering of new difficulties prevented any figures being obtained to cover the cost of installation of these bonds.

If, therefore, the Electric Railway Improvement Company is to install these bonds, I would suggest that a contract be entered into with them for them to do the work on the basis described in my letter of April 3rd, except that the cost for bonds installed is not to exceed that which we find our P1a bonds on the East end will cost.

I would like to have your ideas in this connection, so I can get out bond requisition.

Yours truly,

RB-WLS

Electrical Engineer.

July 23, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to yours of July 20th, the Locke insulators for which you signed a requisition when you were in Butte were small insulators for the trolley line, in connection with which I explained to you that we had had very serious trouble with the O. B. insulators, and that after making tests we found the Locke insulator would be satisfactory.

With regard to the transmission insulators, I explained to you that F. M. Locke had been advertising a boro-porcelain insulator for which great things were claimed, and which I said it would pay to investigate before placing our order for transmission insulators for the West end. I thought at the time that this Locke was, as he used to be, connected with the Locke Insulator Manufacturing Company. I had Urban investigate this new insulator, and he found that it was still in an experimental stage, and further that the Locke Insulator Mfg. Co. were not manufacturing it, although they did take Mr. Urban up to Mr. F. M. Locke's laboratory.

Our requisition for transmission insulators for the West end has not yet gone forward, but I have had new specifications made up on basis of Mr. Urban's experience at the O. B. Works, and we expect to send you this requisition very shortly. The Locke Insulator Mfg. Co. will be asked to bid as well as the Ohio Brass Company.

Yours truly,

RB-WLS

Electrical Engineer.

#2311

July 23, 1915.

Mr. F. J. Taylor, Div. Engr.,
Northern Pacific Railway,
Livingston, Montana.

Dear Sir:

Replying to your favor of the 14th in regard to information showing portions of your Right of Way which are to be occupied by this Company in connection with our electrification, will say that we are now having this prepared and will forward to you just as soon as completed. This should be within one week. I trust this will take care of your requirements.

Yours truly,

RB-WLS

Electrical Engineer.

42310

July 23, 1916.

Mr. E. W. Adams, Sec'y,
Milwaukee, Wis.

Dear Sir:

Referring to yours of June 29th and July 16th in regard to rights to be obtained from the Northern Pacific Railway for guys, stays and anchors other than Right of Way for transmission line already covered by maps, will say that we have found it impossible to anticipate fully just what will be required in the line of the former until the work is actually done. This is owing to the character of our overhead construction and the rush nature of the work.

Shortly after work was taken up the Northern Pacific Company gave us the right to proceed with such locations, subject to adjustment to be made later. This was done with Mr. Goodnow's approval. On November 4th following request from the N. P. Co. we covered the rights required in a general way as per attached copy of letter. Later on the N. P. Co. requested us to make up maps showing the location of all such fixtures on their Right of Way, and we are now preparing to get this information together. As soon as this is done we will send you copies of the maps.

Yours truly,

RE-WLS

Electrical Engineer.

#2315

July 24, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your message of July 19th I am sending you herewith curves which show the comparative voltage drop between East Portal and Avery, using one and two feeders on the loop, respectively.

These curves are based on a current of 1496 amperes taken from current profile ED-#170, of which I also enclose print. This current is the maximum running current, which, however, you will note is fairly constant, corresponding to a 2500 ton trailing load.

There can hardly be any question about the desirability of the cut-off which is a comparatively inexpensive proposition, but the question is as to the advisability of running one or two feeders around the loop.

This, under the present conditions, must be considerably a matter of judgment, and a similar question regarding what is the proper amount of copper to use might be brought up about the copper between any other two substations. The more copper used, the less will be the power loss in the trolley wires and rails for a given train rate and schedule, and the less will be the variation in speed as the train moves between two substations. If we could consider the loss only, then the proper amount of copper to use would be that which would make the first cost plus capitalized annual charges (including cost of power loss) a minimum. On this basis, however, it figures out for our conditions and prices for material and power, that an amount of copper should be chosen which would ~~not~~ entail too great a voltage drop for operating reasons; that is too wide a variation in the speed of the train as it passed between two substations and too low a voltage to enable the apparatus in the locomotive to operate properly.

Just what maximum voltage drop, therefore, to allow in our calculations must as stated above, be largely a matter of judgment, as we do not know to what extent it will be necessary or advisable to bunch trains, where meeting points will figure out best to be, how much speed variation will matter, and similar questions that can only be answered by an experience under operation. We have, however, tried to make the layout such that if additional copper proves to be warranted, the necessary amount could be added with no increase in the number of substations required.

In general it might be said that for the layout from Deer Lodge east, with trains spaced two hours apart, we get an average drop of 11.4 per cent and an average maximum of about 17.5 per cent. Under the case in question the figures are as follows:-

AMPERES	AVERAGE DROP		MAXIMUM DROP	
	1 Feeder	2 Feeders	1 Feeder	2 Feeders
1496 Max. run. cont.	18.3	11.7	18.9	16.3
1410 Av'g " "	11.6	11.0	17.8	15.4
			1 Feeder	2 Feeders
Max. speed between Substations (approx.)			16.3	16.8
Min. " " "			13.3	13.8
Average " " "		1410 amps.	14.9	15.0

The additional copper required for the extra feeder around the loop will cost in the neighborhood of \$14,500.00, and the labor of stringing same, if this is done at the same time that the first feeder is put on, will involve little difference, as two feeders can be strung as readily as one, and it is only the putting on of insulators and tying in that will entail extra cost, and it was my judgment that where the better voltage conditions could be gotten as readily as this, that the extra expenditure was warranted. Of course we could string a second feeder of smaller size than 500,000, but the proposition does not admit of close figuring and the total amount involved is a very small proportion of the total feeder system.

I received your letter this morning about the possibility of a station going to Stetson instead of Avery. In this case we would get a maximum voltage drop of 17.6 per cent with one feeder instead of 18.9, and we would of course also save 3.6 miles of cable between Avery and Stetson.

As regards the cost of the cut-off, this might be about \$9500.00, based on a cut-off of the length as shown on the blue print herewith.

I could have furnished you the figures requested more promptly, except for the fact that recently we made a more detailed study of the conditions on the ground and found that it would be feasible to materially decrease the length of the cut-off compared to what I originally figured on. This made it necessary for us to re-calculate.

In general it might be said that compared with average electric railways, we are using a minimum amount of copper. The B.A. & P. for instance, has the equivalent of two 500,000 C. M. feeders between their two substations, which are say, thirty miles apart, although their maximum loads are less than one-half of what we will get between Avery and East Portal.

Yours truly,

RE-WLS

Electrical Engineer.

Butte, Mont., July 24, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Mont.

Dear Sir:

Referring to small gas car which has just been through the shops, and turned over to Mr. C. R. Strong who is now working with Outfit camped at Sinclair, Mr. Strong and Inspector Soule to whom he reports claim that this car is unfit for use on the road on account of trouble with the frame and also that there is some trouble with the engine.

We have arranged with Mr. Strong to turn this car into the shops and explained fully to Mr. Davis just what has developed on the road. After this is done, will you please have the car examined and advise if in your opinion it can be fixed up, or in other words, just what the condition of the car is.

If practicable we would like to have the car put back into service as soon as possible.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., July 24, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to yours of the 21st in regard to change in pattern E-500 which I believe is pole bracket casting consisting of making a hole in the side of casting in connection with coring, it is rather hard for me to approve this without knowing just what has been done, though it would seem safe to accept the ruling of the Mechanical Department in the matter.

Yours truly,

RB-WLS

Electrical Engineer.

42316

July 26, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to Requisition RB-#1307 and letter referring to same dated July 20th but mailed herewith, I held this letter until we could get out a print which would show you about how the East Portal substation will look according to the way we are carrying out the details of our designs.

This is a front view of the building and I would like an expression from you as to whether the general appearance is satisfactory.

In connection with Avery substation, I have your letter of July 21st which leaves the location of this substation an open question, and I will be governed accordingly.

Yours truly,

RB-WLS

Electrical Engineer.

July 26, 1915.

Dr. Hoy,
St. Maries Hospital Assn.,
Three Forks, Montana.

Dear Sir:

Our Bonding outfit just now being
equipped at Three Forks will want a Stretcher
and Medicine Chest.

Will you please arrange to deliver
same to our Storekeeper at Three Forks and he
will turn same over to the Crew.

Yours truly,

FAC-WLS

Electrical Engineer.

cc--A.E.L.

Butte, Mont., July 27, 1915.

Mr. J. T. Crooker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to your telegram of the 23rd, in regard to General Electric promises for delivery on Section Switches, I wired you yesterday regarding this matter, and in regard to specifications or blue-prints covering these switches, I am sending you duplicate print of our Drawing ED-4315, which is the only thing in our possession on the switches except as covered by our requisition in that they are to be insulated for 5,000 volts and of 1,000 ampere capacity. They are also provided with a quick-brake feeder.

From the blue print you will note that the General Electric Company has been furnishing switch as described mounted in wood box and provided with Hickory insulating stick with connection on lower end for 1½" pipe, also operating lever, detail "D" with connection for 1½" pipe and provided with pin so that switch can be locked open or closed with standard Railway Switch lock. We are furnishing the remainder of the items shown on the drawing.

We took this matter up once with the O. B. Company and they preferred not to bid, and upon taking the matter up with the local Westinghouse office their Manager informed us that he did not believe that their Company had ever made a switch of this kind for commercial purposes on account of its being a special development for our particular class of work. In view of the facts, it would seem that the General Electric Company will probably do as well on delivery as any other manufacturer, with the order in hand, although you may be able to get competitive bids on future orders to be placed for Deer Lodge - Avery Section.

Yours truly,

RB-WLS

Electrical Engineer.

July 27, 1915.

Mr. H. D. Kremer,
City Attorney,
Bozeman, Mont.

Dear Sir:

I have yours of July 26th regarding a contract in connection with lighting of the City of Bozeman and I will go into this matter as soon as possible and communicate with you further.

Yours very truly,

RE-WLS

Electrical Engineer.

July 27, 1915.

Mr. A. E. Manchester,
Supt. of Motive Power,
Milwaukee Shops, Wis.

Dear Sir:

Referring to yours of July 19th regard-
ing repair facilities, there are one or two points
in connection with which I am securing certain
additional information, and I will write you fur-
ther as soon as possible.

Yours truly,

NB-WLS

Electrical Engineer.

Butte, Mont., July 27, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Regarding the matter of reels for copper and steel strand and furnishing you specifications for same, as previously advised, we have made up specifications in which the matter of reels is referred to. However, we thought it might be better to give you a more detailed account of our experience and we have had a further investigation made of all the objections which have come up in connection with reels as so far furnished, and the enclosed report will give you a good idea of the whole situation and enable you to be sure that each manufacturer furnishes the proper kind of reels in the future.

You will see from this report that we cannot write a detailed specification, because manufacturers have their own standards, and all that is required is that these different standards be modified so as to meet our requirements.

I would be glad to know if this information gives you everything which you need on this subject.

Yours truly,

RB-WLS

Electrical Engineer.

42317

July 27, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

You will remember that in connection with the layout of the Draxel, East Portal and Stetson substations, a question of the insertion of extra loops in the path of the lightning arresters came up. In thinking this matter over, it is rather difficult for two reasons to see why the installation of these loops should be seriously objectionable:-

First: Assuming that the lightning has reached the substation buss, before it can do any damage to the apparatus, in preference to passing through the arrester it has to pass through the choke coils which are in the circuits leading to the apparatus, and it would certainly seem that if relative reactances alone influence the situation, the comparatively high reactance of the choke coil would be sufficient to divert the lightning from the apparatus, even if one or two extra loops were introduced into the circuit through the arrester.

Second: The article by Mr. Creighton to which you referred us sometime ago in connection with grounding system, states that the only reason why the loop should be considered as objectionable is that it introduces a greater distance than a straight line would, between the buss and the arrester.

We might add in this connection that we have just received your preliminary layout showing horn gaps mounted inside of the substation instead of outside. It seems to us that this is a very dangerous arrangement from a fire standpoint, and also on account of the possibility of an arc forming between the busses. Can you refer us to any other installation where this arrangement exists?

Inasmuch as this feature holds up our design on the three substations above referred to, we would like you to wire us your comments in this connection just as soon as possible.

Yours truly,

RM-VLS

Electrical Engineer.

Butte, Mont., July 28, 1915.

Mr. C. H. Arnold,
Round House Foreman,
Falls Yard, Montana.

Dear Sir:

On Mr. Rivers' June Bill I again find charges
to repairs on the trolley and electric engine at Great
Falls amounting to \$70.00.

As I understand it, this is for the time of
making repairs by Maintainer Land. I think this is
altogether out of reason. It does not seem possible
that he would spend the bulk of his time during the
month in making repairs, whereas the time that would
actually be spent would only amount to two or three days.

In future I will not accept any bills for
such excessive charges.

Yours truly,

FAC-WLS

Electrical Engineer.

cc--D. B. R.
G. E. C.

Butte, Mont., July 28, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Herewith Bill of Lading covering the return
of empty copper wire reels shipped in St. P. Car
#78349 to St. Paul. This car contains reels fur-
nished by the American Steel & Wire Company as follows:

- 23 - 700,000 C. M., all in good condition.
No lagging returned.
- 23 - 2/0 Hemp Core in good condition.
No lagging returned.

Yours truly,

FAC-wls

Electrical Engineer.

July 28, 1915.

Mr. G. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Herewith requisitions covering supplies furnished in connection with substation and busbar construction.

While the items may appear to be numerous, the amount of money involved is very small. Most of this material was purchased on account of shortages on previous orders or changes which necessitated additional material.

Inasmuch as the work was about complete we deemed it advisable to secure the items locally. I trust this is satisfactory.

Yours truly,

FAC-WLS

Electrical Engineer.

July 28, 1915.

Mr. C. A. Lemmon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

In furnishing bills for the joint work you are doing in connection with our electrification, will you kindly arrange to furnish us with duplicate copies of same.

This will relieve us of quite a burden and I think you can readily take care of it when you are making the original copy.

Yours truly,

FAC-wls

Electrical Engineer.

July 28, 1915.

Mr. C. A. Lemmon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

As per your recent request I shipped you
by Baggage on July 24th, one hundred 7/8" Crosby
Clips, also in St. Paul Car #83398 thirty-five
hundred 1/2" crosby clips and thirty-four hundred
3/8" Crosby Clips. Please advise if you did not
receive same.

Yours truly,

FAC-wls

Electrical Engineer.

July 28, 1915.

The Continental Oil Co.,
Butte, Montana.

Dear Sirs:

Referring to your recent tracer on empty oil barrel #333 shipped to Janney. This barrel has been returned to Butte Freight House. You will be able to get it at that point.

Barrel #335 is still at Janney and we will release it within a few days.

Yours truly,

FAC-wls

Electrical Engineer.

#2319

July 28, 1915.

Mr. A. I. Bouffleur,
St. Maries Hospital Asen.,
Seattle, Washington.

Dear Sir:

Herewith please find executed contract covering the Hospital arrangement with the Montana Power Company in connection with their contract for the electrification of our Rocky Mountain and Missoula Divisions.

The Supplementary contract covering the 10 per cent additional payment and the allowance for burial will be sent later. At the present time the Montana Power Company do not care to give up the right of Artificial Appliances which they claim was one of the advantages advanced at the time the original contract was signed. I am arranging to take this matter up with Mr. Kerr, the Vice-president of the Montana Power Company as soon as he returns to Butte.

Yours very truly,

FAC-WLS

Electrical Engineer.

Butte, Mont., July 28, 1918.

A. E. Long, Stkr.,
Three Forks.

Dear Sir:

Please send Mr. J. T. Kelly, Storekeeper at Deer Lodge a number of samples of the scrap copper sent to you by the various wire stringing crews.

It may be that Mr. Kelly can use some of this to advantage at Deer Lodge. All that he wants will be short pieces about one ft. long, of the various kinds of wire. Send by Baggage under registered cover.

Yours truly,

FAC-wls

Electrical Engineer.

cc--J.T.K.

July 22, 1915.

42318

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Attached are two vouchers covering blue-printing, the one favor Harper-MacDonald covering blue printing which was done in June previous to the arrival of our blue printing machine, and the other favor John W. Graham & Company covering blue prints which were made recently. The latter consisted of making one print of some very long profiles which could not be economically handled by the machine which we have. We therefore arranged to have it done in Spokane.

I have the following report to make concerning the operation of our blue print machine:

Initial Cost of Machine	\$165.00
Cost of Wiring	24.80
Pans	11.00
Drain	5.00
Drying Rack	1.00
TOTAL.....	\$206.80

Cost of Operation to date:

Electricity	6.30
Repairs for Machine	2.85
Labor for Operating	30.54
Material for Operating	25.40
	<u>\$ 65.09</u>

Approximately 4,000 sq. ft. of prints made to date.

The cost of making these prints per sq. ft. not including cost of equipment amounts to 1.6 cents, and this would have cost, if done by outside concerns, \$200.00, making a net profit of \$134.91 to be applied against the cost of equipment.

#2--C.A.G.--7/28/15
Re: Blue Printing.

The cost of material for making these prints runs a little high, due to the fact that it was necessary to purchase six rolls of blue print paper locally at a price of \$4.25 per roll, whereas we could have purchased the same material in Chicago at a price of \$1.40 per roll. We had an order in for this paper but there was a delay in getting the order filled.

Inasmuch as we have but just started to make the prints of profiles and plans for the Western Division you will see that we will soon be able to save the cost of the machine and still have a good piece of equipment for our own use.

Yours truly,

FAC-ELS

Electrical Engineer.

TELEPHONE CALLS ON ELECTRIFICATION

DEPARTMENT TELEPHONE LINE

*** ** **

Indicates One Long Ring.

Indicates One Short Ring

R. Beowkes, Elec. Engr., Butte.....	_____
M. Curtis, Line Construction.....	_____
H. E. Back, Montana Power Co.....	_____
G. E. Cressford, Deer Lodge.....	_____
Mont. Power Co., Camp #1, Fulp.....	_____
Mont. Power Co., Camp #2, Smith.....	_____
Mont. Power Co., Camp #3, Blackely.....	_____
Mont. Power Co., Camp #4, Ferguson.....	_____
Mont. Power Co., Camp #5,	_____
Mont. Power Co., Camp #6, Snider.....	_____
Mont. Power Co., Camp #7, Minkey.....	_____
Mont. Power Co., Camp #8, Taverner.....	_____
Mont. Power Co., Camp #9, Dixon.....	_____
Mont. Power Co., Camp #10, Molisance.....	_____
Mont. Power Co., Camp #11, Mattakora.....	_____
Mont. Power Co., Camp #12, Owens.....	_____
Mont. Power Co., Camp #13, Gilbert.....	_____
Mont. Power Co., Camp #14,	_____
Mont. Power Co., Camp #15,	_____
Mont. Power Co., Camp #16,	_____
Two Dot Substation.....	_____
Summit Substation.....	_____
Josephine Substation.....	_____
Rustle Substation.....	_____
Piedmont Substation.....	_____
Janney Substation.....	_____

\$2320

July 29, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your wire of July 27th regarding estimate for continuing the extension of our transmission line west of Morel, and making such other arrangements as may be necessary to feed Deer Lodge Shops from the substation feed taps, and thus avail ourselves of the contract rate for power, we have considered this matter carefully and find that the cheapest scheme would be to install at Morel a transformer stepping up from 2300 to 6600 volts and transmitting the latter voltage to Deer Lodge, and then stepping down again to 2300 volts. On this basis the line and installation would cost \$22,000.

The above amount charges against the scheme the standard transmission line and cross-arms, which, except for about six miles, have already been set, and the use of small 6600 volt insulators instead of 100,000 volt insulators. The interest, taxes and depreciation chargeable against this transmission line and these transformers would amount to about \$2100.00. The power at the contract rate would cost about \$2900.00, whereas it now costs about \$5100.00. We thus save, as far as the cost of power is concerned, about \$2100.00, but lose this again in taking into account the interest, taxes and depreciation on the new line and equipment, in addition to having to spend the initial \$22,000.

Of course it might be said that if we do not use these poles for a transmission line to Deer Lodge we would either have to let them stand and rot without getting any use from them, or we would have to take them down and use them on other parts of the line. However, even if we do give the Deer Lodge scheme credit for an amount which represents the cost of the poles already in place, less salvage, the scheme still works out not to be a profitable investment.

Of course the line, built with the long and heavy cross arms and equipped with its heavy guying, would look wrong for 6600 volts, but the use of 100,000 volt insulators would add to the cost of the line itself some \$6,000, and require the use at the Deer Lodge end of a lightning arrester which would cost considerably more than the transformer referred to above.

We have made figures at other voltages than 6600 for the transmission line, but there are no differences involved which would lead to serious modification of any conclusions arrived at.

The Power Company now has a transmission line of 60,000 volts extending from Gregson via the Race Track and Warm Springs to Deer Lodge from which line we now derive our power at Deer Lodge. We thought that possibly a connection between the Morel - Great Falls line at Deer Lodge might be considered by the Power Company a desirable acquisition as a duplicate feed of theirs to Deer Lodge and that they might, on this basis, be induced to pay part of the cost of the construction of the transmission line in question. I mentioned this to Mr. Cochrane, but he did not think the Power Company needed another line to Deer Lodge, and in any event it might be cheaper for the Power Company to tap their Great Falls line and run it to Deer Lodge. I bring this point up because you might care to go into this matter further in an official way.

In connection with the feeding of Deer Lodge I am not exactly clear as to the intent of Clause #15. It says that the Power Company shall deliver power to us from their extended lines, but does not clearly say at what rate the power will be furnished. This clause might possibly be interpreted to require the Power Company to already give us power at the reduced rate from their present line as it parallels (though at some distance) our Railway.

The amount already invested in the construction of the line from Morel to Deer Lodge is between \$4,000 and \$5,000. Of course this line, as well as that from Deer Lodge to Gold Creek, has been surveyed and mapped out, and this work costs in addition at the rate of about \$26.00 per mile. If the poles were taken out and used elsewhere the salvage would be \$1,500 or \$2,000.

#3—C.A.G.—7-29/15

In view of the rather complex considerations involved in this whole matter I wired you yesterday as per the attached confirmation regarding your views in the matter, and in accordance with your reply instructed the Power Company to discontinue the work.

Yours truly,

RE-WLS
Encl.

Electrical Engineer.

#2321

July 30, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your letter of the 22nd, we have investigated the matter of moving the substations forty ft. from center line of future main track or present main track as the case may be, and we find this can readily be done in the cases of Gold Creek, Primrose, Tarkio and Drexel. We are arranging with Mr. Webster to get the necessary additional Right of Way for them.

Regarding Ravenna, we are sending herewith three prints showing three different layouts. Here we have assumed that the future main line will be on the building side, that is it will form an extension of the present passing track. In case #1 the building is fifty-five ft. from the present main line, or forty ft. from the future main line. This involves an excavation of some 34,000 cubic yards, which we find could be most cheaply taken out by steam shovel, and would cost about 40¢ a yard, or about \$14,000. In case #2, the building is moved 40 ft. from the center line of the present main track. This involves an excavation of about 27,600 yards at a total cost of about \$11,000. In case #3 the building is located 31 ft. from the center line of the present main track, this allowing the future main line track to go in and giving 16 ft. clearance, the same as at present at Two Dot. In this case the excavation will amount to about 20,400 yards, costing about \$8,000.

We looked into the matter of doing this excavation by teasing, but the prices we got were forty cents for earth, seventy-five cents for loose rock and \$1.00 for solid rock, whereas with the shovel we figure that the excavation can be done at about forty cents.

In view of the extensive excavation required in all but case #3, which at least takes care of any future track changes, we presume that you will want to adopt this scheme. In any event will you kindly wire us soon as possible which case you wish us to go ahead with so that we may arrange to get in a shovel which is now available.

#2--C.A.G.--7-30/15
Substation Locations.

With regard to East Portal, you remember the conditions, and I believe will agree with us that there is nothing to do but locate this building 31 ft. from the center line of the present main track. We are sending you a print which shows the plan on this basis and also a cross-section. The main difficulty of undertaking any excavation here is that we would probably bring down on us immediately the whole mountain side above, and we would at least introduce a very dangerous condition as regards slides. We will go ahead on this basis unless you wire otherwise.

As regards Stetson or Avery, we are sending you herewith three cases corresponding to those which we have outlined above for Ravenna. In Case #1-A the building is 31 ft. from the center line of present main track, which will allow the present passing track to be used in the future as a main track, and give just about the same conditions as obtain at Two Dot. The building is assumed with floor one ft. above top of rail and the excavation amounts to about 22,000 cubic yards, which we estimate might cost in the neighborhood of \$16,000. In Case #2-A, the front of bay is 55 ft. from front of main line, or forty ft. from future main line and the building floor is one ft. above top of rail. This involves an excavation of 38,000 yds, costing \$25,000. In Case #2-B the building is assumed the same distance from the present main line, but sets 10 ft. above top of rail. This involves an excavation of 22,000 cubic yards costing about \$15,000. In Case #1-B the building is taken as 48 ft. from the present main line and taken 10 ft. above top of rail, this condition taking care of slopes and corresponding to the minimum amount of excavation we can get under any condition. The amount of excavation is about 15,000 cubic yards, costing about \$10,000 or \$11,000. We will send you in a day or two the layouts for Avery, and in the meantime would be glad to have you give Stetson consideration so that if you decide to locate the substation there you will be in a position to advise which layout to go ahead with.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

Butte, Mont., July 30, 1915.

Mr. W. L. Slater,
Pole Inspector,
St. Maries, Ida.
Clarkia, "

Dear Sir:

We should start shipment of the 8 ft. and 4 ft. anchor slugs being furnished on Requisition #1105, there being 4,000 of the 8 ft. and 2,000 of the 4 ft. pieces.

Are you in a position to inspect the loading of these slugs along with the poles? Advise quickly.

Yours truly,

FAC-WLS

Electrical Engineer.

Butte, Mont., July 30, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Herewith Bill of Lading covering the return
of empty wire reels in St. P. Car #500419. Following
is a list of reels included:

20 - 500,000 C. M. Strand
1 - 700,000 " "
11 - 4/0, 19-wire strand
17 - 2/0, B & S Hemp Core strand
30 - 4/0 Grooved Trolley

Making a total of 79 reels, all of which were
furnished by the American Steel & Wire Company.

Yours truly,

FAC-wls

Electrical Engineer.

Hutte, Mont., July 30, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

Replying to your letter of July 28th regarding the order for two kitchen, five combination bunk and five dining cars to be used by the Montana Power Company.

Will you kindly arrange to have this outfit gotten out as soon as possible. I am today making requisition covering the work. Four cook stoves have also been shipped to Deer Lodge in St. P. Car #46950. These stoves will be put in the above cars.

By return mail please advise me when I may expect these outfits, as we will need them by the middle of next week.

Yours truly,

FAc-wls

Electrical Engineer.

Butte, Mont., July 29, 1916.

ALL CONCERNED:

Herewith revised statement of telephone calls on our Independent Telephone System. You will notice there are two calls for this office, one being for R. E. Wade's office, and is the same call as heretofore; the other being for the general office and will be answered by the office boy who has a desk in the accounting rooms. By calling the latter office, connections may be obtained to Messrs. Walker's, Williams' and Cooper's offices.

R. BEYER, Elec. Engineer.

July 31, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to my telegram of this morning, I am sending you the original of a letter by Mr. H. D. Kremer, City Attorney for the City of Bozeman, and two copies of the Lighting Contract to which he refers.

You will note that on Page #2 of the Contract that "The approximate cost of the portion of the cost of installing of the dual posts to be borne by the Gallatin Valley Railway Company is \$2,147.80." This checks closely with figures that I have also made. Of course in addition to this cost we have to change our trolley span wires over to the new posts, install 14 additional spans, and provide on the posts bands for supporting the trolley spans and possibly a feeder arm. Whether or not the feeder arm will have to be put on the poles depends on whether Mr. Busch will be able to change over the feeder to other poles not on Main street. I believe that this can economically be done.

I should say that the cost of the work to us over and above that stated in the contract would be in the neighborhood of two or three hundred dollars. On account of the peculiar character of the work this cannot be estimated closely.

Nothing is said in the contract about the proportion which we would have to bear of the lighting bills. In this connection please refer to my wire of May 29th in which it is estimated that this cost would amount to about \$70.00 per annum on the basis described to me by Mayor Luce.

Mr. Urban will be in Bozeman tomorrow and I am having him find out if there is any change in the approximate figures given by the Mayor. If we find there is, I will wire you.

The contract as drawn up by the City of Bozeman looks satisfactory to me except that it does not clearly

#2--C.A.G.--7/31/15

define the portion of the installation the expense of which we bear a part, and when we return the executed contract we should say that we have executed it with the understanding that our share of the cost applies to the pole and setting thereof, without any expense incurred in connection with the installation of the lighting fixture or lighting appurtenances, such as switch cables, etc; in other words, our proportion applies only to the first item for 74 trolley suspension poles on page #3 which page is headed "Form of proposal".

We should also have access to the bids, that is, you might consider we should have a representative present at their opening. The only other point that occurs to me is in connection with paragraph #39 headed "POLES", Page #20. This clause is no doubt a portion of Standard City specifications, but is somewhat contradictory to the Main essence of the contract. We can call the City's attention to this when we execute it. I will await your instructions.

Yours truly,

BB-WLS

Electrical Engineer.

July 31, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

Replying to your letter of July 23rd, the manner in which you are handling the tests on the Motors is satisfactory to me.

Yours truly,

FAC-WLS

Electrical Engineer.

cc--H.S.H.

July 31, 1915.

Mr. F. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

I am sending you by express seven 37" rail bonds, these being samples taken from the bonds which split while they were being installed, as requested by you in your recent telegram.

As Mr. Curtis told you while he was in Schenectady recently, you would not be able to see the break in the bond, because when it is driven out this break is necessarily closed up by the driving tool. I also understand that he told you that when the trouble began to occur we notified Mr. Wolcott in regard to the matter and asked him if he wanted to go out and see the bonds being installed and see them crack as they were being installed, but his reply was that he did not have time just then to attend to it because of an expected trip to Chicago, but said he would attend to it on his return.

I have a letter dated July 15th from Mr. Hills of your Butte office stating that the Factory did not understand exactly where the trouble occurred and asking for a sketch. This I think is unnecessary at present for Mr. Curtis advised that he explained it fully to you and that you understood exactly where the crack occurred.

As soon as you come to any final conclusion as to the cause of this trouble I will appreciate it if you will let me know what it is.

Yours truly,

RD-WLS

Electrical Engineer.

cc--V.A.W. .S.H.

August 2, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your letter of July 26th relative to the Electric Railway Improvement Company's bonds, we made tests on the conductivity of these bonds and find they run the same or better than the pin bonds, also Mr. Urban made tests at the Plant of the Railway Improvement Company which show the same results, but I do not believe we can make any satisfactory tests to determine the comparative qualities of the welded and pin bonds except by observing the action of the bonds in place for a considerable period after electrical operation has gone into effect. If we could put a good deal of current through the rail, bad welds would probably show up, but of course we cannot do this until we get running, and further the question of whether application of the weld has in any affected the strand so that they will break off can only be settled by time. Vibration tests help some to settle this question, but I do not feel that they are conclusive.

Judging from the last bonds that we put on at Three Forks, I would say that we could all feel reasonably sure that the Electric Railway Company will be able to put on a bond which is just as good initially as the pin bond, and the contact of which should not be subject to the deterioration to which the pin bond contact is subject. The only question is how much time and how much expense will be required in putting on the welded bonds. The element of time could be taken care of by getting the Railway Improvement Company started soon as possible on the West end where we know the rail will not be changed in the next few years, and the question of expense could be taken care of on the basis of a contract such as we have already discussed.

Of course, in considering whether the welded bond is more advantageous to us than the pin bond which is very easily installed and replaced, we should remember that the question of deterioration of contacts would

#2--C.A.G.--8/2/15
Welded Bonds

not seem to be of very great importance when the rail has to be changed out every few years anyhow. I have always thought that the main thing against the welded bond, assuming it can be successfully applied, is the difficulty with maintenance. We have not yet got any definite information or ideas on what the maintenance equipment will look like or actually weigh, and from what I have seen of the installation machine I should say that we would actually want to see the maintenance machine made up and tried out before we went into the welded bond proposition too heavily.

Yours truly,

RB-WLS

Electrical Engineer.

August 2, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am sending you herewith two prints showing two schemes for arrangement of substation and bungalow buildings at Avery. This so that in case the substation should go at Avery you will be in a position to advise us which of the two schemes you prefer.

It was our original intention to place horn gaps for lightning arresters on steel work out-doors, and we figured that this steel work would not be objectionable if located in front of the Idaho Hotel. Since we have gotten into the layout of this substation further, however, it appears that it will be better to locate the horn gaps inside of the building, therefore requiring that the latter be considerably longer than in the case of other substations which do not have to be built to take care of the snow load. For the flat roof substations the horn gaps are located on the roofs. Increasing the length of the building means that the bungalows either have to be squeezed up closer to keep in the same space as before, this as shown on Scheme #2 of the Pearson Mercantile Company's building has to be moved to the East.

Inasmuch as the bungalow buildings squeezed as much as they are in Case #2 would look very squat between the high substation building and the high Pearson building, I think you will agree with us that Scheme #1 is the better one. Would be glad to have you advise which Scheme you prefer, so that when the matter of substation location is settled we will be able to go ahead.

Yours truly,

RB-WLS

Electrical Engineer.

August 2, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

With regard to the trouble caused by lightning to our Bozeman substation, wish to advise that the Westinghouse N. P. Station Arrester failed to work and discharged through the armature of the D. C. Generator while operating. A consequent short circuit melted down about six of the Commutator bars and destroyed six of the armature coils. The heat caused by the short circuit melted the solder and fastenings of the armature bands, which flew off and tore off a number of the leads to the field coil. In addition to this two of the motors on the cars were burned out as well as the cut-outs on the air compressor.

There is now at work repairing these troubles an armature winder borrowed from the Montana Power Company. He still has about four or five days work to complete the job.

The City and Inter-urban cars are now being operated from the current supplied by the Springs substation and any necessary switching is done only when all the rest of the cars are out of the service.

It would seem that the reason for the station arrester not operating properly was due to the method of connecting the same. A number of loops were formed by the connections which raised the impedance above that of the choke coil between the leads and the bus bar. This will be corrected at once. The type of arrester is a very old one and is not very sensitive, and it is recommended that an Electrolytic arrester be placed in the substation.

Enclosed find two requisitions covering material necessary to re-place the apparatus destroyed or put out of commission. It is suggested that if this material can be picked up in Chicago, that it be shipped by express so that it can be installed before the Bozeman substation

#2—C.A.G.—8/2/15

is again started.

Yours truly,

RB-WLS

Electrical Engineer.

August 3, 1915.

Mr. E. S. Johnson,
General Elec. Co.,
Schenectady, N. Y.

Dear Sir:

Replying to your letter of the 22nd ult., in which you advise that no work is being done on the potential transformers which will be used in connection with the Montana Power Company's metering, and have to advise that the Power Company will place an order for this apparatus.

Yours truly,

RE-319

Electrical Engineer.

cc--VAN
HSH

Butte, Mont., August 2, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to Requisition RB-#1350 for danger signs, and sample herewith. We obtained this sample sign from the Montana Power Company, and it is one they purchased through the Stonehouse Steel Sign Company at Denver, although they were made by Chas. W. Shank Company, Maywood, Illinois at a cost of 10¢ net, f.o.b. Factory in quantities of 5,000. These signs are made of No. 30 gauge steel and measure 8-3/4 x 9-3/4 inches.

Since the Power Company purchased these signs they received a lower quotation on similar ones from the American Art Works at Coshocton, Ohio.

We would prefer to have enamel signs provided the difference in cost is not materially greater than for these paint-enamel signs. Kindly advise when we may expect shipment on this requisition, as we want to use the signs by the 10th of this month.

Yours truly,

RB-WLS

Electrical Engineer.

August 3, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

We are being called upon to release all equipment promptly as possible.

Please see that all cars containing material are unloaded. Mr. Murphy is calling attention to three box cars which have been on hand at Sinclair containing Electrification material since July 17th. Please investigate and have the material unloaded early as possible.

Yours truly,

FAC-WLS

Electrical Engineer.

August 3, 1918.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to Mr. Johnson's letter of July 24th regarding shipment of Electrical Apparatus, we have made up the following schedule showing when the different types of apparatus will be on hand for each substation.

You will note that Morel, disregarding the Motor Generator sets on which we have not yet received promise of shipment, is limited by D. C. Switchboard which will be on hand about September 30th. Janney, Piedmont and Eustis are similarly limited. These stations, we figure, on basis of the receipt of the D. C. Switchboard as stated above, would be ready to turn over October 10th.

Josephine, Summit and Two Pot get their D. C. Switchboards about October 5th, but on the Motor Generators we have no promise. Assuming that the D. C. switchboard is the limiting feature, these stations would be ready to turn over about October 25th.

If this segregation of shipment of the apparatus is satisfactory to you, will you kindly so advise, and I will instruct the General Electric Company to ship accordingly.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., August 3, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to your wire of the 30th, file
Ingalls regarding material on Requisition #1057.

To date we have only received about one-
fourth of the quantity of material called for on
this requisition. In some cases we have had no
shipments on certain of the items. This was my
reason in asking you if you were proceeding to com-
plete the entire order.

Inasmuch as we are preparing to rush the
work West of Deer Lodge all possible, we do not care
to have any delay in getting this material on the
ground.

Yours truly,

FAC-WLS

Electrical Engineer.

August 3, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N Y.

Dear Sir:

I have your letter of July 30th. We will not change the wire to the Oil Drying Outfit, as though it is larger than needed, it has already been ordered. The wire to the Air Compressor, however, must stand 45 amps. In other words, it must, according to underwriters Rules, be an equivalent of No. 8 instead of No. 10 wire, and we will change it accordingly. I am unable to see why you say that you do not suggest any change in the size of wire, inasmuch as it would not pass Underwriter's inspection unless it was changed.

Similarly regarding the flexible cable which you are furnishing, why should this not be made proper size in accordance with Underwriter's rules, i.e., No. 6 for Air Compressor and No. 4 for Oil Drying Outfit.

Yours truly,

RD-WLS

Electrical Engineer.

cc--VAN
HSH

August 3, 1915.

Mr. H. C. Cochrane,
The Montana Power Co.,
Butte, Montana.

Dear Sir:

Can you give me any idea when we may expect to receive from your Company the suggested contract applying for the installation and operation of Power Indicating and Limiting System between Harlowton and Deer Lodge.

Yours truly,

RB-wls

Electrical Engineer.

August 3, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Attached is correspondence from the Forestry Service Department of the U. S. Dept. of Agriculture, covering payment required on account of transmission line rights crossing the Deer Lodge National Forest Reserve, according to Act of March 4, 1911.

I have not drawn voucher covering the payment as I thought possibly you might want to take the matter up with Mr. Field before payment was made. You will also notice the letter of Transmittal of the 10th states specifically that payment should be made by Postal or Express Money Order. If this bill is alright, will y u kindly arrange to have payment made to the Forestry Department as per enclosed statement.

Yours truly,

RB-WLS

Electrical Engineer.

August 3, 1915.

Mr. A. J. Busch, Supt.,
Gallatin Valley Railway,
Bozeman, Montana.

Dear Sir:

Relative to the re-placement of the one mile of trolley wire on the stretch from the Agricultural College to Grand Avenue which we have under consideration, wish to say that before recommending this I would like to get a little additional information which the Assistant Electrician in Bozeman can secure.

Can the trolley cars be re-used? If not, how many trolley cars are there on this section?

Will you kindly advise me on these points as soon as possible.

Yours truly,

FU-WLS

Electrical Engineer.

August 3, 1915.

Mr. A. Bang, Elec. Engr.,
Pennsylvania Water & Power Co.,
Baltimore, Maryland.

Dear Sir:

Referring to your paper on your operating experience with the Pennsylvania Water & Power Company's plant on the Susquehanna River, in the July proceedings of the A. I. E. E., I would like to get from you if consistent, the names of the makers of the various insulators shown as A. B. C. D. E. and F. on Page #1436.

I would appreciate this information very much and assure you that it will be held as confidential if you decide to give it to me.

Yours very truly,

FU-WLS

Electrical Engineer.

August 3, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Mr. L. W. Smith of the Signal Department was in Butte yesterday and held a conference with Mr. Kerr of the Montana Power Company, regarding Signal work.

It was decided that it would be alright for the Signal Department to go ahead with their work, using non-union men and paying them the Union rates, also hiring a few Union men to create a good spirit throughout the organization.

They expect to have a force of about fifty men on this work, and as they have no office organization for handling the accounting and their reports, it was suggested by Mr. Smith that we handle this part of the work in connection with our own, at least that is what Mr. Smith recommended in his letter to Mr. Mill, copy of which is attached.

I presume this is what you had in mind, also as I recently received a letter and request from Mr. Mill for me to handle the various items of material and the accounting of same.

Of course this matter can be very well handled by us without much extra labor. If you approve of this method of handling the work in this way, please advise.

Yours truly,

RE-WLS

Electrical Engineer.

August 3, 1915.

Mr. A. E. Manchester,
Supt. Motive Power,
Milwaukee Shops, Wis.

Dear Sir:

Mr. Ruech was here in connection with settling on the facilities to be provided for repair and maintenance of the locomotives.

I asked him if he had made any provisions regarding a man to be in charge of this maintenance work, and stated that if you wished, we would turn over Mr. Hertzog to your Department for this purpose.

I presume you will want a man thoroughly acquainted with and experienced in this class of work, and presume that Mr. Hertzog who has had this experienced and incidentally knows the details of our locomotives better than anyone, would be a very valuable man to you.

I would like you to let me know just as soon as possible if you would like to get Mr. Hertzog, so that I may send another man to Schenectady to get broken in to take his place. We are paying Mr. Hertzog \$100.00 per month and of course his traveling expenses.

Yours truly,

RB-WLS

Electrical Engineer.

cc--C. A. G.

August 3, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to the matter of High Tension Insulators for high tension line, I have not sent you requisition for these yet because, although the specifications are completed, we think that it will be very desirable to make certain comparative tests here before we send in our requisitions.

We have some O. B. insulators and also some Thomas insulators, and within a week will have some Eckses from the Montana Power Company. There are certain tests which we want to make on the three types of insulators, these tests constituting the subjecting of the insulators to changes in temperature and then testing them to see whether the porcelain has been affected.

As you doubtless know, all of the large users of insulators have been experiencing a good deal of trouble with insulators after the first one or two years service, on account of the insulators depreciating very rapidly, and it is not yet definitely known what causes this depreciation, but it would seem that the two probable causes of the deterioration are cracks formed in the porcelain due to temperature changes and moisture forming in the porcelain. It is not possible to make any test to discover whether the porcelain will, in the course of time, absorb moisture, as this process seems extremely slow, but it is possible to make tests which will show the effects on the different types of insulators brought about by temperature changes. These are the tests we propose to make, using the Montana Power Company's testing set.

These tests might involve a little delay in our getting our insulators, but I think it will certainly be to our advantage to do anything which will tend to cut down the serious deterioration.

#2--8/3/15

I do not know whether you are interested in the detail of this matter, but in case you care to read it I am sending you herewith a paper by a Mr. A. Bang connected with the Pennsylvania Water & Power Company which has a 70,000 volt line running from the Susquehanna River to Baltimore. The test to which I refer above particularly is that described on Page #1435. You will note that insulator "E" was not affected by the temperature changes, while some of the other insulators were very seriously affected.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

August 4, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

I have just wired you as per the enclosed confirmation.

I understand from a report by Mr. Hartzog that the Exciter Fields are being changed, and that you will take a compound on them on the test stand. I would like to have the results of these tests.

I would not consider that it was necessary for us to arrange to get a power factor as low as eighty per cent leading at full load, and we ought to get the automatic compounding as covered by February letter. You state that we can get any compounding desired, but without knowing more about the exciter saturations and field windings, I cannot of course see this.

Will you kindly write us in detail regarding the relative ampere turns on the different fields and operation of same.

Yours truly,

RE-218

Electrical Engineer.

cc--V.A.W.
H.S.H.

August 4, 1915.

Mr. A. J. Busch, Supt.,
Gallatin Valley Railway,
Bozeman, Montana.

Dear Sir:

As per our letter to Mr. Goodnow, copy of which was sent you, we have recommended that the D. C. end of the station apparatus be equipped with electrolytic lightning arresters, also that new magnetic blow-out arresters be supplied for the cars. We have sent in a requisition covering this material and have suggested that these arresters be sent by express.

In the meantime we would suggest that the connections from the two lines on the D. C. end of the arresters be modified as per enclosed sketch. The arresters at Bozeman at the present time are connected up with a very small wire which forms a number of loops before it reaches the arrester. This was probably the reason why the arresters failed to act. The Assistant Electrician on the ground there can do the work and we would suggest that before turning over the system after the repairs are made, that this be done so as to give it some protection.

We would also suggest that the connections to the arresters at the substation at the Springs be also changed if there are any loops in the connections. This will give us some insurance against a repetition of the trouble just experienced, and we believe should be done at once as the new material may take sometime to arrive.

We have also ordered ten M. F. Arresters to replace those that might have been blown out on the line. These can be exchanged at some convenient time in the future.

Yours truly,

FU-WLS

Electrical Engineer.

August 4, 1915.

Mr. J. E. Neville, Sheriff,
Powell County,
State of Montana.

Dear Sir:

The bearer, L. E. Frazier is my Special Agent in connection with watching copper and other equipment used in the Electrification Work.

I would like to have him deputized by you. Will you please arrange to take care of this matter. You will in no way be held responsible for any of his acts.

Thanking you for your attention in this matter, I remain,

Yours very truly,

RB-WLS

Electrical Engineer.

August 5, 1915.

Mr. H. S. Hertzog,
C. N. & St. P. Inspr.,
#549 Building #5, G.E.Co.,
Schenectady, N. Y.

Dear Sir:

Referring to your report of July 30th regarding Motor Generator sets, I have sent you copies of my wires to the General Electric Co. with regard to the tests on the first set.

You will note that I am awaiting more detailed information regarding the compounding before approving the compounding. I have not yet received tests on any other M. G. sets, or any other transformers than the first three 1900's.

You should certainly witness the tests at Milwaukee of the four 2,000 Kw. Sets which are being manufactured there. Of course you should arrange this inspection so as to require its taking as little time as possible. Let me know how many trips will be required and when you will take them, so that we can arrange for your transportation.

I also have your second report of July 30th regarding switchboards. It would seem that the only thing which will hold up the shipment of the D. C. Switchboards is the Circuit Breakers. Cannot we arrange for mounting these on the board at the substation? I remember that you mentioned certain objections to this, but in view of the fact that we would get the boards so much sooner and be able to get them in place, I would like, if possible, to have the D. C. boards come on as soon as possible.

Yours truly,

RB-WLS

Electrical Engineer.

August 5, 1915.

Mr. F. H. Webster,
Right of Way Agent,
Butte, Montana.

Dear Sir:

Will you kindly let me know the present status of the matter with regard to removal from our Right of Way of the Private Telephone Line which extends between Two Dot and Summit.

Yours truly,

RB-WLS

Electrical Engineer.

August 5, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am handing you herewith Requisition RB-51390 which covers a Megger Testing Outfit, also thermometers used in connection with same for measuring the insulation resistance of our transformers during the drying process and during such other times as may be necessary, and also to be used in detecting faulty high tension insulators.

These instruments are rather expensive, but are now being widely used for these purposes, and is the only thing on the market which is satisfactory for such use. The Montana Power Company has two of these instruments and they are considered by them as indispensable. The instrument is carried in stock by the Biddle Company and I would like to get it soon as possible, so that we will have it on hand inside of ten days or two weeks to dry out our first transformers.

The thermometers are also to be used in connection with drying out of the transformers and in general, to determine temperature rises.

I am making up a requisition for other testing instruments that we will need, but in the meantime wish to get this instrument without delay.

Yours truly,

RB-WLS

Electrical Engineer.

cc--A.J.J.

August 5, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to yours of August 2nd regarding Requisition RB-#1324, we will carefully watch so as to keep the quantities thus purchased as small as possible.

Yours truly,

RB-WLS

Electrical Engineer.

August 6, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

We are sending you herewith Requisition RB-#1392 covering High Tension Insulators for the Deer Lodge to Avery Electrification.

We wrote you August 3rd that we would send you this Requisition after we had finished certain tests we wanted to make, but we have been somewhat delayed in making these, and thought best to send the requisition in advance and get bids on the insulators on basis of the specifications, but no contract should be let until we have completed the tests and furnished you the results of same. These results may very materially influence our action with regard to the placing of the actual order for the insulators.

We have furnished a carbon-back copy of the Specifications and Mr. Jennings can have made as many copies as he needs.

Drawings ED-#19-a, 20-a and 21-a correspond to the original ED-#19, 20 and 21, but it was found advisable from time to time to add notes to the original tracings, and the latter finally got in such shape that we thought best to re-trace the drawings. There are slight differences such as spacing the arms 9 ft. instead of 8 ft.,--modifying the position of the guy so as in the one case to take care of special requirements required by the Idaho Utilities Commission, or on account of the possible use of other insulators than Ohio Brass. The new tracings are also sent you so that you may approve same.

Yours truly,

RB-WLS

Electrical Engineer.

August 6, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to attached Requisition RB-41324,
this consists mainly of spare parts for the track
drills which we use in bonding.

These track drills depreciate very rapidly
as regards some parts, particularly the ball bearings,
and we are studying the matter of how to do away
with this depreciation.

Of course we are getting in a good many
more bonds per day with our gangs than is generally
done, and it may be that the only trouble is that the
wear on the tools is particularly hard. In any event
we are endeavoring to find out how to remedy the
trouble, but in the meantime need the parts as promptly
as possible.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., August 6, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Attention: A. J. Jennings

We are today sending in our Requisition RB-1392 covering High Tension Insulators as well as Clevis Type Insulators for the West end. We are also sending specifications #8 and #9 together with blue prints of drawings Nos. ED-#19-a, 20-a, 21-a, 23, 24, 39, 112 and 113, also ED-#119 showing application of these insulators.

We are sending you this material now so that you can get a line-up on prices, etc., without undue delay.

We will be unable to secure the proper instruments to make the tests which we spoke to you about while in Butte until Next Monday or Tuesday. It will take about two or three days to make these tests and we will immediately communicate to you and Mr. Goodnow our recommendations.

On our requisition we have outlined a general schedule of shipments which we hope you can get the Contractor to fill. The shipments from January 1st on we may want to modify unless we find that we can work the Crews West of Alberton during the winter. In case we are unable to continue West of Alberton during the winter time these shipments can be set forward about two months.

Yours truly,

FU-WLS

Electrical Engineer.

Butte, Mont., Aug. 6, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to correspondence in regard to trolley bracket castings covered by your Order E.O.-8875 and about which there was a misunderstanding, as explained to Mr. Jennings while here, we will not require, as far as we can tell at the present time, a duplication of Requisition #1057 on these items, as this would mean a total of 8300 castings of each kind for use between Deer Lodge and Avery.

Following conversation with Mr. Jennings, therefore, will you please reduce your order E.O.-8875 by 1,000 castings of each kind, as I understand this can be done at this time. We will make requisition on this basis.

Yours truly,

RB-WLS

Electrical Engineer.

August 7, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your letter of August 3rd regarding East Portal and Avery or Stetson substations, the present feature governing the distance between the bungalows and substation is that space must be left to bring machinery installation track into the building. The large door through which this track passes is now next to the extended transformer room, but it could, if desired, be moved toward the wall next to the track. This would enable the bungalows to be moved about fifty ft. nearer to the substation, thus getting further away from the tunnel.

You say that it will be disagreeable for the bungalows to be near to the tunnel. I wondered if you were thinking of smoke. Of course we will not have this smoke when complete electrical operation has gone into effect.

It does not seem practicable to move the substation further East, except by the small distance which would not be worth considering.

Will you kindly advise me if you care to change the building, so as to gain this comparatively small increase of fifty ft. in the distance which is now about 500 ft. This gain seems to be the best we could make.

Yours truly,

RE-WLS

Electrical Engineer.

August 7, 1915.

Mr. C. A. Lemmon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

P.S. Car #503204 containing five reels
of one-half inch S. M. Strand was shipped to
Butte from Deer Lodge today.

Will you please have the two reels you
require for your work removed and the balance of
the material forwarded to me at Three Forks
promptly. This car also contains some 3/8" strand
going to Three Forks.

Yours truly,

FAC-wls

Electrical Engineer.

August 8, 1915.

Mr. A. Bulwinkle,
Asst Claim Agent,
Butte, Montana.

Dear Sir:

I learned this morning indirectly that a young boy was seriously injured last night while riding a bicycle on the Company's Right of Way near Montana Street. He had his arm broken and was rendered unconscious and taken to the hospital.

Today I have been unable to learn the boys name or location. It seems he came in contact with one of our guy wires and I expect we will have to settle the claim. The first time you are in town please see me regarding the matter.

Yours truly,

FAC-WLS

Electrical Engineer.

August 8, 1915.

Mr. A. I. Bouffleur,
St. Maries Hospital Assn.,
Seattle, Wash.

Dear Sir:

We are not getting reports from your
Doctors on the accidents which happen to the
Montana Power Company's men.

It is very important that I have this
information, and I wish you would take it up and
see that we get this information promptly.

I find that we have not received any
of these reports since the month of April, and
I would be pleased to see copies of such reports
as cover accidents between that date and the
present time.

Yours truly,

FAC-WLS

Electrical Engineer.

August 5, 1915.

Crerar, Adams & Co.,
Chicago, Illinois.

Dear Sirs:

We have in use in connection with track bending on our Electrification Work, seventy-two of your Calumet Heavy Duty Track Drills, and are drilling $7/8$ " diameter holes in rail up to 90# in weight, averaging from 80 to 90 holes per day of eight hours with each machine, two men being worked on each machine.

These machines seem to be better constructed than the average track drill, but we are having considerable trouble with the thrust bearings on account of the balls splitting and the ball retainers and bearing plates being destroyed.

We are now using a two-notch feed on all machines, and cannot afford to reduce the cutting speed on account of the amount of work in hand.

We would like full advice from you and any suggestions you may care to make in regard to the care of these thrust bearings, for improving their life under the conditions outlined above. Your early attention will greatly oblige.

Yours very truly,

RB-WLS

Electrical Engineer.

cc--J.T.C.

August 9, 1915.

Mr. K. A. Hills,
General Electric Co.,
Butte, Montana.

Dear Sir:

Replying to yours of sometime since in regard to the splitting of the outer end of terminal when some of your bonds have been expanded in the rail, will say that this trouble is, as you describe it, probably caused by cold-shut at outer end of terminal head. Such bonds have been removed and the process of removal destroys the evidence.

It has been assumed, however, that if the crack extends down to the surface of the rail, that it is liable to go further, and it is advisable to remove the bond.

In view of the facts, it would hardly seem necessary to make a sketch. The number of cases encountered so far have been few, and the matter was brought to your attention for investigation at the Factory. If further trouble develops we will advise you promptly.

Yours truly,

RB-WLS

Electrical Engineer.

August 9, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Will you please advise just what provision is being made for cutting up and burning all trees and brush which have been cut down in connection with the transmission line.

We would of course like to have this all taken care of before wire is strung, if possible.

Yours truly,

RB-WLS

Electrical Engineer.

August 9, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

In conversation with Mr. Buck sometime ago, we decided it was advisable to investigate the relative cost of installing concealed bonds on 90# rail, first as we are now installing them, by removing one bolt and soldering terminal on after bond is passed under angle bar; second, by removing all bolts, terminal being soldered on bond before being placed under angle bar.

Will you please let me have a report on this as soon as it is done, and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

August 9, 1915.

Mr. E. H. Barrett,
Asst General Supt.,
Butte, Montana.

Dear Sir:

We are starting pole setting at Harlowton Yard and as plans contemplate the removal of Track No. 4, placing poles on its center line, will you please issue instructions by wire to proper person to have switches spiked or removed at ends of this track, and necessary help provided for removal of ties where poles are to be located.

Yours truly,

RB-WLS

Electrical Engineer.

August 2, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sir:

Herewith application from Mr. O. E. Zumwalt of Spring Valley, Washington, who acted as Inspector for us on the Great Falls work for a certain length of time, who wishes a job as Foreman or straw boss.

I think you will find this man very satisfactory to try out as Straw Boss with possibility of advancement, as he has had charge of maintenance on the Spokane & Inland Empire Railway for sometime.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., August 9, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Mr. E. S. Johnson of the Railway & Traction Engineering Dept. of the General Electric Co., Schenectady, asks for copies of drawings S-71, 72, 73, 77 and 68, and asks for duplicate copies soon as possible.

As I believe you have the tracings of these drawings, I am wiring you today asking you to send blue prints direct to Mr. Johnson.

Yours truly,

RB-WLS

Electrical Engineer.

August 9, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Attention: Mr. Cochrane

I am returning herewith your application for crossing over our tracks, as following our conversation on the subject I understand this crossing is to be made at a different point, and that the attached application does not apply.

Will you please have papers corrected and returned to me at your early convenience and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

August 9, 1915.

Mr. F. E. Willard, Supt.,
Missoula, Mont.

Dear Sir:

I have your letter of August 9th regarding gas cars used by this Department on the Missoula Division, and have issued instructions accordingly.

However, if at any time you can give me specific instances where the gas cars have been improperly handled I would appreciate this very much, as I would then be in a better position to pursue the matter vigorously.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., August 9, 1915.

R. B.

Confirming conversation and for your own information I wish to offer the following report and suggestions in regard to conditions in connection with the maintenance of Great Falls Terminal electrification in general.

Upon going to Great Falls Friday the 6th, in connection with break in trolley line and damage to locomotive pantograph, I found that the break in the line was at the City Freight Yard and occurred at a frog, though from the condition of the frog and pantograph it was hard for me to determine as to whether the trouble originated on account of the condition of the frog alone. I went to a number of points on the line with Maintainer Lund, and Mr. Tood of the Street Railway Co., and found that the trolley line in general is in very bad condition on account of slack wire. As this line was built in the winter when the ground was frozen, it was to be expected that the entire line would slack up after frost went out, and it should of course have been given a thorough over-hauling long before it reached its present condition, and while Mr. Whiting, Mr. Cessford and Mr. Lund, from their correspondence, seem to be under the impression that the particular frog in question, and those now on the line, have caused and are liable to cause serious trouble, there is of course no question but that if the frogs are properly maintained, that they should work with the pantograph, and there is also a possibility that the recent trouble was due to slack condition of the trolley wire.

The principal trouble that I find on this installation is an apparent lack of definite authority and proper arrangements for taking care of the overhead work. I suppose Mr. Lund is responsible for the maintenance of overhead. The condition of the line, however, would indicate that he does not realize the importance of keeping the slack out of the line unless this condition developed within the last few days, and if the particular frog referred to was responsible entirely for the break, it would seem that the trouble would have developed gradually and could have been taken care of before pantograph was caught. When these frogs were installed and the line put in operation, on account of their weight alone, they imposed a blow on the pantograph pans, but gave no indication of catching the pans.

While Mr. Lund should be able to inspect the line, there is of course very little that he can do unless he is provided with help. There does not seem to be a clear understanding as to his getting help and from past correspondence it would seem that he was depending on this office to arrange for the Street Railway Company when anything is done on the line.

Report on Great Falls Terminal maintenance

In fact he seems to understand that he is to call on this office for authority and instructions if anything is done on the line. It would seem necessary, therefore, to have arrangements made so that either Lund can obtain help and do the work, or so that he can call on the Street Railway Company and be reasonably sure of getting help whenever it is needed. At the present time they are provided with a tower car built on an old bunk car, requiring the use of locomotive for placing and using is on the line. Normally there is one steam locomotive on the job, and this is used for switching tracks which are not electrified. There is only one Train Crew available and this is a Yard Crew to bring the passenger train to the Falls Yard in the morning, arriving there around nine o'clock. They then do switching work, generally at the City Freight Yard. At 1:55 PM they take the passenger train to the passenger station and back to the Yard, and around 4:00 PM when there is no switching they go out to the meat house and then put up for the day. From this you will see that they cannot be depended upon for emergency work, or for repair work of any magnitude. Providing electric locomotive were used, the Engineer could be brought from Three Forks or other point for work covering several days. This would seem inadvisable however, on account of Dead-head mileage expense amounting to from \$25.00 to \$30.00 in addition to his regular pay. The latter on the assumption that arrangements could be made to use the steam engine on regular switching while work was being done. The latter is strongly objected to by Supt. Whiting on account of the agreement with the City.

A third plan would be to equip two push cars with towers, using one for line repairs such as hangers and pull offs, and two with plank platform between towers for heavier work. These small towers could be moved by hand or with a team, making the repair work independent of motive power question.

I recommend that this matter be submitted to the proper authority, with advice that some definite steps must be taken at once in order to avoid indefinite repetitions of the recent occurrence, and that someone must be provided on the ground who will properly inspect and maintain this line without calling on any outside office, unless something extremely radical is involved, and that the man representing the Company must have initiative and resource enough to fix up the line in some way in case of trouble, so as to maintain the service without necessarily having the standard material for temporary work.

We have already supplied Mr. Lund with hangers and ears, and are sending him tomorrow twelve trolley splice sleeves which, together with what he has on hand, should take care of his line repairs for a long time to come.

In view of the weight of the frogs now on the line I would advise having them removed when slack is pulled out of trolley wire, there being six frogs to be taken out, and this work should be begun this coming Sunday, also arrangements should be made to use the steam locomotive within the City Limits for this particular work. If the work is not completed in one day, it should be resumed the following Sunday and continued until it is completed. The Central Avenue crossing with the Street Railway is low and should be raised. The above involves help to be furnished by the Street Railway Company, whatever arrangements are made thereafter for maintenance.

I find that Mr. Arnold has no catalog of parts for the locomotive. He has a rather complete list of parts which are supposed to be on order with the G. E. Co., but very few have been received. All this material should be rushed as there are a number of chances for indefinite shut-down unless a all of these parts are on hand.

In view of the special construction of the pantograph, it would seem desirable to have on hand in addition to what they now have on order, one pantograph pan complete, with brackets, springs, horns of proper type and wearing plates, also two castings which connect the bracket shaft to the pipe train. In this connection, when the pantograph arrived at Great Falls it was fitted with horns with hooks on the ends. These were replaced later by the G. E. man with the type of horn which we are supposed to have on the main line. The order for spare material included one horn and the G. E. Co. have furnished a horn with hook on the end of the discarded type. Attention should be brought to this matter if spare pantograph and other parts are ordered.

The above matters should be taken up at once with all concerned, as this general repair work should certainly be started this coming Sunday.

R.E.W.

August 9, 1915.

Mr. E. H. Barrett,
Asst Gen'l Supt.,
Butte, Montana.

Dear Sir:

Will you please issue instructions so that all Section men in Electrification Territory will report promptly when they remove rails which have been bonded, giving location of rail in each case, so that we can arrange for re-placement of bonds during the construction period.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., August 9, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Mont.

Dear Sir:

Referring to Twist Drills which are being shipped in from Bonding Crews to cut off on account of breakage or taper wear on cutting end, will you please issue instructions so that these drills will be cut off so as to provide full thickness of clearance beard on edge; in other words, to eliminate all taper and have drill cut full sized hole.

Some have been returned from the shop without this precaution having been taken, and cannot be used on account of not drilling full $7/8$ " diameter.

Yours truly,

RE-WLS

Electrical Engineer.

August 10, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Herewith please find Requisition No. RB-#1416
for Trolley Overhead Fittings for use between Deer Lodge
and Avery.

In view of plans for pushing this work, it is
of course desirable to have this order placed and produc-
tion started as soon as possible. If, after bids are
received from Manufacturers, it seems desirable to hold
a portion of this order until a later date on account of
market conditions, it of course can be done. I would
like, however, to determine just what percentages are to
be held up before arrangements are made with the Manufac-
turers.

You will note that some items are described by
G. E. Catalog Number on account of their having made all
of this material heretofore. All material is the same as
heretofore furnished with the exception of link castings
with ears which have been furnished for use with one-half
inch pipe, and we find that it is very desirable to have
these made up for three-quarter inch pipe.

Please note, also, that cut-out switches are
specified for operating handles to be connected up with
 $1\frac{1}{4}$ " pipe, as this is our standard on the rest of the work
and these may be made by some other concern than the G.E.
Co. who made those we now have.

Yours truly,

RB-WLS

Electrical Engineer.

cc--J.T.C.

August 10, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Mr. Buck has requested written authority from this Company covering changes in your Transmission lines between Finlen and Deer Lodge, in order to clear our work.

Upon investigation I find that this matter has been covered in correspondence with Mr. Kerr, particularly his letter of October 13, 1914, in which he states that he understands that any changes in three crossings made by the Stuart-Deer Lodge line are to be borne by the Power Company, and the same applies to the Warm Springs line. Changes in the Butte-Anaconda lines consisting of one steel tower line and two wood pole lines, which I believe will be covered by removal of cradle under Tower line, are apparently to be borne by The Railway Company, as these lines were built before the Railroad was constructed.

I presume the above will clear the matter up so that the work can proceed.

Yours truly,

RB-WLS

Electrical Engineer.

August 10, 1915.

Mr. M. H. Clapp, Supt. Telegraph,
The Northern Pacific Railway Co.,
St. Paul, Minnesota.

Dear Sir:

Following our recent correspondence by telegraph, your Assistant Gen'l Foreman, Mr. Anderson, called yesterday in connection with the proposed change in your telegraph line, and stated that you proposed moving this line between a point about three-fourths of a mile East of Willow Creek and a point East of Sappington, an approximate distance of five and one-half miles, the estimated cost of which, in his opinion, would not exceed \$500.00.

Inasmuch as we contemplate energizing our Transmission line with 200,000 volts about the first of September, it is highly desirable that this change be made before that time if you can arrange to have it done.

Will you please advise if you can proceed on the above lines, and oblige.

Yours very truly,

RE-WLS

Electrical Engineer.

August 10, 1915.

Mr. J. C. Hill,
Signal Engineer,
Milwaukee, Wis.

Dear Sir:

Sometime since you wrote me in regard to
Signal Bridge to be located at East end of Alley
Yard.

Will you please advise at your early con-
venience the exact location for this bridge by
construction stations, if it has been determined,
with distance of posts from center of Main Line
track, size of posts and height of girder above
top of track rail.

Yours truly,

RB-WLS

Electrical Engineer.

cc--L.W.S.

August 11, 1915.

Mr. W. F. McIntyre,
Div. Construction Engr.,
Mtn. States Tel. & Tel. Co.,
Helena, Montana.

Dear Sir:

Referring to your letter of the 10th regarding the short span crossings, we will arrange to side-guy these and will also provide a guard in the form of a pipe or angle iron, running parallel with our lower cross arm, fifteen or twenty ft. long and placed on the pole about on a level with your wires. It seems to us that this should be a satisfactory safe-guard against wires on the long spans coming in contact with your wires.

With regard to the crossings at Janney, our conference in Butte last year was to the effect that we would cross you with either a short span construction, or with our standard Dead-end construction, of which we showed you a print at the time, and with which you expressed satisfaction. It would not seem that the length of the span had much to do with the safety of the crossing, the main point being the tension to which the crossing wires are strung. The wires where they cross you are strung at low tension and have a factor of safety much in excess of that allowed for stringing wire.

It therefore seems to us that the only objection to form of crossing as we have made it is that the wires on the adjacent long spans might break and come in contact with your lead. To safe-guard against this we will install a guard such as that referred to above.

We trust that this arrangement will be satisfactory to you.

Yours truly,

RB-WLS

Electrical Engineer.

August 11, 1915.

Personal

Mr. F. Rusch,
c/o C.M. & P S. Ry.,
Tacoma, Washington.

Dear Sir:

Referring to your letter of August 5th regarding your Nephew, about the only thing I can think of at present is for your Nephew to take a position as helper in connection with the installation of our substation apparatus. Of course this is really semi-skilled laborer's work. That is, we have regular electrical wiremen, and their helpers also are supposed to know enough about pulling of wires, conduit work, etc., to be of proper assistance.

If you will have your Nephew come on, we will talk to him about this matter and if he is satisfied to take a job such as the one outlined, or in connection with some other substation work, we will place him.

Yours truly,

RB-WLS

Electrical Engineer.

August 11, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Attention: Mr. H. C. Cochran

Referring to your letter of July 31st, the only steel supporting structures which we have in connection with our transmission lines are the Dead-end towers at the substations. Inasmuch as the designing loads are infrequent, and the hazard is considerably less than is in the case of railway structures such as bridges, and further, due to the fact that these towers are built up of small members which increase their flexibility over structures commonly used for railway purposes, our design was based on 18,000 lbs. per sq. inch in tension, and 18,000 lbs. - 70 1/r with a maximum value of 150 lbs. for 1/r. In our ordinary bridge practice we use 16,000 lbs. per sq. inch in tension and 16,000 lbs. - 70 1/r in compression with a maximum value of 120 lbs. for 1/r.

We believe for ordinary transmission line towers that the working stresses can be made higher with safety for the reasons above mentioned. However, for a dead end structure the hazard is greater than is that for an intermediate tower, and as a result more conservative unit stresses should be assumed. It is our judgment that a unit stress of 28,000 lbs. per sq. inch is too high. We would not want to use stress higher than 20,000 lbs. with ordinary commercial steel.

Yours truly,

RB-WLS

Electrical Engineer.

August 11, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to yours of August 7th regarding Requisition #1363, Pyrene has been found to be the best extinguisher for any blaze caused by an electric arc, and is used very extensively for this purpose, both in this section of the country by the Montana Power Company and elsewhere.

The Montana Power Company has used as high as four of the extinguishers at one blaze, and I felt that, considering the expense of installation, this would be a minimum investment for fire protection in the substations.

Also it would seem to me that one extinguisher for each locomotive would be a very desirable investment. I trust that this is the explanation you require.

Yours Truly,

RDWLS

Electrical Engineer.

August 11, 1916.

Mr. H. E. Buck,
Montana Power Co.,
Butte, Montana.

Dear Sir:

I am in receipt of a letter from Mr. F. E. Willard, Supt. of the Missoula Division, calling attention to the fact that all employees using gas cars on the Missoula Division must flag through all tunnels.

Will you kindly see that this practice is rigidly adhered to.

Mr. Willard also states that some of the parties connected with the Electrification Work are running their gas cars at excessive speeds at times, and requests that this practice be discontinued at once.

I do not know as any employees of the Montana Power Company have been involved in this matter, but as we are just starting work on the West end I would suggest that you caution your men about the matter.

Yours truly,

RB-WLS

Electrical Engineer.

August 11, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Please find herewith print of Drawing
ED-#571 showing proposed Operator's Room at East
Portal Substation.

This matter has been gone over with the
Asst. Signal Engineer and we believe that the
space and arrangement shown will be satisfactory.

Kindly advise your approval and com-
ments.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

August 11, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Enclosed find requisition RB-#1417 covering our requirements for Portable Testing and Adjusting Instruments, as mentioned in our letter of August 5th.

We have taken up the details of this requisition in a letter to Mr. Crocker.

Yours truly,

FU-WLS

Electrical Engineer.

Butte, Mont., August 11, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Attention: A.J. Jennings

We are today sending forward requisition RB-#1417, copy enclosed, covering Portable Instruments for testing and adjusting purposes.

We have shown on the requisition for your convenience, the Catalog numbers of the several Manufacturers covering the type and rating of the instruments desired. On the items covering the A. C. Instruments we show only the G. E. and Westinghouse catalog numbers, as we have no Weston catalog, and as their prices will be considerably below that of the latter Company. Under the D. C. items we have shown all three catalog numbers or Code words.

It is desirable, although not essential, that the current or potential transformers be purchased from the Manufacturers from whom the A. C. Ammeters, Voltmeters and Wattmeters are ordered.

As noted on the requisition, in some instances catalog numbers covering switchboard type instead of portable type of transformers are given. These switchboard transformers can, we understand, be equipped with handles, etc., so as to make them easily portable, with small additional expense. The shunts and modifiers that go with the D. C. instruments must be purchased from the Manufacturer from whom the corresponding instruments are ordered.

Although the Weston D. C. instruments are supposed to be the best, yet we believe that the G. E. or Westinghouse D. C. instruments at the present time are almost as good; at any rate they will answer our purposes if there is a considerable difference in price.

With regard to the Portable Current Transformer under Item #3, wish to say that this is for measuring the current in our 4400 volt signal line, and will probably have to be made up special. We do not think it safe to measure current directly on a line of this potential.

Sheet #2—J.T.C.—8/11/15
Testing Instruments.

You will note that under Item #6 covering A. C. Ammeter that, owing to the fact that the Induction Type Ammeter allows for a Duplex Scale, that four Westinghouse meters will do, where six G. E. moving coil meters are necessary.

Under Item #12, Column #4, Mille-volt Meters with Shunts, it will be noticed that no Westinghouse instruments have been listed, as their standard scale is somewhat different from the scale of the G. E. and the Weston instruments which we believe allow of greater flexibility.

Under the various items where it is shown that no instruments, etc., with necessary capacity is listed it is probable that they can be made up special to come within the required rating.

We trust that we have given you the necessary information in connection with this requisition.

Yours truly,

FU-WLS

Electrical Engineer.

Butte, Mont., August 12, 1915.

R. B.

Returning herewith letter from Supt. Whiting to Mr. Barrett under date of August 10th in regard to break in trolley wire and damage to pantograph at Great Falls, I note that after trolley wire and pantograph were repaired, service was resumed on the 7th and that on the first trip to the Freight House the pantograph again caught in the frog with similar damage, though less in extent. He states that Mr. Lund explains the resumption of service before all frogs were removed and slack pulled out of trolley wire by the fact that I instructed him that the locomotive could be used following the repairs referred to above if care were used.

In regard to this statement I will say that before leaving Great Falls on Saturday the 7th, I looked at the repairs to the trolley wire with Mr. Lund and did tell him that if slack were pulled at an air switch near the repaired wire, and if he carefully examined all the frogs now in the line to be sure that they would not catch the pantograph, that I saw no reason why service could not be resumed, provided he saw to it that the locomotive engineers ran very slowly at all frogs, the assumption being that under these conditions no damage would be done, even if the pan were slightly caught on the frog. In addition I took the precaution of cautioning Mr. Lund to see that all of the troughs at end of frogs were closely clinched around the wire on the under side, and if necessary, that the ends of these troughs be filed off taper, so as to fit the wire closely at the ends. Mr. Lund informed me that the frogs now in the line were not catching the pantograph, though they were striking a blow on the pan. This striking would of course occur with any change of weight in the contact wire, which would be caused by frogs even if they did not catch the pan.

I note that Mr. Whiting has given instructions that electric locomotive is not to be used again until ordered into service by someone of your force, and I presume he means until the Montana Power Company has fixed the overhead work. It would certainly seem that this Company should have someone at Great Falls capable of passing on the small matters which have been involved in connection with this overhead work, and not incur the expense and loss in time involved in this office if matters are arranged as intended by Mr. Whiting.

#2--R.B.--8/13/15

I presume this is a matter to be taken up with Mr. Cessford as I understand that he is responsible for the maintenance of the equipment and overhead at Great Falls.

We have already discussed the question of removing the frogs and decided to have it done, though there is no reason why they should not be made to work with the pantograph as they are designed for this purpose and I am of the opinion that the troubles already encountered are entirely due to lack of proper maintenance.

I note that Mr. Whiting has instructed Mr. Lund that he is to prepare to give the Montana Power Company Work train whenever they call for it. I went into this matter very thoroughly with the Foreman at the Roundhouse, Mr. Arnold, when I was in Great Falls and we both decided that it was impracticable to attempt to do any work of any magnitude whatever as I have already reported, except on Sunday, as there is one local switching crew and their day is pretty well used up taking care of the passenger train and other regular switching. Furthermore, it is rather impracticable for us to obtain help from the Street Railway Company unless they can do a continuous days work as their forces are arranged on an economical basis and they have about all the work they can take care of at the present time, as I understand it. However, as we have today telegraphed Mr. Urban and Mr. Lund in regard to taking up the necessary repair work immediately, we will develop the question of Work Train service as well as obtaining help from the Street Railway Company.

R.E.W.

August 12, 1915.

Mr. J. J. Linsbaugh,
By. & Trac. Engr. Dept.,
General Electric Co.,
Schenectady, N Y.

Dear Sir:

I have your letter No. 3317 (undated) in reply to mine of July 27th, regarding indoor 100,000 volt lightning arresters.

It would seem from your article, that, as brought out in my letter of July 27th, the main feature influencing the operation of the arrester is the distance between same and bus, and though there is very little difference in this respect between the indoor and outdoor location, still if you have good reason to believe that the fire hazard will not be serious, we think from a construction standpoint that the inside location is the more desirable, and we will arrange accordingly.

Yours truly,

RB-WLS

Electrical Engineer.

cc--f. b. w.
h. s. h.

August 12, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Regarding the Power Limiting and Indicating System, for the East End, I am still waiting to get from the Montana Power Company the legal contract embodying the technical agreement which we made up for the engineers of the Montana Power Co.,

Mr. Cochrane advised me sometime ago that this matter was in the hands of their Legal Department and I have not yet received advice when the agreement will be ready for our consideration.

I have the requisition made out for the line material, but I assumed you would not want to place an order until the whole matter was drawn up in legal form.

Yours truly,

RB-WLS

Electrical Engineer.

August 12, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Mr. Potter of the Telegraph Department states that his instructions are that the Power Company is to be billed for all Continental Messages which are signed by the Power Company employees, but I would like to know if it is to be considered that this rule should also apply to messages which, for instance, Mr. Buck sends to our Operating Department in connection with the movement of Camps or Work Trains.

It has been my understanding all along, of course, that the Power Company would pay for messages sent to others than those in the employ of the Railway Company, but I am a little in doubt about the other class of messages referred to above. Will you kindly advise.

Yours truly,

RB-WLS

Electrical Engineer.

August 12, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Regarding water supply at the substations between Harlowton and Deer Lodge, I will summarize how this matter stands:

At Morel we have sunk a well which yields plenty of good water.

At Janney we have a spring which also yields a supply of good water.

At Piedmont we have a good well.

At Rustis we have no drinking water. Other water will be taken from the River.

At Josephine we have a well with plenty of water. This water has a somewhat unusual taste, but should be satisfactory.

At Summit we found a spring on a homestead about one-half mile from the substation, which spring is understood to give plenty of good water the year around. The measurements which we have so far taken show a good supply of water. The Rancher, however, who owns the spring asks \$1500 for it, but we think we may possibly be able to get it for \$1,000.

I would like if you would wire me what you think about the figure of \$1,000, also what would be your wishes in the matter should we find it necessary in the last event to go to the figure of \$1500. I should think the water supply would be worth this if we come to the conclusion that it is likely to be ample. If we do not use the spring it will mean drinking water must be taken from down the line by train and also possibly water used for the lawns, although we are still considering the matter of using a reservoir for the lawns.

#2--C.A.G.--8/12/15
Substation Water Supply

At Two Dot as you know, we have a City Water
Supply.

From the above you will note that we have
come out pretty well as regards water for our eastern
substations.

As stated above, I would like you to give me
an opinion about the Summit station as soon as you can.

Yours truly,

RB-WLS

Electrical Engineer.

August 12, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

Will you please have me sent at once blue print showing details of construction of pantograph which we have in use on the Great Falls locomotive.

While it is desirable to have dimensions for all parts, it is not necessary, as long as the prints show all parts so that they can be referred to in correspondence.

We wish this information in connection with taking up certain points which have developed since this pantograph has been in service, and it is very important that it be taken care of quickly on account of possibility of affecting the design of the Main Line locomotives.

At the same time, if you can do so, please send similar prints covering pantograph to be used on our Main Line locomotives.

Yours truly,

RB-WLS

Electrical Engineer.

cc--V.A.W.
H.S.H.

August 13, 1915.

Mr. E. G. Gallet, Sec'y,
Public Utilities Commission,
Boise, Idaho.

Dear Sir:

Will you kindly send me two copies of
General Order No. 10 of Regulations and Specifi-
cations Governing the Construction of Overhead
Electric Lines in the State of Idaho, and greatly
oblige.

Yours truly,

MC-wls

Assistant Engineer.

Butte, Mont., August 12, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

File RW-9123

Referring to your letter of August 4th regarding the Number of the reels shipped to you on April 20th in LS&MS Car #67006.

These reels were furnished with the 500,000 C. M. Wire. We have no record of their numbers.

I have instructed our Storekeeper to take this record in the future when returning reels. We cannot, however, advise you the invoice number on which these reels were shipped either.

Yours truly,

FAC-wls

Electrical Engineer.

August 13, 1915.

Mr. W. F. McIntyre,
Div. Construction Engr.,
Mountain States Tel. & Tel. Co.,
Helena, Montana.

Dear Sir:

Referring to your letter of the 10th regarding the short span crossings and other matters, I will say that while the feeder crossings over your line were not discussed, we will arrange to have the feeder poles at such points side-guyed.

At our transmission line short span crossings we will provide a guard in the form of a pipe or angle iron, running parallel with our lower cross arm, 15 or 20 ft. long and attached to our pole about on a level with your wires. It would seem that this arrangement would be a satisfactory safe-guard against wires on the adjacent long spans coming in contact with your wires.

As regards side-guying of Dead-end crossings, our standard construction of this type does not include side-guys. Inasmuch as it consists of two-pole frames with two sets of double arms and two sets of head guys it would hardly seem necessary to make use of side guys, and furthermore, we understood at our meeting that our type of construction as shown you was acceptable as a factor of safety crossing. Were our wires dead-ended on one pole, we would certainly have included side-guys for such poles.

With regard to the crossing on the Janney out-off, the decision at our conference in Butte last year was to the effect that we would cross you there on our standard span construction or with our Dead-end construction of which we showed you a print and with which you expressed satisfaction. It would not seem that the length of the span had much to do with the safety of the crossing, provided the supporting structure is properly designed, and the transmission wires are strung with the proper tension. The wires where they cross you are strung at low tension and have a factor of safety much in excess of that allowed for stringing wire.

Sheet #2--Mtn. States Tel & Tel Co.--8/13/15

It therefore seems to us that the only objection to the form of crossing as we have made is that the wires may break and come in contact with your lead. To safe-guard against this we will install a guard such as the one referred to above.

Trusting this arrangement will be satisfactory to you we remain,

Yours truly,

RB-ELS

Electrical Engineer.

August 13, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am sending you herewith a print of Dwg. ED-4570, showing elevations of East Portal substation. Avery or Stetson will be like this except that the back part will be a little shorter, and Drexel will also be like it, except that the whole building will be shorter on account of having only two M. G. Sets.

What do you think of the appearance of this Station? From an architectural standpoint I personally like it better than the flat roof station.

Yours truly,

RE-WLS

Electrical Engineer.

August 13, 1915.

Mr. Walter Furlong,
Justice of the Peace,
Butte, Montana.

Dear Sir:

Referring to garnishment papers served
on me on July 6th, account Wm. King.

I find this man is working for me at
Janney substation, and has \$34.34 due him up to
and including August 6th. Same will be held
pending further developments.

Yours truly,

FAC-wls

Electrical Engineer.

August 13, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Will you kindly arrange to have your Field Force write their payrolls with copying ink.

These instructions were issued sometime ago, but I find only a small number are using this ink. In endeavoring to make a copy of the June payrolls we only got five copies out of thirty-five sheets, after using every precaution to secure copies.

Will you kindly see that the payrolls are furnished to us written in this way in the future.

Yours truly,

FAC-wls

Electrical Engineer.

August 15, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

I am in receipt of a bill dated July 31st, amount \$1.35 for "Shifting Trolley and Putting on one New Trolley Hanger at Great Falls".

Will you kindly have this and similar bills presented to Mr. Arnold who is in charge of the electrical installation at Great Falls, so that he may O.K. them and send them on to the proper Railway Department.

Yours truly,

RS-WLS

Electrical Engineer.

cc--C.H. Arnold
G.E. Cassford

Butte, Mont., Aug. 13, 1915.

Mr. C. E. Coozford,
Dist. Master Mechanic,
Dear Lodge, Montana.

Dear Sir:

Kindly note herewith a bill by the Montana Power Company dated July 31st, amount \$1.35.

This bill is stated to cover material used for "Shifting Trolley and Putting on One New Trolley Hanger at Great Falls".

If this bill relates to work which this Department has arranged for the Montana Power Company to do in connection with finishing up the construction, the bill should be paid by this Department, but if it covers work done at the instance of Mr. Arnold or other member of your Department, of course the bill should come to you.

I would be pleased to have you find out from Mr. Arnold what the bill is for. In this connection see letter which I am writing the Montana Power Company, copy herewith.

Yours truly,

RB-FLS

Electrical Engineer

cc--N. W. Lund

August 13, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

We have not received any Daily Reports covering your bonding work, and I wish you would please get out a form in this connection as soon as possible.

We do not like to say just how this form should be made out, as this depends on the feasibility of getting the costs for the different observations for the way we are doing the work. You may find it practicable to get costs as follows:

- Type of bonding
- Punching for holes
- Drilling holes
- Removing fish plate bolts
- Applying bonds
- Soldering on bond terminal
- Replacing fish plate bolts

Frog in Passing Track connections.

Kindly let us hear from you regarding this.

Yours truly,

RB-WLS

Electrical Engineer.

August 13, 1915.

Mr. Geo. L. Wilson,
Engr. Maintenance of Way,
Twin City Rapid Transit Co.,
Minneapolis, Minnesota.

Dear Sir:

I have heard indirectly that you have had considerable experience with the use of an Oxycetaline tank for applying rail bonds. I have been told that you simply take an ordinary cable and fuse the ends on to the rail.

If my information is correct, I would appreciate very much if you will kindly advise me as to the details of the manner of application of your bonds, the type of same and the durability of the connection.

Thanking you in advance for this information, I remain,

Very truly yours,

RE-WLS

Electrical Engineer.

August 14, 1915.

Mr. H. Birdsall, Supt.,
Northern Pacific Railway Co.,
Missoula, Montana.

Dear Sir:

Replying to yours of the 10th with reference to yours of July 21st to Supt. Murphy in regard to guy wires and poles obstructing your driveway near Stock Yards at Dempsey, will say that this matter was referred at once to our Inspector for attention, but through misunderstanding we have not received a satisfactory report.

Our Inspector is going to meet your Assistant General Foreman of the Telegraph Department, Mr. T. E. Anderson, at Deer Lodge Monday to take up other matters, and we have instructed him to go to Sinclair with Mr. Anderson and make a quick report on the actual conditions referred to.

We will see to it that this matter is properly taken care of soon as possible, and will advise you as soon as we get the report.

Very truly yours,

RB-WLS

Electrical Engineer.

MAILGRAM

Butte, August 14, 1915.

J T Crocker, Pur. Agt.,
Chicago, Ill.

File: Jennings

We have received all items on Requisition #1167 excepting two dozen No. 3 Bolt Cutters with one-half dozen extra jaws and three dozen metallic tape line fillers. Please have this material come forward quick as possible, as we have already had to buy a number of these items at a much higher rate locally than they can be obtained for in the East.

R. BEEUWKES, Elec. Engr.

August 14, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

In conversation with Mr. Barrett today, I have brought to his attention the fact that we have exhausted our supply of long bonds for use around 36" and 41" angle bars used on light rail.

This is mostly due to the fact that light rail in Yards and Passing Tracks has not been replaced as was originally intended.

Mr. Barrett stated that you were now replacing a certain quantity of light rail with 85# rail, and the short joint which will, of course, tend to take care of the situation. He also agreed that it will be alright for you to arrange to replace long angle bars with short ones on such small rail where the rail is not to be replaced with 85 lb.

In view of the above, will you please have necessary instructions given Section Foremen, so that replacement of rail or joints will be done ahead of our bonding crews, and bonding work can be completed as gang goes along.

Our Inspector on Bonding, Mr. Vanderville, will keep in touch with your Section Foremen ahead of the work, so as to keep this matter lined up. Copy of this letter to Mr. Vanderville for his information.

Yours truly,

RB-WLS

Electrical Engineer.

cc--E.H.B.
P.E.V.

August 16, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your letter of August 7th regarding the rate of pay for laborers at Three Forks storehouse, Three Forks is a more expensive place to live in than Butte, and we have found it very difficult to get suitable men for our work, even at the \$2.50 per day.

These men have to handle very heavy reels of copper wire and cable. There is considerable room for skill and extra energy on the part of these laborers in connection with the car loading operations, cementing on of insulators and other work that they take care of.

We pay our substation laborers \$2.00 per day but they have bunk cars to sleep in. However, on receipt of your letter I took up the matter of rate of pay with our Storekeeper at Three Forks again, and I am attaching hereto his reply. I believe that on consideration of the above explanation and Mr. Long's letter, you will agree with us that it is best to continue the rate as it stands at present.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

August 16, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am enclosing herewith in duplicate, second article by Mr. Wade, dealing with the Feeder and Overhead Contact Systems in Electrified Territory. This completes the work Mr. Wade was to do in this line.

It is understood Mr. Walker will prepare an article on substations for publication in the October issue of the Employees Magazine.

Yours truly,

RD-WLS
Encl.

Electrical Engineer.

August 16, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sir:

Attention: Mr. K. E. Buck

I hand you herewith six prints each of Drgs. ED-419-a, #20-a, and #21-a, being modifications of old drawings for transmission line construction on tangent and curve work.

These modified drawings are to be used in framing poles West of Deer Lodge, and are for use of your Construction Crew now working in that territory when they take up transmission line at Gold Creek.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., August 16, 1915.

Mr. F. R. Nicholas,
Assistant Engineer,
Missoula, Montana.

Dear Sir:

For your advance information, it has been decided, on account of snow conditions, to use 55 ft. poles as standard instead of 50 ft. between Drexel and Stetson for transmission line.

The next time you are in the office I think we had better talk this matter over, in connection with other points which may come up on account of the change.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., Aug. 16, 1915.

Mr. G. E. Cressford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

Herewith copy of Requisition RB-#1441, covering seven tower cars, two reel cars and necessary Cast Iron Washers with Set Screws for Reel Car Arbors.

These Cars are needed to outfit trolley stringing crew which will be started on Deer Lodge end. Will you please advise immediately upon receipt of order, if you will be able to get out the cars as called for.

Referring to tower cars, while I wish provision made for counter-weights, so that adjustable sections can be used if desired, we can dispose of the counter-weights at the start, as the towers will be used for sometime in Deer Lodge, and between there and bridge under B A & P at East end of Silver Bow Canyon. I bring this to your attention so that you can understand that the lack of counter-weights need not prevent getting out the cars and putting them into service.

Regarding the Cast Iron Washers, with set screws for reel cars. I believe you have no facilities for casting, and if your foundry is located so as to cause liability of delay in production on this account, I would suggest having these castings made in Butte. This of course is merely a suggestion on my part, as I am not familiar with your regular practice in this respect, and am only interested in getting the cars out as called for.

Yours truly,

RB-WLS

Electrical Engineer.

August 17, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your letter of August 13th regarding Great Falls trolley situation, I will be in a position to write you fully regarding this matter in a day or two.

Yours truly,

RB-WLS

Electrical Engineer.

August 17, 1915.

Mr. A. E. Manchester,
Supt. Motive Power,
Milwaukee Shops.

Dear Sir:

For your information I am sending you herewith copy of General Electric Company's quotation #10604-B, which gives prices on repair and maintenance parts for locomotives and substation apparatus.

I told Mr. Johnson of the General Electric Company that I wished this information for the substation apparatus parts for which I am preparing to place an order, and inasmuch as the prices on the locomotive parts are also given I am sending you the quotation for your information.

It should be remembered that the exact number of parts called for has, I believe, been modified in Mr. Busch's suggestions to you regarding the ordering of such parts.

Yours truly,

RB-WLS

Electrical Engineer.

cc--C. A. G.

Butte, Mont., Aug. 17, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

The Montana Power Company's foreman installing bonds East of Three Forks reports that eight track drills repaired at Deer Lodge shops were, when received on the job, in as bad condition as when sent to the shops. One machine with a broken brace was brazed and was broken at braze when received. The second machine was assembled without the full number of balls in thrust bearing. He does not give further details, but I am bringing this to your attention with request that you have the matter investigated, and if true, have steps taken so that machines will be properly repaired before being returned to the work.

If any parts are lacking, the machine should of course be held at the shops and the facts reported to this office, so that we can supply the parts.

We have placed a large order for spare parts for these machines, and as soon as they are received we should be able to take care of needs in this respect.

Yours truly,

RB-WLS

Electrical Engineer.

August 18, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I have your letter of the 11th, also copy of Mr. Armstrong's letters to you dated August 10th, regarding Motor Generator compounding.

As we have already instructed the General Electric Company to let the machines come as they are, on basis that the compounding can be changed later if we find it desirable, it does not seem advantageous to further discuss this matter at length.

The only comment I might make is that the compounding curve as originally agreed upon was much flatter than the curve which the machine actually gave. The former curve was of a shape which was very carefully considered and thought best suited to meet all conditions which might arise. In my opinion this curve would have been of sufficiently greater value to us to warrant our endeavoring to meet it if this would not have involved a great deal of further work on the machines, and considerable delay. A large amount of work had already been done on the windings of the machines to make the compounding come nearer to the desired curve.

Yours truly,

RB-WLS

Electrical Engineer.

August 18, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

We have had up for sometime the matter of displacing the present bridge and tunnel warning signals with some other device which will not interfere with electrical operation.

We have made some experiments at Great Falls with an insulated warning signal of the present type, and with the slow locomotive speed which we have at Great Falls I think there will be no trouble in getting out a warning signal which will not interfere with pantograph operation for that service.

As to the Main Line locomotives, I have been for sometime trying to get the General Electric people to make some tests on their test tracks to determine whether it would be possible to get out a warning signal somewhat similar to the present type which would not interfere with pantograph operation. In this connection I am sending you herewith letter dated July 27th from Mr. Johnson. I think we had better go ahead with putting in some kind of a light such as described by Mr. Johnson. In the meantime, if you have any suggestions to make, will you kindly so advise.

Yours truly,

RB-WLS

Electrical Engineer.

August 18, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

On account of cutting out, for the present, the duplicate pole line between East Portal and Station, and also cutting out transmission line between where we left off building it near Deer Lodge and Gold Creek, we expect to have poles left over from the West end pole requisitions.

I do not think, however, that we ought to cancel any of the orders. We can distribute these poles along the Right of Way and along cut-offs so that they would be available for maintenance purposes.

In case of a break-down we should of course have poles always close to the break-down so as to enable quick repairs to be made. I trust this is satisfactory to you.

Yours truly,

RB-WLS

Electrical Engineer.

August 12, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to your letter of August 9th regarding passes good on the Olympian for the first four parties mentioned in my letter of July 20th:

These parties are using their passes every day, and it is impracticable for us to send them to Chicago to have them endorsed by the Pass Bureau. If you will kindly have new passes made out, I will have them substituted for the passes now held by these parties. The following are the parties for whom we wish this transportation:

F. R. Nicholas,.....	Asst. Engineer
A. Wickstrom,.....	Inspector of installation of substation apparatus on account of G.E. Contract.
G. F. Soule,.....	Inspr. this Dept.
R. Wende,	Inspr. " "

Yours truly,

FAC-wls

Electrical Engineer.

August 18, 1915.

Mr. E. A. Patterson,
Supt. Telegraph,
Milwaukee, Wis.

Dear Sir:

In accordance with conversation with Mr. McEwen, we expect on or about the 1st of September to turn current on to our transmission line, and we understand that all your crossings with us will be in such shape by that time that there will be no electrical interference.

We expect first to turn on a current of about 3300 volts which will be used in drying out substation transformers, and soon afterwards will turn on our 100,000 volt current.

This for your information and so that your Department may be ready within a day or two to say that as far as they are concerned, we may turn on the current.

Yours truly,

RB-WLS

Electrical Engineer.

August 18, 1915.

Mr. A. H. Armstrong,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

You will remember that when you were here in Butte we discussed with Mr. Goodnow the matter of having any instructions to the substation installation forces given directly by our Inspector, rather than in accordance with the arrangement referred to in your letter of May 8th, and we arranged with the Montana Power Company on this new basis.

Mr. Wickstrom stopped in the office a few days ago, and advised that the only information he had relative to this matter was that contained in the memo sent him with your letter of May 8th, and that he was consequently a little bothered about how to proceed. I said that I would take the matter up with you.

Will you kindly advise Mr. Wickstrom accordingly. Of course you understand that our Inspector and Mr. Wickstrom are working together in very close relationship and harmoniously, and everything seems to me to be going along very smoothly.

Yours very truly,

RB-WLS

Electrical Engineer.

cc--E.S.J.

August 18, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Referring to my conversation of a day or two ago with Mr. Buck, I am sending you herewith a copy of Fairbanks, Morse & Company's letter to me dated August 11th.

This letter gives the findings of the F. M. Co's representative in connection with his trip of inspection of cars used on the electrification work. I understand, that in accordance with our conversation, you will arrange to take on a man whose whole duty will be to look after the mechanical end of the cars, this to include our Engineering Department cars.

Yours truly,

RB-WLS

Electrical Engineer.

encl.

August 18, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I have your letter of the 11th, also copy of Mr. Armstrong's letter to you dated August 10th, regarding Motor Generator compounding.

As we have already instructed the General Electric Company to let the machines come as they are on basis that the compounding can be changed later if we find it desirable, it does not seem advantageous to discuss this matter at length any further, for the present time.

The only comment I might make is that the compounding curve as originally agreed upon was much flatter than the curve which the machine actually gave. The former curve was of a shape which was very carefully thought out and worked to, and in my opinion the compounding characteristics of the designed machine would have been of sufficiently greater value to us to warrant our endeavoring to meet them if this could not have involved a great deal of further work on the machines and considerable delay. A large amount of work had already been done on the windings of the machines to make the compounding come nearer to the desired curve.

Yours truly,

RB-WLS

Electrical Engineer.

August 18, 1915.

Mr. E. H. Barrett,
Asst General Supt.,
Butte, Montana.

Dear Sir:

Referring to your memo of the 11th with attached papers, in case our substation is located at Avery we would merely put in one of our ordinary boarding camps, probably the one from Two Dot, and we would use this camp only for feeding the substation forces.

Under these conditions, the patronage of the Interstate Company will not be affected in any way whatever, as far as I can see, and I believe the Interstate Company will so agree.

Yours truly,

RE-WLS
Encl.

Electrical Engineer.

August 18, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to yours of August 14th regarding operators room at East Portal substation and returning the print to you herewith.

The machine which you marked "A" is only about 18 inches from the signal levers and it would not appear advisable to make the move which you mention. What do you think of placing the machine marked "B" in the position that I have shown in pencil? In this position the operator would have plenty of room between the machines to handle it conveniently.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

August 18, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am enclosing herewith requisition RB-#1460 covering Pin Expansion Bonds for use between Deer Lodge and Alberton.

This requisition is based on Rail data furnished by Supt. Willard through Mr. E. H. Barrett. I am forwarding this order for bonds to be applied between the above named stations, which should be delivered to Deer Lodge not later than October 1st, in order to insure no delay in bonding work on account of consideration which may be given other types of bonds.

Will you please advise as to the placing of this order and deliveries to be obtained, so that we can make our plans in connection with the bonding gänge.

Yours truly,

RB-WLS

Electrical Engineer.

August 16, 1915.

Mr. E. A. Manchester,
Supt. Motive Power,
Milwaukee Shops, Wis.

Dear Sir:

Mr. Murray, whom we understand will make the necessary changes in round-houses and build inspection shed at Deer Lodge to accommodate electric locomotives, has asked us for information as to the arrangements which should be provided for bringing locomotives into the buildings.

In this connection please find copy of our letter to Mr. Murray of this date. Our reference to the arrangement of pit light is simply a suggestion which we thought might be of assistance. You may have a different arrangement to give Mr. Murray.

Yours truly,

RD-WLS

Electrical Engineer.

cc--C.A.G.
E. Murray

August 18, 1915.

Mr. E. Murray,
Asst Engr B & E.,
Niles City, Mont.

Dear Sir:

In accordance with your request of the 5th, we are sending you herewith two prints of Drg. ED-#624 and of ED-#350, which prints we believe will give you sufficient information to enable you to make changes in the round house and construct the new inspection shed at Deer Lodge in such a manner that the electric locomotives can be properly moved in and out of the building. We have also given detail showing arrangement of pit light which has been used in other places for this purpose.

As to the number of stalls which are to be extended in the different round houses and the facilities in general which will be provided in this connection, we presume you are securing advice from Mr. Manchester.

Yours truly,

RB-WLS

Electrical Engineer.

cc--C.A.G.
A.E.M.

August 18, 1915.

Mr. G. E. Cassford,
Dist. Master Mechanic,
Deer Lodge, Mont.

Dear Sir:

The defective frogs, etc., at Great Falls have been replaced by turn-outs and the line placed in an operative condition, so that the operation of the electric locomotive could resume operation on Monday, August 16th.

As stated to you before, the overhead in general, owing to its having been strung in cold weather, needs trimming up, the sag taken up and minor realignments made to put the line in first-class condition. We have made tentative arrangements to have this work done by the Montana Power Company's linemen, we to furnish any necessary material and a work train.

In going over the matter with Mr. Hill, the Yardmaster, it was found that the regular switching work could be so arranged that the crew and work train would be available from one o'clock in the afternoon. In order to get this work finished as soon as possible it is proposed to work through from one o'clock to eight o'clock P. M. daily, and from eight o'clock A. M. to six o'clock P. M. on Sundays. It should take about eight full days to get the overhead in good condition.

Mr. Lund should follow this work closely so that he can gain the necessary experience to maintain the line in the future.

While the matter is up, it might be well to lay out a definite plan to take care of the future inspection and maintenance of the overhead and track. This, we believe, can well be taken care of by Mr. Lund after the above work is done. He should be instructed to ride over the line about twice a week to note that there are no unusual sags, that the crossings are not low and in general to ascertain if there is any condition of the line that requires attention. An hour now and then in

the afternoon when the switching crew is not busy, should give him ample time and opportunity to make the slight adjustments necessary to keep the overhead trimmed and lined up in first-class condition. We believe it would be well to have him make out weekly reports as to this inspection.

In connection with this matter we would suggest that a requisition for a new pantograph head be placed immediately as a number of the castings of the old pantograph head have had to be welded, and are not to be relied upon. The following description of the head will be sufficient, we believe:

- 1 - Pantograph Head with Horns, complete, ready to attach to flexible pipe frame. For Great Falls Locomotive, G. H. & St. P. No. 10,000, (G.E. Type)

We have supplied Mr. Lund with the proper names to be used in ordering overhead material and have made a list of all material on hand. We shall bring the number of parts up to what we believe to be the right amount, and will put through a requisition on ourselves for the same.

In checking up the power bills, we notice that the amounts for the months of November and December of 1914 are out of proportion. Do you not think it would be well to have Mr. Arnold check these with his meter readings before sending to you?

Yours truly,

RB-WLS

Electrical Engineer.

cc--

August 20, 1915.

Mr. E. MURRAY,
Asst Engr B & B,
Miles City, Mont.

Dear Sir:

Referring to my letter of the 19th with which I sent you print ED-3684 showing method of arranging contact rails so as to bring locomotives into the Roundhouses, it should be noted that with the conductor arranged at the minimum working head of 17 ft. that there is only about four inches between the conductor and the pantograph pan, with the pantograph locked down in position.

With this contact rail, therefore, at 17 ft. height it will not be possible to jack up the locomotive to enable trucks to be taken from under same, or for any other purpose, unless the pantograph was removed, which latter would be an undesirable operation.

It may be, therefore, that in some of the roundhouses, Mr. Manchester will desire you to make changes in the roof height, so as to accommodate a higher location of the contact conductor. I am calling this matter to your attention as you may take it up with Mr. Manchester to whom I am sending copy of this letter.

Of course the raising of the roof, as I understand it, is a rather expensive proposition. We would like, for our information, to be kept posted as to what decision is made in this connection.

Yours truly,

RB-WLS

Electrical Engineer.

cc--A. E. H.
F. Roach
G. E. C.

Butte, Mont., Aug. 19, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

I understand from the Montana Power Company that when the Pole Distribution crew was disbanded at Three Forks, the Portable Telephone which was given to Foreman Utter was taken by Conductor Neelen.

The Telegraph Department also informs me that when one of the Power Company's camps discharged the Work Train at Donald recently, the Portable Telephone was taken by Conductor Bacon.

Will you kindly secure these telephones for us as they belong to this Department, and have them turned over to our Storekeeper at Three Forks.

Yours truly,

RB-WLS

Electrical Engineer.

August 19, 1913.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to the Great Falls trolley situation, as I wired you, the poles were set and the wires strung last winter, but in April when the locomotive was received and tested out, the trolley line was in good condition and there was still clearance for the pantograph at all points.

The change to pantograph operation was made sometime after our work was started, and we had on hand a number of crossing frogs which we had purchased when the intention was to use trolley, but which frogs were, nevertheless, supposed to be O.K. for pantograph operation also. Mr. Wade observed the way these frogs worked and the whole line carefully when the locomotive was tried out, and though there was naturally a slight shock to the pantograph when it passed under the frog as would be the case in passing under any hard spot, the matter did not seem important enough to warrant changing the frogs.

There were some slight adjustments still to be made on the trolley after the locomotive was put in service, and these were finally cleaned up a month or six weeks ago, when the Electrician reported that so far as he could see, everything was O.K.

It seems, however, that in the recent spell of hot weather, which is the first that we have had, the line sagged considerably. There would seem to be no doubt but what, with proper attention, the worst spots could have been taken care of any any trouble averted. The main difficulty is that the Electrician on the job has had practically no trolley experience, and has apparently not been aware of the necessity of making careful and systematic inspection. I discussed this matter with him myself and understood that in case he could not take care of the maintenance work himself, he would secure the necessary authority to call on the Power Company, but this matter does not seem to have been taken care of quite so

Sheet #2--C.A.G.--8/19/15
Great Falls Maintenance.

well as it should have been. When the break-down occurred, I had Mr. Wade go up to Great Falls and personally arrange for making the repairs, and I believe that with the instructions and advice he gave the Electrician, there will be no repetition of the circumstances which have occurred.

Prior to Mr. Wade's trip I had not had a representative at Great Falls recently, because, although as I explained to you I brought Mr. Urban out for this purpose, when he arrived here there was so much very important work to be done on certain items in connection with the Main Line electrification that his visit to Great Falls had to be postponed.

I would say, that while our inspections will be of service in bringing out general questions affecting the operation, such as the matter of handling the locomotive to secure lowest cost of power, etc., it is only by systematic weekly inspection on the part of the Electrician, of the detail trolley construction, and by suitable instructions to the Engineer to keep the Electrician posted in regard to any troubles he notices on the trolley line, that we can be sure of fixing up the trolley before it catches in the pantograph, or some other similar accident occurs. I believe that this feature will, in the future, be taken care of.

Yours truly,

RB-WLS

Electrical Engineer.

August 19, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Schenectady, N. Y.

Dear Sir:

Referring to my Night Letter of August 18th, copy attached, regarding Quotation #10604-B, and your letter of August 3rd, there are a number of points about the quotation which were not clear to us; the more important ones we mentioned in the telegram so that we could get prompt information from you and be in a position to make out our requisition.

In a number of places, for instance Items #6 and #7, page #1 under "Generator", you have added the words "Per Hundred", while under the price column the price is given as applying for each piece. This is repeated in so many places that we will not attempt to enumerate them, but no doubt the net price applies to each piece instead of 100 pieces.

In other places, for instance, the 5th item under "Motor", page #1, words "Per Set of Sixty" occur. Does this mean "60 to a set", or does it mean "60 per set"?

The first item under the word "Motor" (1500 Kw. Set), Page #1, calls for "36 armature coils per set 144, net price \$787.50 lot". We think this should read "36 armature coils 144 per set, price \$787.50 per set", inasmuch as this makes the price look nearer right and also as the first item under "Motor" (2,000 Kw. Set) gives a figure of \$1350.00 for the set.

On page #1, second item under word "Motor" it reads "Field Coils ** each \$69.75 lot". We presume this should read "Field Coils ** \$69.75 each".

On page #2 of the quotation, first item under "Motor" reads "4 field coils ** set of four, \$1023.75 set". We presume this should read "Field Coils ** set of 14, \$1023.75 set".

No spare parts are given for Exciter Fields. Do you not think we should have these? Please give quotation.

Sheet #2--E.S.J.--8/19/15
Repair Parts

On page #3 it seems to me we may omit the items of "Complete Comutator" but we will double the the number of Comutator Segments called for, also we think we can get along with one-half the number of armature punchings called for.

The items of transformer covers we are omitting, and are making some other slight changes in the number of other parts we expect to order.

On page #4, as wired you, we do not understand where E-5, 300 ampere switches will be used and presume this is a mistake.

On page #6, we understand that by purchasing 1001 gallons of the No. 6 oil, price for same will be 16¢ instead of 17½¢. We will modify our order accordingly.

We presume there will be changes in the Drawing numbers applying for the Reversed Power and other relays, and will be glad to get from you the new information soon as possible; also there may be changes in the current transformers and potential transformers referred to on page #6.

One hundred fuses, Cat. #38578 are called for. We understand from Mr. Holcott that this fuse has been superseded. In any event we are unable to tell for what potential transformer it is supposed to be used. Is it for the Signal transformers, and is the number as given correct?

No spare parts are given for air compressor motors, oil drying outfit and transformer drying outfit. Kindly make this up, and forward us quotation covering same together with your recommendations.

Yours truly,

RB-WLS

Electrical Engineer.

cc--V.A.W.
H.S.H.

August 10, 1915.

Mr. A. E. Manchester,
Supt. Motive Power,
Milwaukee Shops, Wis.

Dear Sir:

In further connection with your letter of July 19th, after going into the matter in detail with the General Electric Company, would say that it certainly seems best to us for us to purchase one of the large binding machines required for the substation generator armatures, so that we can make the repairs ourselves.

There will be fourteen substations altogether between Avery and Harlowton, in each of which there will be installed two or more Motor Generators, consisting of a Synchronous Motor driving two D. C. Generators connected in series. The Armatures of these D. C. Generators are the parts for which the binding machine would be necessary. The Motor Generators will be of two sizes, the 1500 K.W. size having two generator armatures as shown on print K-1201705 herewith, and a 3,000 K.W. size having two armatures as shown on K-1201706. There will be ten stations having two 3,000 K.W. units each, one station having three 3,000 K.W. units and three stations having three 1500 K.W. units. The substation machines are so designed that if one armature went out of service, the other machine or machines would carry the load.

Considering the number of machines in use and the great distance from manufacturing point, and the fact that extra armatures are so expensive, as you will note from G.E. Quotation No. 10004-B, of which I sent you copy on the 17th, it certainly seems to us we should get one of the binding machines, so as to make our own repairs.

In this connection, please refer to page #2 of the quotation above referred to. Under the heading "Generator" you will note that when the armature is banded it is mounted in lathe and the binding machine mounted near to it. I took up with Mr. Cassford as to whether he had a lathe suitable for swinging the larger armatures, and have received from him a sketch showing a wheel lathe which he has. I enclose this sketch, and it seems that the lathe should be large enough to swing the larger armatures.

Sheet #2--A. E. M.--8/19/15
Armature Winding Machine

The price of binding machine, you will note, from quotation page #3, line #15, where the machine is called a "Tension Device", is \$800.00. I am sending you a print of machine, Drg. T-161729.

I thought it might be possible to do the binding of the armature without taking it out of its frame in the substation, but I would assume, judging from the G. E. Co's letter of August 5th of which I enclose copy that the best plan would be to take out the armature and send it to Deer Lodge shops.

I think, with this tension device and other machinery which you will entail for the care of the engines, that it will not be necessary to make further special machinery provisions to take care of the substation repairs. I think that it will be possible to make most of the repairs without taking the machinery out of the substations. This of course does not apply to the repairs on the Generator Armatures.

Will you kindly let me know if I have given you all the information that you wish in this connection.

Yours truly,

RB-WLS

Electrical Engineer.

cc--F. Rasch
G. E. C.

August 30, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to the Great Falls trolley situation, as I wired you, the poles were set and the wires strung last winter, but in April when the locomotive was received and tested out, the trolley line was in good condition and there was still clearance for the pantograph at all points.

The change to pantograph operation was made sometime after our work was started, and construction arranged for the installation of frogs for use with wheel trolley, which frogs were, nevertheless, designed for pantograph operation also. Mr. Wade observed the way these frogs worked and the whole line carefully, when the locomotive was tried out, and though there was naturally a slight shock to the pantograph when it passed under the frog, as would be the case in passing under any hard spot, the matter did not seem important enough to warrant changing the frogs.

There were some slight adjustments still to be made on the trolley after the locomotive was put in service, and these were finally cleaned up a month or six weeks ago, when the Electrician reported that so far as he could see, everything was O.K.

It seems, however, that in the recent spell of hot weather, which is the first that we have had, the line sagged considerably. There would seem to be no doubt but that, with proper attention, the worst spots could temporarily be taken care of and trouble averted, but the importance of arranging for systematic inspection and small repairs necessary in connection with the trolley system does not appear to have been sufficiently well understood by those directly connected with the operation. When the break-down occurred, I had Mr. Wade go up to Great Falls and personally arrange for making the repairs, and I believe that with the instructions and advice which he

Sheet #2--C.A.G.--9/30/15
Great Falls Maintenance.

gave the Electrician, there will be no repetition of the circumstances which have occurred.

Prior to Mr. Wades trip I had not had a representative at Great Falls recently, because, although as I explained to you, I brought Mr. Urban out for purposes such as this, when he arrived here there was so much very important work to be done on certain items in connection with the Main Line electrification that his visit to Great Falls had to be postponed.

I would say, that while our inspections will be of service in bringing out general questions affecting the operation, such as the manner of handling the locomotive to secure lowest cost of power, etc., it is only by systematic weekly inspection on the part of the Electrician, of the detailed trolley construction, and by suitable instructions to the Engineer to keep the Electrician posted in regard to any troubles he notices on the trolley line, that we can be sure of fixing up the trolley before it catches in the pantograph, or some other similar accident occurs. I believe that this feature will, in the future, be taken care of.

Yours truly,

RB-WLS

Electrical Engineer.

August 20, 1915.

Mr. C. Todd,
Montana Power Co.,
Great Falls, Mont.

Dear Sir:

I am enclosing a sketch showing proposed method of fixing up the two crossings at Central Avenue and at Twenty-seventh Street.

These two points, we believe, will be the only questionable ones after the work is finished, and in view of the fact that our inspection will be more or less periodic, we would like to fix the line in such shape that no possible shut-down can occur.

You will note that what we propose to do is to run a pair of ears on your trolley line and suspend them to the same span wire to which the frog is attached. This is done to insure the proper clearance between your trolley wire and our pantograph. If this is satisfactory, will you kindly instruct Von Gelts to make this additional change on these crossings.

Yours truly,

FU-wls

Electrical Engineer.

August 20, 1915.

Mr. E. W. Kremer, City Att'y,
Bozeman, Montana.

Dear Sir:

I am sending you herewith, properly executed by our Officials, the contract which you sent me in connection with the joint use of trolley and light poles at Bozeman.

You will note that the clause which our Company wished inserted and which you told me over the phone this morning was satisfactory to you, has been added at the bottom of the second page of the contract.

As no doubt Mr. Busch has told you, I find I am unable to make arrangements to be in Bozeman tomorrow, the 21st, and will try and see you in Bozeman Monday. I trust this will not inconvenience you.

Yours very truly,

RB-WLS
Encl.

Electrical Engineer.

August 20, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

In accordance with your letter of the 17th, we will arrange to have an analysis made of the water supply at our different substations in order to determine whether it is suitable for drinking and domestic purposes or not, and will advise you the results of these tests as soon as they are completed.

Yours truly,

RB-WLS

Electrical Engineer.

MAILLOGRAM

Butte, Mont., Aug. 20, 1915.

A. E. Long, Stkr.,
Three Forks.

Car #90298 was recently shipped from Three Forks containing material for Foreman Blakesly at Donald. It seems this stuff has not arrived. Please have this shipment traced at once and locate material, advising this office promptly. One thing we are needing is the wrenches for the O. B. hangers. If they are lost we are going to be seriously handicapped. Wire.

R. Beuwkes

MAILLOGRAM

Butte, Mont., Aug. 20, 1915.

G. G. Allen, Gen'l Stkr.,
Milwaukee, Wis.

Dear Sir:

Office stationery on Requisition RB-#1339, ordered August 4th not yet received. Please advise when we may expect to receive this material. Badly needed.

R. Beuwkes, Elec Engr

August 21, 1915.

Mr. H. S. Hertzog,
O M & St P Inspector,
#549 Bldg. #5, G.E.Co.,
Schenectady, N. Y.

Dear Sir:

I have just wired you as per the enclosed Night Letter, which seems to me to be the natural way to look at the proposition in question. I see no reason why we should expect different temperature rises on the exciters which form a part of the Motor-generator, than we have been guaranteed on the motor and generators.

To answer your question regarding the 1913 Institute Rules however, would say that these allow 50 degrees rise on Field and Armature, and 55 degrees on Commutator and Brushes; 50 degrees by resistances, Commutator and Brushes 55 by thermometer, Bearings and other parts 40 degrees by thermometer, the machines to carry overload without serious injury by heating, sparking, mechanical weakness, etc., and with additional temperature rise not exceeding 15 degrees C. above rise specified for normal load.

In the case of Exciters, the overload is to consist of "10 per cent more overload than is required for the excitation of the synchronous machine at its guaranteed overload, and for the same period of time. All exciters of alternating-current, single phase or polyphase generators, should be able to give at their rated speed, sufficient voltage and current to excite their alternators, at the rated speed, to the full-load terminal voltage, at the rated output in kilovolt-amperes and with 50 per cent power-factor."

Yours truly,

RB-WLS

Electrical Engineer.

August 21, 1915.

Mr. E. H. Barrett,
Asst Gen'l Supt.,
Butte, Montana.

Dear Sir:

Referring to recent claim by Mr. Hughes in regard to his fence being left down by the Montana Power Company's construction crew in vicinity of Miles Crossing, I attach herewith reports from Timekeeper of the Montana Power Company's construction crew and our Inspector, Mr. Soule, which would seem to indicate that there is doubt as to whether this fence was left down by construction forces as claimed. In any event, the fence has been fully repaired.

Yours truly,

RB-WLS

Electrical Engineer.

August 31, 1918.

Mr. A. J. Busch, Supt.,
Gallatin Valley Railway,
Bozeman, Montana.

Dear Sir:

We are about to make some calculations for Mr. Goodnow on the electrification of the Gallatin Valley road from Bozeman to Three Forks, and in order to work up our load curves it will be necessary for us to have some idea of the tonnage, the train make-up and the number of trains, etc.

Can you procure for us this information from your records. We take it that this can readily be taken from your train records, and should extend over a fairly long period, so that the average traffic can be closely approximated.

Yours truly,

FU-WLS

Electrical Engineer.

August 23, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Confirming conversation with Mr. Buck several days since, it seems very desirable in the line of economy, to fit all cross arms, both for feeder, signal and transmission work with pine and hardware before they are shipped from the storehouse.

I understood from Mr. Buck that it would be necessary to use a lineman for this purpose. If so, will you please arrange for this at Deer Lodge storehouse.

I presume it will be satisfactory for our Storekeeper to furnish necessary help for lineman.

Yours truly,

RB-WLS

Electrical Engineer.

cc--M. Butler

August 23, 1915.

Mr. J. C. Mill,
Signal Engineer,
Milwaukee Shops, Wis.

Dear Sir:

Replying to yours of July 28nd, File 151-A,
in regard to location of points where negative wire
connects to track at out-off points, will say these
points are as follows:

Construction Station	837 - 00	at Vendome.
"	551 - 50	at about 2.05
"		Mi. W. of Cedric.
"	363 - 50	at a point
"		about .4 Mi. W. of Grace.
"	215 - 00	at a point
"		about 2.88 Mi.W.of Grace

The above four points cover the two out-offs
involved.

As regards additional impedance bonds re-
quired, you no doubt can tell better about this, as I
presume your signal plans will decide the matter.

Yours truly,

RB-WLS

Electrical Engineer.

cc--L.W.S.

August 23, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Attached herewith please find Requisition #1467 for two 3-cylinder gas motor cars which are badly needed by the Montana Power Company for handling men on construction work.

These cars are especially needed in view of the fact that it is necessary to have a certain number of cars in the shops for repairs at all times. Will you please issue instructions for delivery as soon as possible.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 23, 1915.

Mr. P. E. Vanlerville,
Bonding Inspector,
Three Forke, Mont.

Dear Sir:

We are arranging to provide Hard Grease and Flake Graphite for lubrication of ball bearings in drilling machines.

Please keep in touch with Storekeeper Long and as soon as this material arrives, see to it that all ball bearings are properly backed with this mixture. The makers of the machines recommend that this combination be used.

Let me know promptly when this has been done.

Yours truly,

REW-als

Assistant Engineer.

cc--M.P.Co.

August 23, 1916.

Mr. W. F. MacIntyre, Div. Engr.,
Mountain States Tel. & Tel. Co.,
Helena, Montana.

Dear Sir:

I note that you are engaged in making line changes between Three Forks and Deer Lodge where you cross our transmission and trolley lines.

Confirming our conversation, however, I wish to call your attention to the desirability of having these changes completed at the earliest possible moment, in view of energizing transmission line.

Will you please advise when you expect to have your work done and oblige.

Very truly yours,

RB-WLS

Electrical Engineer.

August 23, 1915.

Mr. C. A. W. Musson,
Assistant Engineer,
Butte, Montana.

Dear Sir:

Acknowledging receipt of copy of your letter to Mr. Murphy under date of August 18th, with attached print covering proposed changes in track layout at Harlowton Yard, I understand from our Inspector now engaged in work being done at Harlowton Yard that the proposed track revision involves spans carrying eleven tracks, should all tracks be wired at some future time.

This type of construction will of course be inconsistent and possibly prohibitive, especially in view of the fact that track No. 4 has been removed in order to reduce the number of tracks spanned.

While the present wiring layout can be taken care of with necessary pole locations, it is possible that it will be necessary to make additional track changes, should all tracks be wired at some future time. This for your information.

Yours truly,

RB-WLS

Electrical Engineer.

cc--E.H.B.

August 23, 1915.

Mr. E. H. Barrett,
Asst General Supt.,
Butte, Montana.

Dear Sir:

Referring to our conversation a short time since in regard to replacement of long joints on small rail ahead of bonding crews so as to permit of using 37 inch bonds, we find that Roadmaster Fitzgerald was not prepared to make this change at Lombard while bonding crew was at that point.

If possible arrangements should be made so as to keep this replacement ahead of the bonding work, as otherwise we will have to leave a large amount of unfinished work at widely separated points with consequent increase in cost.

Yours truly,

RB-WLS

Electrical Engineer.

cc--J.B. Fitzgerald
Roadmaster,
Three Forks.

Butte, Mont., Aug. 23, 1915.

Mr. P. E. Vanderville,
Bonding Inspector,
Three Forks, Mont.

Dear Sir:

Referring to your inquiry of several days since, I will say that double bonds are to be used between Summit and Lennep only. This for territory between Three Forks and Harlowton.

I am enclosing herewith copy of statement furnished by Roadmaster Fitzgerald, showing rail and joints between Three Forks and Harlowton.

If you require any further detail on this, take the matter up with Mr. Fitzgerald, advising me promptly, however, if you find any discrepancies in the list, as our bond order is based on the statement.

Yours truly,

REW-als

Assistant Engineer.

August 23, 1915.

Mr. E. S. Johnson,
General Electric Co.,
Scheneectady, N. Y.

Dear Sir:

Referring to your Night Letter of the 18th, we intended the synchronizers only for Deer Lodge West, where the substations are fed from two different plants not tied together except through our transmission lines.

Synchronizers are not necessary East of Deer Lodge, as all stations feeding such substations in this district are tied together.

Yours truly,

RE-TLS

Electrical Engineer.

cc--Y.A.W.
H.S.H.

Butte, Mont., Aug. 24, 1915.

Mr. G. F. Soule, Insp.,
Deer Lodge, Mont.

Dear Sir:

I wish to get, as soon as possible, complete data as to any trolley poles, stubs, guys and anchors which we may have projected for location on N. P. Right of Way between Deer Lodge and a point where Smith is now located.

In this connection bear in mind that Smith's staking for span work has been changed where we are to brace certain curves as decided by Mr. Beaulieu, and that we will not want rights from the N. P. Co. at such points.

At the same time, after getting this information from Smith, you will have to have it referenced to the nearest N. P. mile post. Let me hear from you on this just as soon as you have seen Smith.

Yours truly,

REW-wls

Assistant Engineer.

August 24, 1915.

Mr. F. J. Taylor, Div. Engr.,
Northern Pacific Railway,
Livingston, Montana.

Dear Sir:

Replying to yours of the 23rd in regard to desired occupancy of your Right of Way between Garrison and Missoula, will say that we have projected certain transmission line locations on your property, maps of which have been made and sent to our Secretary, Mr. Adams at Milwaukee, who will take up direct with your Company the matter of securing these rights.

I will investigate at once the question of occupancy with trolley poles and anchors and will advise you promptly as soon as I get the information.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 24, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to your wire of the 19th in regard to shipment of No. 4564 Locke Strain Insulators and completion of this order by September 1st, we would like to have the No. 4564 insulators come in partial shipments if production conditions justify, and if this will forward the delivery of insulators.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 24, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

We received yesterday at Three Forks the last shipment of 24 Klein Chicago Grips which are not galvanized, and find that both the jaws in these are plain. In other respects the grip is a duplicate of the one which we have been using which has one jaw roughened.

In order to keep our work going, we are going to have the Deer Lodge shops roughen one jaw on a certain number of these grips, and we are sending you a sample of the grip which has been in use, a sample of grip furnished on our last requisition on which one jaw is grooved instead of roughened, and a sample of the last lot of grips with plain jaws.

In the meantime, will you please have the Klein Company send me for inspection only, if they have it in stock, a sample of their "Quick Sampson" grip to take up to 5/8 inch diameter wire, if in their opinion it is worth our while to consider this grip for pulling our bare copper strand, which we cannot of course take chances on injuring.

I presume you can have this grip sent to your office and have it forwarded to me by baggage in order to save expense of transportation. If this grip seems satisfactory for our work, it is possible that we will place a requisition for a certain number of them, as we have lost a large amount of time and money trying to get a suitable grip for our purpose.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 24, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Replying to yours of the 20th in regard to
crossing material on Requisition #1145.

I note that inter-locking material is
promised by the G. E. Co. Oct. 13th. In order to try
and better this delivery, I would suggest taking up
with the G. E. Co. as to whether our Milwaukee Shops
could make up this material from their drawings, and
thus improve the matter.

In this same connection, please impress
upon the G. E. Co. that we must have delivery on all
of this material bettered if possible in order to
complete our work in time.

Yours truly,

RB-WLS

Electrical Engineer.

August 24, 1918.

Mr. J. O. Mill,
Signal Engineer,
Milwaukee Shops, Wis.

Dear Sir:

We have recently received pink tissue copies of material ordered by J. T. Crocker as per your 804-M, 804-K and 804-L.

I note this material is to be shipped to Butte. Will you please advise if this is something that we are to handle, or is it something that you are taking care of exclusively.

Yours truly,

FAC-wls

Electrical Engineer.

August 24, 1915.

Mr. C. A. Lemmon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

Our telephone and telegraph circuits have been crossed with 2300 volts three times recently, and while the results have been serious in interrupting our service, it of course is liable to be still far more so.

I will be greatly obliged if you will investigate this matter, and see if some steps cannot be taken to put a stop to it.

I understand the difficulties involved in connection with this work, but believe that such cases can be avoided if the proper precautions are taken.

Yours very truly,

RB-TLS

Electrical Engineer.

August 24, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

Foreman Barker, stringing trolley East of Three Forks, has placed an order for brackets, bolts and other fittings for mounting cut-out switches.

As we have received a complete supply of this material for all switches on hand, and he presumably has taken cut-out switches from Three Forks stock, he can be supplied from Camp 43, as the latter camp must have all of the fittings delivered.

For your information, the remainder of the cut-out switches for use between Deer Lodge and Harlowton will not be delivered for sometime yet. This for your guidance in connection with use of switches on hand.

Yours truly,

RB-WLS

Electrical Engineer.

cc--R. Wende

August 24, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

We have as yet received no list of tools required for additional trolley crew to be started at Deer Lodge.

In view of the short time available, please let me have this list at once.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 24, 1915.

Mr. G. F. Soule, Insp.,
Deer Lodge, Mont.

Dear Sir:

The Mountain States Tel. & Tel. Company have requested that we off-set our feeder, signal and power limiting wires so as to clear their pole guys where they cross our track just East of Alloy Yard.

This matter was held up pending location for signal bridge contemplated at this point. I now find that no signal bridge is going in, so you can arrange for clearing the guys, disregarding signal bridge.

Yours truly,

REW-wls

Assistant Engineer.

Butte, Mont., Aug. 24, 1915.

Mr. R. Wende, Insp.,
Three Forks, Mont.

Dear Sir:

Please forward me as soon as possible a statement showing total number of trolley sections of various length, betw en Three Forks and Harlowton, as staked by Waslosky and Miller.

This information is needed quick in order to check up the number of straight line catenary hangers required, statement to show at just what point territory begins on Three Forks end and to include all passing and yard tracks.

Waslosky should be able to get out the greater part of this quickly from his field book, and Miller can give the information for Harlowton Yard.

Be sure that this is accurately worked up in every way, as it is very important.

Yours truly,

REW-wls

Assistant Engineer.

August 25, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

We have made a considerable number of temperature tests on high tension insulators, and the results of these tests are shown in a report hereto attached, dated August 25th, by Mr. Urban.

You will note from this test that insulators of the Thomas and Ohio Brass manufacture stood the test successfully. With regard to the Locke insulators, you will note that two of them showed defects, even before being subjected to the temperature changes the third Locke broke down after the first immersion.

The situation for the Locke insulator looks so questionable to us that we thought it would certainly be advisable at the risk of delay in our construction work, to procure from the Montana Power further Locke insulators and make tests on them, just to make sure that we did not happen to make an unfortunate selection of Locke insulators for the test we have just completed.

Yours truly,

RE-WLS

Electrical Engineer.

cc--J.T.C.

August 25, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am enclosing herewith some photographs which were taken last Friday by one of our substation drafting room men who is a good photographer. I trust these views will be what you want.

Of course a little later on when all the work around the substations, including the erection of wires and towers is completed, we will take views of each substation. Meanwhile I wired you today as per the enclosed telegram.

No. 1	--	Overall looking from East	8/20-15
" 2	--	" " " "	"
" 3	--	Substation bldg. looking from East	"
" 4	--	" " " West	"
" 5	--	Power Co's switching apparatus back of substation	"
" 6	--	Interior high tension room	"
" 7	--	" motor-generator room	"
" 8	--	West bungalow	"
" 9	--	East bungalow	"

Very truly yours,

RB-WLS

Electrical Engineer.

August 25, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

To date we have not gotten our tracing
of progress report for the Miscoula Division com-
pleted.

We are having difficulty in getting
the correct Mile Posts located.

For your information, trolley poles
have been erected to one mile West of Garrison up
to the evening of August 21st.

Yours truly,

RB-WLS

Electrical Engineer.

cc--H.B.E.

August 25, 1915.

Mr. C. A. Lennon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

Our Storekeeper, at Three Forks, advises that 13640 ft. of 500,000 C. M. Cable was shipped to you at Butte instead of 10500 ft. as ordered, through error.

If you are sure that you will not need the excess cable, kindly re-ship this to me at Three Forks, sending the Bill of Lading when you unload the car.

Please let me know promptly what you do about this.

Yours truly,

RB-wls

Electrical Engineer.

August 26, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

We have been trying to locate Portable Telephone sets used by your Foreman Utter who was distributing poles east of Three Forks, and one of your Camps which discharged the Work Train at Donald recently, and were informed that they were taken by Conductors Neelen and Bacon respectively.

On taking the matter up with Supt. Murphy, he claims that the telephones referred to belonged to his Department.

Will you please advise what has become of the telephones which we furnished for your Foremen.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., August 25, 1915.

Mr. G. E. Cessford,
Dist. Master Mechanic,
Deer Lodge, Montana.

Dear Sir:

I am having sent to you from Three Forks storehouse, twelve Klein Chicago Grips which are used for pulling transmission wire.

You will note that these have plain jaws. At the same time I am sending you from this office one grip which has been used on the work and which has the inside of the upper jaw roughened. If you can roughen the upper jaws of the lot from Three Forks in the same way will you please have this done as soon as possible, and re-ship them to me at Three Forks advising when done. If you cannot reproduce the roughening on No. one sample, it can be done with a punch as has been partially done on No. 2 sample, except that if done with a punch, the sharp cutting edges of the turned up material should be removed with a round file, so that the copper strand will not be damaged.

As soon as the work has been done, please return samples #1 and #2 to me at this office, together with one of the grips which you have done at the shops.

We have had considerable difficulty in trying to get the proper grips for the work, and one of our transmission crews is badly handicapped, so anything you can do to push this through will be greatly appreciated.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 25, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

Referring to my Requisition #1463 for O.B. #9403 insulators, and Thomas #1022 Feeder insulators for use West of Deer Lodge.

In reply to yours of receipt date in regard to the new cross arm pins, I have compared samples of the old and new cross arm pins and there seems to be enough difference in size to require that we submit to both Thomas and the O. B. Co's a liberal quantity of the new pins so that we will be sure and have a proper fit between the pin and pin hole, as otherwise the O. B. Company is liable to proceed with making up the #9403's for the smaller pin.

The new pins seem to be accurately made and of very good quantity. Please advise at once if you will have these pins sent to the insulator people, or if you wish us to send them.

Yours truly,

RB-WLS

Electrical Engineer.

August 26, 1915.

Mr. J. C. Vincent, Asset Engr.,
Minneapolis Street Railway Co.,
Minneapolis, Minnesota.

Dear Sir:

The undersigned is the party who wrote you the letter regarding rail bonding. Mr. Mill, to whom you addressed the reply, has just forwarded me the latter, and we thank you for the information, which we find very interesting.

The bond which we are using is a 250,000 C. M. cable pin bond. This bond is, in all cases, connected to the web of the rail. In some cases we use bonds which have both terminals welded on by the Bond Manufacturer, and in other cases where the joint allows, a bond is used which has only one terminal put on by the Manufacturer, the bond being slipped through the joint underneath the plate, and the other terminal is then welded on and pin expanded.

In view of your wide experience with the oxy-acetylene weld, we would like to know if you think it would be feasible for us to weld the bonds to the web of the rail, and if so, if the bonds would have to be made up with a special shaped terminal. The Ohio Brass Company made some demonstrations for us not long ago in which they used a special terminal, but the job was not very successful, inasmuch as copper was merely added to the terminal on top and it was not difficult to pry the bond off by inserting a screw driver underneath the terminal and prying upward. The terminal then separated directly at the line of the weld between the terminal and the added copper.

We have been informed by a certain bond manufacturer that tests which he has made on a rail to which an oxy-acetylene bond had been applied, showed the structure of the rail to be materially altered. Of course, for the very heavy equipment which passes over our rail, this would be a very serious matter.

Sheet#2--8/26/15
J.C.V.--Rail Bonding.

Have you ever made any tests or have you any data in the above connection? If so, I would very much appreciate hearing from you.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 26, 1915.

F. B. W.

I have sent over to Mr. Buck a man by the name of Coover, who I think would make a first-rate wireman. Mumma should keep his eyes on this man with a view to employing him later on operation along the lines we discussed. I am also handing you herewith a letter received from a party named Hopps. He is pretty far away, but in case Mr. Buck does not land enough men from the list we gave him, it might be desirable for Mr. Buck to write Hopps.

R. B.

August 26, 1915.

Local Manager,
Postal Telegraph-Cable Co.,
Butte, Montana.

Dear Sir:

Confirming conversation of our Mr. Crowder today, in regard to our 100,000 Volt Transmission Line crossing with your line at point where Anaconda Road crosses our track west of Finlen, will you please telegraph your headquarters if necessary, asking that they provide temporary clearance if possible and make permanent changes in your line as soon as possible, as we expect to energize our transmission line with 2300 volts soon, and with 100,000 volts as soon as possible thereafter.

I would appreciate your advising me just what steps your Company will take in this matter at your earliest convenience. As this crossing is on the highway, we will have to assume the cost of making the change.

Yours very truly,

RB-WLS

Electrical Engineer.

August 26, 1915.

Mr. E. W. Adams, Sec'y,
Milwaukee, Wis.

Dear Sir:

Enclosed herewith please find copy of letter to F. J. Taylor, Division Engineer of the Northern Pacific Railway, Livingston, Montana, enclosing his maps showing location for poles and anchors on their Right of Way at various points, and also a set of blue prints for your files.

Please advise if additional prints or information is desired.

Yours truly,

RE-WLS
Encl.

Electrical Engineer.

August 28, 1915.

Mr. F. J. Taylor, Div. Engr.,
Northern Pacific Railway,
Livingston, Montana.

Dear Sir:

I am sending you herewith blue prints of maps showing locations of poles and anchors on your Right of Way at various points as follows:

E.D.	#355-G	Vicinity of Sappington
"	#357	Vicinity of Sinclair
"	#358	East of Winlon
"	#359	East of Sappington
"	#360	Near Silver Bow and Dawson
"	#361	at Whitchell branch crossing east of Piedmont.
"	#362	East of Silver Bow.

I am sending copies of these prints to our Secretary, E. W. Adams at Milwaukee who will no doubt connect with your proper official in regard to contract covering these locations.

Since getting out these maps I understand that we have certain locations on your property at Lombard, some of which are possibly due to changes made at request of your Telegraph Department. I will have this investigated at once, and will forward map covering these locations if necessary.

I trust these maps will give you the information which you desire.

Yours truly,

RB-WLS

Electrical Engineer.

cc--E.W.A.

August 26, 1915.

Mr. C. A. Lemmon, Chief Engr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

We are considering the purchase of a gas
car for maintenance and possibly for construction
work in connection with our trolley construction.

I spoke to you about this matter sometime
ago, and understood you to say that you had found
the car to be of little use in connection with con-
struction work, but that you expected to try it out
further.

Will you please let me know if you have
had any further experience with it, and also your
views of the car in general.

Yours truly,

HB-WLS

Electrical Engineer.

August 26, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Referring to yours of August 20th regarding Progress Reports, we will endeavor to keep the latter as closely up to date as possible.

Regarding extension of trolley from Three Forks to Eustis, kindly note from Progress Report for week ending August 21st that this trolley is strung. This matter is also covered by Daily Report of August 11th.

Yours truly,

RE-WLS

Electrical Engineer.

August 26, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I am attaching hereto Requisition #1486
for a gas car for use of our Substation Electrical
Inspector.

I appreciate that we have a large number
of these cars and that the more we have the more
dangerous their use becomes. However, all the
men have been warned regarding doing everything
possible to avoid accidents, and I am asking you
for this car because one man cannot possibly effi-
ciently cover the inspection of the substations
without it. We will be glad to have you approve
the requisition.

Yours truly,

RB-WLS
Encl.

Electrical Engineer.

Butte, Mont., Aug. 26, 1915.

Mr. H. S. Hertzog,
C M & St P Inspector,
549 Bldg. #5, G.E.Co.,
Schenectady, N. Y.

Dear Sir:

I was talking yesterday to a party who used to work on the Locomotive Maintenance for the N.Y.C. Company at Harmon Shops.

During the course of our conversation he happened to refer to the circumstance that on a large number of N. Y. C. locomotives, it was decided necessary to re-solder all the wire terminals.

It seems to me that this is a point that you ought particularly to bear in mind in connection with the inspection of our wiring.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 26, 1915.

Mr. J. T. Crocker,
Purchasing Agent,
Chicago, Illinois.

Dear Sir:

We are in receipt of a letter from the East-Westburg Electric Co., Chicago representatives of the Weston Electrical Instrument Company, in which they ask for additional information in regard to D. C. instruments, and supplying us with data in regard to their A. C. instruments which at the time of placing the requisition we did not have.

In consequence, we wired you yesterday relative to the inquiries made.

In this connection we wish to say that in going over the readings, etc., of various instruments which we desire, we find that it is very seldom two Manufacturers manufacture instruments of the same readings and of a type comparable with the other. In order to obtain the best instruments for the price, we believe it would be advisable for you to send us all the quotations with descriptive matter, etc., covering the instruments the various Manufacturers have quoted upon, and we will select the instruments which we believe best for the price.

We will be in need of some of these instruments within two weeks or so, and would suggest that you hurry this matter forward as much as possible.

Yours truly,

FU-WLS

Electrical Engineer.

August 27, 1915.

Mr. H. Birdsall, Supt.,
Northern Pacific Railway,
Missoula, Montana.

Dear Sir:

Referring to our recent correspondence on the subject of poles and anchors interfering with your driveway at Sinclair industry track, will say that our Inspector Mr. Soule has been on the ground with your Roadmaster C. T. Spousel and has arranged to clear up the ground to the satisfaction of Mr. Spousel.

Yours truly,

RB-WLS

Electrical Engineer.

August 27, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

I notice that transmission poles are distributed between Deer Lodge and Kohra, and think it advisable to pick up these poles and re-distribute them further West the next time the Pole Distribution is taken up. Please advise.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 27, 1915.

Mr. C. F. Loweth,
Chief Engineer,
Chicago, Ill.

Dear Sir:

In connection with proposition to be submitted by the Electric Railway Improvement Company of Cleveland, Ohio, through their Mr. G. Howatt, will you please have sent to them in care of Mr. Howatt, one blue print for both 90 $\frac{1}{2}$ and 85 $\frac{1}{2}$ rail as used between Deer Lodge and Avery with 100 per cent and Continuous joints respectively, the blue prints to show rail section and details of joint.

Yours truly,

RB-WLS

Electrical Engineer.

August 27, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Replying to yours of August 23rd in regard to apparent excess of transmission poles ordered for use west of Deer Lodge, and their distribution along the line for emergency use.

It would seem very desirable to locate such poles at certain intervals along the line, both for trolley and transmission emergency work, as in case of need they could be very easily and quickly transported on gas car, whereas if they are located at widely separated points, such as Deer Lodge and Three Forks, Harlowton and East Portal, it would be very inconvenient to transport them to points on the line where they might be needed. This is particularly true of sections where transmission line is located on private property.

In either case, the number of poles held for maintenance and emergency work would naturally be the same.

Yours truly,

RB-WLS

Electrical Engineer.

August 27, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Replying to yours of August 23rd in regard to Bridge and Tunnel Warning signals and the use of our Standard Warning signals in modified form.

I will say that this matter has been gone into very thoroughly by the New Haven & Hartford road in conjunction with the Public Service Commission of New York State and as far as my last information goes they have been unable to adapt the standard warning signal so as to comply with requirements imposed by use of pantograph collectors.

I would suggest, therefore, that we take this matter up with Mr. W. S. Murray, Consulting Engineer of the New Haven road and get the full benefit of their experience before proceeding further. Will you please advise.

Yours truly,

RB-WLS

Electrical Engineer.

August 27, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Replying to your letter of August 23rd with return of Requisition #1350 for Danger Signs, will say that after receiving your letter I took this matter up with the Montana Power Company, and find that they had just discovered that the painted signs are unsatisfactory for permanent use, on account of the colors showing signs of fading after having been installed eight or nine months, and that they are now looking up the question of getting another type of sign which will be more durable.

On account of the great desirability of installing some such sign as soon as our lines are energized, I would recommend that one of two things be done and that delivery be pushed so that we can accomplish their installation as stated above.

At the point where signs will be attached to poles the diameter of the pole is about 11 inches. This diameter of course will vary slightly, and if, in the opinion of the Enamelled Steel Sign Company think they can make up a sign bent on $5\frac{1}{2}$ " radius and that it will stand very slight bending so as to conform to variation in size of poles, I would recommend that we place an order at once for 1,000 bent signs and 100 flat signs, the former for use on poles and the latter for use around substation buildings.

If the Enamelled sign people cannot make a bent sign, and stand back of its being slightly bent in either direction without cracking, I would recommend that we purchase for immediate use 500 of the painted signs, possibly from the American Art Works of Coshocton, Ohio, and that we go into the question of enamelled signs more fully thereafter.

The installation of flat signs on poles is of course very undesirable on account of necessity for mounting boards on the poles at considerable expense and their greater exposure to damage from being thrown and shot at. I consider it highly desirable to place these

own information, the idea being that his tests will probably be sufficient and do away with necessity for specifications other than those included in the contract, with the understanding that we are to obtain an actual comparison as to cost.

It is understood, subject to your approval, that freight charges will be borne by this Company as with other bond dealers; that we will furnish outfit train and take care of boarding; that we will furnish necessary pump and hand cars, that we will move camps and stock cars from point to point and material from several storage points within territory covered. In other words, that we will take care of all expenses which would be the same, whether pin type or cast weld bonds were used. The Electric Railway Improvement Company is to take care of all labor.

The Electric Ry. Imp. Co. now has one bonding outfit stored at Three Forks and the time which we allow them for bond installation will decide as to whether it will be necessary for them to provide a second outfit if contract is entered into. Mr. Howatt seems to think his Company would prefer to do the work with one outfit. This of course will increase the cost to this Company, inasmuch as our investment and superintendence would be increased in proportion. I have given him the average number of bonds we are now installing per day with one crew and told him that it is desirable that we be able to approximate the same rate with his bonds.

In connection with the type of bond to be used, we now have 80# rail with 100 per cent joint from East Portal to West switch at Bryson, and from about West switch at Henderson to Drexel. The remainder of rail between Drexel and East Portal is 85#. I understand from Mr. Barrett that it is possible that this 85# rail will be replaced with 80# by the time this work is taken up, if postponed until next Spring. I presume this is a matter of conjecture, and if so, type of bond used would have to be adjusted to type of rail at the time the work was started.

Mr. Howatt stated he would like to undertake the installation of about 10,000 bonds, and the number involved in the territory mentioned is about 11,000. I have concluded from his conversation that his reason for

Sheet #2--C.A.G.--8/27/15
Danger Signs.

signs on poles adjacent to all road crossings and some well used farm crossings, at intervals between such points on our Right of Way, on poles around railroad stations and on private right of way, also at certain points around substation buildings.

As soon as you advise your decision in this matter, I will make out a requisition covering the material ordered, but would request that order for signs of one kind be placed at once.

Yours truly,

RB-WLS

Electrical Engineer.

cc--J.T.C.

August 27, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Following your letter of the 16th, I have just had a conference with Mr. Howatt of the Electric Railway Improvement Company, who incidentally has made a trip over the line to Avery and return.

In regard to proposed installation of Cast Weld bonds between Deer Lodge and Avery: In general I do not find that Mr. Howatt is any better prepared than he was before to make recommendations in regard to performance and economical maintenance of his bonds. In fact, in regard to maintenance, which I have always considered an important factor, he prefers to defer recommendations as to the number and style of maintenance outfits until he submits a form of contract. The experience in the New York Subway seems to have to do with bonding third rail with cast metal entirely, expansion joints at suitable intervals being fitted with flexible bonds. This particular installation of course has no bearing on our work.

Mr. Howatt is leaving today and will stop in Chicago on his way home to see you, and matters now stand as follows:

He will submit a form of contract to you with copy to me, covering the installation of his bonds between Brexel and East Portal. You will please advise him as to terms of payment, that is, how payments are to be made and the amount to be retained monthly, after completion of work or both. You will also advise him as to when work is to be started and completed. As regards this latter question, it would seem desirable to defer installation of bonds in the territory referred to until next Spring, in order to avoid the wear and tear due to steam traffic. On the other hand, this would not permit us to provide bond material so that the remainder of the work could be taken up at the same time and completed within the desired time.

It is understood that Mr. Howatt's proposition will include what he proposes in the way of tests for his

Sheet #3--C A G--8/27/15
Rail Bonds.

asking for a small quantity only is that there is still
in his mind possibility of further development work.

I trust that the above will meet with your ap-
proval.

Yours truly,

EB-WLS

Electrical Engineer.

Butte, Mont., Aug. 27, 1915.

Mr. F. N. Webster,
Right of Way Agt.,
Butte, Montana.

Dear Sir:

There is a small telephone line paralleling our Right of Way fence, and according to Right of Way maps, on our Right of Way or very close to it, and passes under our Transmission line twice at South Butte Yard.

This line is owned by James Welch, 42328 South Montana Street, and goes to his quarry.

In view of the dangerous condition now existing, the line should be moved. Mr. Lillewitz in Mr. Barrett's office states that the owner has no permission for locating this line on our Right of Way, though it follows a highway which is used, but marked temporary on the Right of Way map.

Will you please, therefore, investigate this matter thoroughly, and if consistent, take steps to have the line removed from the Right of Way, and do away with the two crossings.

Yours truly,

FB-VLS

Electrical Engineer.

August 28, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

The following comments and criticisms are submitted relative to Circular of the Bureau of Standards No. 54, as issued by the Department of Commerce regarding the proposed National Electric Safety Code.

Page #10, second paragraph:

The difficulty is that there will be a great diversity of opinion as to what constitutes "serious danger". Usually I would not care to leave this to the class of men who are provided as wiring inspectors. I believe where wiring inspector finds cases of "serious danger" and his finding is not in accord with the views of the owner or proper operating official of the plant in question, that there should be some higher authority to whom appeal can be made from what appears to be an injustice and non-essential.

Page #15, paragraph #10:

This would probably mean the licensing of all operators and this immediately suggests unionizing. However, it is difficult to call this to the attention of the Government in any way without the Government inferring that we are trying to avoid unions. This no doubt the Government would consider as none of its affair.

Page #20, "103 (b):

Passage ways, if purely mechanical, and if there is no danger in coming in contact with live parts or wires, should be permitted to have clearances less than stated.

The arched openings under our Motor-generators foundations are about 6 ft. 5 inches high, but there is absolutely no danger to the man passing through them since there are no live parts or wires with which he could come in contact.

Page 421, 110 (b):

There is serious discussion at the present time relative to some of the A.I.E.E. standardization rules and it does not appear that these rules may be strictly applied at the present time without considerable discussion.

Page 423, 114:

Strictly interpreted, our switchboard does not comply with this section, as to clearances, but it is designed according to the best practice of the General Electric Company switchboard engineers. The matter in this section would be more properly discussed by the manufacturers of switchboard equipment.

Page 425, 124 (a):

It is presumed that this does not apply to commutators.

Page 427, 141:

Our transformer location and building construction conforms, except that the room is not sub-divided by fire resistive walls, which would be impracticable with our layout.

As regards the drainage of oil to the outside of the building, this is taken care of in our layout by the transformer oil tank storage tanks therein, both of which tanks are below floor level. The two oil storage tanks provided in each station are of sufficient capacity to hold the oil required for one transformer. The storage tanks are directly connected to the transformer tanks by means of pipe controlled by globe valves, so that by opening the valve, the oil can be drawn directly into the tanks; the storage tanks being connected by means of pipes with valve controls, and midway between them is a sump consisting of an 8 inch pipe which furnishes an air vent so that the transformer tank can be emptied. In case of fire in a transformer, the fire would be at the top of the oil and by drawing the oil down into the tanks, the fire would of course be smothered and extinguished.

Page 433, 161:

There arises the question as to what constitutes an explosive-proof case.

In regard to Rules for Overhead and Underground Lines, part #2, I wish to call attention to the following points:

Rule #210, Page #44:

(a) It is not practicable to so locate our transmission, trolley and feeder lines so that if one over-turns it cannot touch the other, this of course on account of Right of Way limits, and I presume would not be criticised on this account.

Rule #211:

(a) While this rule may not apply, our supplementary negative is located above feeder, signal and power limiting wires, and our transmission ground wire above transmission conductors.

Rule #213, Page #46:

(a) It would seem that instead of specifying definite weights for wires of any description, it would be better to specify factors of safety with loaded conditions governed by conditions common to locality under consideration.

(b) The assumed loading of poles or towers dependent upon wind and ice assumed for poles or towers and wires, is open to discussion and governed to a large extent by local conditions. The figures given for poles are generally accepted.

(c) The requirements for cross arm pins supporting conductors between dead-end points would seem unreasonable in the case of our heavy feeders.

(d) The wind pressure on wires is referred to under Section "b" and in this connection our transmission line is calculated on the basis of 3 1/2 lbs. of wind with 1/2" of ice at 0 degrees Fahrenheit temperature, and following the experience of the Montana Power Company and our further investigations, the assumed conditions seem amply safe.

(e) With the exception of cross arm pins referred to above, our factors of safety are higher than those tabulated.

(f) It might be well to specify a method for determining reduction in factor of safety of wood poles and cross arms.

Rule #270, Page #48:

On account of encountering cuts, fills, rock cliffs, boulders and other inequalities on our Right of Way and on private property, there has naturally been much discussion as to minimum clearances for wires of various circuits, and we have naturally been governed by local conditions in fixing such minimum clearances. It would seem impossible to tabulate definite clearances as they should be governed to a certain extent by accessibility, location of the point in question as regards to veiled ways or localities and fenced Right of Way then protected by suitable danger signs. Our construction in general will comply with the tabulated figures, though in certain localities our feed and transmission wires provide less clearance than shown at points between highways and road crossings. At all crossings over highways and farm crossings, however, we provide more clearance than is required.

Rules #281, #282 and #283, Pages #49 and #50:

Without further explanation, it is hard to see why additional clearance between wires would be required for span over 100 ft., provided the proper factors of safety are applied to supporting structures and conductor wires involved. It would seem well to inquire into the reason for establishing certain clearances up to and including 40,000 volts and increased such clearances for higher voltages.

Rule #284, page #53:

(e) Our ground wires on poles are covered with wood moulding which is generally considered ample protection. You will note rule calls for such wires to be enclosed in suitable insulating conduit.

Rule #285, Page #54:

(b) Clearances required over buildings refer particularly to interference with firemen. Local conditions may require clearances less than shown over certain of our own buildings, or facilities, and no doubt it is intended that this rule is to be used together with good judgment and the actual conditions in hand.

Sheet #
8/28/15--Comments on Safety Rules.

Rule #242, Page #55:

(a) This requires that guy wires, through our transmission poles, be grounded if carried within 8 ft. of ground. We of course have provided no ground other than that provided by six ft. anchor rod and this would certainly seem ample.

(b) This requires that all span wires have insulators inserted between them and trolley contact wire and that strand insulator be inserted in span wire supported by wood poles carrying conductors of different voltage from trolley wire. If the above construction of this section is correct, our method of supporting catenary construction on spans and brackets throughout the entire country does not conform, in that the trolley wire is electrically connected to the span wire through the messenger and hangers and the only insulation provided is strain insulator cutting span wire. Our trolley poles of course carry signal and power limiting wires and possibly in some cases telephone wires, and the requirement covered by paragraph "b" would seem absolutely unnecessary provided suitable strain insulation is used in span wires.

(c) The guy wires which we have been and are now installing are six ft. long.

Rule #250, Page #56:

It is fair to assume that it will not be necessary to mark poles or structures on Company Right of Way so as to identify ownership.

Rule #253, Page #57:

As you know, some of our hardware is not galvanized. This, however, is not an actual requirement.

Rule #254, Page #57:

The horizontal space between our power limit wires carrying 1200 volts East of Deer Lodge is 29 inches. The distance between our feeders which are of the same polarity and carry 3,000 volts east of Deer Lodge is 29 inches and west of Deer Lodge 30 inches. You will note that the rule calls for 40 inches between live conductors carrying over 750 volts. Our spacing agrees with best practice in this part of the country and the change to thirty inches west of Deer Lodge was made on account of proposed laws for the State of Idaho.

The t #
8/28/15--Comments on Safety Rules.

While the rules as given are somewhat modified by notes on rules for electric supply and signal lines, pages 107 and following, I think it possible to take up such points as I have mentioned, and get away as far as possible from tabulating specific values for various requirements which are so materially affected by local conditions, rather than covering the subject by definite factors of safety, and allowing more freedom towards the adoption of perfectly good construction suited to the conditions in each case.

Yours truly,

EE-WLS

Electrical Engineer.

Dutrie, M. et al., Aug. 28, 1915.

R. Wende, Inopr.,
Three Forks.

Dear Sir:

Confirming conversation in regard to proposed change in alignment of curves between Bruno and Lennep, Engineer Munsen advises he will have engineers place center stakes for future location of tracks on all of these curves within the next few days.

In view of the fact that we are limited in bracket length, it will be necessary for you to have Waplosky locate poles at such points in regard to the center stakes so as to avoid future trouble with bracket lengths.

Please see that he takes care of this matter, even if it is necessary to go back a short distance on the work.

Yours truly,

REW-wls

Assistant Engineer.

August 28, 1915.

Mr. H. A. Gallwey, Gen'l Mgr.,
Butte, Anaconda & Pacific Ry.,
Anaconda, Montana.

Dear Sir:

Again referring to detailed costs on B A & P electrification work, about which you wrote me a short time since, I did not originally understand this matter.

You are probably not aware of the fact that I have never furnished Mr. Hebgen or others such costs. In fact, the matter was practically bonded long before the completion of the work, and on account of the fact that the accounts and records were divided up between the forces of Mr. Halloran, Mr. McCarvel and myself, if such a statement was worked up, it would require a long time and co-operation on the part of all concerned.

I have certain rough figures which may be of some advice to you, but it would be impossible for me to furnish actual detailed costs.

I am very sorry that I did not understand just what you wanted earlier, as I could have advised you much sooner as to the facts.

Yours truly,

REW-7LS

August 28, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

I wish to call to your attention the desirability of having any proposed change in elevation of rail on curves west of Deer Lodge made before trolley work is built.

We should be in a position to take up trolley work west of Deer Lodge by November, and arrangements should be made to have rail elevation changes made previous to that time. It is of course of equal importance to have necessary track alignment and surfacing done at the same time.

If you see fit, will you please take these matters up with the proper authorities and have them advise us to what will be done in the matter.

Yours truly,

RB-WLS

Electrical Engineer.

August 28, 1915.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

There are two telephone wires belonging to the Pederson Creek Telephone Company, controlled by Mr. J. H. Meyers at Deer Lodge which cross our tracks at Deer Lodge Yard.

Mr. Meyers claims to have been on the ground before the Railway Company, and that it is up to us to take care of necessary changes in order to insure safe conditions.

Will you please arrange to have these wires put up overhead and other work of similar nature is done.

Yours truly,

RB-7LS

Electrical Engineer.

cc--G.F.S.

August 23, 1915.

Mr. F. E. Willard, Supt.,
Missoula, Montana.

Dear Sir:

Following my letter to you of July 20th and yours to me of the 23rd in regard to providing our Inspectors with permits making their transportation good on freight trains on your Division, I am surprised to see the letter from you to our General Inspector, Mr. G. F. Soule returning his transportation and that of G. R. Strong and three men, stating that it is not necessary to have these passes made good on freight trains as passenger trains stop at nearly every station on the line.

The nature of the work done by these two men is such that they must have the privilege of using freight trains for getting over the road as they have been doing on the F. E. Division. We cannot afford to lose the time involved in waiting for passenger trains.

Will you please advise if you prefer to make the card issued good for such transportation, or issue special permits for these two men, and oblige.

Yours truly,

RB-WLS

Electrical Engineer.

August 31, 1915.

Mr. F. J. Taylor, Div. Engr.,
Northern Pacific Railway,
Livingston, Montana.

Dear Sir:

Following your request of the 30th I
am sending you today duplicate set of blue prints
showing locations of anchors on your Right of Way
at various points between Three Forks and Deer
Lodge.

Yours very truly,

RB-TLS

Electrical Engineer.

August 31, 1915.

Mr. C. A. Goodnow,
Asst to the President,
Chicago, Illinois.

Dear Sir:

Herewith please find voucher favor
the B.A. & P. Railway Company covering settle-
ment of two accidents which happened to their
men while working on joint work.

You will notice that they settled
with the wife of the man who was electrocuted
for \$3380.00.

Yours truly,

FAC-WLS

Electrical Engineer.

Butte, Mont., Aug. 31, 1915.

Mr. E. Murray,
Asst Engr B & B.,
Miles City, Mont.

Dear Sir:

Will you please have instructions issued to any of your employes which are liable to have occasion to disturb rail bonds, to use special care so as not to injure bonds, and to replace them as originally installed.

These bonds are very expensive and in addition it is very essential that they be kept in first class condition.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., August 31, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

I understand that some section men are not using proper care in connection with track bonds when replacing ties and working around track, and that two bonds at Lombard have been replaced on account of being struck by spiking maul.

In view of the cost of these bonds, will you please have instructions issued to all section foremen to see to it that special care is used in working around them. Our bond inspector, Mr. Vandeville will, and I believe has been, pointing out to the foremen the necessity for using such care.

Yours truly,

RB-WLS

Electrical Engineer.

Butte, Mont., Aug. 31, 1915.

Mr. J. J. Murphy, Supt.,
Three Forks, Mont.

Dear Sir:

Referring to letter by Roadmaster Fitzgerald of August 26th addressed to you, in regard to changes to be made in track rail at Lombard, will say that my idea was to have arrangements made, if possible, to have all track changes of whatever nature made ahead of the bonding crews, so that they could clean up their work as they go along.

Of course the changing of rail prohibits completion of bonding just as much as if the joints only were to be changed.

Yours truly,

RB-VLS

Electrical Engineer.

Butte, Mont., Aug: 31, 1915.

Mr. G. F. Soule, Insp.,
Deer Lodge, Mont.

Dear Sir:

Mr. McEwen of the Telegraph Department reports necessity of acquiring right of way for pole line and telegraph line at Haskell, and that this position is similar to the one at Kohse.

Please advise at once just what is needed to be built on if air line is necessary, its width and length, and on which side of the track, so that we can arrange with Mr. Webster to secure rights.

In this connection it would be well to look ahead in this respect, so that we can secure the rights as far ahead of the work as possible and advise the Telegraph Department to clean up the work ahead of ours if possible.

Your truly,

BCH-wls

Assistant Engineer.

cc--F.N.Webster

Butte, Mont., Aug. 31, 1915.

Mr. C. F. Soule, Inspr.,
Deer Lodge, Mont.

Dear Sir:

Mr. McEwen of the Telegraph Department reports necessity of acquiring right of way for a alley or here and telegraph line at Haskell, and that this condition is similar to the one at Kohler.

Please advise at once just what is needed and how well an if strip of land is necessary, its width or length, and on which side of the track, so that we can arrange with Mr. Webster to secure rights.

In this connection it would be well to look ahead in this respect, so that we can secure the rights as far ahead of the work as possible and advise the Telegraph Department to clean up the work ahead of ours if possible.

Yours truly,

RES-wls

Assistant Engineer.

cc--F. N. Webster

August 31, 1915.

Dr. John Erickson,
Head Department Physics,
University of Minnesota,
Minneapolis, Minn.

Dear Sir:

We have three small glass plates for which we are very anxious to get the approximate specific inductive capacity. Knowing that you have excellent standard condensers and other apparatus necessary, and since you have the nearest laboratory so equipped, I would like to find out if you can have this done for us.

Your kindness will be greatly appreciated.

Yours respectfully,

EBV-wls

4511 State Sav. Bk. Bldg.

Butte, Montana.
August 31, 1915.

Mr. C. S. Cooper,
Gen'l Dist. Baggage Agt.,
Spokane, Washington.

Dear Sir:

I have from our Locating Engineer, Mr. F. R. Nicholas, copy of your No. 1341 tracer, addressed to Mr. G. H. Nobles in connection with loss of level box, tripod and level rod, loaded on Train No. 18 at Clinton, Sunday, July 25th for Deer Lodge.

Will you please advise if you have discovered anything in connection with this loss.

Yours truly,

RE-WLS

Electrical Engineer.

August 31, 1915.

Mr. W. F. McIntyre,
Mountain States Tel. & Tel. Co.,
Helena, Montana.

Dear Sir:

Though you may have heard of it through some of your people, I wish to call your attention to the fact that our transmission line between Morel and Gold Creek will not be built.

This of course will not affect your crossing with our trolley construction, but may possibly modify your plans to a slight degree with regard to your crossings.

Yours very truly,

RB-WLS

Electrical Engineer.

August 31, 1915.

The Deer Lodge Elec. Lt. Co.,
Deer Lodge, Montana.

Dear Sir:

Referring to your wires which cross our tracks at Milwaukee Avenue at Deer Lodge and which our Mr. F. R. Nicholas spoke to you about sometime since, the Mountain States Tel. & Tel. Co., as you probably know, have started to change their wires at this crossing.

I understand that their work cannot be carried further until your wires have been changed.

Will you please get in touch with the local Manager of the Telephone Company, and if convenient, arrange so that their work can proceed.

Yours truly,

RB-WLS

Electrical Engineer.

August 31, 1916.

The Montana Power Co.,
Butte, Montana.

Dear Sirs:

In connection with replacement of O.B. X-strain insulators with those furnished by the Locke Company at trolley and messenger dead-ends between Three Forks and some point west, this work being done by Foreman Anderson and finishing crew, we wish to get at the cost of this replacement.

While you may not have separate records on this work, your Foreman no doubt can give a good fair estimate of the labor cost for replacing such insulators, differentiating if necessary between different locations of such insulators and at the same time giving the quantity of each kind replaced.

Will you please take this matter up and advise at your early convenience and oblige.

Yours truly,

RB-NLS

Electrical Engineer.