I. C. C. Docket No. 17021

C. M. & St. P. Ry.
Exhibit No. 66

Witness:

I. C. C. Docket No. 17021

INVESTIGATION OF THE CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY COMPANY

REPLY TO A LETTER DATED OCTOBER 5, 1917, FROM FORMER DIRECTOR PROUTY OF THE BUREAU OF VALUATION OF THE INTERSTATE COMMERCE COMMISSION, REQUESTING INFORMATION IN CONNECTION WITH THE CONSTRUCTION OF THE PUGET SOUND EXTENSION OF THE CHICAGO, MILWAUKEE AND ST. PAUL RAILWAY

(COPY)

INTERSTATE COMMERCE COMMISSION
Division of Valuation

Washington, Oct. 5, 1917.

Mr. C. F. Loweth,
Chief Engineer and Chairman Valuation Committee,
Chicago, Milwaukee & St. Paul Railway Co.,
Chicago, Illinois.

Dear Sir:-

We are enclosing herewith for your information a blue print showing what our accountants have ascertained as the recorded expenditures to December 31, 1912, incurred in constructing the Puget Sound Extension of the Chicago, Milwaukee & St. Paul Railway Company. The amounts shown do not include the cost of land or equipment, neither do they include charges for interest, discount, or commissions. Should you care to have these figures verified, the schedules prepared by our accountants in compiling the blue print data may be of some service and can be made available to you.

In view of the size and importance of this extension we desire to know certain details of its construction program and therefore ask that you kindly advise us regarding the following:

a. The dates the reconnoissance, preliminary and location surveys were begun and completed, and the maximum number of parties at any time engaged on each.

b. The general characteristics of the work, how it was contracted for, the limits of the sections for which different contracts were let, with names of contractors, and any work of unusual difficulty in each section.

c. The names of the different points from which grading was undertaken, with dates of beginning work, the direction in which grading progressed from each point and general nature of work encountered.

d. The dates of beginning and completion of other construction undertaken at points ahead of the grading.

e. Was it the policy to hasten the opening of the road by building standard timber trestles at points of heavy construction, postponing the building of embankment or erection of permanent structure until after the road was opened for operation?

f. The general specifications to which the track was built, as size of ties and number per mile, weight of rail, tie plates, kind and depth of ballast, etc.

g. The points from which tracklaying was undertaken with the dates of beginning work and direction in which tracklaying progressed from each point.

h. What work was done by company forces?

i. How was construction material delivered to the various sections?

j. When were the various sections opened for operation?

k. What original construction was uncompleted when the whole line was opened August 1, 1909?

l. What of such uncompleted work was done after the line was opened for operation?

m. What did the reconstruction of purchased lines consist of?

n. How much was paid for contingencies, the nature of such payments and to whom paid?

o. What was actually expended for general expenditures Accounts 71-77, exclusive of interest during construction, and what was expended on that account?

p. What branch lines were started after August 1, 1909, and dates of beginning work and when opened for operation?

q. How did the extension acquire its equipment?

r. Was it new or second hand, and if new was it built by the Milwaukee or by Equipment companies?

Thanking you for this information which we hope to receive at an early date.

Truly yours,
(sgd) C. A. Prouty,
Director.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY COMPANY

Office of Assistant to President

CHICAGO, July 9th, 1920

Mr. C. A. Prouty,
Director, Bureau of Valuation,
Interstate Commerce Commission,
Washington, D. C.

Dear Sir:-

I am enclosing herewith a forty-four page booklet in reply to the questions in connection with the construction of the Puget Sound Lines of this Company contained in your letter of October 5th, 1917 to Mr. C. F. Loweth.

A copy is being sent to Mr. R. A. Thompson today.

Yours truly,

(Signed) W. W. K. Sparrow,

Assistant to President

QUESTION "A"

THE DATES RECONNAISSANCE, PRELIMINARY AND LOCATION SURVEYS WERE BEGUN AND COMPLETED AND THE MAXIMUM NUMBER OF PARTIES ENGAGED AT ANY ONE TIME ON EACH.

MAIN LINE DATA

Reconnaissance was begun Nov. 1901. Completed Jan. 1907.
Maximum number of parties at any one time, 20.
Total miles of route explored, 8510.
Preliminary surveys were begun Oct. 1905. Completed Mch. 1907
Maximum number of parties at any one time, 50.
Total miles of route surveyed, 5260.
Location surveys were begun Nov. 1905. Completed July, 1907
Maximum number of parties at any one time, 50.
Total miles location, 2790.

EXPLANATORY STATEMENT

The brief statement above does not adequately set forth an idea of the magnitude of the operations necessary to select the adopted route or of the extent of the territory examined. It was one of the largest engineering forces ever organized for the purpose of locating and constructing railroad. The outline that follows shows the general extent of the territory and the principal routes surveyed between the existing terminals in South Dakota and the Pacific Coast.

CALIFORNIA ROUTE

The first explorations contemplated a line from some Missouri River point to some point on the Pacific Coast in California. Chamberlain and Evarts both in South Dakota on the Missouri River and termini of C. M. & St. P. lines were used as starting points while Eureka and San Francisco were the coast objectives selected. These four points mark the corners of a rectangle approximately 125 miles north and south and 1500 miles east and west. During the years 1879-80 and 1901-02 extensive explorations were made within these limits connecting each of the two eastern points with each of the two western points. This work occupied the time of one party with a military escort in 1879-80 and of one party about 3 months in 1901 and of two parties about 8 months each in 1902. In 1903 Portland, Oregon was considered as a Coast point and a reconnaissance was made connecting this point with the net work of explorations previously made. The total mileage covered in this extensive examination of country was approximately 3500 miles. The information thus gained formed the basis of an intelligent comparison of routes when in 1904 and 1905 explorations were made which resulted in the selection of the ports of

Seattle and Tacoma and the fertile undeveloped country traversed by a route further north then those leading to the more southerly ports.

Only a small amount of the mileage of this work is included in the summaries given below under the heading Puget Sound Route.

PUGET SOUND ROUTE

In April 1904, the Company began an investigation that resulted in acquiring terminal facilities at Seattle and Tacoma, Wash. Butte, Mont. was selected as one objective on the proposed line. The route between these points was to be selected after surveys disclosed the most advantageous location. The general route necessitated crossing three principal ranges of mountains, the Rockies, the Bitter Roots and the Cascades. These physical features divided in a general way, the territory to be examined and surveyed as follows:-

TERRITORIES

1st: Missouri River to summit of Rocky Mountains.
2nd: Summit of Rocky Mountains to Summit of Bitter Root Mountains.
3rd: Summit of Bitter Roots to Columbia River.
4th: Columbia River over Cascade Range to Seattle and Tacoma.

The principal routes, and the physical features in each of the above territories follows:-

MISSOURI RIVER TO VICINITY OF BUTTE, MONTANA

The route follows closely, the 46th degree, parallel of latitude. Between Missouri River and Miles City the country is rough and rolling, and necessitated many surveys. From Miles City to Harlowton the Valleys afforded the best route, which required less preliminary and reconnaissance work. Between Harlowton and Lombard the Montana Railway occupied the best route. This advantage of location was utilized when the Montana Railway was reconstructed and subsequently purchased. Only one general route was considered between Lombard and Butte, which was restricted to valley approaches to the summit of the Rockies. This field work summarized as follows:-

Miles-Reconnaissance	Miles-Preliminary	Miles-Located	Miles-Constructed
2600	2160	1140	718

Reconnaissance was begun in Nov. 1901. Completed May 1906.
Maximum number of parties at one time, six.

Preliminary surveys were begun Oct. 1905, Completed Apr. 1907.
Maximum number of parties at one time, fourteen.
Location surveys were begun Dec. 1905, Completed April 1907.
Maximum number of parties at one time, twenty.

BUTTE TO SUMMIT OF BITTER ROOT MOUNTAINS

To find a suitable route over the Bitter Root range, required the exploration of all passes on the divide for a distance of 180 miles south of the adopted line. The most southerly pass being the Nez Perce, at head-waters of the Bitter Root River. Between this pass and St. Paul pass on the north, various routes were explored between the summit and Bitter Root River Valley. The principal ones being; Lost Horse pass, Fish Creek, Lolo pass, Fish Lake, Cedar Creek. The adopted, or St. Paul pass, route east from the summit is in the valleys of the St. Regis, Missoula, Hellgate and Deer Lodge Rivers. The field work is summarized as follows:-

ROUTE	Miles Reconnaissance	Miles Preliminary	Miles Located	Miles Constructed
1. Adopted Line Butte, Missoula, St.Paul Pass	430	743	613	230
2. Iron Mt. Cedar Creek-Wisdom Gulch	175	150	2	
3. Fish Lake Rivulet	125	15	3	
4. Missoula Lolo Pass	50	86	4	
5. Grantdale - Lost Horse Pass	85	-	-	
6. Anaconda - Nez Perce Pass	175	-	-	
Total	1040	994	622	230

Reconnaissance was begun Nov. 1904. Completed June 1907
Maximum number of parties at one time, 8.
Preliminary surveys were begun Dec. 1905. Completed June 1907.
Maximum number of parties at one time, 12.
Location surveys were begun Aug. 1906. Completed July 1907.
Maximum number of parties at one time, 12.

SUMMIT OF BITTER ROOTS TO COLUMBIA RIVER

Three general routes were considered. The most northerly one bring the adopted line. The southerly route, via Nez Perce Pass, Clearwater River, Snake River to Columbia River. An intermediate route; Fish Lake to Palouse River; west to Priest Rapids. There were variations and alternatives of these; the more important routes are listed below;

No. 1 Adopted Line. St. Paul Pass - Tekoa to Beverly.
a - Widdom Gulch, So. Fork St. Joe River to Avery.
b - St. Maries, via St. Maries River, Hangman's Cr. to Tekoa.
c - Miscellaneous Reconnaissance routes viz:

Garfield - Castleton	35 miles
Tekoa - Spangle - Colville Lake, Hillcrest	80 "
Tekoa - La Vesta Lake	40 "
Slate - Couer D'Alene - Pine City	25 "
Ritzville - 3rd Coulee - Coletta	80 "
Priest Rapids - Columbia River	40 "
	300 "

No. 2. Fish Lake - No. Fork, Clearwater, Palouse River, Colfax to Revere.
a - Palouse River, Garfield, Marengo - Ritzville, - Vulcan.
b - Palouse City - Colfax - Cow Creek to Lind.

No. 3. Nez Perce Pass, via Selway Fork, Clearwater river, Snake River to Lewiston and Pasco.
a - Lost Horse Pass via Moose Creek to Selway Fork.
b - Wallula, Pasco, Relief, North along Columbia to Beverly,
c - Lolo Pass, via Lochsa Fork to Kooskia on Snake River.
d - Fish Lake Pass - Southeast via No. Fork, Clearwater, to Orofino on Snake River route to Lewiston.

These three general routes summarized as follows:-

ROUTE	Miles Reconnaissance	Miles Preliminary	Miles Location	Miles Constr'd.
No. 1 North route, adopted line	965	1152	571	275
No. 2 Intermediate route; Palouse River	375	103	-	
No. 3 Southerly route; Snake River	1090	190	185	
Total -	2430	1445	756	275

Reconnaissance was begun April 1904. Completed Jan. 1907.
Maximum number of parties at one time, 7.
Preliminary surveys were begun Oct. 1905, Completed Jan. 1907.
Maximum number of parties at one time, 9.
Location surveys were begun Dec. 1905, Completed March 1907.
Maximum number of parties at one time, 20.

COLUMBIA RIVER TO COAST

Five routes through passes in the Cascades and one general route along Columbia River to Portland were examined; Outlined as follows:-

1st. Adopted Line Columbia River, via Johnson Creek, Yakima River Snoqualmie Pass, Cedar River to Maple Valley.

2nd. Pasco, North Yakima, via Natches River and Pass, White and Greenwater Rivers to Buckley and Auburn.

3rd. North Yakima, via Natches River, Bumping River, Carlton pass, Cowlitz River to Morton.

4th. Natches River via Rattlesnake Creek, Cowlitz pass, Cowlitz River to Morton.

5th. North Yakima, via Atanum River, Cispus pass, Cispus River to Morton.

6th. Pasco & Wallula along Columbia River to Portland.

a - Portland, Kelso via. Cowlitz River, Morton to Tacoma.
b - The Dalles, via. Klickitat River to Cispus Pass.

The above are summarized, as follows:-

ROUTES	Miles Reconnaissance	Miles Preliminary	Miles Located	Miles Constr'd
1. Adopted Line. Snoqualmie Pass Maple Valley	220	455	236	133
2. Pasco - No. Yakima, Natches Pass - Auburn	725	149	37	-
3. North Yakima - Carlton Pass - Morton	70	-	-	
4. Natches River - Cowlitz Pass - Morton	125	-	-	
5. North Yakima Cispus Pass - Morton	350	-	-	
6. Pasco - Columbia River, Portland - Tacoma	950	60	-	
Total	2440	664	273	133

Reconnaissance was begun April 1904 - Completed Jan. 1907.
Maximum number of parties at one time, 7.
Preliminary surveys were begun Oct. 1905 - Completed Mch. 1907.
Maximum number of parties at one time, 20.
Location surveys were begun Oct. 1905 - Completed July 1907.
Maximum number of parties at one time, 20.

SUMMARY

The surveys necessary to produce the 1356 miles of main line constructed are summarized as follows:-

Total Miles		Ratio - Survey Miles to Miles built
Reconnaissance	8510 Approx.	6.1 to one.
Preliminary	5263 "	3.9 " "
Location	2791 "	2.1 " "

Period of Puget Sound surveys Nov. 1901 to July 1907 - 5½ years
" " Continuous " April 1904 to July 1907 - 3¼ "

In addition to foregoing data for main line, appended is a tabulation of surveys for some of the branch lines constructed in this territory, aggregating 950 miles.

CONCLUSION

These surveys were largely through an undeveloped country, settled only along the principal streams. An unusual amount of pioneering was required of the engineering parties. They traversed vast regions of timbered wilderness in the mountains, stretches of uninhabited desert, encountered many difficulties and endured many hardships to produce the final adopted lines.

The figures given above are taken from reports and the mileage for each class would be greatly increased if the various short trial explorations and surveys shown in the daily notes were collected and added to the totals.

STATEMENT SHOWING EXPLORATIONS & SURVEYS FOR
VARIOUS BRANCH LINES, WEST OF MOBRIDGE.

BRANCH LINE		VALUATION SECTION NO.	MILES BUILT	RECONNAISSANCE BEGUN	RECONNAISSANCE FINISHED	RECONNAISSANCE MILES	INSTRUMENTAL SURVEYS BEGUN	INSTRUMENTAL SURVEYS FINISHED	INSTRUMENTAL SURVEYS MILES PRELIM.	INSTRUMENTAL SURVEYS MILES LOCT'N.	TOTAL MILES
MOREAU	*	SD-2	62	3-1909	3-1909	15	3-1909	4-1909	195	87	282
CHEYENNE	*	SD-3	106	3-1909	3-1909	150	3-1909	7-1909	170	130	300
NEW ENGLAND		SD-4 ND-2	133	5-1909	5-1909	150	5-1909	9-1909	150	150	300
GRASS RANGE		M-6	36	10-1909	12-1909	75	1-1910	4-1910	90	88	178
ROY & WINIFRED		M-7	66	5-1910	6-1912	100	6-1910	10-1912	130	92	222
GREAT FALLS		M-8	137	3-1910	4-1910	400	5-1910	5-1912	500	417	917
ST. MARIES	*	I-3-3A	72	3-1907	11-1908	270	7-1907	7-1909	266	224	490
PLUMMER-SPOKANE	*	I-8-W2 & 3	22	10-1908	11-1911	300	12-1909	5-1912	650	60	710
COUER D'ALENE		I-4-W-6	26	11-1908	11-1911	102	12-1908	2-1912	123	41	164
WARDEN-MARCELLUS		W-7	47	12-1908	3-1909	150	10-1909	3-1910	93	200	293
TIFLIS-HEPPEL		W-7-A	16	12-1908	3-1909	40	6-1911	8-1911	42	40	82
HANFORD	*	W-8	46	10-1907	1-1909	175	12-1908	3-1912	200	95	295
EVERETT		W-9	55	3-1906	5-1909	200	14-1909	4-1910	100	125	225
ENUMCLAW		W-10	16	6-1907	8-1907	80	4-1908	12-1909	89	31	120
McKENNA-GATE		W-11	34	12-1907	8-1908	140	5-1908	5-1909	124	66	190
WILLAPA HARBOR		PS & WH-W-1	66	8-1910	6-1913	161	3-1913	8-1913	120	100	220

Note:- Lines marked * Benefitted from Reconnaissance for Main Line.

QUESTION "B"

THE GENERAL CHARACTERISTICS OF THE WORK, HOW IT WAS CONTRACTED FOR, THE LIMITS OF THE SECTIONS FOR WHICH DIFFERENT CONTRACTS WERE LET WITH THE NAMES OF THE CONTRACTORS & ANY WORK OF UNUSUAL DIFFICULTY IN EACH SECTION.

The present constructed line crosses the Missouri River at Mobridge, S.D. and thence runs in a general westerly direction through the Western parts of the South Dakota and North Dakota to a crossing of the Little Missouri River near Marmarth, N.D. The territory encountered was a rolling prairie practically uninhabited except for a few scattered settlers and Indians living along the creeks and waterways.

From the North-Dakota-Montana State Line just west of Marmarth, the constructed line follows the Valleys of Sandstone and O'Fallen Creeks to a point five miles east of Terry, Montana where it enters the Valley of the Yellowstone River. This is followed to Forsythe, Mont. whence the line ascends the divide and crosses into the Valley of the Musselshell near Melstone. This last named river is followed and crossed numerous times from this point to Harlowton, Mont. From this point the reconstructed line of the Montana R.R. ascends the Musselshell to its headwaters, crosses the Little Belt Mountain Divide and descends through Sixteen Mile Canyon to the Missouri River at Lombard. The line crosses the Missouri at this point, follows the valley to the mouths of the Jefferson, Madison and Gallatin Rivers near Three Forks, thence up the Jefferson River, Valley to Piedmont. Here the line ascends the eastern slope of the Rocky Mountains crosses the divide through Pipestone Pass Tunnel near Donald, and descends the western slope to Butte.

From Butte westward, the line descends Silver Bow Creek parallel to the B. A. & P. Ry. and Northern Pacific Ry. for about six miles then enters Silver Bow Canyon which is followed to Finlen. After leaving Finlen the line follows Deer Lodge Valley for about fourteen miles to the junction of the Deer Lodge and Blackfoot Creeks near Garrison, whence it follows the Hellgate River to Bonner. From Bonner the line follows the Missoula River Valley to St. Regis, thence ascends the eastern slope of Bitter Root Mountains and crosses the divide through St. Paul Pass Tunnel into the State of Idaho.

After leaving St. Paul Pass Tunnel, the line descends the western slope of the Bitter Roots to the north fork of the St. Joe River, which it follows to Avery. From here the line follows the St. Joe River to Ramsdell then crosses Lake Benwall, and ascends the eastern slope of the Coeur d'Alene Mountains. The summit is crossed through Watts Tunnel, whence the line descends the western slope into eastern Washington, traversing the rolling hilly - semi-mountainous territory to a crossing of the Columbia River near Beverly. From this point the line ascends the east slope of the Saddle Mountains, crosses the summit near Boyleston and descends the western slope to Kittitas. From here the line follows the Yakima Valley to Cle Elum, from which point the ascent of the eastern slope of the Cascade Mountains is begun. The Summit is crossed between

Keechelus and Rockdale through Snoqualmie Pass Tunnel and the foot of the western slope is reached at Cedar Falls. From Cedar Falls to the junction with the C. & P. S. Ry. at Maple Valley, the line follows the Cedar River Valley.

Between Maple Valley and Seattle the C.M.& P.S.Ry. operates over the tracks of the C. & P.S. Ry. under a 99 year lease with the latter Company. The Tacoma line of the C.M.& P.S.Ry. leaves the above line at Black River Junction and runs south and west to Tacoma.

The clearing, grubbing, grading, tunneling, timber bridge and culvert work, track laying by force acc't. handling of stores and supplies for the entire Puget Sound Extension excepting, for the Snoqualmie Tunnel and for dredging and dock work at Coast Terminals and a few other instances, was let to three general contracting firms on the basis of cost plus percentage. The contract for the territory from Glenham, S.D. to Butte, Mont. was let to McIntosh Brothers of Milwaukee, Wisc., for the territory between Cliff Junction (on the B. A. & P. Ry., Now Pinlen) Montana and Avery, Idaho, to Winston Bros., of St. Paul & Minneapolis, Minn. and for the territory between Avery, Idaho and Seattle to H. C. Henry of Seattle. The above contractors sub-let their work to smaller contractors. All contracts let by the general contractors were let on competitive bids, subject to the approval of the Chief Engineer, and adequate bonds were required from each firm to whom work was awarded. The work was thoroughly advertised over the entire country and all contractors desiring to bid were taken over the line by the Engineers in order that they might familiarize themselves with the conditions under which the work was to be performed.

The construction work on Coast Terminals, Seattle and Tacoma was not included in the general contract let to H. C. Henry, but wascovered by contracts let direct by the Company to individual contractors or done by company forces.

In October 1906, a contract was let to Nelson Bennett, of Tacoma, for driving of St. Paul Pass Tunnel. This contract was later cancelled on account of inability of contractor to finance the work and new contract let to Winston Bros. dated April 1st, 1907.

On the section between Glenham, S.D. and Butte, Montana several very difficult pieces of construction work were encountered. The first and by far the most difficult of these was the Missouri River Crossing at Mobridge, S.D. This structure with its deep foundations, sunk by the pneumatic caisson process, required a long time in building, which fact necessitated the bridging of the river with a temporary structure in order that contractor's equipment and construction materials could be transported to the western bank. During the construction of the permanent bridge, this temporary structure was completely destroyed by ice and high water on three different occasions entailing considerable loss in time and money. Between Mahto and McLaughlin, S.D. it was necessary to build a temporary line 5.62 miles long known as the "Cashmere or Cottonwood Creek Line" on account of some very heavy work on the located line which the contractors were unable to complete until heavy equipment necessary to that work could be transported by rail to that point.

At the beginning of construction operations the section through the two Dakotas was devoid of settlement, roads, or supplies of any kind. As grading operations started almost simultaneously at various points on the line, all contractors' equipment and supplies had to be transported by team from the nearest railroads, necessitating the building of miles of wagon road and innumerable bridges. The average team haul on equipment and supplies on this section was about 100 miles. These conditions combined with the scarcity of and difficulty of obtaining water and fuel, and the utter absence of sustenance for men or animals in the territory made this a very difficult section.

Destructive floods on the creeks and rivers of Eastern and Central Montana during grading operations washed away many miles of partially completed embankment causing considerable loss to both Railway Company and the contractors.

Other difficult features encountered on this section are twelve (12) tunnels totaling 6482 feet in length, located between Harlowton and Butte, Mont., nearly all of which were driven through solid rock.

On the section between Butte and Avery, destructive floods occurred in the Hellgate and Missoula River Valleys during construction carrying away contractors equipment and construction material of all kinds and destroying many miles of nearly completed roadbed. Between Butte and Avery there are 24 tunnels totaling 23018 feet in length, the longest and by far the most difficult of these being the St. Paul Pass Tunnel 8774 feet long. This tunnel could not be shoo-flied and had to be built at first. Considerable trouble was experienced in the driving of the Garrison Tunnel near Garrison, Montana occasioned by the striking of a large pocket of disintegrated rock.

Construction work through the Bitter Root Mountains presented many unusual difficulties. The country was virgin forest, unsurveyed with no existing trails or roads. In order that contractors' equipment and supplies could be transported to the work, it was necessary to build a wagon road through this forest and over the mountains. It extended from Taft, Montana to St. Joe, Idaho, and was approximately sixty miles in length. It was built on a force account basis, and its construction and maintenance cost the Railway Company in excess of $335,000.00.

In order to get construction material over the mountain to the west portal of St. Paul Tunnel, (Pass) a five ton electrically driven cable tramway was built between the east portal and the summit. This was about 5000 feet long and was built of native hewn timber.

During the Summer of 1910 a very disastrous and destructive forest fire occurred in the Bitter Root Mountains in the course of which about forty miles of newly constructed line was so badly damaged that it had to be practically rebuilt.

Construction work between Avery, Idaho and the coast presented many difficult features. On some sections of the line the transportation problem was especially serious. This is particularly true of the section through eastern Idaho, and of that part of the line in Washington between Lind and Ellensburg, and between Easton and Cedar Falls through the Cascades. Material and supplies used on the western slope of the Bitter Roots in Eastern Idaho were either transported over the mountains by means of the tramway at St. Paul Pass or teamed in over the Taft-St. Joe wagon road. This road as a rule was located considerably above or below the roadbed and equipment, material and supplies were either carried by men to the work, or hoisted or lowered by block and tackle when it was impossible to handle them otherwise. Between Lind and Ellensburg inaccessibility of the line, in-so-far as other railroads were concerned, made long team hauls necessary. Very poor roads existed in this section and the railway company was forced to build and maintain many miles of wagon road during the construction period. The section through the Cascade Mountains was characterized by this same lack of adequate wagon roads. The territory was a wilderness ofvirgin forest and before camps could be located or equipment and supplies brought in a wagon road had to be constructed. This road extended from Sallal on the N.P. Ry. to the summit of the Cascades near the present town of Laconia. The topography was very rough, clearing very heavy and the road crossed the north fork of the Snoqualmie River many times. Its maintenance was especially difficult and expensive due to the heavy snow fall during the Winter months.

Other notable construction features on the section between Avery, Idaho and Seattle, Wash. are the 12 tunnels aggregating 20972 feet in length. The longest of these is the Snoqualmie Pass Tunnel through the Cascades, 11,890 feet in length. It was built after the line was opened to operation.

Work along the Cedar River Valley through the Seattle City water shed was both expensive and difficult. The work was done under the supervision of a sanitary engineer and a corps of assistants. Special plans were followed out in the construction of the camps to provide for the sanitation and for the disposal of sewerage.

Another notable feature of this section is the Columbia River Bridge near Beverly, Wash., a job made especially difficult owing to the lack of transportation facilities, the swiftness of the river current and the high winds prevailing in that locality.

QUESTION "C"

THE NAMES OF THE DIFFERENT POINTS FROM WHICH GRADING WAS UNDERTAKEN WITH DATES OF BEGINNING WORK, THE DIRECTION IN WHICH GRADING PROGRESSED FROM EACH POINT, & GENERAL NATURE OF THE WORK ENCOUNTERED.

Construction work on the Puget Sound Lines was let to three general contractors, McIntosh Bros. of Milwaukee, Wisconsin, Winston Bros. of Minneapolis and St. Paul, Minnesota and H. C. Henry of Seattle, Washington. McIntosh Bros. handled the construction work between Glenham South Dakota and Butte, Montana, the work being done under three general contracts as follows:- Glenham, South Dakota, west to South Dakota state line contract dated December 23, 1905; South Dakota State Line to Harlowton Montana contract dated December 27, 1905; and Lombard to Butte contract dated July 30, 1906. The reconstruction of the Montana Railroad between Harlowton and Lombard, Montana was handled by McIntosh Bros. under a general contract dated October 31, 1906. Winston Bros. handled the construction between Butte, Montana and Avery, Idaho, the work being done under two general contracts as follows:- Finlen to Avery, Idaho, exclusive of that portion of the line between Garrison, and Missoula Montana, contract dated February 19, 1907; and Garrison to Missoula, dated February 19, 1907. Work between Avery, Idaho and Seattle and Tacoma, Washington was handled by H. C. Henry under the following two general contracts; - Avery, Idaho to Idaho-Washington State Line, contract dated February 1, 1907; and Idaho-Washington State Line to Seattle and Tacoma, contract dated March 31, 1906.

Grading operations began at points on each of the above mentioned sections most accessible to the stations on existing carriers' lines and generally progressed either way from these points. Construction was expedited as much as possible, but the beginning of some work was delayed because of the inability to secure right of way quickly, or to allow more investigations as to final location. Also, because of the large number of contractors engaged on this work and on other construction work in the northwest at this time, some ofthe work on the more difficult portions, from a contractor's standpoint, could not be contracted for quickly.

Work began on that part of the line between Evarts and McLaughlin, South Dakota in April 1906 and on the remainder of the section between McLaughlin and the Little Missouri River Crossing near Marmarth, North Dakota in March 1907. Contractors' outfits and supplies came in over the C.M.& St.P. Ry. to Evarts, South Dakota and over the N.P. Ry. to Dickenson, North Dakota from which points they were teamed to the work. This territory was principally prairie country, unsettled, devoid of roads, with an utter lack of supplies of sustence for men or animals. The materials encountered in grading included common earth, hardpan, gumbo, shale, loose and solid rock, earth work being the predominating classification.

Grading operations between the North Dakota-Montana State Line and Harlowton, Mont. began in May 1906 and work was well under way on this entire section by the first of September 1906. Contractors on the line as far west as the first crossing of the Yellowstone about five miles west of Terry, Mont. were teamed in from Fallon, Mont. on the N. P. Ry. Between Terry and Forsyth, outfits were hauled in or ferried from points on the N.P. Ry. which parallels the constructed line between these points. Outfits on the line between Forsyth and Harlowton were teamed in from Forsyth and Billings on the N. P. Ry. and from Harlowton on the Montana R.R. The line in general, follows the valleys or water-courses on this section. Many of these valleys were settled, in many instances under irrigation, and in a high state of cultivation. Common earthwork, gumbo, hardpan, loose and solid rock were all encountered on this section, the larger cuts as a rule being loose or solid rock. Much riprapping, many channel changes, and the construction of numerous wing dams were necessary along the rivers.

Between Harlowton and Lombard, Mont. the present line occupies the location of the old Montana R.R. Between 1906 and 1910, on which date its ownership passed to the C.M.& P.S.Ry., the line was relocated and reconstructed to adopt it to the standards of construction required by the latter company. Contractors engaged on this work came in over the existing line. The reconstruction involved much heavy work, the country being mountainous and rocky. In some places the old line and the revised line had the same alignment and in such cases it was necessary to construct temporary tracks to take care of the unusually heavy traffic which developed from the great volume of construction work in progress. Numerous crossings of Sixteen Mile Creek occur thru the canyon of the same name which the line occupies and several channel changes were made to avoid others. Eight tunnels varying between 160 and 380 feet in length occur between Fanalulu and Lombard, a distance of 30 miles. The material encountered on the reconstruction work consisted largely of solid rock.

Grading operations between Lombard and Butte began in October, 1906, and were well under way over the entire section by the Spring of 1907. Materials, supplies and equipment were hauled in from Lombard, Three Forks, Jefferson Island, Whitehall and Butte on the N. P. Ry. The work from Lombard to Piedmont, located at the foot of the continental divide was relatively light, except that between Lombard and Three Forks and thru the Jefferson River Canyon. Classification was largely loose and solid rock. From Piedmont west over the Continental Divide the work was unusually heavy. The rough and mountainous character of the country increased the difficulties of construction and necessitated the construction of numerous long steel viaducts and the drilling of four tunnels. The materials encountered were largely disintegrated granite and solid rock, the latter being exceptionally hard and difficult to handle.

The work between Butte, Mont. and Avery, Idaho was done during two periods. That between Butte and Finlen was done in 1912-13, prior to which time the C. M. & P. S. Ry. operated over the tracks of the E. A. & P. Ry. The work between Finlen and Avery was done between 1907 and 1909, grading operations beginning in the spring of 1907. Between Butte and Haugan, Montana contractors came in over existing railroads, which as a rule were in

close proximity to the located line, and were either teamed or ferried to the work. From the point where the line leaves the St. Regis River Valley near Saltese to the St. Paul Pass Tunnel, the country was virgin forest with no trails or roads and it was necessary to build wagon roads at heavy expense before outfits could be teamed in. Contractors outfits and supplies used on the west slope of the Bitter Roots were delivered at Taft, Montana whence they were teamed over the Taft-St. Joe wagon road to points near the line. Material handled by the contractors in this section was variant in the different valleys traversed. Heavy rock work characterized the construction through the Silver Bow Canyon. The work here involved many difficult features due to the narrowness of the Canyon and the proximity of two existing railroads. Work through the Deer Lodge Valley was characterized by heavy side hill development involving heavy cuts and fills. Common excavation predominated here, with a small percentage of classified material. In the deep cuts along the Hellgate River a large amount of solid rock and other classified material was encountered. Conditions as to material in the Missoula River Valley up to Missoula were practically the same as in the Hellgate Valley. In the first twenty miles west of Missoula, the material handled was largely common earthwork. Considerable solid rock was encountered between this point and St. Regis, from whence to St. paul Pass Tunnel, solid rock was encountered almost exclusively. St. Paul Pass Tunnel, 8774' long, was driven through solid rock. The general characteristics of the twenty-one miles of line between St. Paul Pass and Avery are high steel Trestles crossing sidehill drainage, deep cuts and high embankments, and numerous tunnels. The material encountered was almost exclusively solid rock. There are a total of twenty four tunnels aggregating 23018 feet in length on this section, sixteen of which are located on the western slope of the Bitter Roots between St. Paul Pass and Avery.

Grading operations began in the State of Idaho in May 1907. On account of the mountainous character of the territory traversed by the new line, and due to its inaccessibility, it was necessary before getting contractors on the line to construct roads over which contractor's equipment and supplies could be transported. The principal road thus constructed was between St. Joe, Idaho and Taft, Montana. Outfits on the line between Avery and St. Joe were teamed in from Taft, Montana over the Taft-St. Joe wagon road. Contractors on the line between St. Joe and Pedee were teamed from Taft, Montana to St. Joe and then rafted down the river, or were unloaded at points on the O. W. R. & N. Ry. near the river and transported by boat to the work. On the line between Pedee and the Idaho-Washington State Line outfits came in over the O. W. R. &N. Ry. to points nearest the line whence they were teamed to the work. The roads and trails used for this purpose were constructed, and maintained during the construction period, at the expense of the railway company. The grading work along the St. Joe River between St. Joe and Ramsdell was exceptionally heavy, solid rock being the predominating Classification. Work between Ramsdell and the State Line was steep side-hill development, characterized by high trestles crossing side-hill drainage, deep cuts and high embankments. The material encountered was largely solid rock.

Grading operations began on the line in the State of Washington in the Spring and Summer of 1906. Between the state line and Rosalia contractor's outfits came in from Rosalia on the N.P., and from Colfax on the O. W. R. & N. This territory was fairly well settled and fair roads were in existence. Considerable improvement and maintenance were necessary, however, to permit of the hauling of heavy loads. For the line from Rosalia to Lind, contractors came in from Rosalia on the N.P. and O. W. R. & N. and from Cheney, Sprague, Ritzville, and Lind on the N. P. Between Lind and the Columbia River, contractors came in from Lind, Washtucna, Holton, Connell, and Pasco on the N. P. Between the Columbia River and Ellensburg contractors came in from Yakima and Ellensburg on the N. P. Long team haul over poor roads characterized the transportation of outfits and supplies in this territory. Many miles of wagon road were built and maintained throughout the construction period by the railway company. The rivers were utilized for transportation purposes as much as possible and many outfits were brought in by boat or ferry.

Contractors on the line between Ellensburg and the summit of the Cascades came in from Ellensburg, Cle-Elum and Easton on the N.P. and between the summit and Cedar Falls from North Bend on the N.P. Transportation between Ellensburg and Easton presented no unusual difficulties, but between Easton and Cedar Falls through the Cascade Mts., it was both difficult and expensive. No roads were in existence and many miles of wagon road were built through dense forests.

Through the semi-mountainous country between the Idaho-Washington State Line and the Columbia River the materials encountered in grading included common earthwork, cemented gravel, hardpan, loose rock, and solid rock; earthwork, hardpan and solid rock being encountered in about equal proportions. Between the Columbia River and Kittitas which includes the section over the Saddle Mts., hardpan, loose rock and solid rock were encountered, the latter predominating. Through the Yakima Valley between Kittitas and Murdock relatively light work was encountered, but between Murdock and Cle Elum the work was much heavier, considerable solid rock, hardpan, and cemented gravel being encountered. The Cascade Mt. range is crossed between Cle Elum and Cedar Falls and the work here was characterized by heavy side hill development, high trestles over deep mountain gorges deep cuts and high fills. Extraordinarily heavy rock work characterized this entire section.

From Cedar Falls to the junction with the C. & P. S. Ry. at Maple Valley the line follows the Cedar River Valley. Contractors came in from Kenaskat and Barnston on the N. P., and from Maple Valley on the C.& P.S. Ry. This section lies in the Seattle City watershed and extra precautions had to be taken to avoid pollution of the streams. The work was done under the supervision of a sanitary engineer and a corps of assistants. Special plans were followed out in the construction of the camps and roadbed to provide for sanitation and for the disposal of sewerage etc. The work on this section was moderately light although some heavy work was encountered. Classification included common earthwork, hardpan, cemented gravel, loose and solid rock.

Between Maple Valley and Seattle the C.M.& St.P.Ry. operates over the tracks of the Pacific Coast Ry. (Formerly C. & P. S. Ry.) under a 99 year lease with the latter company. The Tacoma line of the C.M.& St.P. Ry. leaves the above line at Black River Junction and runs south and west to Tacoma. Work on this section began in May 1906. Contractors came in from Kent, Auburn, and Sumner. In general the line traverses a valley which is to a certain extent boggy and soft. Good side borrow in sufficient quantities to finish the embankments could not be found in many cases. Consequently the embankments were made low and narrow and were later completed with train hauled material.

TACOMA LOCAL TERMINALS

All of the grading on the Tacoma Local Terminals for that part of the line between Tacoma Junction and Pacific Ave. was done by the Railway Company forces. The material was largely hardpan although some solid rock was encountered. The land between K and G Streets was very swampy.

TACOMA SOUND TERMINALS

The fills for the yards at the Tacoma Sound Terminals was largely made from material obtained in dredging the waterways to the docks and wharves. Substantial bulk heads with riprap and brush were placed to prevent washouts during the filling. Entrance to these terminals was originally obtained on a long pile trestle which has since been filled and the line double tracked.

Many of the industrial spurs to the mills, etc. in these terminals were built across land that had been previously filled with slabs and sawdust, making the construction of the trestles unusually expensive.

SEATTLE TERMINALS

About the same conditions held true in the seattle terminals as in the Tacoma Sound Terminals, although with the exception that a large amount of the property in the Seattle Terminals lies close to the city water front while that in Tacoma is in a more outlying district. It was necessary to dredge and place a large amount of material in the Seattle Terminals as much of the adjacent property which is now improved was not improved at the time of construction. Numerous complications in the way of street, water and railway crossings occurred in these terminals, which added materially to the delay and expense of the work.

QUESTION "D"

THE DATES OF BEGINNING & COMPLETION OF OTHER CONSTRUCTION UNDERTAKEN AT POINTS AHEAD OF THE GRADING.

The following comprise the more important structures.

		Yr. Begun	Yr. Completed
Missouri River Bridge	Mobridge, So. Dak.	1906	1908
Little Mo. River Bridge	Marmarth, No. Dak.	1906	1908
3 Yellowstone River Bridges	Terry, Tusler, & Miles City, Mont.	1906	1907-8
Tongue River Xing	Miles City, Mont.	1906	1908
12 Musselshell River Xings	Melstone Mont. to Harlowton, Montana	1906-7	1908-9
8 Tunnels	On Montana R.R. betw. Harlowton & Lombard, Mont.	1907	1908
Missouri River Bridge	Lombard, Mont.	1906	1907-8
3 Jefferson River Xings	Three Forks to Piedmont, Mont.	1906	1907-8
Pipestone Pass. Tunnel	Donald, Mont.	1906	1908
Fish Creek, Spring Creek & Black Tail Creek Viaducts	Piedmont to Butte, Mont.	1907	1908
4 Tunnels	Lombard to Butte, Mont,	1907	1908
6 Hellgate River Xings	Garrison to Missoula, Mont.	1907	1908
4 Missoula River Xings	Missoula to Mont. Ida. St. Line	1907	1908
7 Tunnels	Garrison to " " " "	1907	1908-9
St. Paul Pass. Tunnel	Mont. - Idaho	1906	1909
19 Tunnels	State of Idaho	1907-8	1908-9
Kelly Creek Viaduct	Adair, Idaho	1907	1908
Bear Creek Viaduct	Falcon, Idaho	1907	1908
ClearCreek Viaduct	" "	1907	1909
St. Joe River Xing	St. Joe, Idaho	1907	1908
Chatcolet Viaduct	Peedee, Idaho	1907	1908
Peedee Viaduct	" "	1907	1908
Tekoa Viaduct	Tekoa, Wash.	1907	1908
8 Tunnels	State of Washington	1907	1909
Pine Creek Viaduct	Palisade, Wash.	1907	1908
Cow Creek, Viaduct	Hillcrest, Wash.	1907	1908
Columbia River Xing	Beverly "	1906	1909
Yakima River Xing #1	Thorp "	1907	1908
" " " #2	Cle Elum "	1907	1907
" " " #3	" " "	1907	1907
" " " #4	Easton "	1907	1908
" " " #5	" "	1907	1908
Cedar " " #1	Cedar Falls "	1907	1908
" " " #2	Trude "	1907	1908
" " " #3	Landsburg "	1907	1908
" " " #4	Noble "	1907	1908
" " " #5	" "	1907	1908
" " " #6	Maple Valley "	1907	1908

In addition to the above, all pile and timber bridges, timber culverts, pipe culverts, many concrete culverts, and numerous steel bridges with permanent substructures were built ahead of, or contemporaneous with, the grading.

QUESTION "E"

WAS IT THE POLICY TO HASTEN THE OPENING OF THE ROAD BY BUILDING STANDARD TIMBER TRESTLES AT POINTS OF HEAVY CONSTRUCTION, POSTPONING THE BUILDING OF EMBANKMENT OR ERECTION OF PERMANENT STRUCTURES UNTIL AFTER THE ROAD WAS OPENED FOR OPERATION?

Yes. Many timber trestles were built by the contractors and by company forces during the early construction period. The most notable of these are the high timber structures which were built through the Rocky, Bitter-Root, and Cascade Mts. Most of these have since been either filled or replaced with permanent structures. Considerable of this work was done during the latter part of the construction period, before the line was opened to operation.

QUESTION "F"

THE GENERAL SPECIFICATIONS TO WHICH THE TRACK WAS BUILT, AS TO SIZE OF TIES & NUMBER PER MILE, WEIGHT OF RAIL, TIE PLATES, KIND & DEPTH OF BALLAST, ETC.

Track was built to true standard gauge on tangents, and on curves over six degrees widened 1/8 of an inch for each additional degree of curvature up to 10°.

On main track 6"x8"x8' and 7"x9"x8' ties were laid 18 to a 33' rail, except on curves of 4° and up to 8° when 20 ties per 33' rail were used. On all curves over 8°, 22 ties per 33' rail were used. Selected ties were used at joints.

Tie plates were used on all soft ties on main track, and on curves from 3° to 6° M-S (Milwaukee Std. for 85# rail, 7/16 in. thick) tie plates, and on curves over 6° M-SS (Milw. std. for 85# rail 1/2 in. thick) tie plates were used.

On bridges no tie plates were used on tangents or on curves under 3°/ On curves 3° or over tie plates were usedas on roadbed. Tie plates have since been placed on nearly all bridges and curves.

Common angle bars and patent rail joints were used in laying track, except that common angle bars only were used on track over open deck bridges.

When track was laid on oak ties, rail braces were used on curves of 4° or over. On 4° to 12° curves, 3 to 7 pairs of braces were used per rail length.

New 85#, 33 ft. steel rail was laid for the entire main line with 75# and 65# rerolled steel for sidings and yard tracks. This was full spiked in all cases except on heavy curves which were double spiked, switches were laid as per standard plans. Roberts Bros. tracklaying machines were used on all but a very small portion of the line.

Ballast was obtained from gravel pits at intervals as closely adjacent to the main line as possible. The entire line was ballasted with gravel to the standard depth of 18 inches. the only exceptions being a few instances where lime rock and disintegrated granite were used.

QUESTION "G"

THE POINTS FROM WHICH TRACK LAYING WAS UNDERTAKEN WITH THE DATES OF BEGINNING WORK & DIRECTION IN WHICH TRACK LAYING PROGRESSED FROM EACH POINT.

From Glenham, South Dakota west via temporary line to Cashmere, (about two miles east of McLaughlin) beginning in September, 1906.

From Cashmere, South Dakota west to Ismay, Mont. beginning in July, 1907.

From Cato, Mont. (about 4 miles east of Terry) east to Ismay, Mont. beginning in May 1907; and west to Tusler, Mont. beginning in August, 1907.

From Harlowton, Mont. east to Tusler, Mont. beginning in May, 1907.

From Lombard, Mont. east to Harlowton the Montana Railroad was reconstructed and relaid with heavy rail 1907 and 1908.

From Lombard, west to Piedmont, Mont. beginning in April, 1908.

From Piedmont, west to Donald, Mont. beginning in September, 1907.

From Butte, Mont. east to Donald, beginning in December, 1906.

From Butte, to Finlen, Mont. rail was laid in 1913, (account operating via B. A. & P. Ry. 1909-1913.)

From Finlen, west to Garrison, Mont. beginning in August, 1908.

From Garrison, (material from Finlen Yard,) west to Missoula Mont. beginning in February, 1909.

From Huson, Mont. east to Missoula, beginning in October, 1908; and west to St. Regis, Mont. beginning in September, 1908.

From Haugan, Mont. east to St. Regis, beginning in October, 1908; and west to Kelley Creek viaduct, (about 5 miles west of Montana-Idaho State Line) beginning in October, 1908.

From Plummer, Idaho, east to Kelley Creek viaduct beginning in April 1908; and from Plummer, west to Sorrento, Idaho, beginning in July, 1908.

From Lind, Wash. east to Sorrento, beginning in May, 1908; and from Lind west to Columbia River (1 mile west of Beverly, Wash.) beginning March, 1908.

From Columbia River (material from Lind Yard) west to tunnel No. 45, one mile east of Boylston, Wash. beginning in February, 1909.

From Murdock, Wash. east to tunnel No. 45, one mile east of Boylston, beginning in February, 1908; and west to Ragnar, Wash. (via Snoqualmie High Line), beginning in July, 1908.

From Maple Valley, Wash. (material from Seattle Yard) east to Ragnar, beginning in October, 1907.

From Seattle, via Black River Jct. to Maple Valley. C.M.& St. P. operates over the C. & P. S. Ry. under agreement.

From Black River Jct. (material from Seattle Yard) west to Tacoma beginning in August, 1908.

QUESTION "H"

WHAT WORK WAS DONE BY COMPANY FORCES?

The general contract between the Railway Company and McIntosh Bros. covering the territory between Glenham, So. Dak. and Butte, Mont. provided that the contractor should do all clearing, grubbing, grading, framing and placing of timber in pile or wooden bridges and culverts, placing culvert pipe, tunneling and tracklaying and surfacing. The railway company was to furnish all material for pile and timber bridges, wooden and pipe culverts, steel and iron in bridges, all track material and tools and appliances necessary for erection of structures and for tracklaying. The above program was following quite closely on this section. In addition to constructing all permanent bridges of steel and concrete, the Railway Company constructed all concrete culverts, concrete dams and spillways, concrete reservoirs, snow fences and snow sheds, crossings and signs, station and roadway buildings; fuel and water stations, shop and engine houses, storage warehouses, signals and interlockers, telegraph and telephone lines, and miscellaneous structures. All concrete lining in tunnels on this section was placed by Company forces. Between Piedmont, Montana and Butte, eighteen (18) large timber trestles were built and later filled by Company Forces.

The contract between Winston Bros. and the Railway Company covering the territory between Cliff Junction, Montana and Avery, Idaho was similar to the one covering the construction work east of Butte, but provided further that the contractor should construct all buildings, water and fuel stations, and do all other work that the Railway Company elected to have done. This latter part of the contract relaying to buildings and similar structures was not carried out by the contractor, for the Railway Company took over this part of the work and carried it out with its own forces. In addition the Railway Company constructed all concrete culverts, both sub-and superstructure of all permanent bridges, except the sub-structures of the bridges between Garrison and Missoula, Mont. which were built by the contractor. Practically all of the concrete tunnel lining on this section was placed by Company Forces.

The construction work between Avery, Idaho and Seattle and Tacoma was covered by the contract similar to the one covering the section between Butte and Avery, H. C. Henry was the general contractor. All clearing, grubbing, grading, tunneling with the exception of the Snoqualmie Pass Tunnel, timber bridge and culvert work and the track laying and surfacing were done by the contractor. The Railway Company built all concrete culverts and bridges, the sub and superstructure af all permanent bridges, except the substructure of the Columbia River bridge which was built by contract, placed about 50 per cent of the concrete tunnel lining, and built the Snoqualmie Pass Tunnel.

In addition to the above a large amount of construction work over the entire line has been done by Company Forces, both prior to and subsequent to the opening of the line to operations. Work of this nature is as follows:- Bank widening, day-lighting cuts, raising sags and lowering cuts,

changing alignment to conform with original plans, riprapping, bridge filling removing slides and dangerous rock, station ground filling and parking, grading of yards and terminals, ballasting of the roadbed, construction of right of way fences, snow fences and snow sheds, crossing and signs, station and roadway buildings, water and fuel stations, shops and engine houses, storage warehouses, wharves and docks, signal and interlockers, telegraph and telephone lines and miscellaneous structures.

All track laying except that done by railway company forces was done by the general contractors on a force account basis.

QUESTION "I"

HOW WAS CONSTRUCTION MATERIAL DELIVERED TO THE VARIOUS SECTIONS?

On the section between Mobridge, So. Dak. and the Little Missouri River Crossing near Marmarth, No. Dak. construction materials were hauled in from material yards located near Glenham, and later at Mobridge, ferried across the Missouri River and thence teamed to points on the line. Considerable material was also hauled from Dickenson, No.Dak. on the N. P. Ry.

Cato, Montana on the N. P. Ry. near the present station of Terry served as a distributing point for that part of the line from the Little Mo. River Crossing near Marmarth, No. Dak. to the first crossing of the Yellowstone River, about five miles west of Terry. Between this point and Forsyth, Mont. materials were delivered to various points on the N.P.Ry. which parallels the constructed line between these two points, and either hauled or ferried to points where needed.

Forsyth on the N. P. Ry. served as a distributing point for territory between that point and Melstone, Mont. Materials for use on the line between Melstone and Harlowton came in over the N. P. Ry. to Billings whence they were teamed to the work.

Materials and supplies used in the reconstruction of the Montana Railroad Between Harlowton and Lombard were shipped in overforeign roads to points on the Montana R.R. and transported over that line to points where needed.

Lombard, Three Forks, Jefferson Island, Whitehall and Butte, all on the N. P. Ry. served as distributing points for the line between Lombard and Butte.

Between Butte and Haugan, Montana the close proximity of other railroads was a great help in getting construction material to the work. Material was shipped to points nearest the located line and team hauled or ferried to the job.

Construction material used between Haugan, Montana and St. Joe Idaho was shipped to Taft, Mont. over the N. P. Ry., thence team-hauled over the Taft-St. Joe wagon road to points near the located Line. Material used on the western slope of the Bitter Root Mts. was transported from the eastern portal of the St. Paul Pass Tunnel to the summit by means of the tramway which had been built for this purpose.

On the line between St.Joe Idaho and Pedse, material was teamed from Taft, Mont. to St. Joe and thence rafted down the river, or was brought in by rail over the O. W. R. & N. Ry. to points near the river whence it was transported by boat or raft to the work. Between Pedse and the Ida.Wash. State Line material was unloaded at points on the OWRAN Ry. nearest the located line and hailed by team to the job. The roads and trails used for this

purpose were constructed and maintained during the construction period at the expense of the Railway Company.

Construction material for use on the line between the Ida-Wash. State Line and Rosalia was shipped to Tekoa on the O.W.R.& N.Ry. and Rosalia on the N.P.Ry. and thence teamed to the work. Fair roads were in existence in this territory, but considerable improvement and maintenance by the Railway Company was necessary to permit of the hauling of heavy loads. Branch Roads from the main highways to the camps were built where necessary.

The transportation problem between Rosalia and Ellensburg presented many difficulties as existing railroadswere not, as a rule in close proximity to the located line. Rosalia, Lind and Ellensburg on the N.P.Ry. and St. John on the O.W.R. & N. Ry. were used as bases for supplies. Long team haul over poor roads having steep grades, or transportation by boat or ferry was the rule. Many miles of wagon road were built and maintained by the Railway Company during the construction period in this section. Construction material for the Columbia River bridge was unloaded at Vulcan on the G. N. Ry. from whence it was transported by boat to the job.

Between Ellensburg and Easton existing railroads were in close proximity to the line and team hauls were relatively short. Transportation between Easton and Cedar Falls thru the Cascade Mts. was a difficult problem. Material was delivered at Sallol on the N.P.Ry. whence it was team hauled over the Snoqualmie Wagon Road to points on the line. Heavy snow fall blocked this road many times during the winter months and much labor was required to keep it open. Between Cedar Falls and Maple Valley the N.P.Ry. was in close proximity to the located line and material was hauled from points on that line.

QUESTION "J"

WHEN WERE THE VARIOUS SECTIONS OPENED TO OPERATION?

From	To	Date	Class of Service
Mobridge, So. Dak.	Lemmon, So. Dak.	10- 6-07	Frt. and Mixed
Lemmon, " "	Hettinger, No. Dak.	10-27-07	" " "
Hettinger, " "	Bowman, " "	12- 1-07	" " Pass.
Bowman, " "	Marmarth, " "	1-12-08	" " "
Marmarth, No. Dak.	Terry, Mont.	2-15-08	Mixed
Terry, Mont.	Miles City, Mont.	3-15-08	Frt. and Pass.
Miles City, Mont.	Roundup, Mont.	3-15-08	" " "
Roundup, Mont.	Harlowton, Mont.	12-15-07	Mixed.
* Harlowton, Mont.	Lombard, Mont.		Montana R. R.
Lombard, Mont.	Butte, Mont.	8-30-08	Frt. and Pass.
Butte, Mont.			
Via. B. A. & P. Ry.	Finlen, Mont.	7- 4-09	Frt.
Finlen, Mont.	Avery, Idaho	7- 4-09	Frt.
Avery, Idaho	Malden, Wash.	7- 4-09	Frt. and Pass.
Malden, Wash.	Seattle & Tacoma	6-13-09	" " "

* Freight and Passenger Service when line was acquired on January 15, 1910.

The above dates are those of the establishment of the first revenue train operations.

Thru freight service from Mobridge to Seattle and Tacoma was inaugurated on July 4th, 1909.

Fast passenger service was inaugurated on June 28th, 1911.

Thru daily local passenger trains, one each way, were placed in operation on July 10, 1910.

QUESTION "K"

WHAT ORIGINAL CONSTRUCTION WAS UNCOMPLETED WHEN THE WHOLE LINE WAS OPENED AUG. 1, 1909?

See reply to Question "L" on Sheet 29.

QUESTION "L"

WHAT OF SUCH UNCOMPLETE WORK WAS DONE AFTER THE LINE WAS OPENED FOR OPERATION?

The following is a general outline of the classes of work started before operation began and completed after the line was opened.

Steel viaducts; bridges and concrete culverts; replacing temporary bridge structures with permanent and the necessary filling in connected with this operation; widening fills and daylighting cuts; raising and lowering embankments to original grade; ballasting; placing riprap in places where not economical or feasible to do so before track was laid; construction of Snoqualmie Tunnel; concrete tunnel lining; numerous line changes that were more favorably accomplished by Company forces after track was laid; completion and construction of numerous water supply stations as needed to complete original plans; permanent station structures taking the place of temporary buildings at different points the line; snow sheds and fences; right of way fencing.

QUESTION "M"

WHAT DID THE RECONSTRUCTION OF PURCHASED LINES CONSIST OF?

Early explorations in the territory between Harlowton and Lombard, Mont., disclosed that the most desirable and economical route between the above two points was already occupied by the Montana Railroad. Its location was such that it was impossible to build another line of railroad through the same territory, without practically rebuilding the entire line. Consequently the C. M. & P. S. Ry. Co., entered into an agreement with the Montana Railroad in December 1907, by which the latter company agreed to improve its line between Harlowton and Lombard and granted trackage right to the former Company for a period of 99 years. The reconstruction was carried out and on January 15, 1910, the Montana Railroad Company deeded its entire road and property lying between Lewistownand Lombard, Montana to the Chicago, Milwaukee & Puget Sound Co.

RECONSTRUCTION

There were a number of surveys made for the revision and betterment of the Montana Ry. previous to the adoption of the line as reconstructed. The topography of the country is such that it was necessary to contour the whole valley from Summit, west to Lombard to obtain a satisfactory location.

The Montana Railroad as originally constructed followed the natural ground line as closely as possible from Harlowton to Loweth, light grading and heavy curvature and gradients prevailing. From Loweth the line followed Sixteen Mile Creek down a narrow and box like Canyon to its mouth at Lombard. The reconstruction of this line consisted of lowering the gradients and decreasing the curvature and distance. In this connection it was necessary to abandon the old line of the Montana Ry. between Summit and Lombard except in a few instances where the same alignment was used. Numerous crossings of sixteen Mile Creek occur and several channel changes were made to avoid others. Eight tunnels varying in length from 160 to 380 feet occur in this Section.

The original culverts and bridges were of light construction and were all rebuilt to conform to the C. M. & P. S. standards. New 85# rail was laid in the main track and 65# and 75# rerolled rails on the sidings. On the heavy curves the 85# rail has been replaced with 90# rail. Eighteen inches of ballast was placed under the main line tracks.

Except when inaccessible and in isolated places the Right of Way fences, with the necessary crossing openings have been built. All cuts are protected with either portable or permanent snow fences.

New water supply stations of standard design have been built. Old depots section houses, engine houses, coal derricks, etc. have been torn down and replaced by new standard structures on the revised locations. New telegraph and telephone lines and equipment were necessary onthe entire line.

QUESTION "K"

HOW MUCH WAS PAID FOR CONTINGENCIES, THE NATURE OF SUCH PAYMENTS AND TO WHOM PAID?

NATURE OF CONTINGENCY	TO WHOM PAID	AMOUNT
Cedar River Washout	Company Forces	$140,000
Cedar River Sanitary District	Co.Forces & H. C. Henry	112,000
Cottonwood Creek "Shoo Fly"	Co.Forces & McIntosh Bros.	56,018
Pipestone Pass "Shoo Fly"	Co.Forces & McIntosh Bros.	44,204

CHANGES IN PLANS, ALIGNMENT, ETC.

General losses due to changes in plans of the Great Falls Passenger Station	Company Forces	Unknown
Change of Tracks at Butte Pass. Station	" "	"
Mile 12 W. of Mobridge, S.D. work abandoned	McIntosh Bros.	7,000
Cutting down grade at Dawson, Mont.	" "	750
Mile 80 E. near Door Lodge, Mont. Br. Location changed, loss of piling driven	" "	Unknown
Bridge change on Mile 5 near Missoula	Winston Bros.	320
Near Tarkio, Mont. Mile 51 abandoned work	" "	1,300
Near Dawson, Mont. Mile 9, cutting down grade	" "	750
Near Sinclair, Mont. Mile 86 Grade revision	" "	4,560
Revere, Wash. line changes	H. C. Henry	3,676
Near Corfu, Wash. line changes	"	Unknown
Near Bandera, Wash. line change	"	5,899
15 Miles E. of Avery, Ida. line change	"	7,100
Mile 28 betw. Taunton & Corfu, line change	"	19,072
Br. change EE 164, near Marengo, Wash.	"	1,700
Alberton, Mont. Plan change yard layout	Company Forces	700
Change in N.P. Ry. near Terry, Mont.	McIntosh Bros.	15,200
" " " " " Easton, Wash.	H. C. Henry	55,852
" " G.N. " at Great Falls, Mont.	McIntosh Bros.	2,500
" " O.W.R. & N.Ry. Plummer Jct. Ida.	H. C. Henry	5,670
Road change for State of Wash. along Lake Keechelus	"	10,000
Snoqualmie High line abandoned line	" & others	630,911
Change in Plans for erection Peedee Viaduct time & expense of men while change was being made	Company Forces	1,200
Temp. connection with the B.A.& P.Ry. abandoned	Winston Bros.& "	37,744
Temp. line near Lone Tree Mont.	" " " "	Unknown

DELAYS

General work train delays Trans.Mo. Division	Company Forces	1,503
For Right of Way at Primrose, Mont. Moving Matl. Trk.	" "	Unknown
" " " " " Pass. Station, Lewistown, Mont.	" "	
Delay due to shortage of labor.		

NATURE OF CONTINGENCY	TO WHOM PAID	AMOUNT
DUE TO SHORTAGE OF MATERIAL		
Butte freight house extension delayed 3 weeks	Company Forces	Unknown
" Passenger station delayed 8 days	" "	"
" Simmons Bldg. delayed 1 week	" "	"
" Freight house office delayed 1 week	" "	"
" Pass. Depot changing temporary heating plant	" "	"
Change in bridge & Culvert plans, due to abnormal conditions.	" "	"
Transportation of Contractors outfits from East on account of lack of outfits in West	" "	"
On Mile 27 West of Mobridge delays on a/c reorganisation.	McIntosh Bros.	4,900
LOSS & DELAY DUE TO FLOODS		
Cloudburst near Cohasset, Wash.	H. C. Henry	6,600
Floods in Yellowstone, Tongue & Musselshell Rivers caused damage to falsework on permanent bridges	Company Forces	Unknown
Washout of temporary structures on Musselshell River between Ryegate & Melstone, four pile drivers night & day - 2 weeks	Company Forces	Unknown
Loss of cement at Tunnel 46 - due to washout	" "	"
Cloudburst on O'Fallon Creek near Baker, Mont. caused loss of supplies, equipment stk. & washed out 12 miles of trk.	McIntosh Bros.	38,123
A washout at Bridge DD242 nr. Falcon, Idaho, caused damage	H. C. Henry	1,300
Washout near Sappington, Mont. caused damage	McIntosh Bros.	7,200
DELAYS DUE TO WEATHER CONDITIONS.		
Force account allowed during winter, 1907-8-9 in Cascades	H. C. Henry	Unknown
Transportation of material by train & wagon over the mountains for construction of track between Clear and Kelley Creek, Idaho	H. C. Henry	Unknown
Reconstruction on brick work Butte freight house due to cold weather	Company Forces and others	Unknown
WIND STORMS		
At Butte, Mont., caused damage on Passenger Station	do.	"
" " " " suspension of work at Simons Warehouse	do.	"
At Columbia River Bridge caused loss of time in const.	Bates & Rogers	"
INCREASED COST ON ACCOUNT OF NEARNESS TO OTHER RAILROADS		
Between Ellensburg & Easton, Wash. damages paid to N.P.Ry. & repairs to telegraph lines & protection of N.P.Ry. due to blasting	Co. Forces & N.P.Ry.	2,100
Mt. Big Bend, Mont. protection to N.P.Ry. trains	McIntosh Bros.	1,800
On Mile 28 nr. Ravina, Mont. Protection N.P.Ry. trains	"	650
" " 95 " DeBorgia, Mont. " " " "	"	220

NATURE OF CONTINGENCY.	TO WHOM PAID	AMOUNT
Equipment.		
From 1907-1912 Rental & repair paid the C.M.& St.P. for all equipment used on construction	C.M.& St.P.Ry.	Unknown
On Columbia River bridge tools stolen & lost	Bates & Rogers	"
FLOODS		
In the Hellgate Canyon caused damage loss	Co. Forces, Winston Bros. & others	409,804
On Musselshell River damage to Br. BB-240	Company Forces	5,400
" " " " " " BB-172	" "	9,400
" Jefferson River " " " CC-300	" "	9,500
" Trans Missouri Div. " "Culv.AA-444	" "	370
" " " " " " AA-336	" "	250
" Musselshell Division " " " BB-118	" "	370
" " " " " " BB-120	" "	150
" " River " " Br. BB-112	" "	125
" Missouri River " " " AA- 2	" "	55,000
At Marmarth a flood in the Little Missouri River caused loss of material and supplies	Contractors	Unknown
Between Miles 215 and 222 line abandoned on account high water	McIntosh Bros.	7,500
At Mile 287, Yellowstone Riv.Xing. 1 ton of dynamite used for protection.		300
At Mile 291 near Bonfield, Mont. material washed away		
Flood at Bridges BB-220 and BB-218 caused loss of false work and tools	Company Forces	Unknown
A washout at bridge EE-18 over St.Joe River, Idaho caused damage		750
Washouts on the West Slope of the Cascade added 30% to cost of Culverts.	Company Forces	Unknown
FIRES		
Prairie fires thru Dakotas & Mont. caused by Company forces; damages paid.	Property owners	Unknown
Fire fighting & protection againstfire in the forests not including the Bitter Root fire	Company Forces & others	12,000
Construction warehouse at Lind, Wash. destroyed by fire	" " " "	Unknown
Fire caused damage to Br. AA-2 during construction	" " " "	"
Forest fire in the Bitter Root Mountains caused loss to Company	" " " "	327,688
FOUNDATION DIFFICULTIES.		
Additional expense on a/c high water at Seattle on American Radiator Building	" " " "	3,000
Bow Creek Viaduct Foundation work very difficult	" " " "	Unknown
Columbia Riv. Br. " troubles on Pier #8	Bates & Rogers	"
Missouri Riv. Br.AA-2 " " " " #3	Company Forces	10,000

NATURE OF CONTINGENCY.	TO WHOM PAID	AMOUNT
HOSPITAL ASSOCIATION		
Milwaukee Hospital Association, Assistance rendered	Milw.Hosp.Assn.	Unknown
INSURANCE		
Industrial Insurance under the State of Wash. Compensation Act.	State Ind. Comn.	75,400
LOSS OF GRADING DUE TO OVERSHOOTING	Company Forces	8,700
CHANGING TELEPHONE, TELEGRAPH AND POWER LINES		
Mile 1 near Butte, moving telephone line	Company Forces	400
Mile 80 near Deer Lodge moving " "	" "	600
Mile 68 " " " " "	" "	1,300
Drummont to Missoula " " "	" "	1,500
Bearmouth to " " " "	" "	200
Forner to Missoula changing transmission line	" "	600
Missoula to St.Regis moving telephone line	" "	1,400
Atlas, Idaho & Vicinity Moving telephone line.	" "	2,000
Plummer Jct. moving telegraph wires	" "	250
At Tekoa, Wash. moving power lines.	" "	1,750
COST OF MOVING BUILDINGS OFF RIGHT OF WAY		
At Coeur d'Alene, removing old docks buildings, walks etc.	" "	Unknown
Near Rosalia, Wash. a two story house removed & destroyed	" "	"
at Spokane, Wash. A- 3 Story Building moved.	" "	5,000
MATERIAL LOST & STOLEN		
Timber stolen from bridge near Marengo, Wash.		Unknown
" " " dock at Coeur d'Alene		"
Indian Creek Viaduct wagon load of lumber stolen.		"
PROPERTY DAMAGES		
Damage to timber by blasting in Cascade Mts.	Property owners	5,000
" " " " " " Bitter Root Mts.	U.S. Gov't.	Unknown
Damages to property owners at Spokane, Wash. during construction of subway	Property owners	25,000
River changecaused damage at Ferrel, Idaho.	Mr.S.Newcumbon	Unknown
PERSONAL INJURIES		
Personal injuries to men employed in the State of Washington not covered by industrial insurance	Company Forces	Unknown
At Missouri River Bridge injury to laborer	" "	18,000
" " " " " " "	" "	2,200
Damages paid to caisson workers for injuries	" "	Unknown
At Chatcolet Viaduct, Idaho. Personal injuries	Mr. Mitchell	300

NATURE OF CONTINGENCY	TO WHOM PAID	AMOUNT
REMOVING DANGEROUS TREES & ROCKS		
Removal of dangerous trees	Company Forces	5,000
" " " rock at Snoqualmie high line	H. C. Henry	4,000
Rosalia Temporary track Tunnel #42	" "	33,467
ROADS		
On Mile 10 West of Mobridge wagon road	McIntosh Bros.	9,020
" " 21 between Collets & Corfu Wash. keeping road clear of rocks during construction	H.C.Henry	5,748
On Mile 1-6 East of Beverly, Wash. keeping road clear of rocks	" "	2,600
Construction & Maintenance of Snoqualmie wagon Rd.	" "	29,317
From St.Joe to Avery, Idaho. Wagon road 30.7 miles	" "	172,314
" Avery, Idaho to Taft, Mont. Wagon Rd. 29.6 miles	Winston Bros.	100,956
Clearing for road between Avery & Taft &trails	Company forces	13,394
Maintenance shoveling snow etc. on Avery,Taft Rd.	Winston Bros.	57,803
ST. PAUL PASS TUNNEL		
Due to shortage of men bonus paid	Company forces	80,646
Sand pocket in tunnel cost of labor and material	Winston Bros.	25,000
On account of water encountered, rubber clothing furnished men.	" "	47,000
Increased cost of lining tunnel due to delays on a/c passing trains.		Unknown
Aerial cable way over mountain connecting east and west portal, and Electric power for operating	" "	416,865
SLIDES		
At Bonfield, Mont. numerous slides occured 1908-9	Company forces	Unknown
Mile 334-336 Lock Bluffs Mont. slides occured	" "	"
At Tunnel #2 West of Harlowton, Mont. removing slide	" " & others	765
From Mile 65-E to Mile 38-W. of Missoula, Mont.	" " " "	23,791
From Mile 47 to Mile 79 W. " " "	" " "	9,391
From Mile 84 to Mile 110 W. " " "	" " "	33,426
At points 8 and 9 miles E. of St.Joe, Idaho "	" " "	2,373
Near Avery,Wash., removing slide	" " "	1,680
At Tunnel #37 near Herrick, Idaho 1909, removing slide	" " "	2,100
At Bridge #38-39 near Karnac, Idaho " "	" " "	3,700
Ten Miles E. of St. Joe Idaho relocation of highway on a/c slide	" " "	1,300
During fall of 1909 and Spring of 1910-11 extra gangs were employed thru Bitter Root Mts. removing slide Matl.	" " "	Unknown
Slide near E. end of Switch Ragner, Wash.	H. C. Henry	"
Cleaning out sand blown into cuts, between Servia & Lind, Wash.	" "	1,100
Slides between Plummer Jct. & St. Maries, Idaho.	" "	53,130
" " " " " " construction of new bridge	Company forces	Unknown
Slides between " " " " repairing culv.	" "	"
" " " " " " change of aligament	H. C. Henry	4,370

NATURE OF CONTINGENCY	TO WHOM PAID	AMOUNT
TUNNELS		
Tunnel #14 near Garrison, Mont. bad material and a slide of disintegrated granite encountered	Winston Bros.	74,500
Tunnel #14 due to over break	" "	34,500
Tunnel #21 removing slides over break etc.	" "	5,124
" #22 " " " " " force account	" "	5,400
" #23 " " " " "	" "	3,290
" #24 " " " " "	" "	2,580
" #25 " " " " "	" "	3,727
" #26 " " " " "	" "	1,500
" #27 " " " " "	" "	900
" #28 " " " " "	" "	4,075
" #29 " " " " "	" "	1,500
" #35 " " " " "	" "	815
" #36 " " " " "	" "	1,426
" #16 near Bonita Mont, bad material encountered increased cost	" "	10,000
WATER SUPPLY		
In South & North Dakota 14 temporary water stations were installed. In addition the following wells were dug or drilled & failed to yield water	Company Forces	Unknown
Fatanka - 8" well drilled 570' - cost	" "	2,700
Company furnished 460' of 10" & 8" casing fuel transportation, etc. for above well	" "	Unknown
McIntosh S.D. Five water stations were established 786' of 8" wells were drilled, one reservoir was constructed. All were failures	" "	"
240' of 10" well, one 6" well 220' deep & one reservoir failure - Lemon, South Dakota	" "	"
In Mont. 12 tem. stations were installed bet. Butler & Idaho State Line	" "	"
In Mile 68 a well 19'x22' deep was dug and abandoned	" "	"
" " 49 " " 19'x16' " " " " "	" "	"
At Marmarth No.Dak. a well & settling basins were dug in Mo. River and abandoned	" "	"
St. Joe Idaho a settling tank basin with connection to River abandoned	" "	"
Kittitas Wash. well 200' deep abandoned	" "	"
Cle Elum Wash. two dug wells abandoned	" "	"
Othello Wash. Well 6"x358' deep & 10"x485' deep abandoned.	" "	"
In Eastern Montana Temporary reservoirs in Mile 238 for use during construction	McIntosh Bros.	1,293
Mile 288 Custer Creek for use during construction	" "	1,498
" 288 Cherry Creek " " " "	" "	1,213
" 322 Steiger Creek " " " "	" "	437
" 323 Reservation " " " "	" "	368
At Boyleston Wash. abandoned dug & drilled wells	" "	5,000

NATURE OF CONTINGENCY	TO WHOM PAID	AMOUNT
TRANSPORTATION		
Of Men over Foreign Lines	Northern Pacific Ry.	69,000
Time & expense of men to and from jobs	Company Forces	Unknown
" " " " " looking for & hiring laborers	" "	"
Contractors outfits & equipment lines E. of Butte, Mont.	C.M.& St.P. Ry.	Unknown
Shipments of Company material by the Engineering B.& B. and other departments over Company lines	" "	Unknown
TEMPORARY CONSTRUCTION		
Temporary track just West of Missouri River near Bridge AA 2	Company Forces	16,800
Temporary track & "shoofly" Mile 86 E Sinclair Mont.	Co. forces & others	848
"Shoofly" in Mile 46-E of Drummond, Mont.	Winston Bros.	230
" " " " 26-W of Soudan "	" "	100
" " " " 2 near Rosalia, Wash.	H. C. Henry	1,045
" " " " 29 near Taunton "	" "	Unknown
" " 4 miles east of Jerico, Wash.	" "	630
" " in construction of tunnel #37 near Avery, Idaho	" "	5,700
"Shoofly" just west of Avery	" "	453
Temp. Main Line near Morengo, Wash.	" " & others	43,000
"Shoofly" 5 miles west of St. Joe Idaho	H. C. Henry	1,264
" " 5 " " " Ramsdell, Idaho	" "	5,000
Line change 6 miles west of St. Joe Idaho	" "	10,820
4½ miles of temporary track near Lone Pine, Wash.	" "	Unknown
Numerous temporary tracks built during construction for loading & unloading material, set out tracks for bunk & boarding cars and for temporary gravel pits, etc.	" " Co. Forces & others	"
COST OF CAMP BUILDINGS		
At St. Paul, Pass. Tunnel	Co. Forces & others	25,900
At Missouri River Bridge	" "	12,200
At Columbia River Bridge	" "	Unknown
SPECIAL CAMP BUILDINGS		
Camp buildings thru the Seattle City Water shed The camps were constructed along strict Sanitary Lines	H. C. Henry	Unknown
TEMPORARY BRIDGES RUNAWAYS, ETC°		
In Mile 98 near Morel, Mont. Tempomry bridge	Winston Bros.	200
In Mile 40 & 39 near Bearmouth Mont. Temporary Br.	" "	900
In Mile 4-7-8 betw. Missoula & Primrose Tem. Br.	" "	2,600
In Mile 23 & 26 bet. Huson & Soudan Temp. Bridges	" "	2,900
In Mile 54 & 56 near Cobden Mont. " "	" "	900
In Mile 68 near Ashmore, Mont. " "	" "	230

NATURE OF CONTINGENCY	TO WHOM PAID	AMOUNT
WEATHER CONDITIONS On account of the short summer season in Montana and the Dakotas a great deal of the construction work had to be carried over into the winter months. It is estimated that efficiency during the extreme cold weather is reduced 45%	McIntosh Bros.	Unknown
Y. M. C. A. HEADQUARTERS IN CAMPS Company paid Secretiaries furnished board and room and otherwise contributed to support	" "	"

The statement of contingencies given above is not a complete one, but covers only those features readily obtainable from the records in the time allowed.

N-E.

QUESTION "O"

WHAT WAS ACTUALLY EXPENDED FOR GENERAL EXPENDITURES ACCOUNTS 71-77, EXCLUSIVE OF INTEREST DURING CONSTRUCTION & WHAT WAS EXPENDED ON THAT ACCOUNT.

Total General Expense Accounts -	$14,047,101.66
Interest during construction -	11,244,125.55
Total exclusive of Interest -	2,802,976,11

Note:- The above amounts are charged to the General Expense Accounts on the records of this company. They do not include any amount properly chargeable to the above accounts which have been included in the Roadway Accounts.

O-1

QUESTION "P"

WHAT BRANCH LINES WERE STARTED AFTER AUGUST 1st, 1909 AND DATES OF BEGINNING WORK AND WHEN OPENED FOR OPERATION?

The Cheyenne, Moreau and Cannon Ball Branches in North and South Dakota, aggregate 301 miles. Explorations and surveys were begun in March 1909; Construction started the same year, and operation of trains started on Moreau Branch in July, 1910; other Branches December, 1910.

Harlowton-Lewistown Branch, 64 miles long, was surveyed and constructed in 1902-1903 by the Montana Railroad Company, and purchased in 1910 by this Company.

The Grass Range, Roy & Winifred Branches, 102 miles total length. Explorations and surveys started in December, 1909, constructions started in May 1910. Operation of trains started on the Grass Range Line in October, 1913. On the Roy and Winifred Line between Lewistown and Hilger in December, 1911, for the remainder in May 1914.

Great Falls Line, 137 miles long. Surveys started in March, 1910. Construction started in June, 1912. Operation of trains began in January, 1914.

Ringling-Dorsey Line, 5 miles in length. Originally part of the Montana Railroad, which was acquired in 1910.

Gallatin Valley Railway, a subsidiary line, 73 miles long. Of this total, 27 miles between Three Forks and Bozeman Hot Springs was constructed in 1910. The Belgrade Branch, 5 miles long, built in 1911; and the Menard Branch, 25 miles long, was built in 1912. All of this construction, except steel bridge and track laying, was done by contract, the original portion having been purchased in 1910, at which time it was being operated as an electric line. Mixed electric and steam power operation was in force on the entire branch in 1912.

The Big Blackfoot Ry., a subsidiary line 60.7 miles long from Bonner to Browns Lake. First surveys began in 1907 and construction of first eleven miles began in 1909. Train operation began in 1911. Work began on the extension of the line between Big Blackfoot Jct. and Browns Lake in 1910 and was discontinued in same year. Work was renewed in 1916 and grading on 22 miles between Big Blackfoot Jct. and Clearwater completed. No track has been laid on the extension to January 1st, 1918.

St. Maries Branch, 71 miles in length. Surveys for this line were first started in March, 1907. Construction was started in April 1909. The track was ballasted and operation of trains began in July, 1910.

Plummer-Spokane & Coeur d'Alene Branches, 46 miles in length, were constructed to form a line into Spokane and a connection with the Idaho & Washington Northern Railway, which was, at a later date purchased. ,Surveys for these lines were started in November, 1908. Construction was started in April, 1910. The lines were ballasted and operation of trains began in September, 1913.

Idaho, Washington & Northern Railway, which was purchased in January 1913, was originally constructed between 1907 and 1910.

Warden Branch, 48 miles in length. Surveys were started in November, 1908. Construction started in March 1910. The line was placed in operation in December, 1910.

Beverly Hanford Branch, 45 miles in length. Surveys were first started in October, 1907. Construction started in January, 1909. The line was ballasted, and operation of trains began in May, 1913.

Everett Branch, 55 miles in length. Surveys were first started in March 1906, and completed in April 1910. Grading was started in April, 1910. The line was ballasted and operation of trains began in November, 1911.

Enumclaw Branch, 15 miles in length. First explorations for this line were made in June, 1907. Final location was completed in December, 1909. Grading was started in December, 1909, and operation of trains began in April, 1911.

Tacoma Eastern Railroad, 97 miles in length, and the Puget Sound and Willapa Harbor Railway, 66 miles in length, are subsidiary lines, which join the C. M. & St. P. Ry. at Tacoma and Maytown, respectively, and act in a sense as feeders. The greater portion of the former line was constructed between the years of 1901 and 1910, while the latter was constructed between 1910 and 1913.

McKenna Gate Branch, 34 miles in length, Surveys were first begun in February, 1908. Grading was started in June, 1909, and operation of trains was started in August, 1910. This line extends from McKenna on the Tacoma Eastern Railroad to Helsing Junction where it connects with a line serving Grays Harbor and owned jointly by the C.M.& St.P.Ry. and O.W.R.R. & N. Co.

The Seattle, Port Angeles and Western, a subsidiary line 62.29 miles long. Surveys began in 1911, work began in 1912, and train operation in January, 1915.

The Bellingham and Northern Ry. Co. a subsidiary company having 63.5 miles of line was purchased in 1912.

QUESTION "Q"

HOW DID THE EXTENSION ACQUIRE ITS EQUIPMENT?

By Purchase.

QUESTION "R"

WAS IT NEW OR SECOND HAND AND IF NEW WAS IT BUILT BY THE MILWAUKEE OR BY EQUIPMENT COS.

A very small percentage of second hand equipment was purchased from the C. M. & St. P. Ry. This included a few engines, bunk cars and work equipment. The rest of the equipment was purchased new, some from the C. M. & St. P. and some from equipment Companies. That purchased from the C. M. & St. P. was built by them in the Company's Shops located at Milwaukee, Wisconsin.