



Northern Pacific Railway Company.
Engineering Department Records.

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N. P. 1757
6-24

OFFICE OF BRIDGE ENGINEER

FILE NO. 381

SUBJECT:

ALGONA ROAD HIGHWAY BRIDGE

AUBURN, WASH.

L-18

Saint Paul, January 26, 1936.

Mr. A. R. Cook:

Referring again to my letter to you of the 22nd, about negotiations with the authorities at Auburn to permit abandonment of the Algoma Street viaduct, and advising that I would hold AFE pending completion of negotiations.

I have had this AFE (Seattle ED-133-25) returned to my office, and find it covers the Traeger viaduct instead of the Algoma Street.

On my way to Yakima I spoke to Mr. Stotler about this matter and advised him it was my recollection the AFE covered the Traeger viaduct, and that it was my understanding Judge Reid's negotiations covered Algoma Street. Will you please advise me just what is covered by Judge Reid's negotiations and if the Traeger viaduct AFE should be held up.

H. F. STEVENS.
Chief Engineer.

cc-Mr. M. F. Clements

L-18

On #4, R. M. Diva.,
January 22, 1936.

Mr. A. B. Cook:

Judge Reid advised me he expects to be able to complete negotiations with the authorities at Auburn which will permit abandonment of the Algoma Street viaduct over the Auburn yard. I am therefore holding up the AFE pending completion of these negotiations.

If the condition of the viaduct is such that it cannot be safely retained in service until the negotiations are completed, such minor repairs as are necessary to keep it in safe operating condition should be made.

H. E. STEVENS;

Chief Engineer.

cc-Mr. M. F. Clements

Saint Paul, December 29, 1925.

Mr. H. E. Stevens:

Referring to your notation on my letter of December 24th in regard to an application of the Pacific Telephone and Telegraph Company to place cross arms on the Algona Street Viaduct at Auburn.

That portion of the Algona Street Viaduct over the Auburn Yard consists of 1-60 foot Pony Howe Truss, 114 feet of timber trestle, 1-120 foot Thru Howe Truss and 1-146 foot Thru Howe Truss. The construction of the floor is the usual Howe Truss type with floor beams resting on the bottom chord. The depth of floor beam is 16 inches and the chord 16 inches. If the cross arms of the proposed wire line are attached near the center of the floor beam, the wires would be approximately 30 inches above the clearance line or 24'-6" above the rail.

The sketch attached to the application shows the supports over tracks to be approximately 90 feet apart and the sag in a wire of this length would be approximately 2-1/2 feet in cold weather and 6 feet in hot weather.

The usual requirement for placing wires over the track is to provide a 27 foot clearance over the track at the lowest point in the sag when the temperature is 60 degrees F., although the 27 foot requirement has only recently been increased from 25 feet. Placing cross arms on the bridge as outlined on the

Mr. Stevens

-2-

sketch attached to the application will not provide 22 feet over the tracks in hot weather and will not at any time meet the 27 foot clearance.

There is no objection to placing the wires on the bridge if they meet clearance requirements and they may be supported on cross arms at a higher elevation. If the cross arms be placed on top of the floor beams and not to exceed 25 feet apart, the sag would be small and the clearance over the track would be approximately 25 feet. The cross arms could also be placed on top of the top chords of each truss and extending over the side to permit the sag hanging free of the timber.

Bridge Engineer.

Encl.

Saint Paul, December 29, 1925.

Mr. H. E. Stevens:

Referring to your notation on my letter of December 24th in regard to an application of the Pacific Telephone and Telegraph Company to place cross arms on the Algona Street Viaduct at Auburn.

That portion of the Algona Street Viaduct over the Auburn Yard consists of 1-60 foot Pony Howe Truss, 114 feet of timber trestle, 1-120 foot Thru Howe Truss and 1-146 foot Thru Howe Truss. The construction of the floor is the usual Howe Truss type with floor beams resting on the bottom chord. The depth of floor beam is 16 inches and the chord 16 inches. If the cross arms of the proposed wire line are attached near the center of the floor beam, the wires would be approximately 30 inches above the clearance line or 24'-6" above the rail.

The sketch attached to the application shows the supports over tracks to be approximately 90 feet apart and the sag in a wire of this length would be approximately 2-1/2 feet in cold weather and 6 feet in hot weather.

The usual requirement for placing wires over the track is to provide a 27 foot clearance over the track at the lowest point in the sag when the temperature is 60 degrees F., although the 27 foot requirement has only recently been increased from 25 feet. Placing cross arms on the bridge as outlined on the

Mr. Stevens

-2-

sketch attached to the application will not provide 22 feet over the tracks in hot weather and will not at any time meet the 27 foot clearance.

There is no objection to placing the wires on the bridge if they meet clearance requirements and they may be supported on cross arms at a higher elevation. If the cross arms be placed on top of the floor beams and not to exceed 25 feet apart, the sag would be small and the clearance over the track would be approximately 25 feet. The cross arms could also be placed on top of the top chords of each truss and extending over the side to permit the sag hanging free of the timber.

Bridge Engineer.

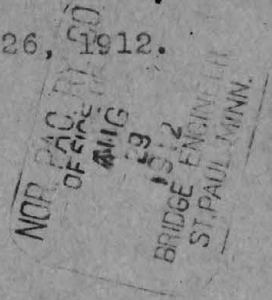
Encl.

FROM OFFICE OF
ENGINEER OF MAINTENANCE OF WAY
TACOMA, WASH.

418

Tacoma, Washington, August 26, 1912.

Mr. H. E. Stevens,
Bridge Engineer,
Saint Paul, Minnesota.



Dear Sir:-

Replying to yours of August 7th relative to
overhead crossings at Auburn.

One of these crossings is located on the
Algona Road, and is the one known as the "Algona Viaduct".
The other one is located on a lane which had no name, but
which passes close to the house on some property which we
purchased, known as the "Traeger Place". If a name is
desired for this viaduct, I would suggest that it be called
the "Traeger Crossing", this being the common local name
for it at present.

Yours truly,

Engineer of Maintenance of Way.

LMP-W
WCS

*MSB
Have this put in place
Traeger Crossing
H. E. Stevens
8-29*

*#68.
Shall 31-44 taken
to be the Traeger Crossing
P.W. ask
that is correct.*

L 18

Saint Paul, June 25, 1913.

Mr. H. E. Stevens,
Bridge Engineer.

Dear Sir:-

I attach Mr. Perkins' letter of the 21st with
a set of blueprints signed by the County Engineer of King
County, covering the Algona Viaduct, near Auburn.

These I suppose should be made a matter of record
in your office.

Yours truly,

W.C. Smith

*Put
in file and note
reference in letter.*

*W.C.S.
Prints filed
#426-29
J.M. 8/1/12*

FROM OFFICE OF
ENGINEER OF MAINTENANCE OF WAY
TACOMA, WASH.

Tacoma, Washington, June 21, 1912.

Mr. W. C. Smith,

Chief Engineer of Maintenance of Way,

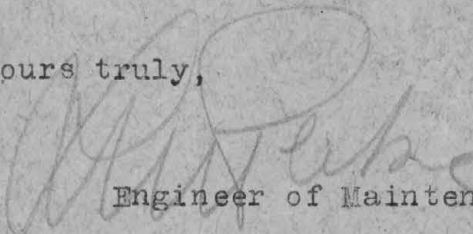
Saint Paul.

Dear Sir:-

I am handing you herewith a set of blueprints signed by the County Engineer of King County, covering the Algona Viaduct, near Auburn.

The original set of prints sent in for signature was lost in transmittal after he had signed same, which accounts for the delay.

Yours truly,


Engineer of Maintenance of Way.

LMP-w

encl.

#426-29

L18

St. Paul, Minnesota. June 8, 1912. HES

Mr. L. M. Perkins,
Engineer of Maintenance of Way,
Tacoma, Wash.

Dear Sir:-

As per your wire of the 6th I am handing you herewith
one complete set of prints of the Algona Road Viaduct, near
Auburn.

Yours truly,

Bridge Engineer.



FORM 1386

TELEGRAM.

All Railway Messages must be written in ink on these blanks, which must not be used for other purposes, and those for parties on trains (except trainmen) enclosed in sealed envelopes. The exact time sent, time received, personal signal of sending and receiving operators, call of sending office and name of receiving station must be entered on this blank. After transmitting telegrams which in their judgment would have served the Company's interest as well if sent by train mail, or which appear unnecessarily long, operators are required to attach a copy to Form 233, and forward same to Superintendent of Telegraph.

556 by v sn

Tacoma June 6th--12

W.C.Smith

StPaul

Please send one complete set algona viaduct

plans.

L.M.Perkins

1155 PM.

H.E. Stevens
W.C.S.

6/7/12
ms
Donner
KRD

Ordered 6/7/12

L 18

FROM OFFICE OF
ENGINEER OF MAINTENANCE OF WAY
TACOMA, WASH.

TACOMA, WASH. APR 15 1912

Tacoma, Washington, April 15, 1912.

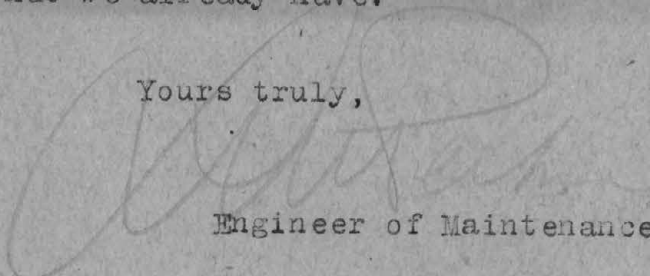
Mr. H. E. Stevens,
Bridge Engineer,
Saint Paul, Minnesota.

Dear Sir:-

I beg to acknowledge receipt of plans of
Algona Viaduct received with yours of the 11th instant.

I omitted answering you regarding approval of
plans by County Commissioners, but will arrange for this,
although I doubt if any formal approval is necessary
further than what we already have.

Yours truly,


Engineer of Maintenance of Way.

LMP-w

WCS *L 18*
St. Paul, Minnesota. April 11, 1912. HES

Mr. L. M. Perkins,
Engineer of Maintenance of Way,
Tacoma, Wash.

Dear Sir:-

I am handing you herewith six complete sets of the general and detail plans covering the Algona Road Crossing over the Auburn Yard, sheets 1 to 4 inclusive, also sheet 4 of the typical details for 117'6" Howe Truss for highway bridge south of Auburn---this sheet being needed to show typical details for the Algona Road.

These drawings have been gotten out in conformity with your sketch dated Jan. 12, 1912. I have received no reply from you to my inquiry of March 15th as to the approval of these plans by the County Commissioners. If it is necessary to secure further approval than you now have, will you kindly arrange to get same before starting work. Also, please have the location, ^{rate} raise of grade, clearances, etc., as indicated on our plan, checked up on the ground and advise if correct.

The bill of material sent you with my letter of March 14th covered the approaches only. The bill of material

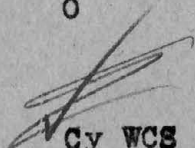
Mr. L. M. Perkins, page 2.

as shown on sheet #4 of the drawings covers all material necessary, including that covered by the list sent you March 14th. In making additional order you should therefore deduct from our detail bill whatever material you have previously ordered.

Yours truly,

Bridge Engineer.

0



Cy WCS

L 18

St. Paul, Minn. April 8, 1912. HES

MEMO

Mr. W. L. Darling:

I am handing you herewith, for your approval, plans covering a Highway Bridge to carry Algona Road over the new yard at Auburn, Wash.

These plans were gotten up in conformity with contract and agreement made with the County Commissioners.

The work is authorized under Comp. No. 151-12.

H. E. Stevens.

L 18

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

Mr. L. M. Perkins,
Engineer Maintenance of Way,
Tacoma, Wash.

Dear Sir:-

I am returning you herewith copy of the results of tensile tests made on the two samples of welded rods which you selected and sent in from material used in the construction of the Auburn foot bridge.

Test No. 1 failed abruptly in the weld, and the fracture showed that only about 50% of the metal had actually been welded.

Test No. 2 developed practically the full strength of the rod before failing in the weld.

Test No. 1A was a test made on a section of one of these rods cut outside the welded portion in order to determine the strength of the iron itself without weld----the result showing 48,000# per sq.inch, which is a fair grade of so called commercial iron.

It is my understanding that the two welds you sent me were about the worst of the entire lot, and would in fact have been rejected on their appearance. This being the case

Mr. L. M. Parkins, page 2. 3/27/12.

it seems probable that the welds in the balance of the rods could be safely counted upon to develop the full strength of the rod section.

I am enclosing Modjeski & Angier's bill for \$16.00 covering the cost of making these tensile tests. Will you kindly arrange for avoucher.

Yours truly,

O

Bridge Engineer.

Cy W C Smith Enclosing copy of Mr. Perkins letter of Feb. 21st, also copy of report from Modjeski & Angier.

MODJESKI & ANGIER
MONADNOCK BLOCK
CHICAGO, ILL.

RALPH MODJESKI, M. AM. SOC. C. E.
W. E. ANGIER, M. AM. SOC. C. E.
J. C. REEVES, MANAGER

March 26th,
1912.

Mr. H. E. Stevens,
Bridge Engineer,
Northern Pacific Ry.,
St. Paul, Minn.

Dear Sir:-

The following results were obtained from
Tensile Tests of 1-1/4 inch diameter, round rods which
you stated had been cut and welded.

| | <u>Test #1.</u> | <u>Test #1A</u> | <u>Test #2</u> |
|--|-----------------|-----------------|----------------|
| | <u>Rod #1</u> | <u>Rod #1</u> | <u>Rod #2</u> |
| Minimum diameter, inches, (Average of two diameter intersecting at right angles) - - - | 1.220 | 1.250 | 1.192 |
| Minimum area of cross section in square inches - - - - - | 1.169 | 1.227 | 1.112 |
| Yield point, actual pounds - - - | 37,740 | 34,930 | 34,930 |
| Yield point, Lbs. per sq. inch - - - | 30,750 | 31,400 | 31,400 |
| Ultimate strength, actual pounds | 34,760 | 58,830 | 54,570 |
| Ultimate strength, Lbs. per sq. in | 29,700 | 48,000 | 49,100 |
| Elongation in 8 inches, actual ins - - - | 1.30 | 0.53 | 0.53 |
| Elongation in 8 inches, per cent - - - | 16.3 | 6.6 | 6.6 |
| Reduction in diameter, inches - - - | 1.038 | 1.101 | 1.101 |
| Reduction of area, per cent - - - | 31.1 | 14.5 | 14.5 |

Test No. 1 broke in weld; broken section showed about 50% of metal in weld; no yield point detected.

Test No. 1A broke outside of guage marks; no weld in section tested.

Test No. 2 broke in weld near center of 8 inch guage marks.

Speed of drawhead 0.18 inches per minute.

We are sending under separate cover by express section cut from the specimens showing fracture.

Yours truly,

Modjeski & Angier

Mgr 6

JCR/ER

March 8, 1912. HES

Modjeski & Angier,
Monadnock Bldg.,
Chicago, Ill.

Gentlemen:-

I am sending you by express, two $1\frac{1}{4}$ " dia. round rods, which have been cut and welded. Welded rods similar to these have been used in a small foot bridge over our tracks, and we wish to ascertain the approximate strength of the weld. Will you kindly test these rods to destruction, and report results?

Yours truly,

Bridge Engineer.

Northern Pacific Railway Company

Auburn Mar. 4 1912

Mr Imbertus
 Engr M of way
 Dear Sir:-

As per your request of the 1st inst, I am sending by express today to H E Stevens Bridge Engr at St Paul, sections of 2 rods furnished for overhead Bridge. The sections including a weld. These are the 2 rods $1\frac{1}{4}$ ϕ referred to in my letter of the 14th ult. Am unable to find the $1\frac{1}{8}$ " rod & didn't get a section of the $1\frac{1}{2}$ " rod as the welds in that look good, so thought you wouldn't care to have it tested.

Yours truly,

G A Kerrick
 Asst Engr

Copy to
 H. E. Stevens

6
St. Paul, Minnesota. Feb. 26, 1912. HES

Mr. L. M. Perkins,
Engineer of Maintenance of Way,
Tacoma, Wash.

Dear Sir:-

I have your favor of the 21st regarding rods for
the Auburn Highway Viaduct.

I am sorry you were obliged to use the welded rods.
Did you make arrangements to test any of these welds? If
not, I would suggest that you have the welded portion of one
or two of the rods which you state were rejected, sent in to
this office and I will arrange to have them tested.

Yours truly,

0

Bridge Engineer.

Northern Pacific Railway Company

Tacoma, Washington, February 21, 1912.

Mr. H. E. Stevens,
Bridge Engineer,
Saint Paul, Minnesota.

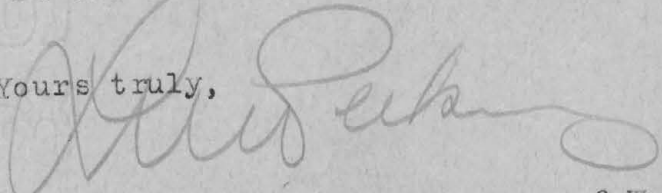
Dear Sir:-

Replying to yours of February 14th and previous message, relative to the rods for the Auburn viaduct.

The probability for getting maximum load on this viaduct is so small that we have used the welded rods, except a few of them where quality of the weld seemed doubtful. This was particularly necessary because we had been waiting for some time for these rods, and the erection of the trusses was being delayed.

Furnishing these was due to an error on the part of the shops -- material being purchased full length and then thoughtfully cut in two and welded together again.

Yours truly,


Engineer of Maintenance of Way.

LMP-w

L18

St. Paul, Minnesota. March 15, 1912. HHS

Mr. L. M. Perkins,

Engineer of Maintenance of Way,

Tacoma, Wash.

Dear Sir:-

As requested in your letter of the 4th, I am handing you herewith an approximate bill of material covering the approaches of the Algona Road Highway Bridge, Auburn Yard. We are working on the plans for this structure, and will soon have same ready so that you can start work by the time you get the material.

Will it be necessary to secure any further approval of the plans by the County Commissioners?

Yours truly,

O

Bridge Engineer.

Cy W C Smith

WCS-r

Saint Paul, March 14, 1913.

Mr. H. E. Stevens:-

Please do not forget to hurry the preparation of the bill of material for the Algona Road Viaduct. This should be sent direct to Mr. Perkins so that same can be assembled as quickly as possible, as I understand the crew is ready to start work on it.

W. C. SMITH. ✓

DICTATED.

NORTHERN PACIFIC RAILWAY COMPANY

SEATTLE DIVISION - AUBURN YARD

ALGONA ROAD HIGHWAY BRIDGE.

Bill of piles and lumber for two approach trestles
400 lineal feet each, and bulkheads along
one side of each of the 120' fills
approaching these
trestles.

| | | | |
|-----------------|--------------------|-------|---|
| 30 Piles | 40' long | | Trestle. |
| 30 " | 35' " | | " |
| 30 " | 30' " | | " |
| 36 " | 25' " | | " |
| 20 " | 15' " | | Bulkheads. |
| 20 " | 10' " | | " |
| 45 pieces | 14 x 14 x 26' - 0" | | Caps. |
| 400 " | 6 x 14 x 20' - 0" | | Stringers. |
| 20 " | 3 x 10 x 32' - 0" | | Bracing. |
| 20 " | 3 x 10 x 30' - 0" | | " |
| 20 " | 3 x 10 x 26' - 0" | | " |
| 50 " | 3 x 10 x 16' - 0" | | " |
| 50 " | 3 x 10 x 20' - 0" | | Bulkhead |
| 16 " | 3 x 10 x 12' - 0" | | " |
| 100 " | 3 x 10 x 30' 0" | S1S | Floor. |
| 450 " | 3 x 10 x 24' 0" | S1S | " |
| 25,000 lin. ft. | 3 x 10 | S1S | in 16 and 20 foot lengths, one-half of each. |
| 15 pieces | 4 x 12 x 20' 0" | | Guard Rail |
| 100 " | 6 x 6 x 20' 0" | S2S | " |
| 300 " | 2 x 4 x 20' - 0" | S1S1E | Handrail |
| 100 " | 2 x 6 x 20' - 0" | S1S1E | " |
| 125 " | 4 x 4 x 5' - 8" | S4S | |
| 125 " | 4 x 4 x 5' - 3" | " | |
| 25 " | 4 x 6 x 6' - 9" | " | |
| 65 " | 4 x 4 x 6' - 9" | " | |

Office of Bridge Engineer,
March 14, 1912.

W.R. Ry - Seattle Div

Algonquin Yard

Algonquin Road Highway Bridge

Bill of Material for 1800' linear feet of approach
trestle and bulkheads along one side of the 120' fills
filled approaches.

Approaching these trestles

| | | | |
|--|---------------|-----------|---|
| 30 files | 40' long | Trestle | ✓ |
| 30 " | 35' " | " | ✓ |
| 30 " | 30' " | " | ✓ |
| 36 " | 25' " | " | ✓ |
| 20 " | 15' " | Bulkheads | ✓ |
| 20 " | 10' " | " | ✓ |
| 45 pcs | 14x14x 26'-0" | Cps. | ✓ |
| 400 " | 6x14x 20'-0" | stringers | ✓ |
| 20 " | 3x10x 32-0 | Bracing | ✓ |
| 20 " | 3x10x 30-0 | " | ✓ |
| 20 " | 3x10x 26-0 | " | ✓ |
| 50 " | 3x10x 16-0 | " | ✓ |
| 50 " | 3x10x 20-0 | Bulkhead | ✓ |
| 16 " | 3x10x 12-0 | " | ✓ |
| 100 " | 3x10x 30'-0" | SIS Floor | ✓ |
| 450 " | 3x10x 24-0 | SIS | ✓ |
| 25000 lin ft | 3x10 | " | ✓ |
| in 16 and 20 foot lengths - one half of each | | | |

| | | | |
|--------|------------|------------|-------|
| 15 pcs | 4x12x 20-0 | guard rail | 525 |
| 100 " | 6x6x 20-0 | " " | 525 |
| 300 " | 2x4x 20-0 | Handrail | SISIE |
| 100 " | 2x6x 20-0 | " | SISIE |
| 125 " | 4x4x 5-8 | | 545 |
| 125 " | 4x4x 5-3 | | " |
| 25 " | 4x6x 6-9 | | " |
| 65 " | 4x4x 6-9 | | " |

ORD

Trefe

FAS

3/12/12

Northern Pacific Railway Company

Tacoma, Washington, March 4, 1912.

Mr. H. E. Stevens,
Bridge Engineer,
Saint Paul, Minnesota.

Dear Sir:-

Referring to your message of the 2nd instant relative to plans of the Algona Viaduct.

If possible, would like to secure these before the end of the month. We are up against it now, as we cannot extend the yard across the Algona Road and complete work of track laying and surfacing until this viaduct is constructed.

We also will have the bridge crew working on the other viaduct available shortly for the Algona Road.

Possibly your plans are in such shape that we could order the material for the approaches and get started on those, which would relieve the situation somewhat, and probably make it possible for us to operate at lease one track at grade, so that the people in the vicinity have an evidence of good faith in the way of starting work.

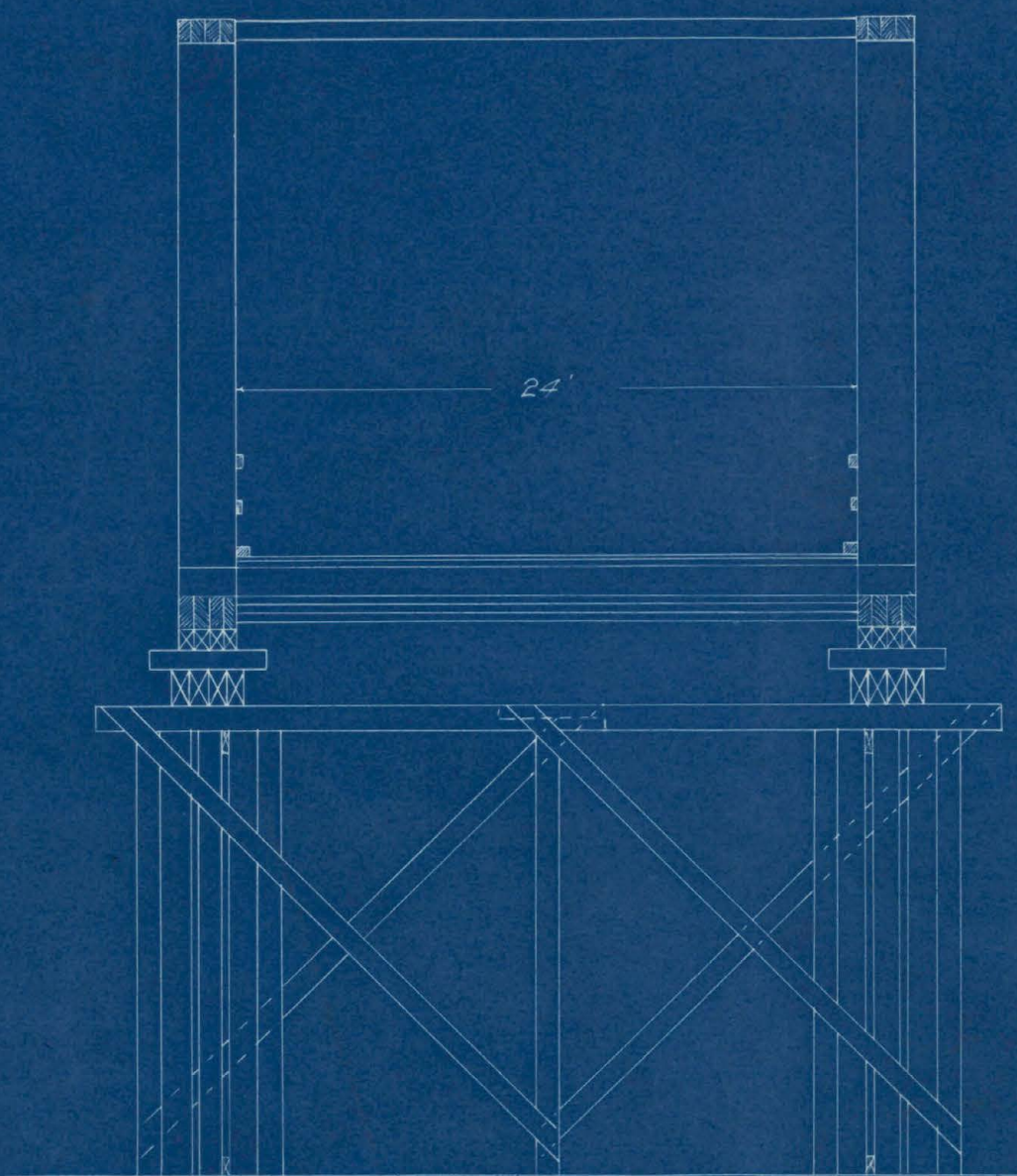
Yours truly,

LMP-w
WCS

Engineer of Maintenance of Way.

Handwritten notes:
To Mr. B
Get me have
fill of material
approach at grade
3/19

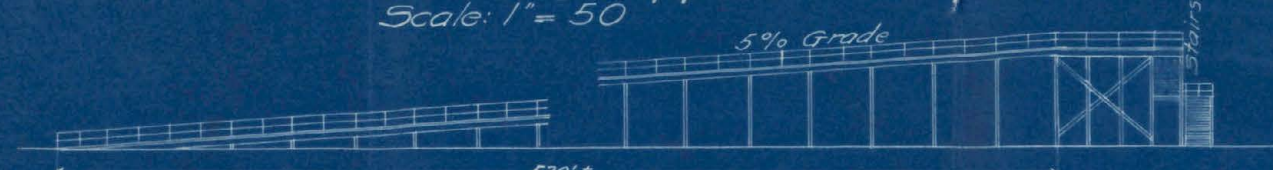
Stamp:
APR 10 1912
BRIDGE DIV.
ST. PAUL



Section

Elevation of Approach

Scale: 1" = 50'



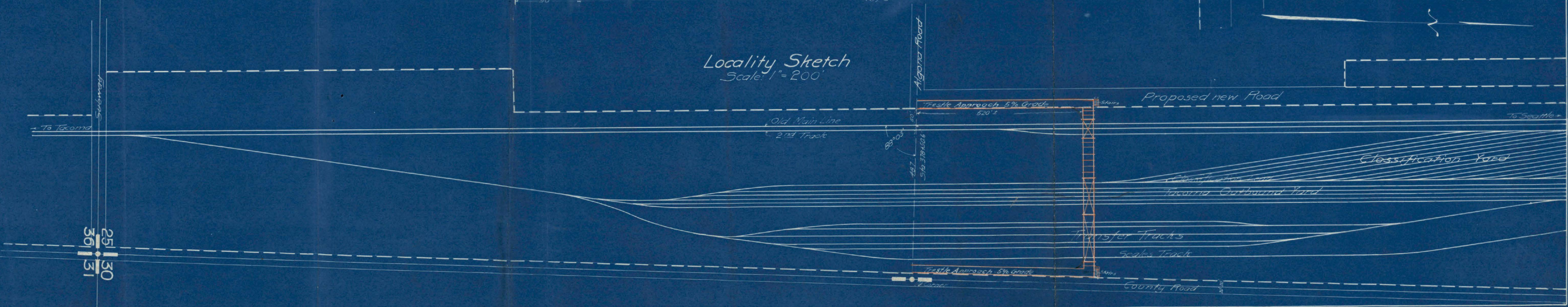
Elevation

Scale: 1" = 50'



Locality Sketch

Scale: 1" = 200'



N.P.R.
Seattle Div. — Main Line
AUBURN YARD
Sketch showing proposed
Overhead Crossing for Algona Road
South of Auburn, Wash.
Office of Engr. Maint. of Way, Tacoma, Wash.
Jan. 12-1912

L 1.8

St. Paul, Minnesota. March 9, 1912. HES

Memo.

Mr. W. C. Smith:

Your memo of the 8th.

I expect to send Mr. Perkins an approximate bill of material for the Algona Road Viaduct, the early part of next week. We will finish the plans in about three weeks.

I understood from you the structure has not yet been authorized.

H. E. Stevens.

0



FORM 1386

TELEGRAM.

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

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

L18

St. Paul, Minn. March 2, 1912. HES

L M Perkins
Tacoma Wash

Your wire 29th We expect to complete plans for Algona Viaduct
latter part of this month

H E Stevens 1045 a.m.



FORM 1336

TELEGRAM.

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

333. BY. O. SI.

Auburn Wn Feb 29th 1912

H.E.Stevens

St. Paul Minn.

When may we expect plans for Algona viaduct.

L.M.perkins

1130PM

Bruck

St. Paul, Minnesota. February 14, 1912. HES

Mr. L. M. Perkins,

Engineer of Maintenance of Way,

Tacoma, Wash.

Dear Sir:-

I have your favor of the 9th, and have just wired you as per the attached confirmation, regarding the truss rods for the Auburn Viaduct.

Under a full live and dead load the rods are stressed to the full allowable limit for continuous rods. The stresses of 13,000 and 13,500 per square inch do not include any impact: On the other hand, it is of course unlikely that the bridge will be loaded over its entire surface to the extent of 100,000 lbs. per square foot, which is the figure used in our calculations. If there are any testing machines available on the Coast, I would suggest that you pick out a couple of the poorest welds and have them tested to destruction. It is extremely difficult to say what percentage of the full strength these welded rods will develop, but it looks to me as if their use would be questionable. As far as I am aware, we have always used continuous rods in trusses for railroad spans. The ends of these rods are upset, but not welded.

Yours truly,



Form 1386

TELEGRAM.

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

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

| NUMBER | REC'D FROM | SENDER | RECEIVER | TIME REC'D | DATE REC'D | TIME FILED | NUMBER | SENT TO | TIME SENT | SENDER | RECEIVER |
|--------|------------|--------|----------|------------|------------|------------|--------|---------|-----------|--------|----------|
| | | | | M. | | M. | | | M. | | |

FROM

St. Paul, February 14, 1912. HES TO

L M Perkins

DATED

AT

Tacoma Wash

Re welded rods Auburn Viaduct. Live and dead load stress without impact runs from twelve thousand five hundred to thirteen thousand five hundred per square inch. Unless you have a first class job of welding, rods would not be suitable for such heavy ~~rod~~ loads

H E Stevens

1030 a.m.

Northern Pacific Railway Company

Tacoma, Washington, February 9, 1912.

Mr. H. E. Stevens,
Bridge Engineer,
Saint Paul, Minnesota.

Dear Sir:-

A large proportion of the truss rods which we are receiving for the Auburn Viaduct are welded. With one or two exceptions, the welds seem to be of a good average quality, but of course cannot be depended upon to develop nearly the full strength of the rod.

Will you kindly wire me, on receipt of this, advising if there is any serious objection to using these welded rods?

In this same connection - I will be glad if you will advise if you wish to insist on continuous rods for trusses which we may have occasion to erect for railroad spans?

Yours truly,

Engineer of Maintenance of Way.

LMP-W

FAB
How do the stresses
run in these rods
(18 ft)
2/12

Transfer on materials
for LL + full DL
125 ft - 13000
117" = 12500
104" = 13500

NTP RAILWAY CO
FEB 12 1912
BRIDGE ENGINEER
ST. PAUL, MINN.

St. Paul, Minn. February 2, 1912. FAB

MEMO

Mr. W. C. Smith:

Yours of the 24th in regard to estimate for the Algona Road Highway Bridge.

I have made estimate of the cost of this as per Mr. Perkins' letter, and the plan which he submitted, showing the approaches at 5% grades, and find that the total cost is practically the same as what Mr. Stevens estimated. Mr. Stevens' estimate is based on 2,000 ft. of structure with four approaches at 7% grade; the revised estimate attached is for about 1,490 ft. of structure with two approaches at 5% grade. Although the structure has been shortened about 500 ft. the increased length of Howe Truss spans will bring the estimate up to practically what it was before. Am attaching an estimate of cost.

F.A. Berghom.

Northern Pacific Railway Company

Saint Paul, January 24, 1912.

Mr. H. E. Stevens:

Referring to the attached papers from Mr. Perkins regarding the proposed viaduct over the new Auburn yard to take care of the Algona Road:

You will note that it has been necessary, in order to procure the approval of the County Commissioners, to change the approach to a five per cent grade. How will this affect the estimate upon which Mr. Perkins has based the AFE, the original of which I think you prepared?

W. Churnit

NORTHERN PACIFIC RAILWAY COMPANY.

SEATTLE LINE - AUBURN TERMINALS.

Estimated cost of bridge to carry Algona Road over proposed yard at Auburn, as per agreement dated January 16, 1912, and plan dated at Tacoma January 12, 1912.

Bridge to give 24' clear roadway and to provide approaches at five per cent grades parallel to yard tracks.

-0-

| | Labor | Material | Total |
|---------------------------------------|---------|----------|----------|
| 800 cu.yds. earth fill L 30¢ | \$240 | ----- | \$240 |
| 10000 lin. ft. piling L 10¢ M 10¢ | 1,000 | \$1,000 | 2,000 |
| 305000 P.B.M. Lbr. L \$8.00 M \$12.00 | 2,440 | 3,660 | 6,100 |
| 89000 " H.T.Lbr. L \$20. M \$14. | 1,780 | 1,246 | 3,026 |
| 151000 lbs. Iron L 1¢ M 2½¢ | 1,510 | 3,775 | 5,285 |
| Painting | 300 | 150 | 450 |
| Falsework | 400 | 200 | 600 |
| Engine and Work Train Service | 300 | ----- | 300 |
| Engineering & Incidentals 10% | 797 | ----- | 797 |
| Total | \$8,767 | \$10,031 | \$18,798 |

Office of Bridge Engineer,
St. Paul, Minn.
February 2, 1912.

St. Paul, Minn., November 3, 1911.

HES.

Mr. W. C. Smith,

Chief Engineer Maintenance of Way.

Dear Sir:-

Herewith four copies each of estimated cost of highway bridge to carry Algona Road across proposed new yard at Auburn compared with subway to carry road under proposed yard.

Estimated cost of subway scheme is \$31,334 against \$18,756 for overhead bridge scheme. The subway scheme provides permanent structure under the two main tracks, but the maintenance on the balance of the subway which would be constructed in temporary form would, in my opinion exceed the maintenance on the entire overhead structure proposed.

I have compared the per foot cost of the subway estimate to the per foot cost of similar subway at Livingston, and find them to check out very closely.

The highway estimate is based on detail plans already prepared for another highway crossing of the Auburn yard which is very similar to the one proposed for Algona Road.

I think, therefore, that both estimates are fairly close and give a good comparison of the relative

Mr. W. C. Smith Page -2- 11/3/11

cost of the two schemes. Aside from cost considerations the subway scheme has so many disadvantages in matters of drainage , lighting and maintenance , that in my opinion it should be thrown out from the consideration.

Yours truly,

Bridge Engineer.

B

NORTHERN PACIFIC RAILWAY COMPANY

SEATTLE LINE - AUBURN TERMINALS

Estimated cost of bridge to carry Algona
Road over proposed new yard at Auburn. Bridge to give
24' clear roadway and to provide approaches
parallel to yard tracks. All
approaches on 7% grade

-----oOoe---

| | | | |
|--|---------|---------|----------|
| 1,040 cu. yds. earth fill L 30¢ | #312 | | \$312 |
| 14,000 lineal feet piling L 10¢ M 10¢ | 1,400 | 1,400 | 2,800 |
| 354,000 F.B.M. Lumber L \$8.00 M \$12.00 | 2832 | 4,248 | 7,080 |
| 80,000 F.B.M. H.T. lumber L\$20 M \$14 | 1,600 | 1,120 | 2,720 |
| 105,000# Iron L 1¢ M 2½¢ | 1,050 | 2,625 | 3,675 |
| Painting | 300 | 150 | 450 |
| Falsework | 400 | 200 | 600 |
| Engine & Work train service | 300 | | 300 |
| Engineering & Incidentals 10% L | 819 | | 819 |
| Total | \$9,013 | \$9,743 | \$18,756 |

Office of Bridge Engineer,

St. Paul, Minn.,

November 3, 1911.

NORTHERN PACIFIC RAILWAY COMPANY

SEATTLE LINE - AUBURN TERMINALS

Estimated cost of subway to carry Algona Road under proposed new yard at Auburn - Subway to give 24' clear roadway and 13' clear head-room and to provide approaches parallel to yard tracks - All approaches on 5% grade. Permanent structure under two main line tracks only.

-----oOo-----

| | | | |
|---|----------|----------|----------|
| 21,000 cu. yds. exc. L 30¢ | \$6,300 | | \$6,300 |
| 450 cu. yds. concrete L \$2.50 M \$3.50 | 1,125 | \$1,575 | 2,700 |
| Forms | 170 | 160 | 330 |
| 27,500' Piling L 10¢ M 10¢ | 2,750 | 2,750 | 5,500 |
| 338,000 F.B.M. Lumber L \$10.00 M \$12.00 | 3,380 | 4,056 | 7,436 |
| 16 Tons Steel L \$8.00 M \$50.00 | 128 | 800 | 928 |
| 30,000# Cast & Wrought Iron M 3¢ | | 900 | 900 |
| Engine & Work train service | 300 | | 300 |
| 2600' of 18" drain L \$1.25 M 75¢ | 3,250 | 1,950 | 5,200 |
| Engineering & Incidentals 10% L | 1,740 | | 1,740 |
| Total | \$19,143 | \$12,191 | \$31,334 |

Office of Bridge Engineer,

St. Paul, Minn.,

November 3, 1911.