

Message

From: Prendergast, Thomas F. [Thomas.Prendergast@stvinc.com]
on behalf of Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com> [Thomas.Prendergast@stvinc.com]
Sent: 7/31/2019 1:45:33 PM
To: John Manconi [john.manconi@ottawa.ca]; michaelj.morgan@ottawa.ca
CC: Prendergast, Thomas F. [Thomas.Prendergast@stvinc.com]
Subject: Fwd: CP Rail Temp charts and CN
Attachments: Ottawa Stage 1 CWR Tech Memo-Rev3.pdf; ATT00001.htm

John/Michael -

Please read summary e-mail below as well as the attachment. I believe that these documents summarize the issue from a technical perspective and give OC Transpo the leeway to use as it deems best to influence its decision as to how to approach RTG/RTM on the CWR issue and its affect on the need for Temporary Speed Restrictions.

If either of you have concerns with what is stated and/or the position taken please call me to discuss. I would like to finalize it and submit as soon as possible, but no later than COB Friday, August 2nd.

Tom Prendergast

Sent from my iPhone

Begin forwarded message:

From: "Olson, Joseph E." <Joseph.Olson@stvinc.com>
Date: July 30, 2019 at 6:23:21 PM EDT
To: "Prendergast, Thomas F." <Thomas.Prendergast@stvinc.com>
Cc: "Bobby, Albert R." <Albert.Bobby@stvinc.com>, "Bobby, Paul E." <Paul.Bobby@stvinc.com>
Subject: RE: CP Rail Temp charts and CN

Hi Tom,

Attached is the revised CWR Issue tech memo based on your comments below.

Major updates include a new Rail Industry Research and Analysis section with criteria from various North American systems. We can generate an appendix with sources if we need, but will take a little more time to format and make presentable.

If you have any questions or comments, let us know.

Thanks,
Joe

-----Original Message-----

From: Prendergast, Thomas F.
Sent: Tuesday, July 30, 2019 9:18 AM
To: Olson, Joseph E. <Joseph.Olson@stvinc.com>
Cc: Bobby, Albert R. <Albert.Bobby@stvinc.com>; Bobby, Paul E. <Paul.Bobby@stvinc.com>
Subject: Re: CP Rail Temp charts and CN

Joe/Al -

Also, I should have stated it in my earlier e-mail, but forgot to do so. Let's see if we can move up the

completion of the summary to COB today so that I can get it into the hands of the client early tomorrow. I expect that John Manconi will ask for a teleconference call with you two and me, along with key OC Transpo staff, to discuss in more detail with the track experts RTG has. That call would likely take place tomorrow.

Tom Prendergast

Sent from my iPad

On Jul 30, 2019, at 10:14 AM, Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com> wrote:

Joe/Al -

In addition to including the comments regarding the neutral temperatures used by other Light Rail systems in North America as well those from Class I railroads it would be advantageous to make reference to the fact that while the use of a much lower neutral temperature in Ottawa does not present any safety concerns per se, it will surely result in higher maintenance costs and the higher likelihood of the imposition of Temporary Speed Restrictions at lower than normal temperatures (say 86 degrees and above) that could affect end-to-end running times and overall throughput.

As you normally do use a tone that is fact based, straightforward and objective that clearly stated the impacts for the client and contractor to understand. I fully expect some pushback from RTG, BUT having said that we have a duty to the client to be unmistakably clear on this issue since one of its impact might very well be on service performance.

Tom Prendergast

Sent from my iPad

On Jul 25, 2019, at 5:15 PM, Olson, Joseph E. <Joseph.Olson@stvinc.com> wrote:

Tom,

Below is our overview/narrative to accompany the tech memo addressing comments below. Also attached is Rev2 of the Tech Memo.

Please let us know if you have any questions or need anything else. We do have some more technical references if we need to go that route.

Overview:

The contractor for Stage 1 Confederation Line laid continuous welded rail (CWR) at 10° C – 20° C or 50° F – 68° F based on De-stressing Inspection Quality Forms. This temperature is lower than the typical standard railroad practice of laying rail with neutral temperatures ranging 90° F – 100° F or higher depending on geographic location.

Based on practical railroad maintenance experience and guidelines from AREMA and TCRP 155, the neutral laying temperature or Preferred Rail Laying Temperature (PLRT) for a project should consider extreme heat and the highest rail temperature possible in project area. Factoring the highest rail temperature into the PLRT will help to prevent sun kinks (track buckling) during extreme heat conditions. For example, during a hot sunny summer day when ambient temperature is 100° F, the actual rail temperature can reach 115° F to 120° F +/- . If rail in this area was laid at a PLRT of 50° F – 60° F, the difference in temperature between PLRT and actual could be as high as 70 ° F creating high compressive forces due to thermal expansion. The resulting thermal forces could create a sun kink at a weak point in track section.

For comparison, Canadian freight railways specify a PLRT of 90° F – 95° F in the subdivisions near Ottawa. In addition to a high PLRT, the railways also institute speed restrictions either during extreme heat conditions or if track structure has recently been disturbed (e.g. track surfacing) where ballast has not yet fully settled.

In regards to difference between freight and passenger operations, thermal expansion impacts steel rail track no matter what type of traffic is traversing a corridor. The factors that typically lead to sun kinks and track buckling are: high compressive forces due to thermal expansion and weakened track structure. Dynamic vehicle loading does increase risk of sun kinks on downgrades and horizontal curves due to increase forces to a lesser extent. Although dynamic loading of freight traffic can be higher than passenger, the main forces leading to sun kinks, specifically thermal expansion, do not change based on vehicle type.

To mitigate sun kinks on the Confederation Line this summer, the contractor reported removing small sections of rail at three locations. The sections ranged in size from 10mm (3/32”) to 15mm (5/32”) for a total removal of less than 1/2”. This method of removing rail is consistent with our recommendation to mitigate track buckling in warmer conditions although the limited size of the removal at less than 1/2” does not seem cost effective. Additionally, the prospect of reinstalling less than 1/2” of rail in the cooler fall season not only eliminates improvement in increasing neutral rail temperature it also does not seem cost effective.

In regards to comment on ballast settlement, although we do not have exact record of traffic on the line, it is our understanding that there have been trains running for nearly 1 year. Over the past five to six months, daily traffic has increased to 10 to 15 trains a day for testing and commissioning. The traffic over the line in the past year has sufficiently settled and compacted the ballast. In addition, we strongly recommend the use of a Dynamic Track Stabilizer in future maintenance activities.

Finally, based on the three contractor De-stressing Inspection Quality Forms from June 20th and 21st 2017, the rail was laid on the lower range of the PLRT of 10° C – 20° C at an average of 12.45° C (54.41° F). This average rail temperature is approximately 35° F below typical railroad PLRT. It is our recommendation that the Preferred Rail Laying Temperature be raised to 90° F based on good railroad practices and provide safer railroad operations.

-----Original Message-----

From: Olson, Joseph E.

Sent: Thursday, July 25, 2019 2:17 PM

To: Bobby, Albert R. <Albert.Bobby@stvinc.com>; Prendergast, Thomas

F. <Thomas.Prendergast@stvinc.com>

Cc: Bobby, Paul E. <Paul.Bobby@stvinc.com>

Subject: RE: CP Rail Temp charts and CN

Hi Tom,

Attached is the draft tech memo for Stage 1 Continuous Welded Rail Issues Related to Temperature.

Please let us know if you have any questions or edits.

We will be sending a follow up narrative in the next hour or so.

Thanks,

Joe

-----Original Message-----

From: Bobby, Albert R.

Sent: Thursday, July 25, 2019 2:14 PM

To: Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com>

Cc: Olson, Joseph E. <Joseph.Olson@stvinc.com>; Bobby, Paul E.

<Paul.Bobby@stvinc.com>

Subject: Re: CP Rail Temp charts and CN

Hi Tom: Will sending you a memo on

Findings, Conclusions and Recommendation per our discussion.

Hope this is the format you wanted, let us know if you would like to change anything.

Will be sending you shortly a Overview / Narrative covering a lot of Kevin Vokey comments. Some of this is redundant but drives home the seriousness of the issue at hand.

Feel free to call anytime. A.R. Bobby

Sent from my iPhone

On Jul 23, 2019, at 10:12 AM, Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com> wrote:

Al -

That's fine. What phone number should I use when I call you and Joe?

Tom Prendergast

-----Original Message-----

From: Bobby, Albert R.

Sent: Tuesday, July 23, 2019 11:05 AM

To: Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com>

Subject: Re: CP Rail Temp charts and CN

10:30 it is

I am down town office today thought I would have Joe Olson sit in he the design Engineer/lead Engineer for phase 2and been involved with Ottawa project. If you're ok with that?

Sent from my iPhone

On Jul 23, 2019, at 9:56 AM, Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com> wrote:

Al -

Yes, the call would just be you and me for now. I would like us to share our collective thoughts and make sure that we are aligned in our thinking as you prepare to summarize your thoughts and "put pen to paper" so to speak. Shouldn't take more than 20-30 minutes at most.

Tom Prendergast

-----Original Message-----

From: Bobby, Albert R.

Sent: Tuesday, July 23, 2019 10:40 AM

To: Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com>

Subject: RE: CP Rail Temp charts and CN

Will this call be just you and I ? to basically finalize our thoughts, theory's and recommendation's for final write up? If so sure, I am waiting to get a couple questions answered (I sent a email to Bruce Howie But response yet.

-----Original Message-----

From: Prendergast, Thomas F.

Sent: Tuesday, July 23, 2019 9:30 AM

To: Bobby, Albert R. <Albert.Bobby@stvinc.com>

Subject: RE: CP Rail Temp charts and CN

Al -

I just received notice that I need to be on another Ottawa LRT call at Noon EST (which is the same time as when we are going to talk). Would it be possible to move our call up 30 minutes and have it at 10:30 AM CST? If not, we will stay with 11:00 AM CST for our call. Just let me know.

Tom Prendergast

-----Original Message-----

From: Prendergast, Thomas F.

Sent: Monday, July 22, 2019 8:22 PM

To: Bobby, Albert R. <Albert.Bobby@stvinc.com>

Subject: Re: CP Rail Temp charts and CN

Al -

Sounds good. I will call you then.

Tom Prendergast

Sent from my iPad

On Jul 22, 2019, at 8:05 PM, Bobby, Albert R. <Albert.Bobby@stvinc.com> wrote:

Let shoot for 11:00 cst will work for you? I know it close to beans.

Sent from my iPhone

On Jul 22, 2019, at 6:30 PM, Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com> wrote:

Al -

I forgot to recommend a time for our call prior to hitting send on the e-mail below. How about 10:30 or 11:00 AM your time?

Tom Prendergast

Sent from my iPad

On Jul 22, 2019, at 7:12 PM, Prendergast, Thomas F. <Thomas.Prendergast@stvinc.com> wrote:

Al -

Photos are not crude at all and are easy to read for sure. After reviewing both documents from the CP and CN it is clear that RTG has used a much lower temperature (range?) when installing the CWR for the Ottawa LRT. I am not sure what their logic was in doing so and I sincerely hope that it wasn't a matter of convenience. I vaguely recall their deciding to do it at a certain time for scheduling purposes and to get it done and "out-of-the-way".

From what I see their use of a much lower preferred temperature won't necessarily result in a safety issue per se as much as an ongoing maintenance one with the potential of a higher frequency of sun kinks. The experience so far has been no rail breaks and quite a few sun kinks which aligns with the lower temperature range they used.

Let's talk in the morning and then you can write up the report summarizing your findings. Take care and stay cool.

Tom Prendergast

Sent from my iPad

On Jul 22, 2019, at 6:36 PM, Bobby, Albert R. <Albert.Bobby@stvinc.com> wrote:

Tom: I apologize for crud photos hope you can read them ok if not let me know, please find CP Preferred Rail Laying Temperature for Canada and US.

E:

From: Bobby, Albert R.

Please consider the environment before printing this e-mail.

<CN-A1-1a-Rail Laying Temp by Division.jpg> <CN-A1-1b-Rail
Laying Temp by Division.jpg> <CN-A1-2-Rail Laying Temp by
Division US.jpg>
<Ottawa Stage 1 CWR Tech Memo-Rev2.pdf>