1995 SPRING WASHOUTS IN BRITISH COLUMBIA

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Introduction

A flood event on June 6 and 7, 1995, resulted in extensive damage to CP Rail System track and structures in southeastern British Columbia. Watercourse discharges, with peak flows estimated in the order of a 200 year return frequency event, were caused by heavy localized precipitation on June 6 in combination with a rapid snow melt in local mountains. Dikes, including one at Sparwood, BC, designed in 1988 to 200 year return frequency flood event standards were damaged and breached by the June 6 flood.

Preliminary data revealed that about four inches of rain fell over a 15-hour period on June 6 and a snowpack of about 3 feet thick (water equivalent of about 14 feet) existed at an elevation of 5,900 feet at Fernie, BC. The rapid depletion of the snowpack due to and in conjunction with the heavy precipitation resulted in the large run off volumes and subsequent damaging flows in the Elk River Valley of southeastern British Columbia.

The flood event stream flows caused washouts at 44 locations on CP Rail System's Cranbrook, Fording River, and Byron Creek subdivisions. The flood damage ranged in scope from minor bank and bridge substructure scouring to complete loss of subgrade and bridge supports. In addition, heavy localized precipitation resulted in debris torrents depositing materials on the tracks at four locations. These subdivisions are critical transportation links in Canada's coal export market, as CP Rail System transports about 25 MGT of coal from the mines of southeastern BC to west coast terminals on an annual basis. Prompt restoration of service on these lines, particularly the Forcing River subdivision and Cranbrook subdivision west of Sparwood that service four mines was of paramount importance.

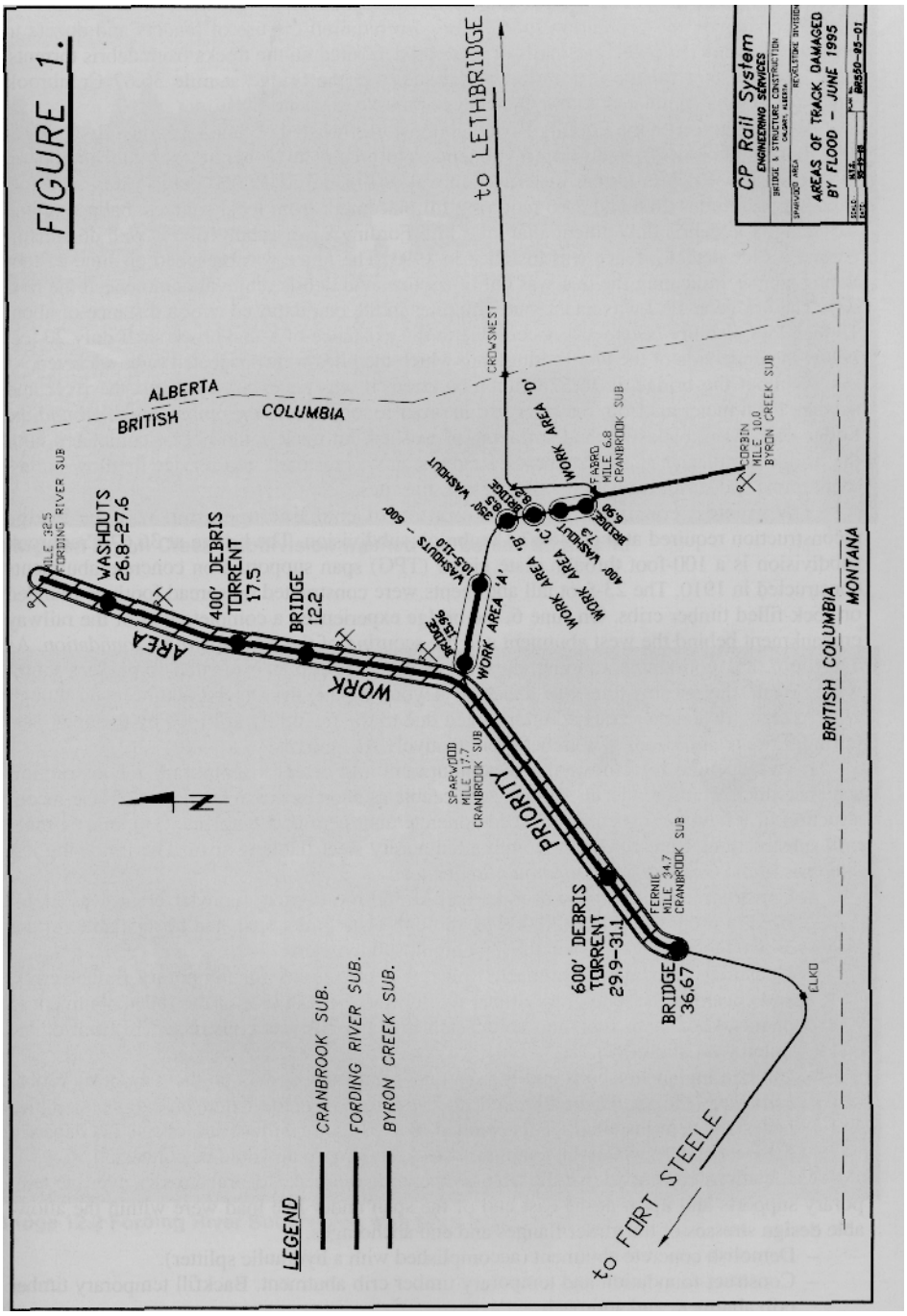
Repairs on the Byron Creek subdivision were arranged by the mining company serviced by the line at Corbin, under the supervision and guidance of CP Rail System engineering personnel. The Byron Creek subdivision restoration involved about 4,000 linear feet of subgrade construction over nine locations (about 1,500 feet at mileage 7.7) requiring fill and/or rip rap placement. Washouts occurred behind the substructures at five bridges on the Byron Creek Subdivisions. These bridges, constructed in 1977 on pile foundations, remain intact with only restoration of the embankment required. Also, a debris slide deposited an estimated volume of 200 cubic yards of material at mile 10.3 on the Byron Creek subdivision. The remaining 33 sites on the Cranbrook and Fording River subdivisions were apportioned into five project segments in order to best meet the challenge to restore train operations within seven days on priority segments of the line and within four weeks at other locations.

Emergent Reconstruction: Priority Work Sites

Priority work sites, consisting of the bridge at 36.67 Cranbrook and 21 other locations were established for locations west of mile 17.7 on the Cranbrook subdivision and on the Fording River subdivision in order to restore coal service to four mines on the Forcing River Subdivision. The challenge facing CP Rail System services personnel was to effect reconstruction in order to establish coal train operations over the line segment within seven days.

The work consisted of embankment reinforcement at IS locations, 9 at bridge crossings, removal of material from debris torrents at three locations and the reconstruction of the bridge at mile 36.67 Cranbrook subdivision.

Seven locations west of mile 29.9 Cranbrook subdivision, four bridges and three embankments, excluding the bridge at mile 36.67, required only the securing of bridge substructures and the subgrade with rip rap transported to the sites by railway airdump cars and placed with loaders and excavators.



Two sites on the Cranbrook subdivision also required the use of loaders and dozers to remove an estimated 600 cubic yards of material deposited on the tracks from debris torrents. This work, except for the restoration of service over the bridge at mile 36.67 Cranbrook subdivision, was completed within three days of the flood event.

Work required on the Fording River subdivision consisted of nine locations, five bridges and four embankments, requiring revetments reinforcement (concrete lock blocks and rip rap), one site of debris torrent material removal (estimated as 12,000 cubic yards) and two sites between miles 26.8 and 27.6 requiring fill placement from local sources, ballasting and surfacing. The debris flow potential at mile 17.5 Fording River subdivision is well documented and a slide detector fence was installed in 1993. The fence was breached on June 6, activating signals indicating the line was out of service, and debris removal commenced the next day. The bridge at 12.2 was intact, but with piles in the pier exposed over a distance of about 15 feet. Pier stability became a concern due to the existence of a shale rock shelf only 20 feet below the underside of the pier footing, into which the piles were suspected to be socketed.

Without the bridge at 36.67 Cranbrook open, it was necessary to divert the river and salvage local materials from the river bed in order to reconstruct the embankment around the bridge pier. Also, ballasting and surfacing of washed out track could not be completed until the bridge at mileage 36.67 Cranbrook subdivision was restored into service to allow ballast work trains and surfacing equipment access to the sites.

The greatest constraint to the restoration of coal line operation was the bridge reconstruction required at mile 36.67 Cranbrook subdivision. The bridge at 36.67 Cranbrook subdivision is a 100-foot through plate girder (TPG) span supported on concrete abutments constructed in 1910. The 23-foot tall abutments were constructed on spread footings founded on rock-filled timber cribs. On June 6, the bridge experienced a complete loss of the railway embankment behind the west abutment and the scouring of the west abutment foundation. As a result of this footing undermining, the west abutment tipped an estimated 15 degrees southward. While the substructure was damaged beyond repair, the superstructure, even though twisted along its length remained undamaged due to the flexibility afforded by the open plan (stringer/floorbeam) floor system between relatively stiff girders.

It was decided to remove the west abutment and effect a temporary reconstruction scheme which would render the bridge serviceable as soon as possible and enable the reconstruction of a new permanent reinforced concrete abutment under traffic. Temporary timber crib substructures were constructed with a temporary steel flanking span. The following is a synopsis of the temporary reconstruction sequence.

- Construct access roads and crane pad (a 360-ton capacity crawler crane was mobilized in order to lift the 320,000 lb. through plate girder span and be available for use at two other bridge sites on the Cranbrook subdivision).

- Construct foundation (compacted pit-run crushed rock for temporary timber cribs) and construct the temporary timber pier crib to the east side of the failed abutment (a peninsula of large rock and compacted granular fill was constructed in front of the failed west abutment).

- Cut hearing anchor bolts and lift span onto timber pedestals on the temporary timber crib pier (the span was blocked and supported on the tilted bridge seat as pier pedestals were installed). This resulted in a 10 foot cantilevering of the TPG span at the west end, to which the temporary steel flanking span would be connected.

- Calculations confirmed that the negative bending moment flexural stresses over the temporary supports and uplift at the east end of the span under live load were within the allowable design stresses of the girder flanges and end anchorages.

- Demolish concrete abutment (accomplished with a hydraulic splitter).

- Construct foundation and temporary timber crib abutment. Backfill temporary timber crib abutment and approach.

- Install temporary steel flanking span (a 25 foot steel I-beam flanking span, complete with diaphragms and bracing, was fabricated and assembled at the site with clip angle connections for attachment to the TPG end floorbeam and bearing pads at the other end for bearing on temporary timber crib abutment).

- Install deck (prefabricated and framed at site).

- Complete backfilling, ballast, construct and surface track.

Bridge 36.67 Cranbrook Subdivision. Temporary reconstruction completed.

Bridge 36.67 Cranbrook Subdivision. Span supported on temporary steel bent and formwork for permanent abutment being constructed.

With crews working around the clock, the reconstruction of the bridge at 36.67 Cranbrook subdivision was completed within six days of the flood event and subsequent coal service interruption. The first train proceeded over the reconstructed bridge at 0044 hours June 12 at 5 mph.

Engineering services personnel inspected the reconstructed structure and regular coal train service was resumed. The bridge crossing speed was raised to 10 mph after 14 days of service. The bridge continued to perform well until commencement of the permanent concrete abutment at the end of July, at which time a total cumulative subsidence of two inches at the temporary girder bearings had occurred (the subsidence attributed to a combination of timber crushing and foundation settlement under coal train service with 65,000 lb. axle loads).

Ballasting and surfacing was completed at sites between miles 26.8 and 27.6 on the Fording River Subdivision at about 1200 hours June 12, thereby restoring coal train service on the critical coal route segments on the Fording River and Cranbrook Subdivision west of Sparwood, BC (mile 17.7 Cranbrook Sub). Reconstruction: Work Area Packages "A", "B", "C" and "D"

With priority work completed and the resumption of coal train operations on the Fording River and Cranbrook Subdivision west of Sparwood established, the remainder of the restoration work was divided into four packages in order to effect an ordered and structured approach to complete the work within four weeks.

Work Package "A"

Work package "A" consisted of sites between miles 8.9 and 16.0 on the Cranbrook subdivision. Flood-related damage occurred to bridges at miles 8.9, 9.2, 9.4 and 15.96; and the railway embankment at three sites between miles 10.5 and 12.5. The bridges at miles 8.9, 9.2 and 9.4 Cranbrook subdivision suffered considerable scouring behind abutment wingwalls but remained intact and operational. However, the bridge at mile 15.96 experienced similar flood related damage as the bridge at 36.67, with the embankment behind the west abutment destroyed and the west abutment footing undermined. The washout and scouring at the west abutment precipitated its total failure as it subsided an estimated eight inches below the preflood stream bed. It was decided to reconstruct this bridge as first priority within Work Area "A" in order to allow airdump railway cars with rock and fill to proceed to the sites at miles 10.5, 11.0, and 12.5 on the Cranbrook subdivision.

At 12.5 Cranbrook subdivision, only rip rap was required to stabilize the toe of the embankment. However, at miles 10.5 and 11.0, a combined length of about 350 feet of embankment was completely washed out leaving the track suspended. The embankment was restored, subgrade constructed, and track laid within 12 days of completion of the temporary reconstruction of the bridge at mile 15.96 Cranbrook subdivision.

The bridge at mile 15.96 Cranbrook subdivision is a two span (two 110 foot TPG spans) structure supported on concrete abutments and central pier constructed in 1910 (substructures were repaired and jacketed in 1954). The June 6 flood event caused complete failure of the west abutment and embankment behind the abutment for a distance of about 300 feet after peak flows breached a dike immediately upstream of the bridge. The result was the subsidence of the west abutment and west end of the west TPG span into the river. The west TPG span was submerged over about half its length and displaced downstream about 20 feet at the west end. It was decided to reconstruct the bridge in a similar manner to that underway at mile 36.67. The immediate challenge, however, was to re-route the river under the east TPG span in order to construct the necessary access and crane pad to commence the reconstruction.

Bridge 36.67 Cranbrook Subdivision failed west abutment.

Bridge 36.67 Cranbrook Subdivision supported on temporary timber crib pier.

A large berm extending from the newly washed out stream bank to the center pier of the bridge was built in order to construct access, pile driving/crane lifting pads and a foundation for a new subgrade embankment over a distance of about 300 feet west of the bridge. The berm was constructed of local materials and protected with rip rap transported by railway airdump cars to the west end of the site (about 3000 cubic yards was transported to the site). In conjunction with this work, the stream bed under the east span was dredged to accommodate the high discharge volumes in the channel, using excavators in the river upstream and downstream of the bridge.

In order to effect a prompt opening of the bridge at 15.96 Cranbrook to traffic, and allow airdump work trains to transport materials to washed out embankments at miles 10.5, 11.0, and 12.5, a design-construct approach was undertaken commencing June 10. Fourteen piles were driven, capped, and braced to provide a temporary steel bent on which to support the span. The piles were driven in a pattern so they could be incorporated into the final pile plan being designed by CPRS structural engineers. The following construction sequence was generally

followed as necessary resources were mobilized from the bridge at 36.67 Cranbrook (in addition to a 40,000 foot per pound rated energy pile driver).

- Construct river training berm

- Construct access and crane/pile driving pads.

- Drive piles for temporary steel support bent and de-water at location of failed west abutment.

- Construct base of temporary timber crib abutment to south side of west end of the west span and channel runways (Blocked to the pier and berm for support) to south side of center pier.

- Install sliding devices in channel runways (Hillman Rollers), remove anchor bolts and install safety cables in TPG spans.

- Lift west end of west span (span was lifted from lugs with spreader beam as it was not possible to sling underneath submerged end of span).

- With crane at west end and cables attached to a dozer at the east end of the west span, slide span southwards and support west end on base of temporary timber crib abutment. The east end of the span rested on the glide/roller arrangement on timber blocking. The span was moved laterally about 20 feet in this manner to allow for the demolition of the failed abutment, driving of remaining piles for the temporary steel bent, steel bent construction and east end roller bearing inspection,

- Demolish old abutment (drilled and blasted with rubble left in place).

- Construct temporary retaining wall behind location of temporary timber crib abutment to allow embankment construction to proceed concurrently with bridge reconstruction.

- Drive remaining piles for temporary steel bent (some pile locations were coincident with location of failed abutment and abutment demolition required first). Construct temporary steel bent (cut off piles, cross cap, brace and install bearing plates).

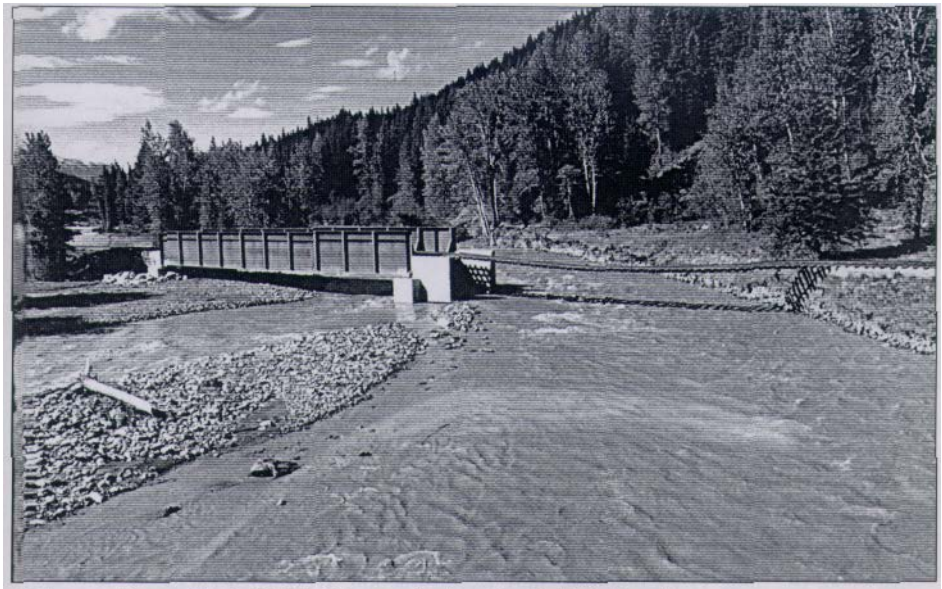
- Slide span back into position on pier and temporary steel bent.

- Lift and place base of abutment to position about 25 feet west of the west end of the bridge and complete construction of timber crib and ballast retention wall. Backfill temporary timber crib.

- Install prefabricated steel I-beam flanking span.

- Install pre-framed deck (complete with safety railings) on flanking span, perform minor steel repairs (torn stringer top flange angle temporarily reinforced with welded cover plate until final steel repairs) and install new TPG deck ties in place of damaged ties on TPG span.

- Construct subgrade and track. Ballast and surface.



Bridge on Bryon Creek Subdivision washed out behind abutment.

Bridge 12.2 Fording River Subdivision with piles exposed at pier.

In addition to damage to the top flange angles of a stringer in the west panel of the west span, inspection of steel work revealed damaged intermediate web stiffeners and web plate on the south side of the west end of the west TPG span. Immediate repairs were made to the stringer flanges with other steel repairs being deferred, as it was determined the span was in acceptable condition to carry train loads at 10 mph commencing June 18.

The movement of airdump cars with materials over the bridge at 15.96 Cranbrook enabled the next phase within Work Area "A" to proceed and the embankment, subgrade, and track at miles 10.5, 11.0, and 12.5 Cranbrook subdivision were reconstructed. The work required at mile 12.5 consisted of rip rap protection at the embankment toe only. However, the sites at 10.5 and 11.0 required extensive grade reconstruction over a combined length of about 350 linear feet to a depth of approximately 25 feet.

During the reconstruction of the bridge at mile 15.96, efforts to construct berms in the river and divert stream flow away from the toes of the proposed embankment slopes were undertaken. With this complete, the dumping and placement of rock fill could proceed.

Concern over embankment foundation conditions (exposed and sloping bedrock) and high water at mileage 10.5 precipitated an investigation into slope excavation and realignment of the track. However, river training was successful and a stable rock foundation was placed enabling embankment reconstruction in its original location. Both embankments at locations at miles 10.5 and 11.0 were restored (large rock foundation with five feet of freeboard above high water level and granular fill placed and compacted), track constructed, ballasted, and surfaced by June 30. Rip rap was transported and deposited at locations where minor scouring occurred behind wing walls at bridges 8.9, 9.2, and 9.4 Cranbrook subdivision, thus completing (except for placement of rip rap at the bridges) the Work Area "A" project and opening this portion of the subdivision to traffic. Slow orders of 10 mph will remain on the bridges until the permanent reconstruction is completed, and on reconstructed subgrade until roadmaster's inspections reveal no further subsidence and surfacing requirements under load (after about 500,000 gross tons has passed over the affected areas).

Work Package "B"

Work package "B" consisted of a washed out section of track at mile 8.5 Cranbrook subdivision. A 350 foot long section of the railway subgrade was scoured away to a depth of about 20 feet leaving the rails and ties of the 6 degree curved track hanging over the washed out embankment. In order to open this segment of track concurrently with those of work packages "C" and "D" (comprising the bridge at 8.24 and washed out subgrades at miles 6.9 and 7.3 Cranbrook subdivision), thereby restoring service on the Cranbrook subdivision east of Sparwood, BC (mile 17.7 Cranbrook subdivision), materials were transported to site by road commencing June 20 (river training completed and track removal began June 14).

Embankment reconstruction in lifts from imported rock and granular fill materials was completed by June 30. Track construction, ballasting, and surfacing was completed July 3 concurrent with the temporary reconstruction of bridge 8.24 Cranbrook.

Work Package "C"

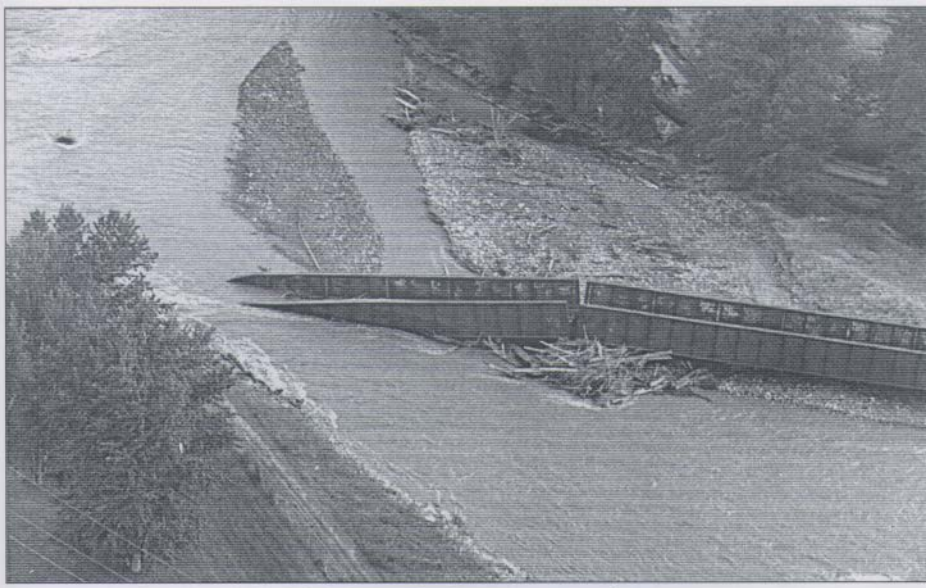
The bridge at 8.24 Cranbrook subdivision suffered extensive damage from the flood event river discharges of June 6. Similar to the flood damage experienced at bridges 15.96 and 36.67 Cranbrook subdivision, the railway subgrade west of the bridge and the west abutment of the bridge were washed away by the flood waters. This 103 foot TPG span erected in 1910 on concrete abutments on spread footings was lying in the river at all angle with its west end about 70 feet downstream. The west abutment had tipped into the river bed due to scour at the footing and the east abutment bridge seat and ballast wall were damaged when was pulled downstream as the west abutment failed.

Access for heavy construction equipment, such as the 365 T crawler crane and 40,000 foot per pound pile driver, as limited by a steep, and possibly unstable, slope (the roadway elevation adjacent to the bridge site is considerably higher than the track). Construction of an access road on this slope was not an option due to potential slope instability (piezometers were noted in the slope and the soils were wet from recent rains) and difficult grades for transport of the crawler crane components.

To provide the necessary access, the track structure was moved aside and the railway subgrade widened to the west of the bridge to access the roadway at a location with an elevation similar to the track, With this access constructed, equipment for the construction of a berm to re-channel the river to its former location (the berm

took the form of an island as high flows made it necessary to allow for discharge behind the west abutment location) was constructed, The failed west abutment was located, drilled and blasted to allow for pile driving for a temporary support bent and the proposed new abutment. The bridge dock was removed in panels with the crane to lighten the span, enable an inspection of the floor system, and permit evaluation of damage to the deck. As expected, many ties were destroyed by debris and required replacement.

Bridge 36.67 with permanent abutment constructed.



Bridge 15.96 Cranbrook Subdivision washed out at west end.

Adequate lead time for the design of the proposed permanent abutment pile layout enabled the driving of all piles for the final abutment. Reconstruction followed the following procedure:

- Construct access, river diversion berms and crane pads.

- Demolish abutment

- Erect crane and remove bridge deck.

- With the extent of berm construction constrained by river flows and the difficult span position, the crawler crane could not lift the 230,000 lb. TPG span at a boom radius necessary to lift the span at its center. A lifting arrangement consisting of the 360 T crane lifting at the west end of the span, such that a 200 T capacity auxiliary locomotive crane could lift at the east end floor beam of the span, was designed.

- The span was lifted onto blocking on the berm at the west end and onto a prefabricated timber pad under the northeast corner to position and stabilize the span; as well as enable cable slings to be installed at the east end floor beam (the blocking was placed under the northeast corner in high river flows and was installed with stabilizing cables to a dozer while being positioned with an excavator bucket while the northeast corner of the TPG was lifted with the crawler crane).

- Safety cables were installed along the TPG interior knee braces.

- The east abutment was repaired by epoxy injection of cracks and removal/reconstruction of failed concrete on the bridge seat and ballast retention wall.

- All piles were driven for the permanent abutment with the central 16 piles being cut off at elevations to allow for the construction of a steel temporary support bent with wide flange section caps, steel shims and bracing.

- Temporary bearings of timber blocking, steel plates and angles were field constructed and installed at the east abutment.

- With the locomotive auxiliary crane at the east end and the crawler crane at the west end of the span, the cranes working in tandem lifted the superstructure into position on the repaired east abutment and temporary steel bent at the west end. The locomotive crane lifted its rated capacity of 35 T at a boom radius of 50 feet from the track on the east abutment, leaving the crawler crane to lift 80 T with a 60 foot boom radius (about 90 percent of rated capacity at radius of 60 feet).

- A temporary timber crib abutment (with dimensions to provide adequate safety factors against bearing pressure, sliding and overturning) and a 25 foot temporary steel flanking span were fabricated and erected.

- The deck was prefabricated in panels (damaged ties were replaced) and installed on the superstructure.

- The fill behind the temporary timber crib abutment was constructed and track construction, ballasting, and surfacing operations ensued once the subgrade was on the access road west of the bridge.

Inspection of the steel work revealed only minor damage to knee brace angles and some loose rivets (which appeared to have been a pre-existing condition due to evidence of "bleeding" at rivet holes). Steel repairs were assessed as non-critical and would be performed after the span was in service.

The work at 8.24 Cranbrook proceeded well and was completed within 16 days; five days ahead of the original projection date of July 7. The lift of June 28 was accomplished by careful scheduling of Work Package -D- as it was necessary to complete the work at miles 6.9 and 7.3 Cranbrook subdivision in order to mobilize a locomotive crane from Calpry (east of flood sites).

Bridge 15.96 Cranbrook Subdivision being lifted and moved laterally on to temporary supports.

Bridge 15.96 Cranbrook Subdivision Temporary reconstruction completed.

Work Package "D"

Work package "D" involved the restoration of washed out subgrade at miles 6.9 and 7.3 Cranbrook subdivision.

The bridge at mile 6.9 is TPG span on concrete abutments with pile foundations. The bridge remained intact during the flood, but about 100 feet of the railway embankment behind the west abutment was washed out. The river was re-channeled into its former position and the embankment reconstructed with large rock transported by airdump cars and local materials salvaged from river diversion. Work commenced on June 12 and was completed within five days in order to allow completion of the embankment reconstruction work at 7.3 Cranbrook by June 25.

At mile 7.3 Cranbrook subdivision, about 500 feet of the subgrade was destroyed to a depth of 25 feet during the June 6 flood conditions. With river flow rechanneling completed on June 20, embankment and subgrade reconstruction commenced. Embankment materials were transported to the site by airdump cars and local material salvaged from river training exercises.

Concluding Remarks

Train operations were completely restored on the Cranbrook and Fording River subdivisions on July 2 with inaugural eastbound train CP6048 arriving at Crowsnest at 20:35. The restoration of service on critical coal service lines (Fording River sub and Cranbrook 'sub west of mile 17.7) on June 12 and east of mile 17.7 Cranbrook sub by July 2 exhibited the CP Rail System engineering services' commitment to customer service.

In conjunction with the customers of CP Rail System transportation services, the Byron Creek subdivision work was completed on July 28. The challenge of rail service restoration on critical coal routes within seven days and within four weeks on the remainder of the lines affected by the June 6 flood in southeast BC was accomplished by CP Rail Systems engineering services personnel in a timely and cost-effective manner.

Permanent reconstruction of abutments at bridges 8.24, 15.96 and 36.67 Cranbrook, as well as some rip rap reinforcements, remain in order to lift slow orders and resume normal operating speeds on the coal route.

The work of permanent reconstruction at 36.67 Cranbrook commenced the week of July 3 with the driving of piles for the abutment (piles were driven between the temporary steel flanking span stringers after ramp construction for placing the pile driver leads) construction of a temporary steel bent and removal of the timber crib pier supporting the bridge since June 12.

Construction of formwork reinforcement placement and concrete pouring around the temporary steel bent and foundations piles (cut off above ground elevation at three feet and six feet for back row and front row piles, respectively) proceeded under traffic.

After concrete curing to a compressive strength of about 4,000 psi, hearing installation, removal of temporary steel flanking span, and concrete pour completion (ballast wall pockets); backfilling, track construction, ballasting and surfacing will be performed to bridge to normal operation. The work of dike restoration and revetment protection of the dike and new abutment will be coordinated with municipal, provincial and federal agencies responsible for land, water, environmental and fish habitat protection.

The bridges at miles 8.24 and 15.96 Cranbrook subdivision are being permanently reconstructed in a similar manner as the bridge at 36.67 Cranbrook subdivision (sheet pile cofferdams were required due to the water levels and depth of new foundations).

At 15.96 Cranbrook subdivision, an additional 11 piles were driven for permanent abutment (abutment pour commenced September 18). Land remediation. (like restoration, and revetment protection also remains at bridge 15.96. This work will be performed in coordination with local, provincial, and federal agencies. All permanent works are anticipated to be complete by October 1995.

Projects such as this test the technical substance of engineering personnel and the financial resources of the company. Successful planning and execution of this emergent response project was accomplished due to the dedicated efforts of all operating, engineering, and transportation personnel engaged in this reaction to an interruption of customer service.

Thank you. (Applause)

Bridge 15.96 Cranbrook Subdivision with formwork for permenent abutment constructed.

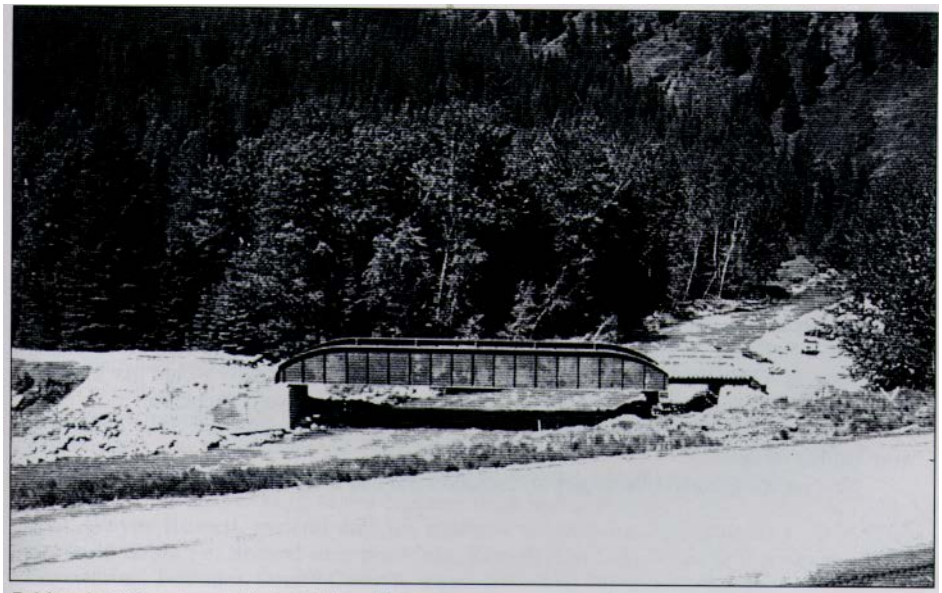
Reconstruction of subgrade at mile 10.5 Cranbrook Subdivision.

Washed out embankment at mile 11.0 Cranbrook Subdivision.

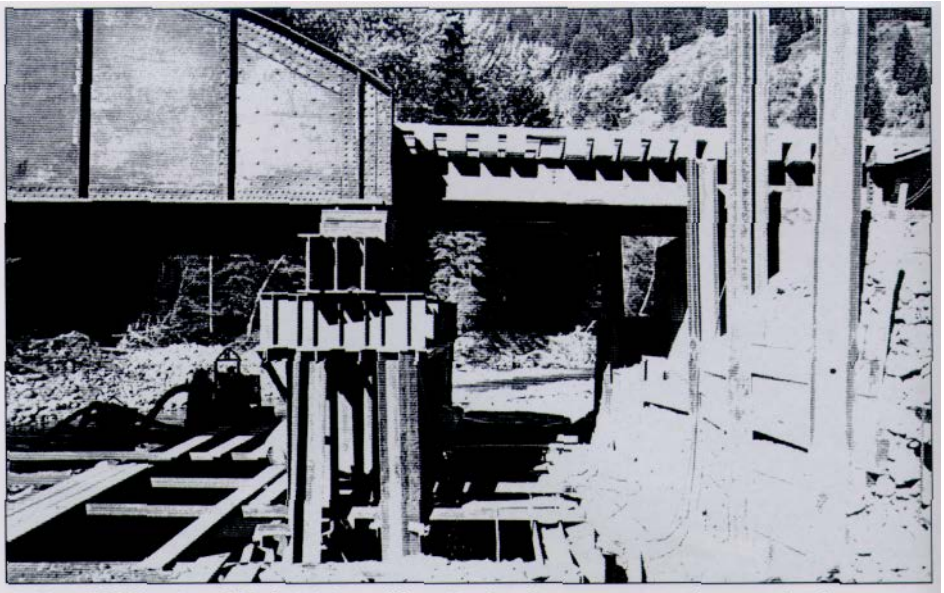
Washed out embankment at 8.5 Cranbrook Subdivision.

Bridge 8.24 Cranbrook Subdivision being lifted on to repaired east abutment and temporary steel bent.

Bridge 8.24 Cranbrook Subdivision West abutment failed and span displaced due to washout.



Bridge 8.24 Cranbrook Subdivision. Temporary reconstruction completed.



Bridge 8.24 Cranbrook Subdivision with cofferdam for permanent abutment footing constructed.

President Nordlund: Thank you, John, for sharing that with us.

I would like to thank Pete Murgas and Joe Lileikis for all of their work in putting together the organization of the presentation. That was the last of the formal ones and you had a good audience, John. This was very interesting.

At this time I would call on the outgoing directors of the Roadmasters Association. Would Ron Poulsen on completion of his term of treasurer come forward and Dave Kelly on completion of his term as a director please come forward. On behalf of the Association, I would like to present plagues to Ron and Dave recognizing their participation and support over the past years. (Applause)

President Van Huis: At this time I would like to call the outgoing directors from the Bridge and Building Association. Would Lee Hostler, Jimmy Neece and Ron Kaye please come forward. On behalf of the B&B Association and myself, I certainly would like to thank these guys for the support they have given during the year. Thank you. (Applause)

President Nordlund: This board of directors doesn't have a cushy job. They do have to work behind scenes.

Next on our agenda is the report of resolution and this will be lead by Pete Murgas.