



BRIDGE MAINTENANCE

Fisheries and Oceans Canada
Manitoba Operational Statement

Version 3.0

Bridge maintenance is undertaken to extend the life of the structure and to ensure that it functions as designed, thus ensuring public safety. This Operational Statement applies only to: deck sweeping and washing to remove traction material (e.g., sand and salt residue), cleaning of all bridge components (substructure, superstructure and deck), the removal and application of protective coatings, deck wearing surface replacement, the removal of debris to protect piers and abutments, and structural repairs.

Bridge maintenance activities have the potential to negatively impact fish and fish habitat by introducing sand, sediments, deck surface materials such as concrete and asphalt, and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into watercourses. Removal of woody debris and riparian vegetation may alter natural habitat features and flows that exist in the watercourse. Operation of machinery may impact habitat on the banks and bed, and result in erosion and sedimentation. Placement of rock to stabilize structures may alter natural habitat and flows, and block fish passage.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your bridge maintenance project without a DFO review when you meet the following conditions:

- the work does not include realigning the watercourse or replacing the existing bridge,
- the work does not involve new dredging, placing fill (e.g., filling scour pools) or excavating the bed or bank of the watercourse below the ordinary high water mark (HWM) (see definition below),
- explosives are not used to remove debris, including ice build-up,
- the withdrawal of any water will not result in reduction in the wetted width of a stream, and will not exceed 10% of the instantaneous flow, in order to maintain existing fish habitat, and

- you incorporate the *Measures to Protect Fish and Fish Habitat when Maintaining a Bridge* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Manitoba Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Maintaining a Bridge

1. Deck Sweeping

- 1.1. Adequately seal drains and open joints before sweeping to prevent material from falling into the watercourse.
- 1.2. Clean and remove debris and sediment from drainage devices and dispose of the material in a way that will prevent it from entering the watercourse.

2. Deck Washing

- 2.1. Sweep decks, including curbs, sidewalks, medians and drainage devices to remove as much material as practical before washing.
- 2.2. Adequately seal drains and open joints before washing to prevent sediment-laden wash-water from entering the watercourse.

- 2.3. Direct wash-water past the ends of the bridge deck to a vegetated area to remove suspended solids, dissipate velocity and prevent sediment and other deleterious substances from entering the watercourse. If this cannot be achieved, use silt fences or other sediment and erosion control measures to prevent wash-water from entering the watercourse.
- 2.4. When extracting water from a watercourse, ensure the intakes of pumping hoses are equipped with an appropriate device to avoid entraining and impinging fish. Guidelines to determine the appropriate mesh size for intake screens may be obtained from DFO (*Freshwater Intake End-of-Pipe Fish Screen Guideline* (1995), available at www.dfo-mpo.gc.ca/Library/223669.pdf).
- 2.5. Where possible, avoid using small streams as a source for water.

3. Removal and Application of Protective Coatings

- 3.1. Remove paint or protective coatings in a manner that prevents any paints, paint flakes, primers, blasting abrasives, rust, solvents, degreasers or other waste material from entering the watercourse.
- 3.2. Use measures such as barges or shrouding to trap and prevent blasting abrasives, protective coatings, rust and grease from entering the watercourse.
- 3.3. Contain paint flakes, abrasives, and other waste materials for safe disposal.
- 3.4. Store, mix and transfer paints and solvents on land and not on the bridge to prevent these materials from entering the watercourse in the event of a spill.
- 3.5. Do not clean equipment in the watercourse or where the wash-water can enter the watercourse.

4. Removal of Debris (e.g., including woody debris, garbage and ice build-up)

- 4.1. Unless the debris accumulation is an immediate threat to the integrity of the piers and abutments, time debris removal to avoid disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*), with the exception of ice build-up removal.
- 4.2. Limit the removal of material to that which is necessary to protect piers and abutments.
- 4.3. Remove debris by hand or with machinery operating from shore or a floating barge.
- 4.4. Emergency debris removal using hand tools or machinery (e.g., backhoe) can be carried out at any time of year. Emergencies include situations where carrying out the project immediately is in the interest of preventing damage to property or the environment, or is in the interest of public health or safety. DFO is to be notified immediately. **You should follow all other measures to the greatest extent possible.**
- 4.5. A separate Operational Statement exists for the removal of beaver dams and associated debris, and it applies to dams that are not directly connected or immediately adjacent to the bridge structure.

5. Structural Repairs and Reinforcements

- 5.1. Use barges or shrouding to trap and prevent concrete and other bridge materials from entering the watercourse.

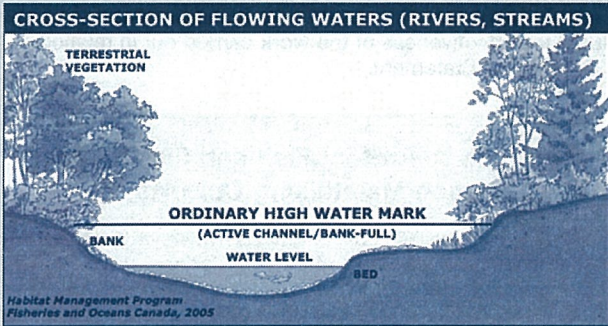
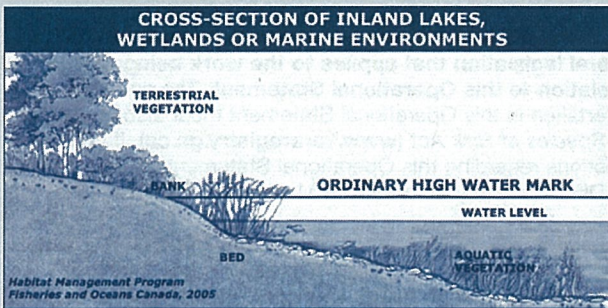
- 5.2. If replacement rock reinforcement/armouring is required to stabilize eroding areas around bridge structures (e.g., abutments and/or wing walls), the following measures should be incorporated:

- 5.2.1 Place appropriately-sized, clean rocks into the eroding area.
- 5.2.2 Do not obtain rocks from below the HWM of any water body.
- 5.2.3 Avoid the use of rock that is acid-generating. Also avoid the use of rock that fractures and breaks down quickly when exposed to the elements.
- 5.2.4 Install rock at a similar slope to maintain a uniform stream bank and natural stream alignment.
- 5.2.5 Ensure rock does not interfere with fish passage or constrict the channel width.
- 5.2.6 If any in-water work is involved, adhere to fisheries timing windows, as outlined in Measure 4.1 above.

- 6. If working from land, install effective sediment and erosion control measures before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
- 7. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be required. This removal should be kept to a minimum and limited to the right-of-way of the bridge.
- 8. Operate machinery on land (from outside of the water) or on the water (i.e., from a barge or vessel) in a manner that minimizes disturbance to the banks or bed of the watercourse.
 - 8.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 8.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
 - 8.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
 - 8.4. Restore banks to original condition if any disturbance occurs.
- 9. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
- 10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark (HWM) – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).



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http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp



CULVERT MAINTENANCE

Fisheries and Oceans Canada
Manitoba Operational Statement

Version 3.0

Culvert maintenance is undertaken to extend the life of the structure and to ensure that it functions as designed, thus ensuring public safety and safe fish passage. Culvert maintenance includes the removal of accumulated debris (e.g., logs, boulders, garbage, ice build-up) that prevents the efficient passage of water and fish through the structure. Culvert maintenance may also include the reinforcement of eroding inlets and outlets, but does not include the replacement of damaged or destroyed bevel ends. Culverts requiring regular maintenance should be considered for future remediation via redesign or reinstallation.

Culvert maintenance activities can affect fish and fish habitat by the removal of woody debris that is important for cover and food production, by causing flooding and excessive stream scouring if blockages are removed too quickly, excessive erosion and sedimentation from the use of equipment along the stream bank, and disruption of critical fish life stages. Replacement of eroded rock armouring can alter flows and fish movement patterns if done excessively.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your culvert maintenance project without a DFO review when you meet the following conditions:

- the work does not include realigning the watercourse, installing a culvert liner or support struts, replacing damaged or destroyed bevels ends, or extending/replacing the existing culvert,
- explosives are not used to remove debris,
- the work does not include any dredging, infilling (e.g., filling scour pools) or excavation of the channel upstream or downstream of the culvert, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Maintaining Culverts* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to

obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Manitoba Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Maintaining Culverts

1. Use existing trails, roads, or cut lines wherever possible to avoid disturbance to the riparian vegetation.
2. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be required. This removal should be kept to a minimum.
3. Unless accumulated material (i.e., branches, stumps, other woody materials, garbage, ice build-up, etc.) is preventing the passage of water and/or fish through the structure, time material and debris removal to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*). Any proposal to conduct such work under ice-covered conditions, with the exception of ice build-up removal, requires prior review by DFO.
4. Emergency debris removal using hand tools or machinery (e.g., backhoe) can be carried out at any time of year. Emergencies include situations where carrying out the project immediately is in the interest of preventing damage to property or the environment, or is in the interest of public health or safety. DFO is to be notified immediately. **You should follow all other measures to the greatest extent possible.**
5. Install effective sediment and erosion control measures before starting work to prevent sediment from entering the watercourse. Inspect them regularly during the course of

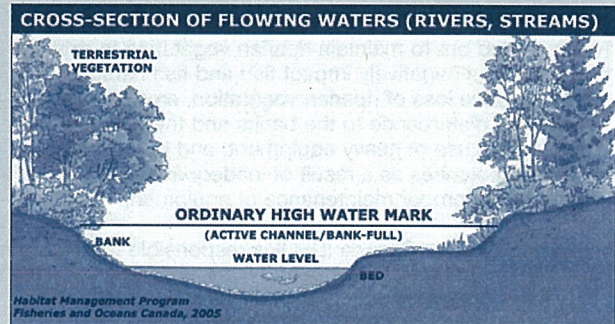
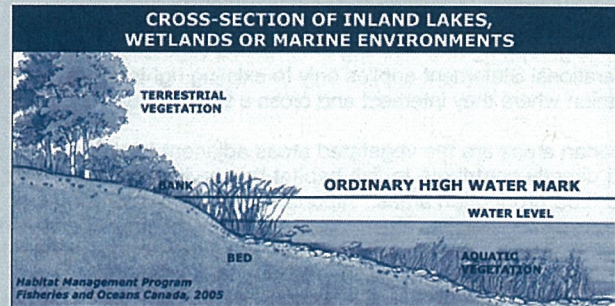
construction and make all necessary repairs if any damage occurs.

6. Limit the removal of accumulated material (i.e., branches, stumps, other woody materials, garbage, etc.) to the area within the culvert, immediately upstream of the culvert and to that which is necessary to maintain culvert function and fish passage.
7. Remove accumulated material and debris slowly to allow clean water to pass, to prevent downstream flooding and reduce the amount of sediment-laden water going downstream. Gradual dewatering will also reduce the potential for stranding fish in upstream areas.
 - 7.1. A separate Operational Statement exists for the removal of beaver dams and associated debris and it applies to dams that are not directly connected or immediately adjacent to the culvert structure.
8. Operate machinery on land (from outside of the water) and in a manner that minimizes disturbance to the banks of the watercourse.
 - 8.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 8.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
 - 8.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
 - 8.4. Restore banks to original condition if any disturbance occurs.
9. If replacement rock reinforcement/armouring is required to stabilize eroding inlets and outlets, the following measures should be incorporated:
 - 9.1. Place appropriately-sized, clean rocks into the eroding area.
 - 9.2. Do not obtain rocks from below the ordinary high water mark (see definition below) of any water body.
 - 9.3. Avoid the use of rock that is acid-generating. Also avoid the use of rock that fractures and breaks down quickly when exposed to the elements.
 - 9.4. Install rock at a similar slope to maintain a uniform stream bank and natural stream alignment.
 - 9.5. Ensure rock does not interfere with fish passage or constrict the channel width.
 - 9.6. If any in-water work is involved, adhere to fisheries timing windows, as outlined in Measure 3 above.
10. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
11. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 11.1. Maintain effective sediment and erosion control

measures until re-vegetation of the disturbed areas is achieved.

Definition:

Ordinary high water mark – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).



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MAINTENANCE OF RIPARIAN VEGETATION IN EXISTING RIGHTS-OF-WAY

Fisheries and Oceans Canada
Manitoba Operational Statement

Version 3.0

Rights-of-way are areas of land devoted to providing transportation corridors (e.g., highways, railways) or utilities (e.g., pipelines, power lines, water lines) that often intersect waterways. Vegetation is closely managed in these areas to prevent disruption to transportation or utilities (e.g., circuit outages, fires) and to ensure personal safety. Maintenance activities include mowing, brushing, topping and slashing of terrestrial vegetation. This Operational Statement applies only to existing rights-of-way at the location where they intersect and cross a water body.

Riparian areas are the vegetated areas adjacent to a water body and directly contribute to fish habitat by providing shade, cover and food production areas. Riparian areas are also important because they stabilize stream banks and shorelines. In order to minimize disturbance to fish habitat and prevent bank erosion, it is important to retain as much riparian vegetation as possible, especially the vegetation directly adjacent to the watercourse, in the right-of-way corridor.

Activities carried out to maintain riparian vegetation in existing rights-of-way can negatively impact fish and fish habitat by causing excessive loss of riparian vegetation, erosion and sedimentation, disturbance to the banks and the bottom of the water body from use of heavy equipment, and introduction of deleterious substances as a result of inadequate containment of spoil piles and improper maintenance of equipment.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to be incorporated into your project in order to avoid negative impacts to fish habitat. You may proceed with your right-of-way maintenance project without a DFO review when you meet the following conditions:

- the work involves the maintenance of vegetation in an **existing** right-of-way for a transportation or utility corridor and not construction of a new right-of-way,
- it is an existing right-of-way at the location where it intersects and crosses a water body,
- it involves the use of vegetative maintenance techniques that allow the root system to stay intact, to help bind the soil and encourage rapid colonization of low-growing plant species, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Maintaining Riparian Vegetation in Rights-of-Way* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact the DFO office in your area (see Manitoba DFO office list).

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Manitoba Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Maintaining Riparian Vegetation in Rights-of-way

1. While this Operational Statement does not cover the complete clearing of riparian vegetation, the alteration (e.g., topping and pruning) of select plants may be necessary to meet operational and safety needs.
2. Combined maintenance activities (e.g., mowing, brushing, topping, slashing, etc.) will affect no more than one third (1/3) of the total woody vegetation, such as trees and shrubs, in the right-of-way within 30 metres of the ordinary high water mark (see definition below) in any given year.
3. When practicable, alter riparian vegetation in the right-of-way by hand. If machinery must be used, operate machinery on land and in a manner that minimizes disturbance to the banks of the water body.
 - 3.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 3.2. Wash, refuel and service machinery and store fuel and other materials for the machinery, which include hand

tools, at locations away from the water to prevent any deleterious substance from entering the water body.

- 3.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
- 3.4. Restore banks to original condition if any disturbance occurs.

4. Machinery fording the watercourse to bring equipment required for maintenance to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing Operational Statement* is also available.

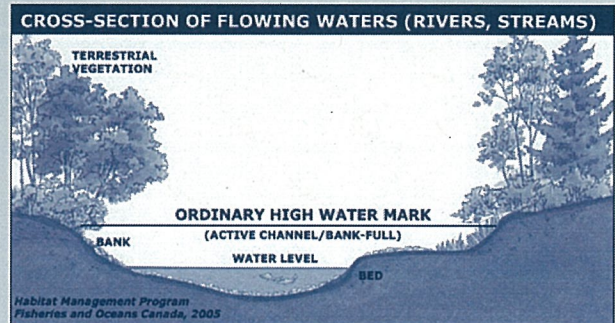
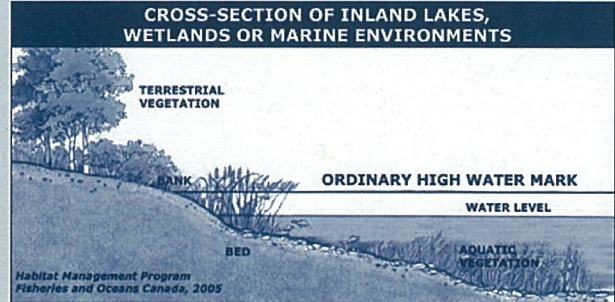
- 4.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
- 4.2. Grading of the stream banks for the approaches should not occur.
- 4.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
- 4.4. The one-time fording should prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Manitoba In-Water Construction Timing Windows*).
- 4.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

5. When altering a tree that is located on the bank of a water body, ensure that the root structure and stability are maintained.
6. Stabilize any waste materials removed from the work site to prevent them from entering the water body. This could include covering spoil piles with biodegradable mats or tarps. All long-term storage of waste materials should be kept outside of the riparian area.
7. In order to prevent erosion and to help seeds germinate, vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 7.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/ bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those

parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).



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Standards and Best Practices for Instream Works



Bridges

Version 1.0

Other Guides in this Series

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Bank Stabilization
Beaver Dam Removal
Bridges
Channel Maintenance
Culverts
Habitat Enhancement & Restoration
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Urban Stormwater Management
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Supporting Documents

General BMPs & Standard Project Considerations
Regional Timing Windows
Contact List B.C. Ministry of Environment Contacts Fisheries and Oceans Canada (DFO) Contacts
Glossary
MOE/DFO Notification, Approval & Authorization Instructions & Forms

You have selected this document because your project involves **Bridge** activities in or about a stream. Bridge activities include:

- clear-span bridge construction, maintenance or removal;
- bridge superstructure maintenance or repair;
- ice bridge/winter ford/snowfill construction or maintenance; and/or;
- clearing an obstruction from a bridge during a flood event.

Bridge activities can potentially have negative affects on riparian areas and fish and fish habitat. Advice should be obtained from a Qualified Professional or government agent for works having potentially negative impacts on a watercourse (e.g. rock armouring). When planning your project develop designs and select locations to minimize potential impacts to fish and fish habitat. If your works are outside the scope of this Guidebook then a MOE Approval application must be completed and DFO contacted to determine if a review and/or Authorization under the *Fisheries Act* is appropriate.

Introduction

About this document...

Before you proceed with your project you must ensure that you:

- understand and apply the appropriate **Water Act Standards** to your project;
- understand the federal **Fisheries Act** and ensure you are in compliance with Section 35 of the **Act** which prohibits the **Harmful Alteration, Disruption or Destruction (HADD)** of fish habitat and Section 36 of the **Act** which prohibits the release of **deleterious** substances to a watercourse;
- review the appropriate DFO Pacific Region Operational Statement(s) and determine if Operational Statement Notification and/or DFO review and/or Authorization is appropriate;
- incorporate the applicable **Best Management Practices** to comply with the Standards; and,
- complete and submit a **Notification, Approval and/or Authorization application** for MOE and DFO as required for your project.

Glossary

Important words, denoted in **bold text**, are defined in the glossary, included as a separate document for download as part of this same series.

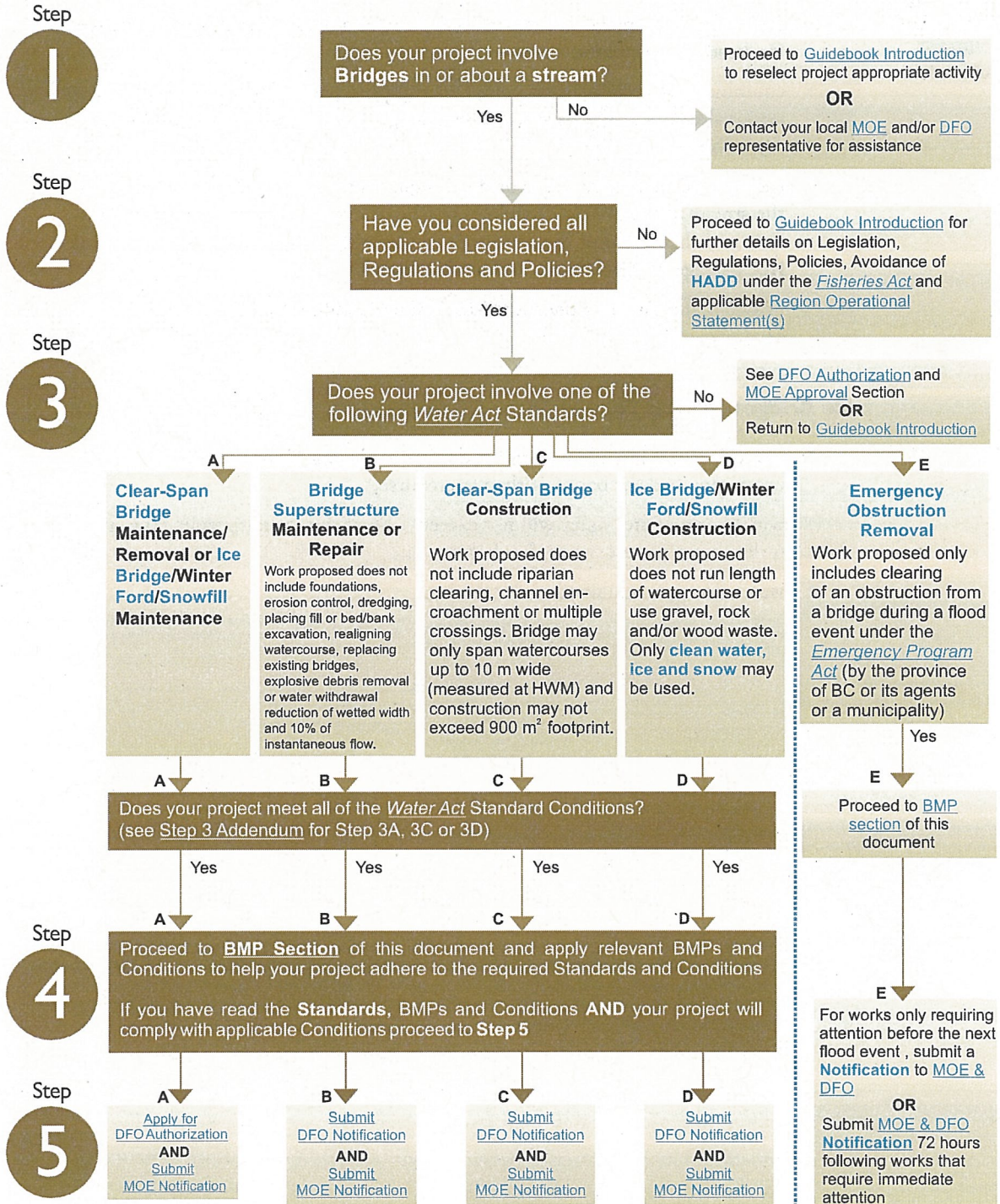
Disclaimer

Information in this document is provided for guidance only. Users must apply appropriate legislation and regulations as applicable to the works in and about a stream that are being considered. It is strongly recommended that an appropriately **Qualified Professional(s) (QP)** be consulted as part of project development. Legislation and regulations should be consulted and applied as they pertain to your project. If a discrepancy arises between this document and legislation, the legislation takes precedence. Neither the Province of British Columbia nor Government of Canada guarantee the accuracy or completeness of the information referenced herein and in no event are liable or responsible for damages of any kind arising from its use. Note that other legislation and regulations (e.g., municipal) may also apply to such activities and should be consulted.



How to proceed with your Bridge Project

The following **five (5) steps** will help guide you through the provincial and federal **Notification, Approval** and/or **Authorization** process for **Bridge Installation, Maintenance or Removal** works



How to proceed with your Bridge Project

Step

3

Addendum

Clear Span Bridge Construction, Maintenance or Removal Water Act Standard Conditions:

- the bridge and approach roads do not produce a backwater effect or increase the head in the stream;
- equipment used for construction, including site **preparation, maintenance or removal** of the bridge, is situated in a dry stream channel or operated from **top of bank**;
- the hydraulic capacity of the bridge is equivalent to the hydraulic capacity of the stream channel or is capable of passing the 1 in 200 year maximum daily flow and the height of the underside of the bridge is also adequate to provide free passage of flood debris and ice flows; and,
- bridge materials meet the standards of the Canadian Standards Association, as applicable.

Ice Bridges, Winter Ford or Snow Fill Construction and/or Maintenance

- work does not include realigning, dredging, placing fill or grading or excavating beds or banks of the watercourse;
- withdrawal of any water will not exceed 10% of the instantaneous flow, in order to maintain existing fish habitat; and,
- water flow is maintained under the ice.

Best Management Practices (BMPs)

Step

4

The following Best Management Practices (BMPs) are methods, that if followed, will help ensure your project minimizes potential impacts to fish and fish habitat and will provide a standard level of protection to the aquatic and terrestrial environment potentially affected by your project.

It is the responsibility of the proponent/developer to ensure that they are in compliance with all applicable legislation.

There are three (3) types of BMPs you should consider:

- i. [General BMPs and Standard Project Considerations](#) applicable to any project;
- ii. [Bridge Installation, Maintenance or Removal](#) specific BMPs (below); and,
- iii. [Supportive information](#) applicable to project design, implementation and [Bridge Installation, Maintenance or Removal](#) techniques.

i. General Project BMPs and Standard Project Considerations

Please proceed to the [General BMPs and Standard Project Considerations](#) section to review considerations applicable to your project.

ii. Bridge Installation, Maintenance or Removal Specific BMPs

To achieve the required Standards and objectives that your activity must meet, apply the following BMPs as applicable to your works.

To reduce impacts on fish and wildlife habitats and populations, your bridge design and implementation must consider:

A. Clear-Span Bridge Maintenance or Removal and Ice Bridge/Winter ford/Snowfill Maintenance

Clear-Span Bridge Maintenance

DESIGN

- BR01** ensure [General BMPs and Standard Project Considerations](#) have been consulted and appropriately applied prior to, during and after commencement of work;

Best Management Practices (BMPs): continued...

BR02 maintenance activities must adhere to [Regional Timing Windows](#) to prevent disruption of fish and wildlife habitat;

BR03 avoid work during wet and rainy periods;

OPERATIONAL

BR04 install effective [erosion and sediment control measures](#) before starting work to prevent the entry of sediment into the watercourse. Inspect erosion and sediment control measures regularly to ensure they are functioning properly. Make all necessary repairs if any damage occurs and to maintain functionality;

BR05 conduct maintenance work by hand, where possible;

BR06 use [hydroblasting](#) or manual techniques, where possible, when removing road dirt, soluble salts and loose paint to minimize impacts to the watercourse;

BR07 use water without [cleaning agent additives](#) if grease film removal is necessary;

BR08 avoid use of toxic liquid paints, primers, solvents, degreasers and rust inhibitors;

BR09 ensure paint flakes, [abrasive grits](#) and abrasive/paint flake mixtures do not enter the watercourse as they may leach toxic heavy metals into receiving waters and/or be ingested by fish;

BR10 install [ground covers](#) and/or [vertical drapes](#) such as sheets of plastic or air-permeable cloth (e.g., burlap or canvas) prior to removal activities to capture falling debris. Floating barges may be deployed in watercourses to capture falling debris, such as paint flakes and dust;

BR11 waste materials collected during removal and application of protective coatings operations (e.g., blasting abrasives, paint particles, rust and grease) should be collected and retained for disposal at appropriate locations. Waste materials must not be deposited into watercourses or [riparian areas](#);

BR12 minimize spill potential by storing, mixing and transferring paints and solvents on land;

BR13 equipment must never be cleaned in watercourses and contaminated water flowing from onshore cleaning operations must not enter the watercourse;

BR14 when taking water from a watercourse, ensure pump hoses are equipped with an appropriate device to avoid entraining fish. Guidelines to determine the appropriate mesh size for intake screens may be obtained from DFO ([Freshwater Intake End-of-Pipe Fish Screen Guidelines](#)) and Short Term use application may be obtained from MOE ([Water Act Section 8, Short Term Use of Water Approval Application](#)). Avoid using small streams and wetlands as a water source;

BR15 adequately seal drains and any open joints on the bridge deck before sweeping or washing to prevent material or sediment-laden wash water from entering any watercourse;

BR16 clean and remove debris and sediment from the bridge deck and drainage devices and dispose of the material in a way that will prevent it from entering the watercourse;

Best Management Practices (BMPs): continued...

BR17 sweep decks, including curbs, sidewalks, medians and drainage devices, to remove as much material as practical before washing;

BR18 direct wash-water past the ends of the bridge deck to a **vegetated area** to remove suspended solids, dissipate velocity and prevent sediment and other **deleterious substances** from entering the watercourse. If this cannot be achieved, direct it to a sump for disposal and/or use silt fences or other **erosion and sediment control measures**.

POST WORKS MITIGATION

BR19 maintain effective **erosion and sediment control** measures until complete re-vegetation of disturbed areas is achieved;

Clear-Span Bridge Removal

DESIGN

BR20 ensure **General BMPs and Standard Project Considerations** have been consulted and appropriately applied prior to, during and after commencement of work;

BR21 removal activities must adhere to **Regional Timing Windows** to prevent disruption of fish and wildlife habitat.

OPERATIONAL

BR22 avoid work during wet and rainy periods;

BR23 stabilize any waste soils or organic matter removed from the work site to prevent them from entering the watercourse. This could include covering stockpiles with biodegradable mats or tarps or planting stockpiles with grass or shrubs;

BR24 clear-span bridge structures, materials and equipment must not be dragged through, or otherwise alter, streambeds during removal procedures;

BR25 surficial water flow at the crossing location must be controlled upon deactivation;

BR26 remove timber bridges in one piece;

BR27 remove all approaches upon deactivation of clear-span bridges;

BR28 leave cribbing of a wooden bridge in place if it is stable and over time has integrated into the stream banks and channel and now contributes to their complexity during deactivation. If the cribbing significantly constricts the channel or the upper portion of the cribbing could decay and fail in time then it should be removed and only the lower portion left in place;

POST MITIGATION WORKS

BR29 maintain effective **erosion and sediment control** measures until complete re-vegetation of disturbed areas is achieved;

Best Management Practices (BMPs): continued...

- BR30** restored [stream substrate](#), channel, banks and other affected areas to their approximate original configuration and composition during the deactivation/modification of stream crossings. Any fill material that has been added to the watercourse channel and floodplain must be removed and placed in location where it will not re-enter the stream;

Ice Bridge/Winter ford/Snowfill Maintenance

DESIGN

- BR31** ensure [General BMPs and Standard Project Considerations](#) have been consulted and appropriately applied prior to, during and after commencement of work;
- BR32** maintenance activities must adhere to [Regional Timing Windows](#) to prevent disruption of fish and wildlife habitat.

OPERATIONAL

- BR33** maintain all snowfill stream crossings in such a manner that sediment and [deleterious substances](#) are not integrated into the crossing structure in order to prevent [Harmful Alteration, Disruption or Destruction \(HADD\)](#) of fish habitat;
- BR34** ensure structures do not restrict water flow at any time;
- BR35** monitor material thickness regularly to ensure appropriate thicknesses are achieved;
- BR36** clear excessive snow to prevent ice from weakening;
- BR37** infill puddles of water with fresh snow to minimize heat absorption;
- BR38** regularly monitor structures for signs of cracking and repair immediately upon discovery.

POST WORKS MITIGATION

- BR39** restore banks to original condition where any disturbance has occurred;

B. Bridge Superstructure Maintenance or Repair

DESIGN

- BR40** ensure [General BMPs and Standard Project Considerations](#) have been consulted and appropriately applied prior to, during and after commencement of work;
- BR41** maintenance or repair activities must adhere to [Regional Timing Windows](#) to prevent disruption of fish and wildlife habitat.

OPERATIONAL

- BR42** install effective [erosion and sediment control measures](#) before starting work to prevent the entry of sediment into the watercourse. Inspect erosion and sediment control measures regularly to ensure they are functioning properly. Make all necessary repairs if any damage occurs and to maintain functionality;

Best Management Practices (BMPs): continued...

- BR43** use **hydroblasting** or manual techniques, where possible, when removing road dirt, soluble salts and loose paint to minimize impacts to the watercourse;
- BR44** use water without **cleaning agent additives** if grease film removal is necessary;
- BR45** avoid use of toxic liquid paints, primers, solvents, degreasers and rust inhibitors;
- BR46** ensure paint flakes, **abrasive grits** and abrasive/paint flake mixtures do not enter the watercourse as they may leach toxic heavy metals into receiving waters and/or be ingested by fish;
- BR47** install **ground covers** and/or **vertical drapes** such as sheets of plastic or air-permeable cloth (e.g., burlap or canvas) prior to removal activities to capture falling debris. Floating barges may be deployed in watercourses to capture falling debris, such as paint flakes and dust;
- BR48** waste materials collected during removal and application of protective coatings operations (e.g., blasting abrasives, paint particles, rust and grease) should be collected and retained for disposal at appropriate locations. Waste materials must not be deposited into watercourses or **riparian areas**;
- BR49** minimize spill potential by storing, mixing and transferring paints and solvents on land;
- BR50** equipment must never be cleaned in watercourses and contaminated water flowing from onshore cleaning operations must not enter the watercourse;
- BR51** when taking water from a watercourse, ensure pump hoses are equipped with an appropriate device to avoid entraining fish. Guidelines to determine the appropriate mesh size for intake screens may be obtained from DFO ([Freshwater Intake End-of-Pipe Fish Screen Guidelines](#)) and Short Term use application may be obtained from MOE ([Water Act Section 8, Short Term Use of Water Approval Application](#)). Avoid using small streams and wetlands as a water source;
- BR52** adequately seal drains and any open joints on the bridge deck before sweeping or washing to prevent material or sediment-laden wash water from entering any watercourse;
- BR53** clean and remove debris and sediment from the bridge deck and drainage devices and dispose of the material in a way that will prevent it from entering the watercourse;
- BR54** sweep decks, including curbs, sidewalks, medians and drainage devices, to remove as much material as practical before washing;
- BR55** direct wash-water past the ends of the bridge deck to a **vegetated area** to remove suspended solids, dissipate velocity and prevent sediment and other **deleterious substances** from entering the watercourse. If this cannot be achieved, direct it to a sump for disposal and/or use **silt fences** or other **erosion and sediment control measures**;

Best Management Practices (BMPs): continued...

- BR56** if **rip rap** reinforcement/armouring is required, limit placement to stabilize eroding areas around the **piers** and **abutments** and incorporate the following measures:
- place large, durable, clean, suitably-graded and sized angular rocks (**rip rap**) into the eroding area by hand or using machinery operating outside of the water;
 - carefully unload rocks and key into place (if placing rocks along the embankment);
 - implement appropriate **erosion and sediment control** measures and maintain their functionality;
 - do not obtain rocks from below the **high water mark** (HWM) of any water body;
 - install **rip rap** at a similar slope as the stream bank to maintain a uniform stream bank slope and natural stream alignment to a maximum slope of 1V:2H (except in special circumstances);
 - ensure **rip rap** does not constrict the channel width or flow; and,
 - ensure that the placement of **rip rap** does not infill instream fish habitat (e.g. outlet pools) and does not create a barrier to fish passage, particularly during low flow periods.

BR57 conduct maintenance work by hand, where possible;

BR58 operate machinery, if required, from the top of bank;

POST MITIGATION WORKS

BR59 restore banks to original condition where any disturbance has occurred;

C. Clear-Span Bridge Construction

DESIGN

BR60 ensure **General BMPs and Standard Project Considerations** have been consulted and appropriately applied prior to, during and after commencement of work;

BR61 construction activities must adhere to **Regional Timing Windows** to prevent disruption of fish and wildlife habitat;

BR62 avoid **floodplains, meander bends, braided streams, alluvial fans** and areas where bank stability may be a concern;

BR63 align stream crossings perpendicular to stream flow;

BR64 prevent unnecessary repair and hazard by designing the bridge to withstand maximum loads;

BR65 design structures to span the full bank width of the watercourse;

BR66 ensure that the bridge is properly designed to address river and channel processes at flows above the **high water mark** (HWM);

Best Management Practices (BMPs): continued..

BR67 minimize road material and gravel on a bridge deck from entering the watercourse. Design the bridge to use containment logs or boards between the bridge deck and the guard rails to minimize the potential of road material on the bridge decks from entering the stream;

OPERATIONAL

BR68 avoid work during wet and rainy periods;

BR69 ensure activities and structures (including excavation, backfilling of **footings/abutments** and placement of **rip rap**) do not encroach on the full bank width;

BR70 install effective **erosion and sediment control measures** before starting work to prevent the entry of sediment into the watercourse. Inspect erosion and sediment control measures regularly to ensure they are functioning properly. Make all necessary repairs if any damage occurs and to maintain functionality;

BR71 if dewatering of the site is required, an **Environmental Monitor** holding all necessary permits required by fisheries agencies to collect and transport fish, should be on hand to make the final decision regarding the need for a **fish salvage** program. If a **fish salvage** is necessary, recovered fish must be relocated to a safe area outside of the influence of the worksite and transport containers must not be overloaded with fish (see **General BMPs and Standard Project Considerations: Salvage of Fish and/or Wildlife** section for further information);

BR72 prevent sediment delivery to a watercourse by elevating the road grade to ensure that the grade falls away from the crossing for a minimum of 10 m on either side of the crossing (if the topography permits);

BR73 ensure appropriate ditching is constructed to direct water to infiltration areas so deposit of sediment to the waterbody is avoided;

BR74 construct turnouts sufficient distances from the bridge to prevent road material from entering the watercourse and to minimize impacts on riparian vegetation.

BR75 ensure adequate **cross drainage** is in place before the bridge approach, to minimize water volume directed into approach ditches at bridge sites;

BR76 ensure **cross-ditches** are properly armoured at the outlet and along the base, if required;

BR77 **abutments/footings** must not be **backfilled** with vegetation, debris or mud. Only site appropriate, compacted fill material is to be utilized for **backfill**;

BR78 operate machinery, if required, from the top of bank;

BR79 keep machinery, if required, free of excess oil and grease and ensure equipment contain no hydraulic fluid leaks (see **General BMPs and Standard Project Considerations: Deleterious Substance Control/Spill Management** section for further information);

BR80 ensure cutting of treated timber takes place away from the bridge and watercourse;

Best Management Practices (BMPs): continued...

POST WORKS MITIGATION

- BR81** restore banks to original condition where any disturbance has occurred;
- BR82** maintain effective [erosion and sediment control](#) measures until complete re-vegetation of disturbed areas is achieved;

D. Ice Bridge/Winter Ford/Snowfill Construction

DESIGN

- BR83** ensure [General BMPs and Standard Project Considerations](#) have been consulted and appropriately applied prior to, during and after commencement of work;
- BR84** construction activities must adhere to [Regional Timing Windows](#) to prevent disruption of fish and wildlife habitat;
- BR85** ensure crossings do not impede water flow or fish passage at any time of the year;

OPERATIONAL

- BR86** install effective [sediment control measures](#) prior to starting work to prevent the entry or **deleterious** sediment in the watercourse and **Harmful Alteration, Disruption or Destruction (HADD)** of fish habitat;
- BR87** when taking water from a watercourse, ensure pump hoses are equipped with an appropriate device to avoid entraining fish. Guidelines to determine the appropriate mesh size for intake screens may be obtained from DFO ([Freshwater Intake End-of-Pipe Fish Screen Guidelines](#)) and Short Term use application may be obtained from MOE ([Water Act Section 8, Short Term Use of Water Approval Application](#)). Avoid using small streams and wetlands as a water source;
- BR88** construct/deactivate all ice bridges in such a way that the natural flow of the watercourse being crossed is not affected;
- BR89** use clean, compacted snow and/or ice to a sufficient depth to avoid cuts to the banks of the lake, river or stream. Clean logs may be used to stabilize approaches;
- BR90** securely cable approach logs together to they can be easily removed and ensure logs or woody debris are not left within the waterbody, banks or shoreline;
- BR91** maintain all snowfill stream crossings in such a manner that sediment and **deleterious** substances are not integrated into the crossing structure in order to prevent **Harmful Alteration, Disruption or Destruction (HADD)** of fish habitat;
- BR92** control surficial water flow at the crossing location during deactivation;

POST WORKS MITIGATION

- BR93** remove structures immediately upon completion of the project or prior to spring **freshet**, whichever comes first;

Best Management Practices (BMPs): continued...

- BR94** remove all approaches during snowfill deactivation to prevent the deterioration of streambanks and sedimentation of watercourses;
- BR95** removal of instream snowfill material during deactivation by using an effective removal technique. Partially notching the snowfill is not an approved means of removal;
- BR96** keep a record of ice thickness and water depth to verify that that stream flow is maintained and grounding does not occur.
- BR97** restore banks to original condition where any disturbance has occurred;

E. Emergency Obstruction Removal

DESIGN

- BR98** ensure [General BMPs and Standard Project Considerations](#) have been consulted and appropriately applied prior to, during and after commencement of work;
- BR99** ensure an appropriately qualified professional confirms all emergency works and properly classifies works as Type 1 or Type 2 emergencies
- Type 1: works requiring immediate attention during a flood event or as designated under the *Provincial Emergency Program*. These situations have caused or present an immediate (within 24 hours) high potential danger to human life, damage property or fish and wildlife populations or habitat; and,
- Type 2: works requiring attention prior to the next flood event. These situations present a high potential danger to human life, damage property or fish and wildlife populations if not addressed prior to the next flood event.
- BR100** ensure Type 1 emergencies use the following protocols:
- commence necessary works to alleviate the emergency and immediately advise appropriately qualified professional monitors (at any time of day or day of the week);
 - incorporate the standards and Best Management Practices appropriate to bridge works being competed to ensure the protection of fish and wildlife populations and habitats;
 - ensure monitoring professionals attend the site immediately to conduct salvages and environmental protection measures are designed, constructed or installed and maintained appropriately. The monitor should remain at the site full-time to monitor the works until completion;
 - ensure only works necessary to mitigate the emergency are completed. Any remaining works should be deferred until the next work window or conducted through the regular process; and,

Best Management Practices (BMPs): continued...

- ensure monitors notify MOE, DFO and any other appropriate agencies by fax and phone within 72 hours. The monitor should include technical rationale for justification of the proposed emergency works, information associated with the Notification and any special mitigating Best Management Practices used for completing the works outside the work window (agency staff may visit the site after receipt of the Notification).

BRI01 ensure Type 2 emergencies use the following protocols:

- advise appropriately qualified professional monitors during the first available office hours;
- ensure only works necessary to mitigate the emergency are proposed. Any remaining works should be deferred until the next work window or conducted through regular processes;
- schedule works to be completed prior to the next flood event and ensure designs incorporate the recommended standards and Best Management Practices appropriate to the type of works proposed. If appropriate, special mitigative measures should be incorporated into the design to reduce the risks of working outside work windows;
- ensure monitoring professionals notify MOE, DFO and any other appropriate agencies by fax and phone and include all design, plans and mitigation documents. The professional should include in the communication the use of appropriate protocols, technical rationale for justification of the proposed emergency works, information associated with the Notification and any special mitigating best practices used for completing the works outside work windows (agency staff may visit the site after receipt of the Notification);
- ensure monitoring professionals meet onsite with agency staff, if available, to review designs, associated plans and proposed works. Any additional Best Management Practices should be discussed and agreed to during the site visit. Works should then be completed prior to the next flood event; and,
- ensure monitoring professionals attend the site prior to conducting any works to complete salvages and to ensure environmental protection measures are constructed, installed and maintained appropriately. Works should be monitored full-time until completion.

OPERATIONAL

BRI02 remove all obstruction debris from the **active floodplain** to ensure it is not redeposited during the next flood event;

BRI03 remove obstructions by hand, where possible;

BRI04 remove debris accumulation gradually to prevent downstream erosion, flooding, habitat damage and mobilization of sediment;

BRI05 any machinery, if required, must work from the top of the bank and not in the stream channel;

Best Management Practices (BMPs): continued..

BR106 install effective **erosion and sediment control measures** before starting work to prevent the entry of sediment into the watercourse. Inspect erosion and sediment control measures regularly to ensure they are functioning properly. Make all necessary repairs if any damage occurs and to maintain functionality;

BR107 limit the removal of debris material to only that which is absolutely necessary to protect **piers** and **abutments**; and,

BR108 ensure an appropriately qualified professional monitors all emergency works full time and has extensive knowledge and experience in erosion and sediment control and fish and wildlife salvage.

POST MITIGATION WORKS

BR109 maintain effective **erosion and sediment control** measures until complete re-vegetation of disturbed areas is achieved;

BR110 ensure monitors provide a report within 10 working days of completion of the majority of works to proponents and a final copy to MOE and any other agency(s) in the jurisdiction;

BR111 ensure monitoring reports contain:

- detailed accounts of the completion of works including milestone events;
- confirmation of the use of standards and recommended best practices or supported alternatives through an appropriate professionals' supported signed and sealed technical rationale;
- confirmation of consistency of completed works with the submitted Notification;
- fish and wildlife protection mitigation difficulties encountered and how those difficulties were managed; and,
- outstanding issues with the Notification, and how and when those activities will be completed and confirmed and how and when they will be reported.

Supportive Information

iii. Supportive Information

The following sources provide you with additional planning, design, implementation and review advice for a variety of project-specific activities. Please follow the appropriate links to obtain further information on your project specific activity.

General Considerations

Pacific Region Operational Statements

http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/operational_statements_e.htm

Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia

<http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare2006/DWC%202006%20Sec%201%20Introduction.pdf>

Freshwater Intake End-of-Pipe Fish Screen Guideline

<http://www.dfo-mpo.gc.ca/Library/223669.pdf>

Guidelines to Protect Fish and Fish Habitat From Treated Wood Used in Aquatic Environments in the Pacific Region

<http://www.dfo-mpo.gc.ca/Library/245973.pdf>

Land Development Guidelines for the Protection of Aquatic Habitat (Section 5 and 6)

<http://www-heb.pac.dfo-mpo.gc.ca/publications/pdf/165353.pdf>

Timing Windows and Measures to Adequately Manage and Conserve Aquatic Resources for the Cariboo Region Forest Districts

http://wlapwww.gov.bc.ca/car/env_stewardship/ecosystems/reports/timing_windows_measures_cariboo.pdf

Oil and Gas Commission Stream Crossing Planning Guide (Northeast BC)

<http://www.ogc.gov.bc.ca/documents/guidelines/Stream%20Crossing%20Planning%20Guide.doc>

Fish-Stream Crossing Guidebook, Forest Practices Code

<http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/FishStreamCrossing/FSCGdBlk.pdf>

Riparian Areas and Revegetation, Pacific Region

http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/riparian-reveg_e.htm

Canadian Standards Association

<http://www.csa.ca/>

Bridge Maintenance Design & Techniques

Bridge Maintenance Operational Statement, DFO Pacific Region

http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/os-bridge_e.htm

Best Management Practices for Highway Maintenance Activities (Section 6.12 Bridge Structure Management)

http://www.th.gov.bc.ca/Publications/eng_publications/environment/MoT_Hwy_Maint_BMP.pdf

Supportive Information continued...

Guidelines for the Protection of Fish and Fish Habitat During Bridge Maintenance Operations in British Columbia

http://www.bicapfremf.org/toolbox/pdfs/guidelines_for_protection_of_fish_and_fish_habitat_during_bridge_maintenance_operations_in_bc.pdf

Bridge Maintenance Design & Techniques continued...

Roadway and Bridge Maintenance, Ministry of Environment, Environmental Protection Division

http://www.env.gov.bc.ca/wat/wq/nps/BMP_Compndium/Municipal/Bridge_Maintenance/Bridge.htm

Best Management Practices Guide for Stormwater, BMP OM7: Roadway and Bridge Maintenance, Metro Vancouver

<http://www.metrovancouver.org/about/publications/Publications/BMPVol1b.pdf>

Bridge Construction Design & Techniques

Small Clear-Span Bridges Operations Statement, DFO Pacific Region

http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/os-clear_span_e.htm

Drainage Management Guide-No. 14, Bridge Construction

<http://www.agf.gov.bc.ca/resmgmt/publist/300Series/373020-1.pdf>

Ice Bridge Design & Techniques

Ice and Snow Fill Bridges Operational Statement, DFO Pacific Region

http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/os-ice_bridge_e.htm

Safety Guide for Operations Over Ice

http://www.tbs-sct.gc.ca/pubs_pol/hrpubs/TBM_119/CHAP5_3-1_e.asp

Rip Rap Design & Techniques

Rip Rap as Bank Stabilization Above High Water Level

http://www.th.gov.bc.ca/publications/eng_publications/best_practices/bp.pdf

Rip Rap Design and Construction Guide

http://www.env.gov.bc.ca/wsd/public_safety/flood/pdfs_word/riprap_guide.pdf

Best Management Practices Guide for Stormwater, Appendix H: BMPEC13 Rip Rap, Metro Vancouver

<http://www.metrovancouver.org/about/publications/Publications/BMPVol2c.pdf>

MOE/DFO Notification, Approval & Authorization

Step

5

If you determine that your project requires notification and/or approval from MOE or DFO, please ensure that MOE and/or DFO application **instructions** are followed and **forms** completed and sent to the appropriate agency.

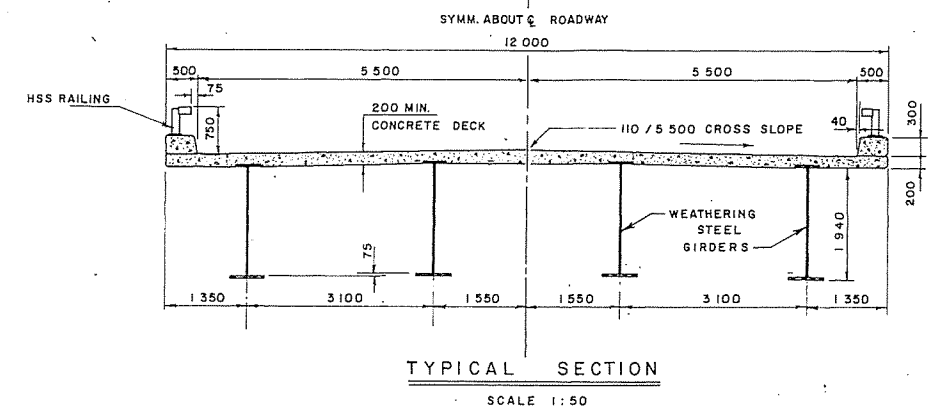
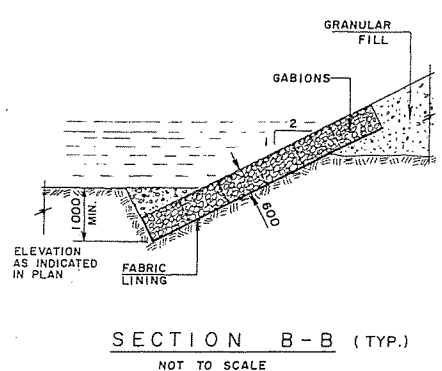
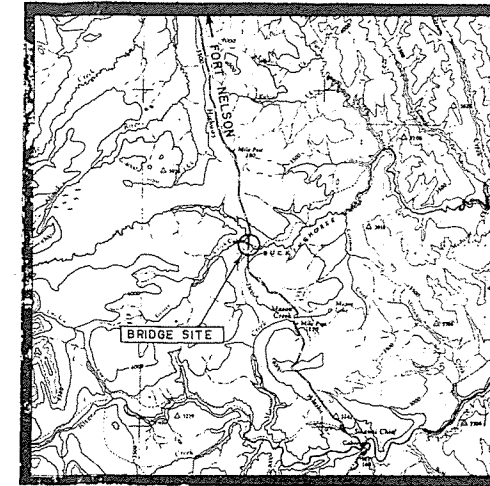
The latest application instructions and forms for MOE and DFO can be found at <http://www.env.gov.bc.ca/wld/BMP/>

Design and construction Branch
Conception et construction

Transportation Directorate
Direction des transports

Structures (Bridges) Division
Division des ouvrages d'arts
(ponts)

A. detail no.
B. location drawing no.
C. drawing no.
revison / révison

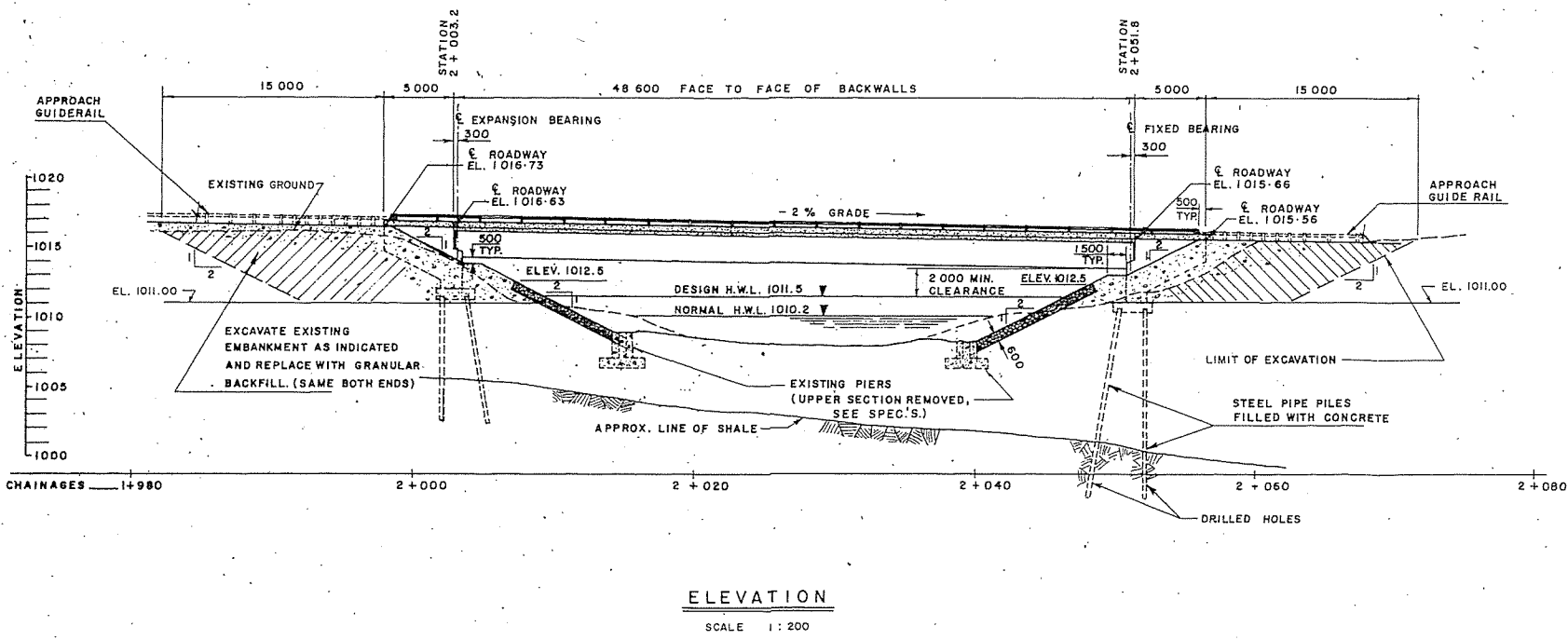
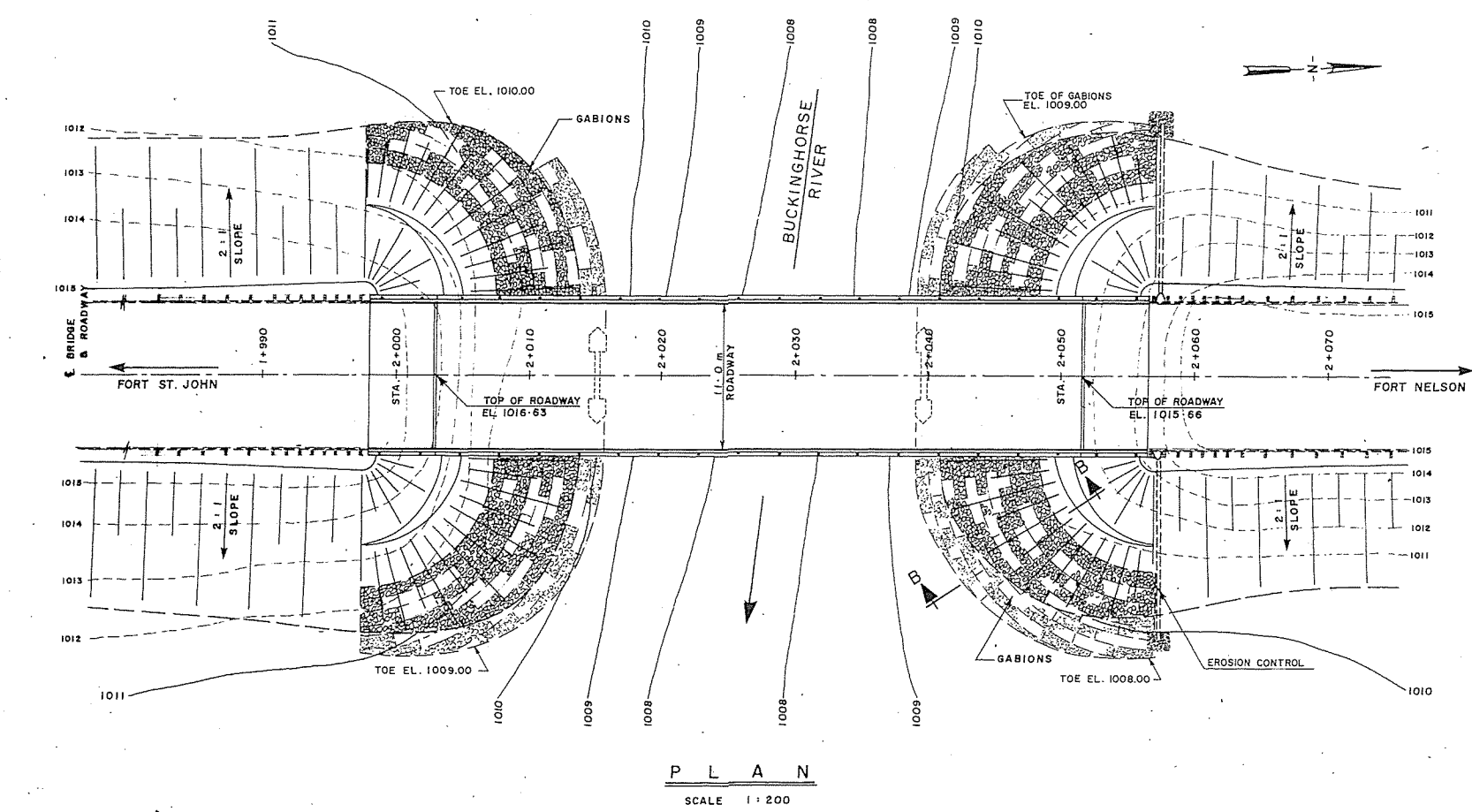


GENERAL NOTES

- SPECIFICATIONS: PROJECT SPECIFICATIONS HEREINAFTER THESE WILL BE REFERRED TO AS SPEC'S, AASHTO SPECIFICATIONS 1977, CSA STANDARDS AND AS NOTED.
- DESIGN CODE: CSA CAN3-S8-M78 UNLESS OTHERWISE NOTED.
DESIGN LOAD: 1. WS250
2. ALLOWANCE FOR FUTURE LOAD OF 1.2 kPa ON ROADWAY.
- UNITS:
1. CHAINAGES AND ELEVATIONS IN m.
2. DIMENSIONS IN mm.
3. WELD SIZE, ROLLED STEEL SECTIONS AND BOLTS IN INCHES.
4. AS NOTED.
- CONCRETE: SEE SPEC'S
1. ABUTMENTS: 25 MPa AT 28 DAYS, MINIMUM
2. DECK AND CURBS: 30 MPa AT 28 DAYS, MINIMUM
- REINFORCING STEEL: TO CSA G30.12-M1977, OR G30.16-M1977.
GRADE 400 DEFORMED BARS. SEE SPEC'S.
- CONCRETE COVER FOR REINFORCING BARS: 75mm UNLESS OTHERWISE NOTED.
- CHAMFER EXPOSED EDGES OF CONCRETE 20mm UNLESS OTHERWISE NOTED.
- STEEL PIPE PILES: TO ASTM A252-75, GRADE 2 WITH MODIFICATIONS, CONCRETE FILL SEE SPEC'S.
- STRUCTURAL STEEL: TO CSA G40.21-M1978, GRADE 350A, UNLESS OTHERWISE NOTED.
- HOT DIP GALVANIZING: TO CSA G164-M1978, MINIMUM THICKNESS 90µm AFTER FABRICATION.
- WELDING: TO CSA W59-1977 UNLESS OTHERWISE NOTED. SEE SPEC'S.
- HIGH STRENGTH BOLTS: TO ASTM A325-76c TYPE 3, UNLESS OTHERWISE NOTED. SEE SPEC'S.
- GABIONS: SEE SPEC'S.
- CENTERLINE OF NEW BRIDGE COINCIDES WITH CENTERLINE OF EXISTING BRIDGE. EXISTING BRIDGE TO BE REMOVED EXCEPT BOTTOM OF PIERS AS SHOWN. SEE SPEC'S.
- INFORMATION ON BENCH MARKS, BRIDGE LOCATION AND ORIENTATION WATER ELEVATIONS AND BORE HOLE DRILL LOGS TO BE OBTAINED FROM PUBLIC WORKS CANADA, PACIFIC REGION, 201 RANGE ROAD, TAKIMI, WHITEHORSE, YUKON. Y1A 3A4.

LIST OF DRAWINGS

- GENERAL LAYOUT
- FOUNDATION LAYOUT & BORE HOLE DATA
- ABUTMENT CONCRETE
- ABUTMENT REINFORCING
- STEEL GIRDERS
- GIRDER SPLICE & DECK DRAIN
- BEARINGS
- DECK CONCRETE & RAILING LAYOUT
- DECK REINFORCING
- DECK AND CURB EXPANSION JOINTS
- EROSION CONTROL & REINFORCING SCHEDULE
- RAILINGS
- EXISTING STRUCTURE



Date
70-10-28
70-11-26

P.W. de L.

B.P.W. 7000 (revised January 1978)

centimetres 0 2 4 6 8 10 12 14 16 18 20 centimetres

project title / titre du projet

BUCKINGHORSE RIVER BRIDGE
ALASKA HIGHWAY
Km 277:6

drawing title / titre du dessin

GENERAL LAYOUT

project no./no. du projet
035480

drawing no./no. du dessin
1 of/da 13

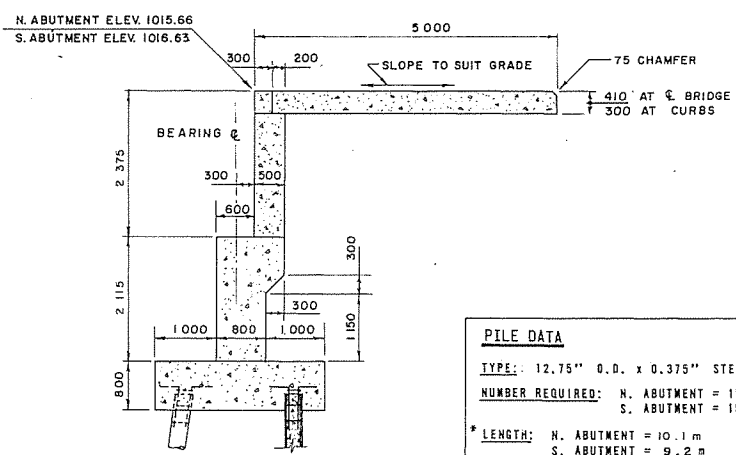
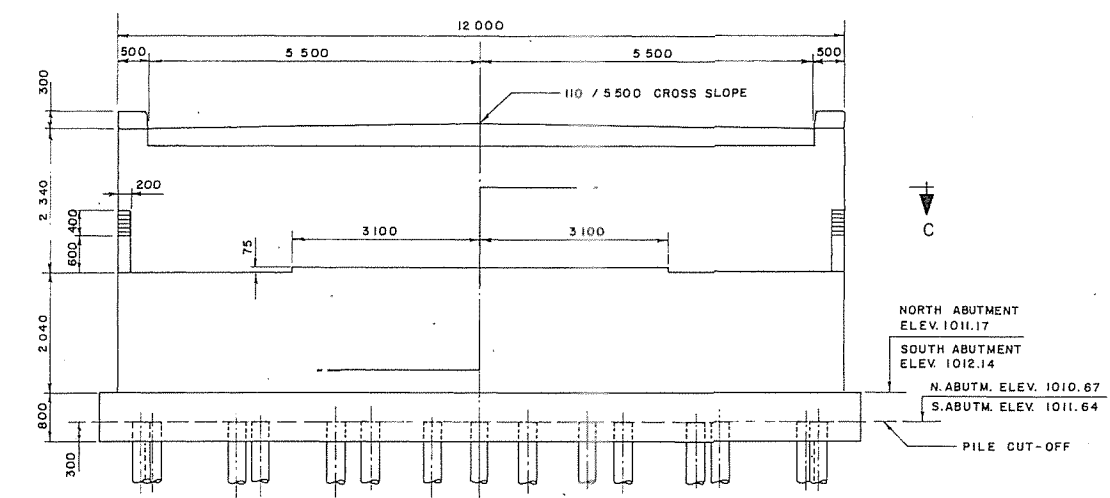
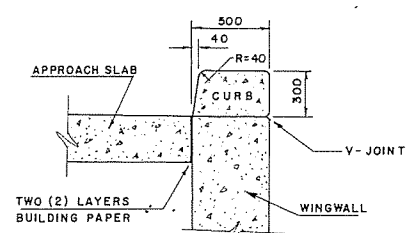
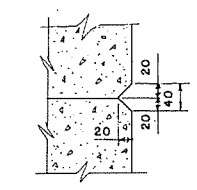
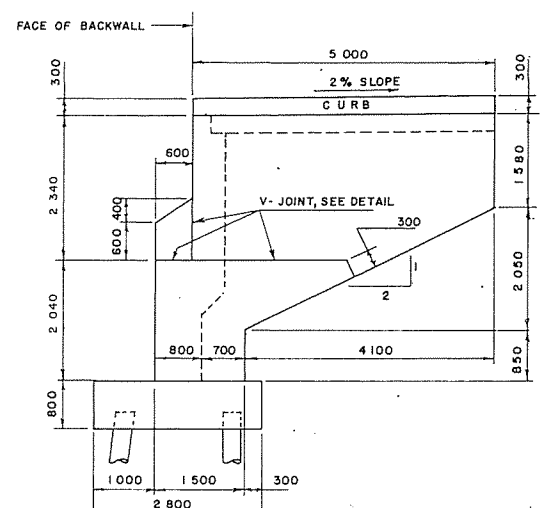
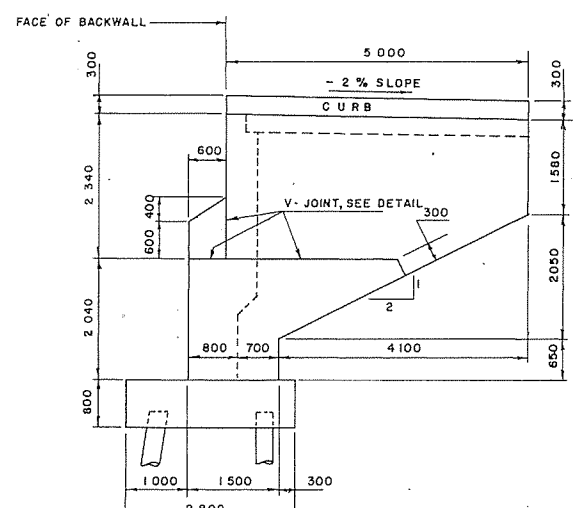
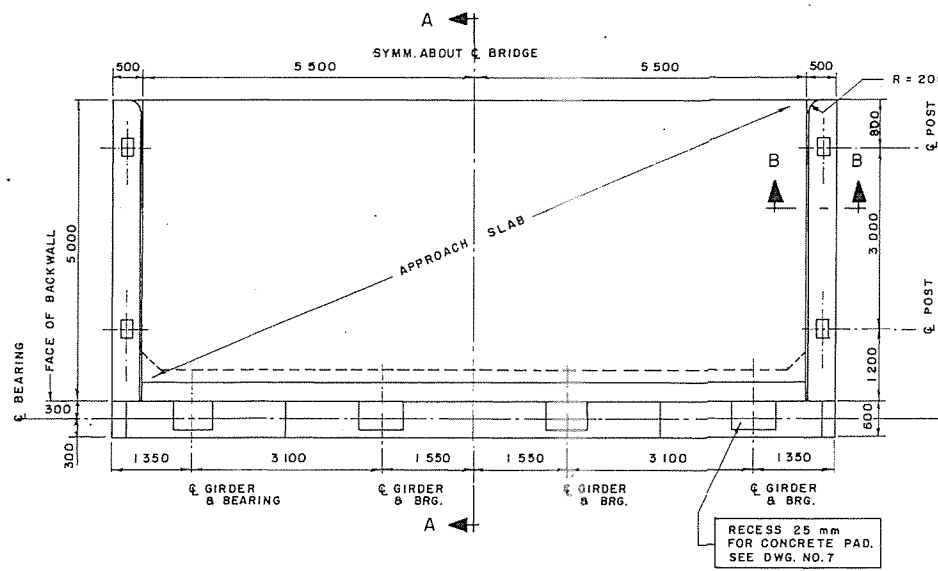
Design and construction Branch
Conception et construction

Transportation Directorate
Direction des transports

Structures (Bridges) Division
Division des ouvrages d'arts
(ponts)

A. detail no.
détail no.
B. location drawing no.
sur dessin no.
C. drawing no.
dessin no.

revision / révision



PILE DATA

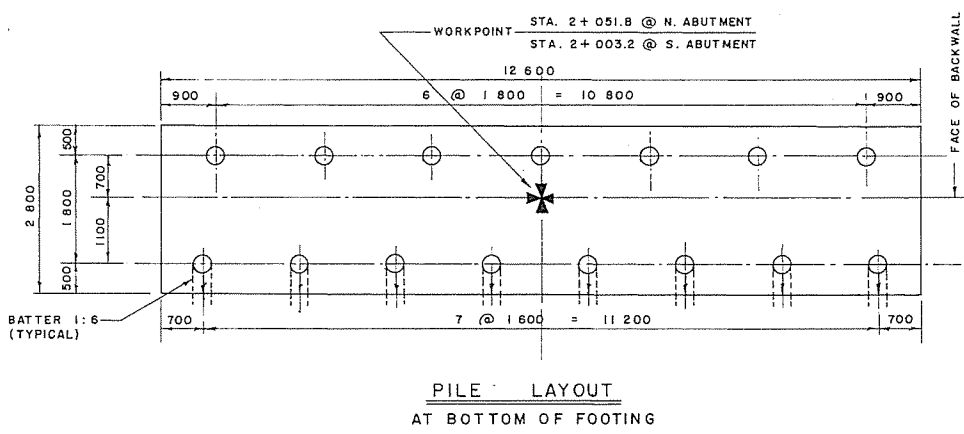
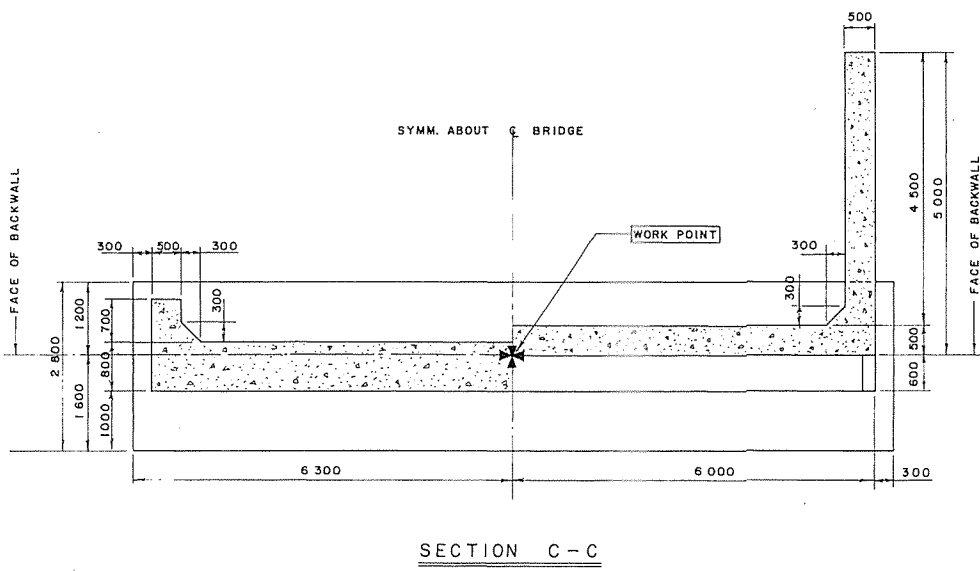
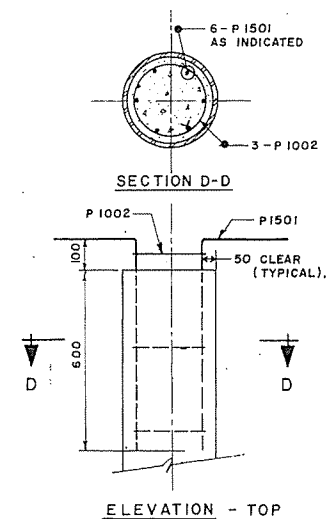
TYPE: 12.75" O.D. x 0.375" STEEL PIPE

NUMBER REQUIRED: N. ABUTMENT = 15
S. ABUTMENT = 15

LENGTH: N. ABUTMENT = 10.1 m
S. ABUTMENT = 9.2 m

DESIGN LOAD: 445 kN

EST. LENGTH OF PILES IN PLACE AFTER CUTOFF



- NOTES**
- SEE GENERAL NOTES ON DWG. NO. 1.
 - SCALE 1:50 UNLESS NOTED OTHERWISE.
 - NORTH AND SOUTH ABUTMENTS ARE IDENTICAL UNLESS NOTED OTHERWISE.

project title / titre du projet

BUCKINGHORSE RIVER BRIDGE
ALASKA HIGHWAY
Km 277:6

drawing title / titre du dessin

ABUTMENT CONCRETE

project no./no. du projet
035480

drawing no./no. du dessin
3 of/da 13

Date
79-10-29
79-11-22

P.W. de L.

Design and construction Branch
Conception et construction

Transportation Directorate
Direction des transports

Structures (Bridges) Division
Division des ouvrages d'arts (ponts)

A. detail no.
B. location drawing no.
C. drawing no.
D. dessin no.

revision / révision

project title / titre du projet

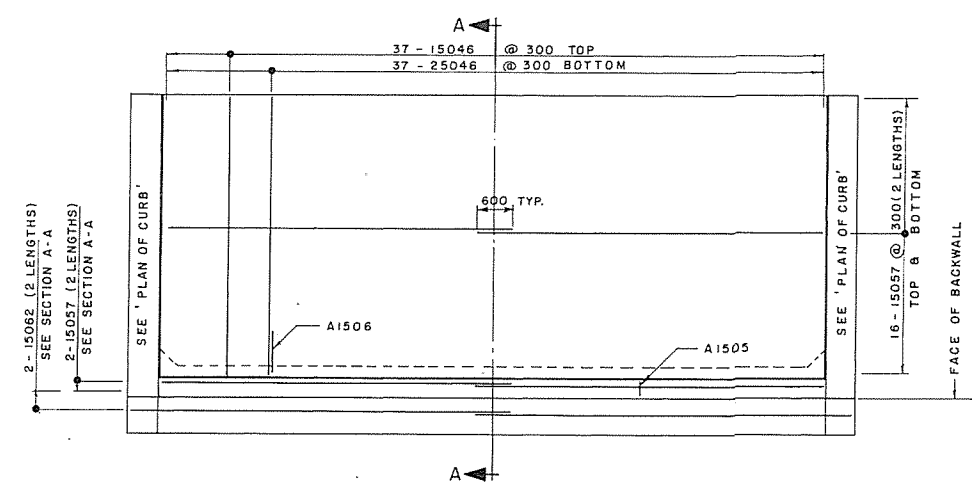
BUCKINGHORSE RIVER BRIDGE
ALASKA HIGHWAY
Km 277:6

drawing title / titre du dessin

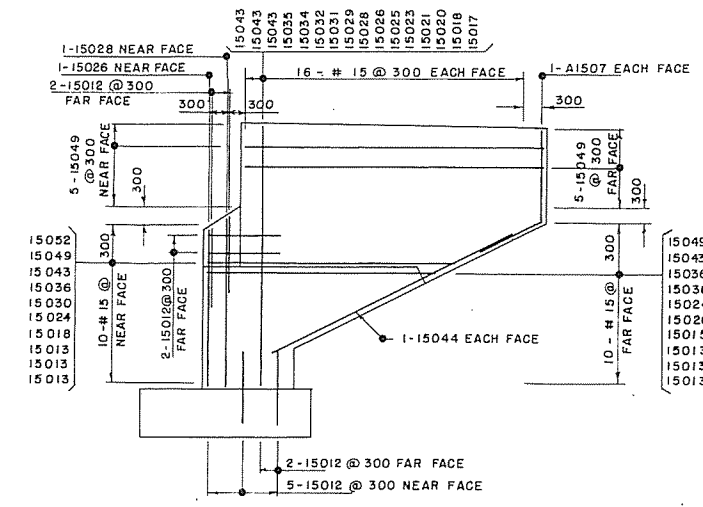
ABUTMENT REINFORCING

project no./no. du projet
035480

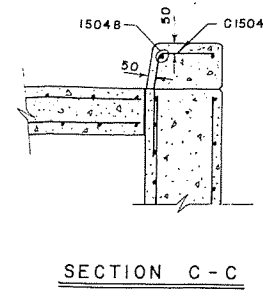
drawing no./no. du dessin
4 of 13



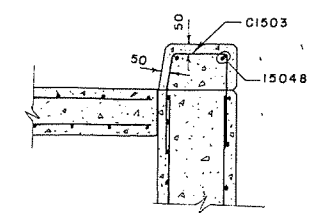
PLAN



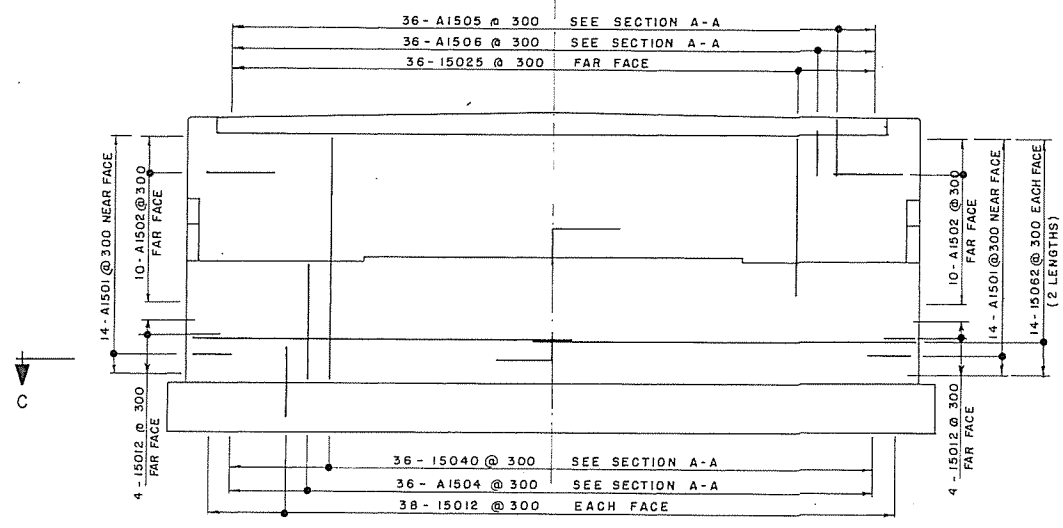
WINGWALL



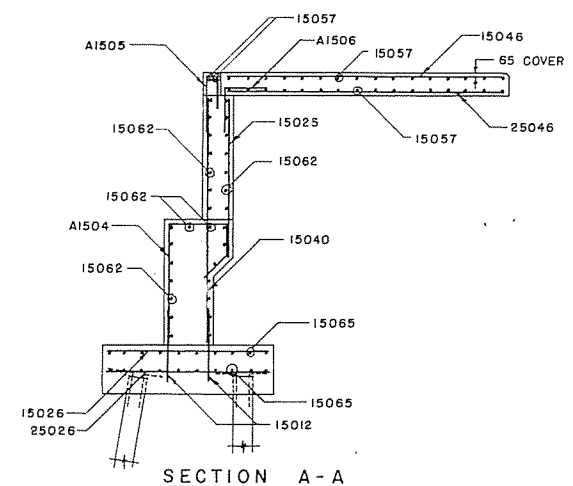
SECTION C - C



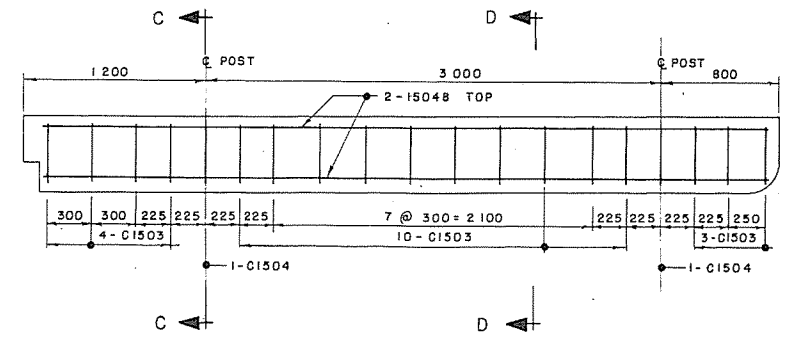
SECTION D - D



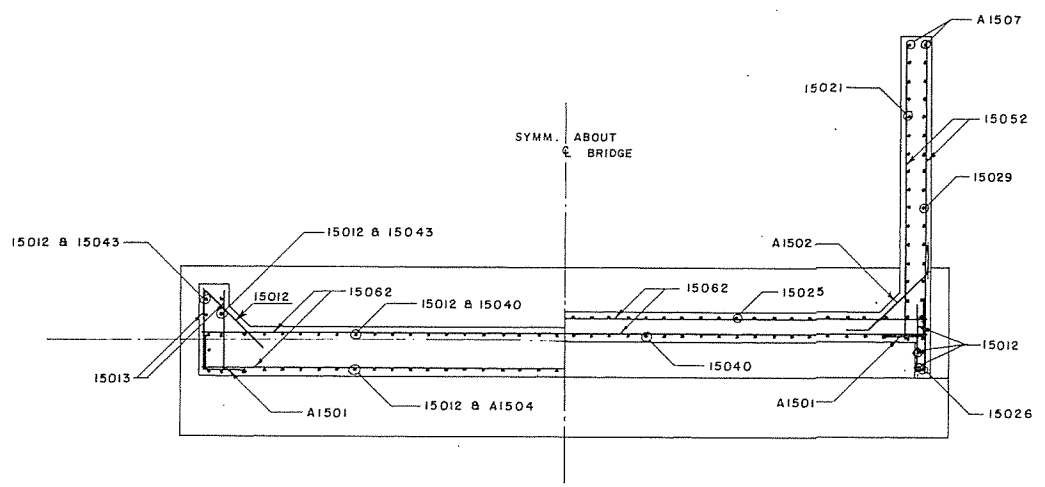
FRONT ELEVATION



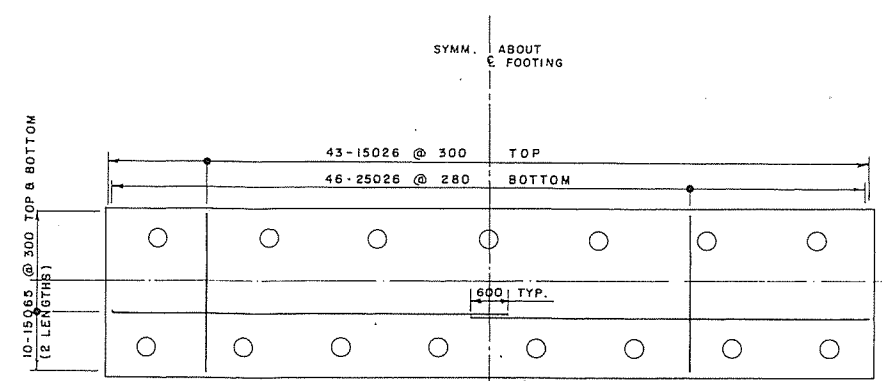
SECTION A - A



PLAN OF CURB
SCALE 1:20



SECTION C - C



FOOTING PLAN

- NOTES
- SEE GENERAL NOTES ON DWG. NO. 1.
 - SCALE 1:50 UNLESS NOTED OTHERWISE.
 - IDENTICAL REINFORCING FOR NORTH AND SOUTH ABUTMENTS.

Date
79-10-29
79-10-31

P.W. de L.

4 etc.

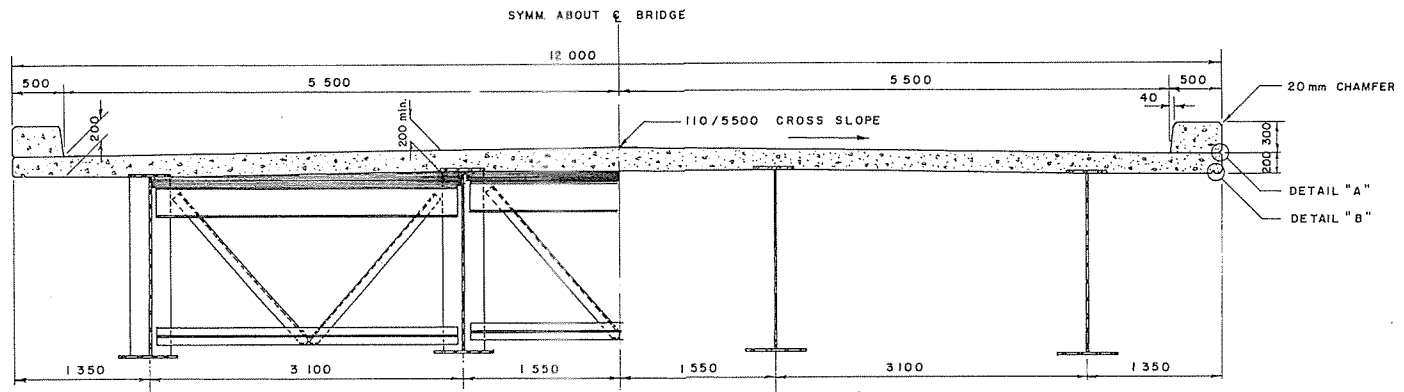
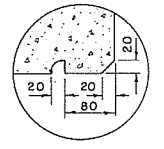
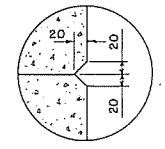
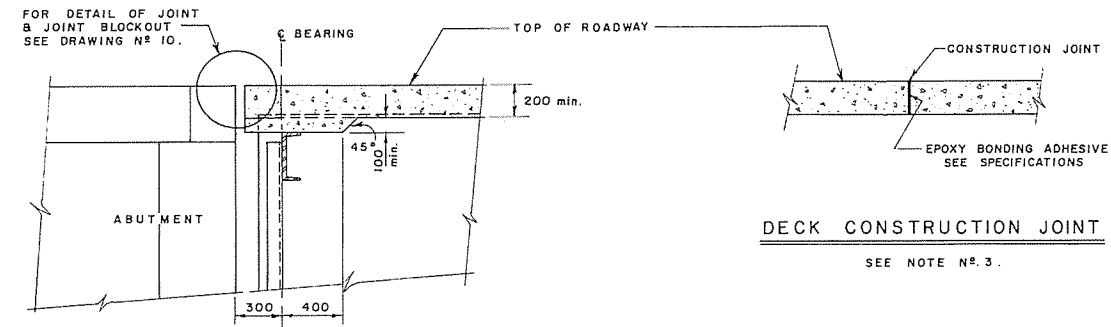
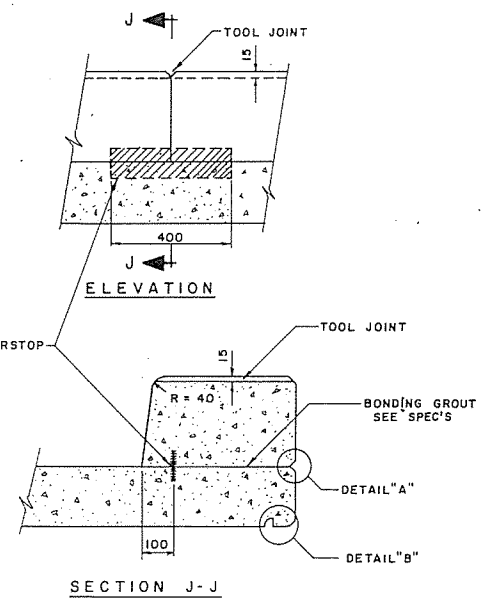
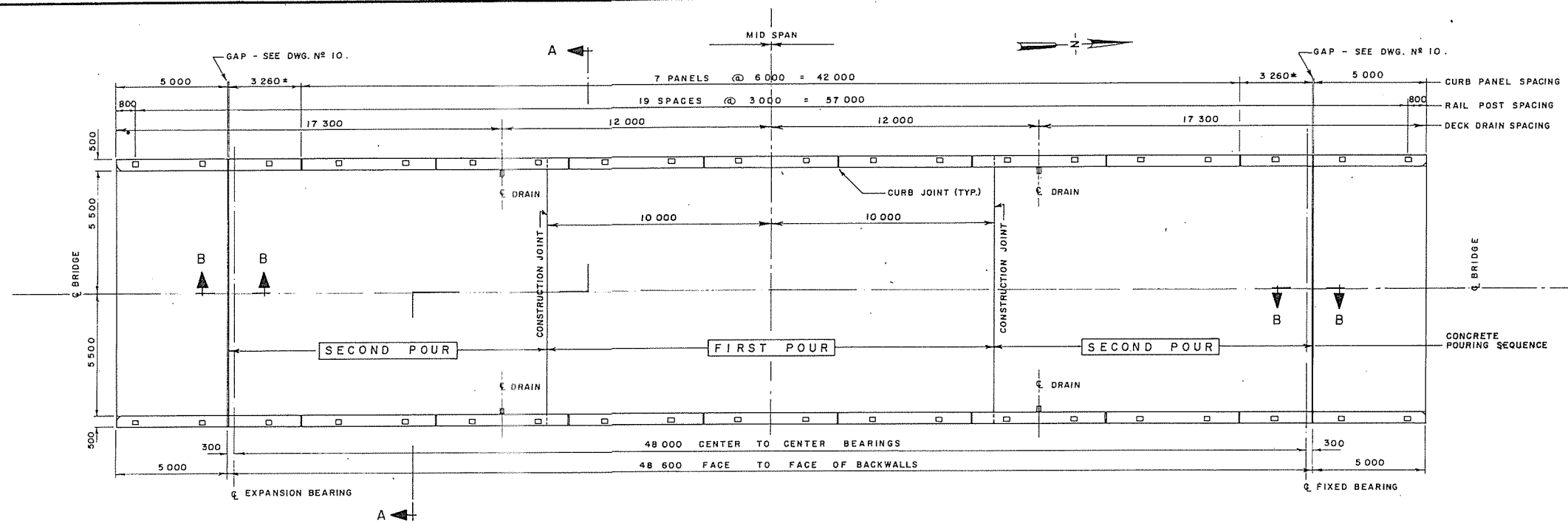
Design and construction Branch
Conception et construction

Transportation Directorate
Direction des transports

Structures (Bridges) Division
Division des ouvrages d'arts (ponts)

A. detail no. / détail no.
B. location drawing no. / sur dessin no.
C. drawing no. / dessin no.

revision / révision



- NOTES**
- SEE GENERAL NOTES ON DWG. NO. 1.
 - SCALE 1:20 UNLESS NOTED OTHERWISE.
 - ALLOW FOR A MAXIMUM OF TWO DECK CONSTRUCTION JOINTS.

project title / titre du projet

BUCKINGHORSE RIVER BRIDGE
ALASKA HIGHWAY
Km 277:6

drawing title / titre du dessin

DECK CONCRETE
&
RAILING LAYOUT

project no./no. du projet
035480

drawing no./no. du dessin
8 of 13

Date
79-10-29
79-11-02
79-12-03

P.W. d.e.L.

Design and construction Branch
Conception et construction

Transportation Directorate
Direction des transports

Structures (Bridges) Division
Division des ouvrages d'arts (ponts)

A. detail no. / détail no.
B. location drawing no. / sur dessin no.
C. drawing no. / dessin no.

revision / révision

project title / titre du projet

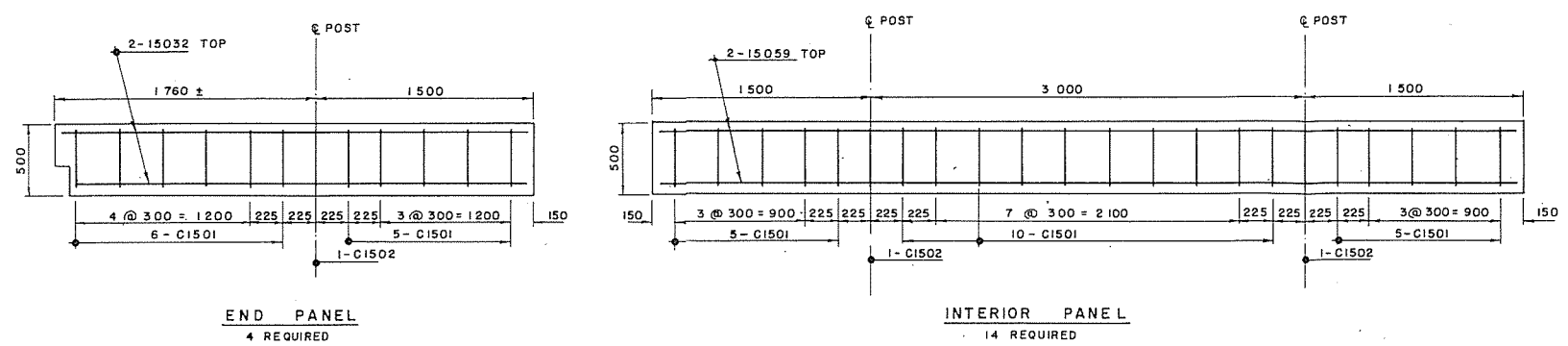
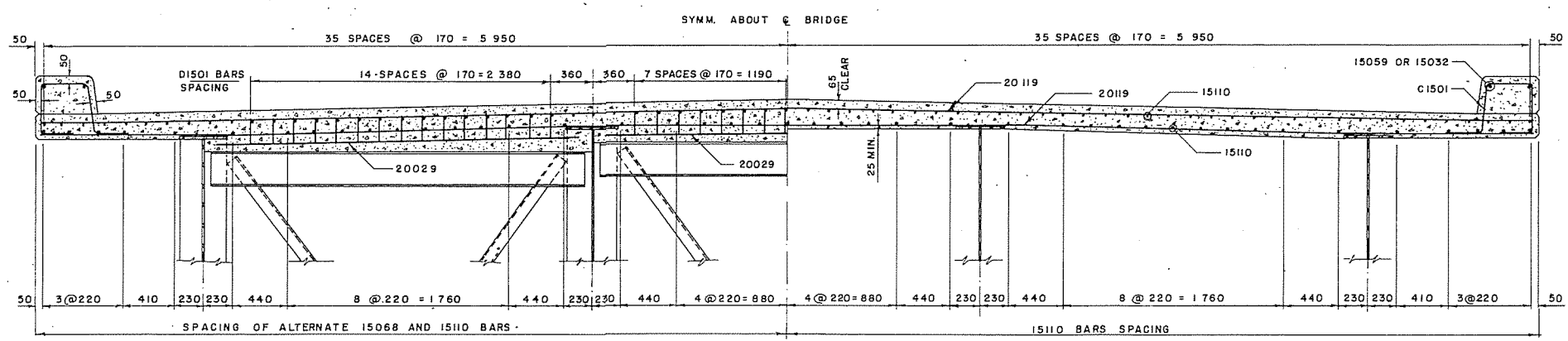
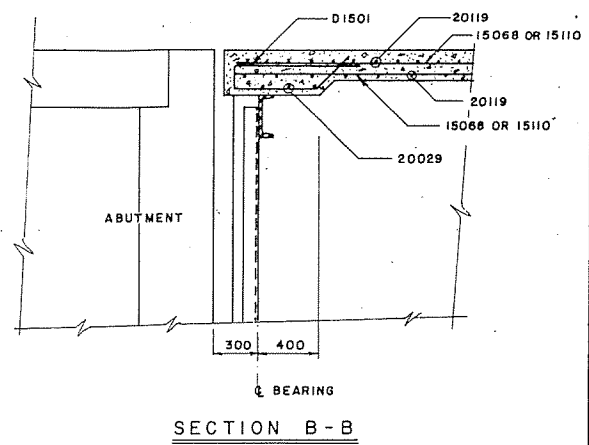
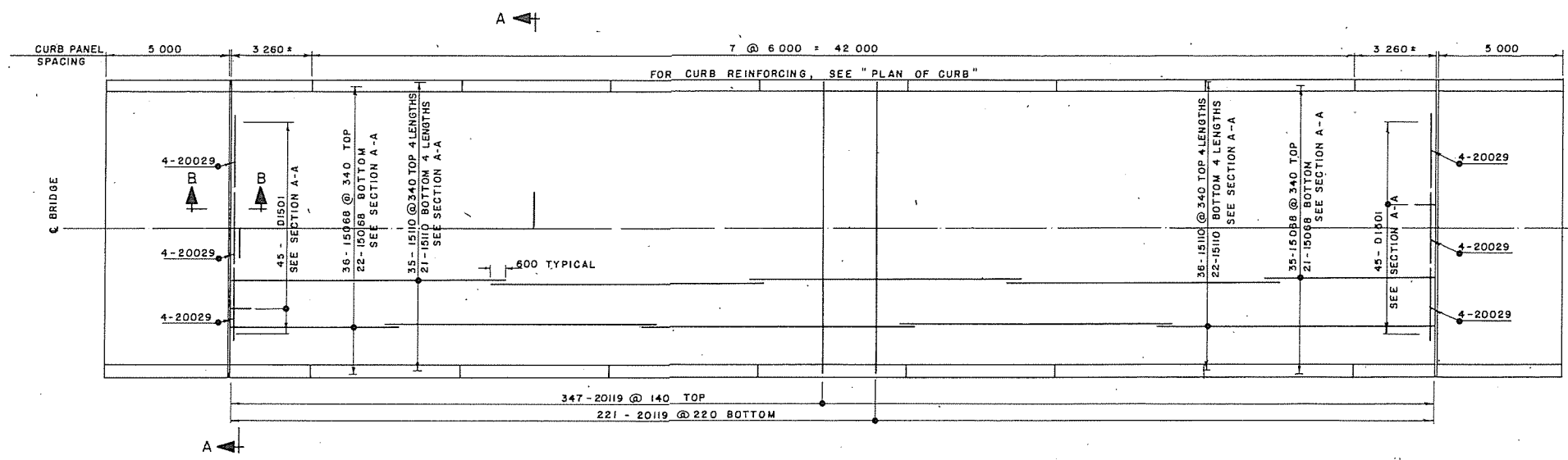
BUCKINGHORSE RIVER BRIDGE
ALASKA HIGHWAY
Km 277.6

drawing title / titre du dessin

DECK REINFORCEMENT

project no./no. du projet
035480

drawing no./no. du dessin
9 of 13



- NOTES**
- SEE GENERAL NOTES ON DWG. NO. 1.
 - SCALE 1:20 UNLESS NOTED OTHERWISE.
 - REINFORCING BARS MAY BE CUT AND BAR SPACING MAY BE ADJUSTED TO ENGINEER'S APPROVAL TO SUIT DECK DRAIN LOCATIONS (SEE DWG. NO. 8).

Date
79-10-29
79-11-05

P.W. de L.

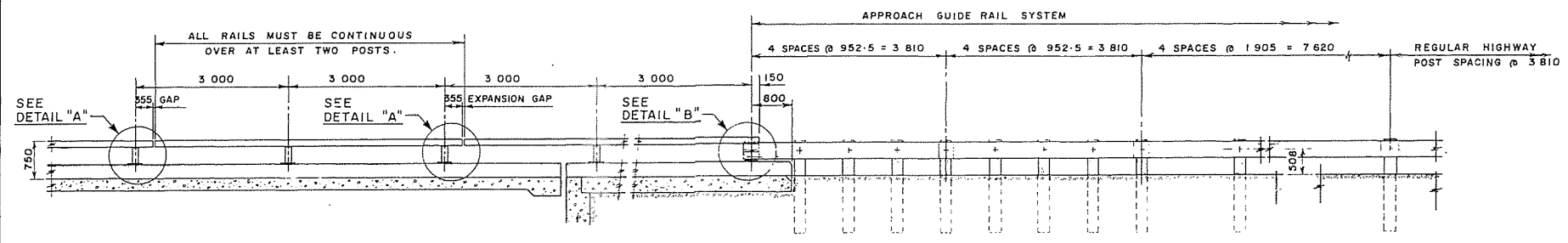
Design and construction Branch
Conception et construction

Transportation Directorate
Direction des transports

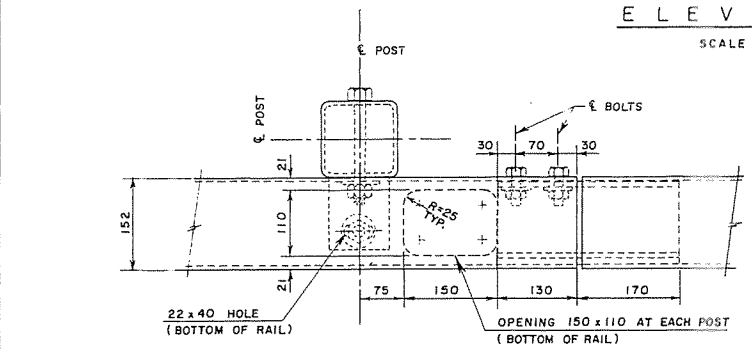
Structures (Bridges) Division
Division des ouvrages d'arts (ponts)

A detail no. / détail no.
B location drawing no. / sur dessin no.
C drawing no. / dessin no.

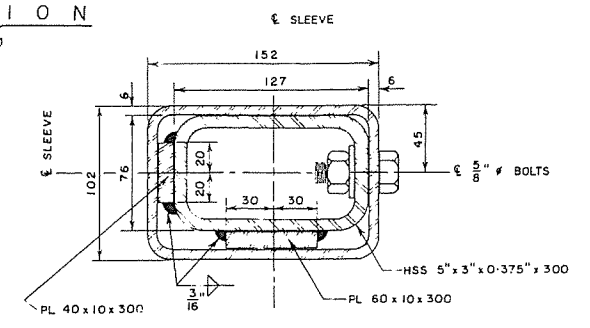
revision / révision



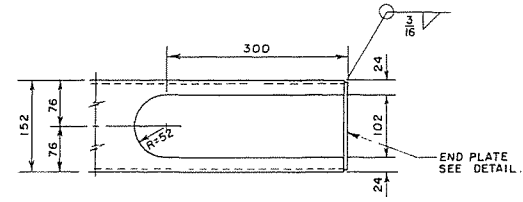
ELEVATION
SCALE 1:50



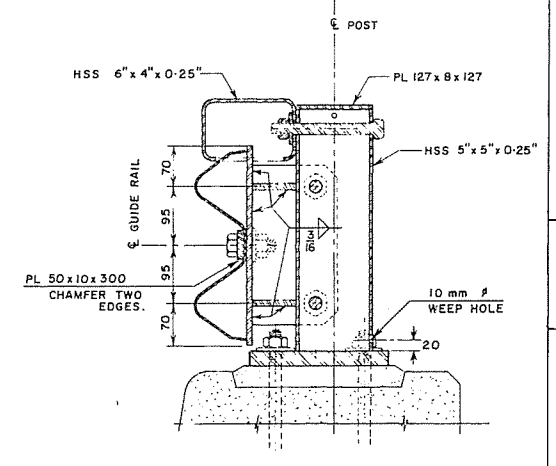
PLAN A-A



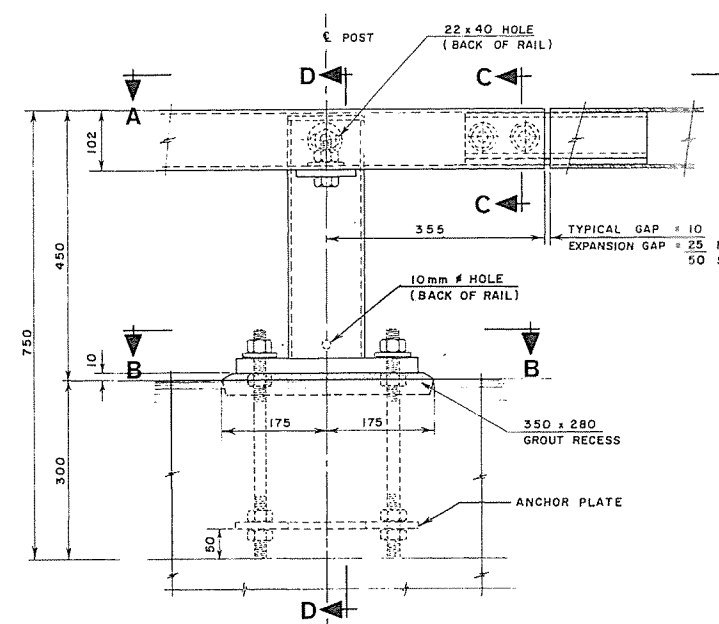
SECTION C-C
SCALE 1:2



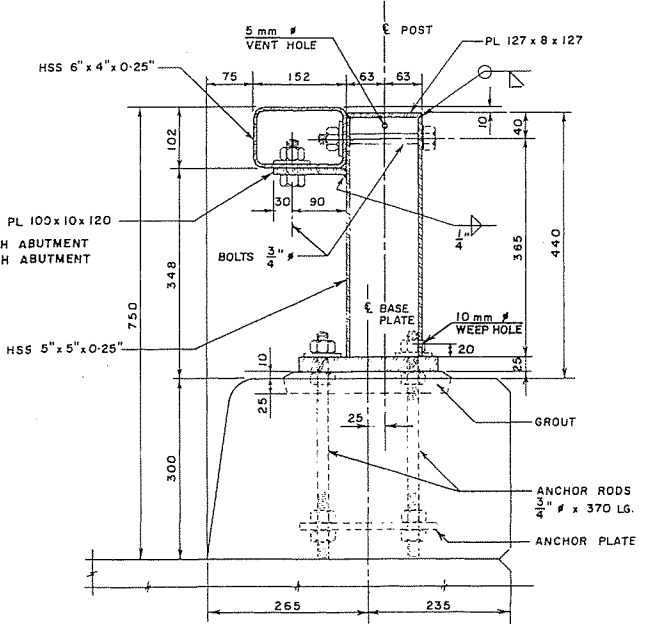
SECTION F-F



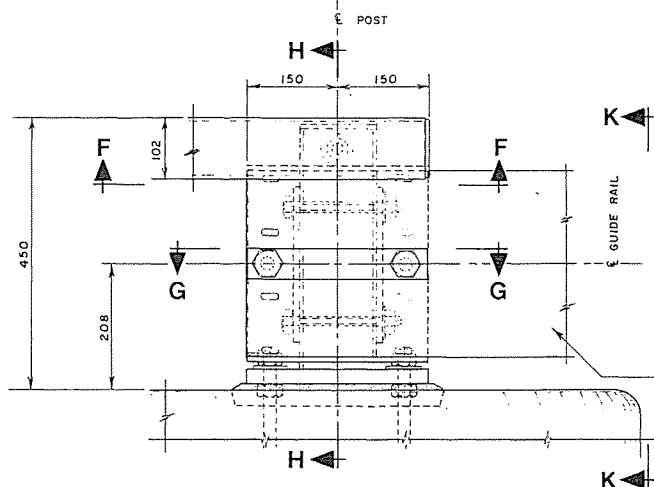
SECTION H-H



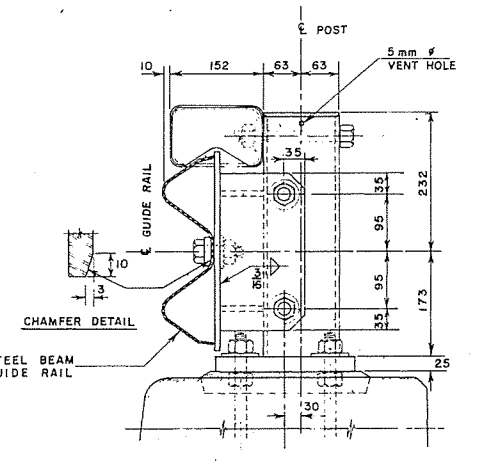
DETAIL "A"



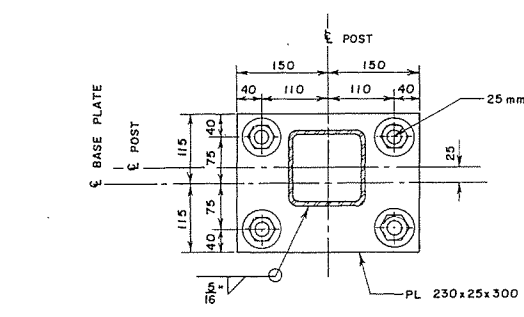
SECTION D-D



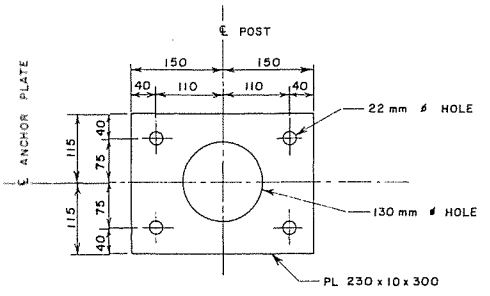
DETAIL "B" (SIMILAR TO DETAIL "A" EXCEPT AS NOTED).



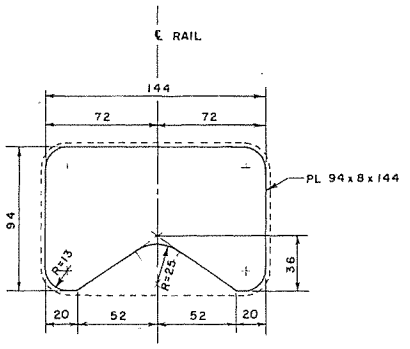
END VIEW K-K



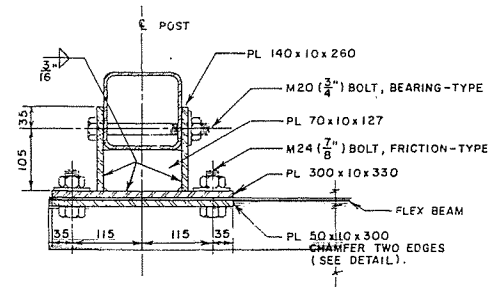
SECTION B-B



ANCHOR PLATE



END PLATE DETAIL
SCALE 1:2



SECTION G-G

NOTES

- FOR GENERAL NOTES SEE DWG. NO. 1.
- SCALE 1:5 UNLESS NOTED OTHERWISE.
- INSTALL RAIL POSTS VERTICAL. ERECT RAILING TO LINE AND GRADE INDICATED. DO NOT FOLLOW UNEVENNESS IN SUPERSTRUCTURE. ALIGN AND ADJUST RAILING PRIOR TO FIXING IN PLACE TO ENSURE MATCHING OF JOINTS. CORRECT ALIGNMENT AND CAMBER THROUGHOUT ENTIRE LENGTH.
- H.S.S.: TO CSA G40.21-M1978, GRADE 350M, TO BE GALVANIZED EXTERNALLY ONLY EXCEPT SLEEVES TO BE FULLY GALVANIZED.
- PLATES: TO CSA G40.21-M1978, GRADE 300M, AND TO BE GALVANIZED.
- BOLTS: TO ASTM A325-1976C, TYPE 1; TO BE GALVANIZED.
- GROUT: SEE SPEC'S SECTION HC03316
- ANCHOR RODS: TO CSA G40.21-M1978, GRADE 350A OR 350T; TO BE GALVANIZED.

project title / titre du projet

BUCKINGHORSE RIVER BRIDGE
ALASKA HIGHWAY
Km 277.6

drawing title / titre du dessin

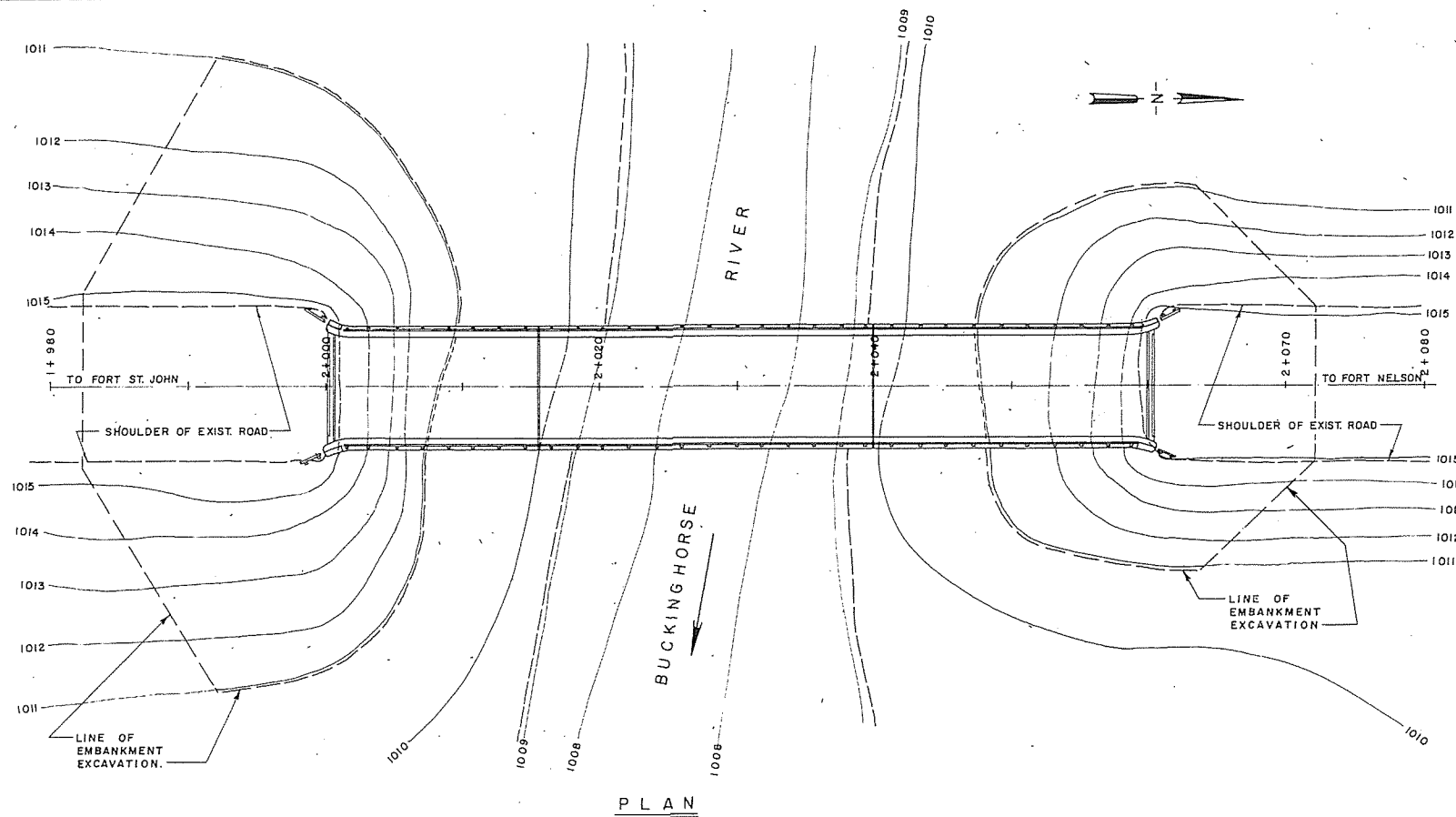
RAILING

project no./no. du projet
035480

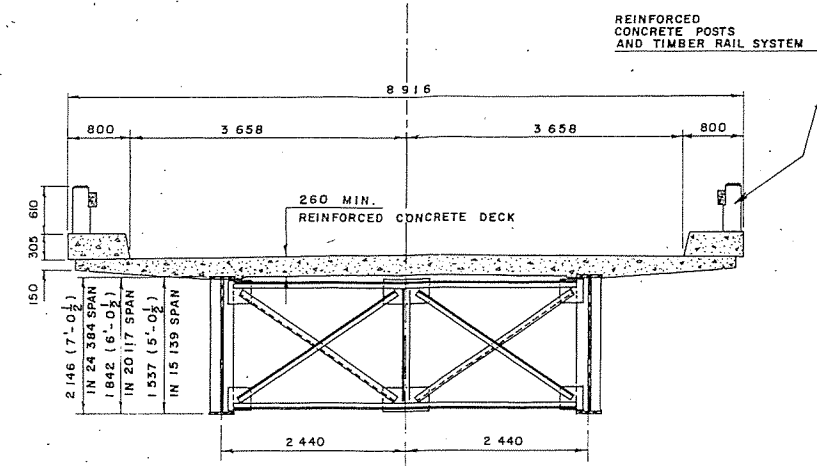
drawing no./no. du dessin
12 of/du 13

Date	79-07-17
	79-11-02

Inches 0 1 2 3 4 5 6 7 8 pouces

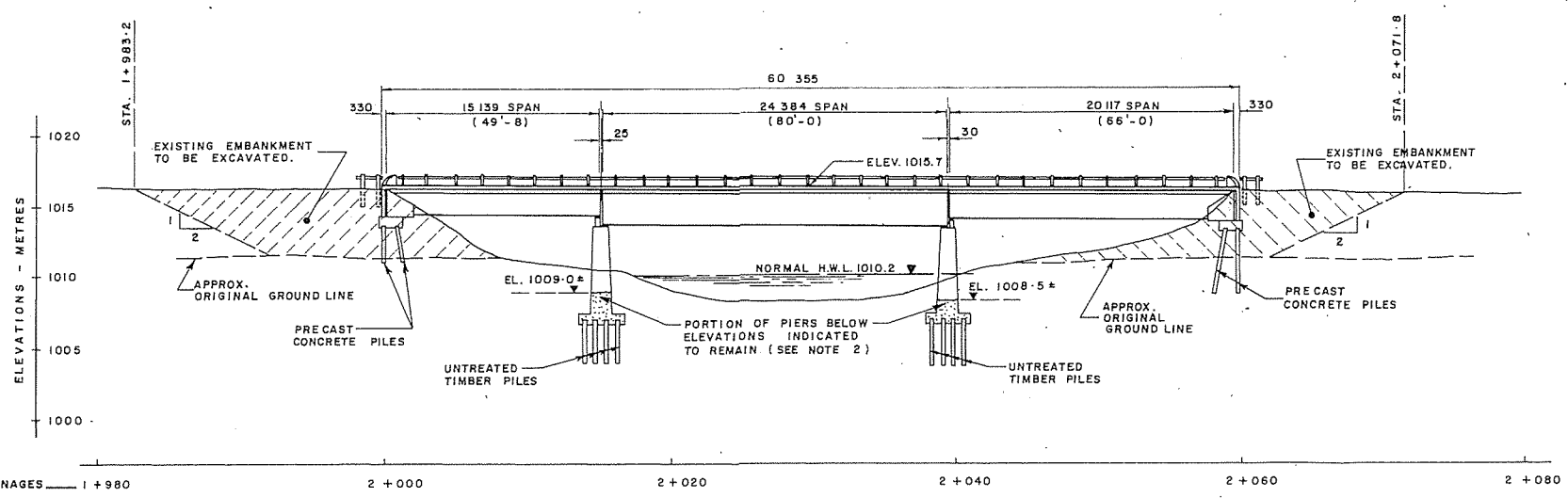


PLAN



TYPICAL SECTION (THRU DECK)

SCALE 1:40



ELEVATION

Date
79-10-29

P.W. d.L.

D.P.W. 700 B (revised April 1977)

centimetres 0 2 4 6 8 10 12 14 16 18 20 centimetres

Public Works Canada / Travaux publics Canada

Design and Construction Branch
Conception et Construction
Transportation Directorate
Direction des Transports
Structures (Bridges) Section
Section des ouvrages d'art (ponts)

A. detail no. détail no.
B. location drawing no. sur dessin no.
C. drawing no. dessin no.

revisions / révisions

project title / titre du projet

BUCKINGHORSE RIVER BRIDGE
ALASKA HIGHWAY
Km 277.6

drawing title / titre du dessin

EXISTING STRUCTURE



project no. / no. du projet
035480

drawing no. / dessin no.
13 of 13

NOTES

- EXISTING STRUCTURE TO BE DEMOLISHED AND REMOVED EXCEPT AS INDICATED. SEE SPECIFICATIONS.
- INDICATED ELEVATIONS TO WHICH PIERS MUST BE REMOVED ARE APPROXIMATE AND MAY VARY TO SUIT GABION INSTALLATION. ELEVATIONS MUST BE VERIFIED IN THE FIELD TO THE ENGINEER'S SATISFACTION.
- COMPLETE SET OF DRAWINGS FOR EXISTING BRIDGE IS AVAILABLE AT PUBLIC WORKS CANADA VIEWING OFFICES, FOR EXAMINATION BY BIDDERS.































































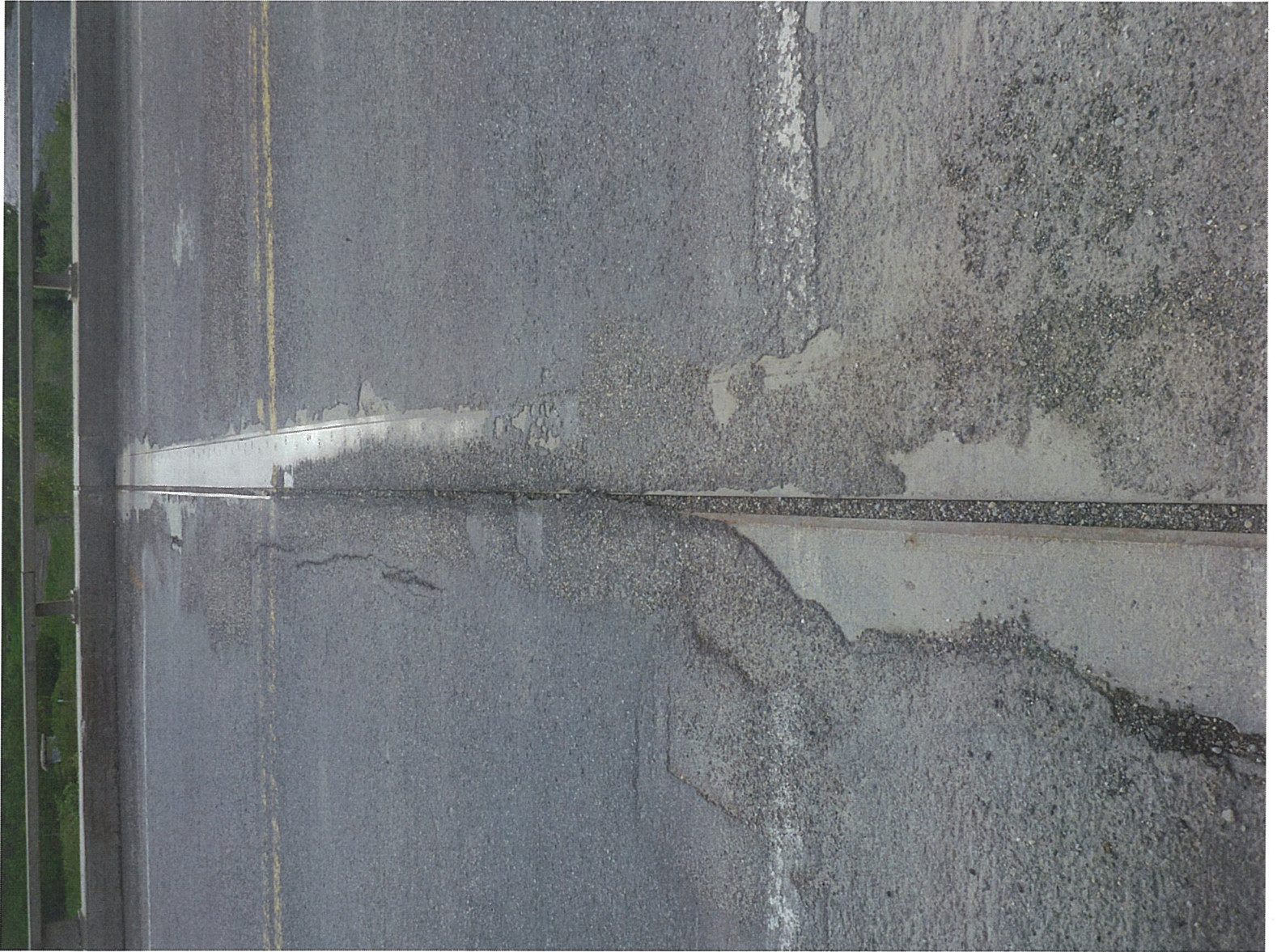
















PRELIMINARY HAZARD ASSESSMENT FORM

Project Number:	
Location:	
Date:	
Name of Departmental Representative:	
Name of Client:	
Name of Client Project Co-ordinator	PH: ()- -

Site Specific Orientation Provided at Project Location Yes No

Notice of Project Required Yes No

NOTE:

PWGSC requires "**A Notice of Project**" for all construction work related activities.

NOTE:

OHS law is made up of many municipal, provincial, and federal acts, regulations, bylaws and codes. There are also many other pieces of legislation in British Columbia that impose OHS obligations.

Important Notice: This hazard assessment has been prepared by PWGSC for its own project planning process, and to inform the service provider of actual and potential hazards that may be encountered in performance of the work. PWGSC does not warrant the completeness or adequacy of this hazard assessment for the project and the paramount responsibility for project hazard assessment rests with the service provider.

TYPES OF HAZARDS TO CONSIDER	Potential Risk for:				COMMENTS
	PWGSC, OGD's, or tenants		General Public or other contractors		
Examples: Chemical, Biological, Natural, Physical, and Ergonomic Listed below are common construction related hazards. Your project may include pre-existing hazards that are not listed. Contact the Regional Construction Safety Coordinator for assistance should this issue arise.	Yes	No	Yes	No	Note: When thinking about this pre-construction hazard assessment, remember a hazard is anything that may cause harm, such as chemicals, electricity, working from heights, etc; the risk is the chance, high or low, that somebody could be harmed by these and other hazards, together with an indication of how serious the harm could be.

Typical Construction Hazards					
Concealed/Buried Services (electrical, gas, water, sewer etc)					
Slip Hazards or Unsound Footing					
Working at Heights					
Working Over or Around Water					
Heavy overhead lifting operations, mobile cranes etc.					
Marine and/or Vehicular Traffic (site vehicles, public vehicles, etc.					



Fire and Explosion Hazards					
High Noise Levels					
Excavations					
Blasting					
Construction Equipment					
Pedestrian Traffic (site personnel, tenants, visitors, public)					
Multiple Employer Worksite					Example : Contractor working in a occupied Federal Employee space.

Electrical Hazards					Comments
Contact With Overhead Wires					
Live Electrical Systems or Equipment					
Other:					
Physical Hazards					
Equipment Slippage Due To Slopes/Ground Conditions					
Earthquake					
Tsunami					
Avalanche					
Forest Fires					
Fire and Explosion Hazards					
Working in Isolation					
Working Alone					
Violence in the Workplace					
High Noise Levels					
Inclement weather					
High Pressure Systems					
Other:					
Hazardous Work Environments					
Confined Spaces / Restricted Spaces					Review and provide confined space assessment(s) from PWGSC or client confined space inventories. Refer to PWGSC Standard on Entry into Confined Spaces. Contact the Regional Construction Safety Coordinator.
Suspended / Mobile Work Platforms					
Other:					
Biological Hazards					
Mould Proliferations					
Accumulation of Bird or Bat Guano					
Bacteria / Legionella in Cooling Towers / Process Water					
Rodent / Insect Infestation					
Poisonous Plants					
Sharp or Potentially Infectious Objects in Wastes					



Wildlife					
Chemical Hazards					
Asbestos Materials on Site					If "yes" a pre-project asbestos survey report is required. Provide Contractor with DP – 057 ELF Form 16 "Contractor Notification and Acknowledgement"
Designated Substance Present					If "yes" a pre-project designated substance survey report is required.
Chemicals Used in work					
Lead in paint					If "yes" a pre-project lead survey report is required.
Mercury in Thermostats or Switches					If "yes" a pre-project mercury survey report is required.
Application of Chemicals or Pesticides					
PCB Liquids in Electrical Equipment					
Radioactive Materials in Equipment					
Other:					
Contaminated Sites Hazards					
Hazardous Waste					
Hydrocarbons					
Metals					
Other:					

Security Hazards					Comments
Risk of Assault					
Other:					
Other Hazards					

Other Compliance and Permit Requirements ¹	YES	NO	Notes / Comments ²
Is a Building Permit required?			
Is a Electrical permit required?			
Is a Plumbing Permit required?			
Is a Sewage Permit required?			
Is a Dumping Permit required?			
Is a Hot Work Permit required?			
Is a Permit to Work required?			Mandatory for ALL AFD managed work sites.
Is a Confined Space Entry Permit required?			Mandatory
Is a Confined Space Entry Log required?			Mandatory for all Confined Spaces
Discharge Approval for treated water required?			



Notes:

- (1) Does not relieve Service Provider from complying with all applicable federal, provincial, and municipal laws and regulations.
- (2) TBD means To Be Determined by Service Provider.

Service Provider Acknowledgement: We confirm receipt and review of this Pre-Project Hazard Assessment and acknowledge our responsibility for conducting our own assessment of project hazards, and taking all necessary protective measures (which may exceed those cited herein) for performance of the work.			
Service Provider Name			
Signatory for Service Provider		Date Signed	
RETURN EXECUTED DOCUMENT TO PWGSC DEPARTMENTAL REPRESENTATIVE PRIOR TO ANY WORK COMMENCING			



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Confirmation of Prime Contractor's Main Responsibilities Under the Worksafe B.C. Occupational Health and Safety Regulations and *Worker's Compensation Act*

Name of Project: _____

Owner: Crown Owned

Contractor: _____

Consulting Engineer: _____

	YES	NO
1. The Contractor acknowledges appointment as Prime Contractor on the construction project noted below	<input type="checkbox"/>	<input type="checkbox"/>
2. The name of the Prime Contractor's Qualified Coordinator of occupational health and safety activities for this project has been submitted to the Owner and is as shown below.	<input type="checkbox"/>	<input type="checkbox"/>
3. The Prime Contractor understands that in any conflict of directions, WCB OH&S Regulations and/or the Worker's Compensation Act shall prevail.	<input type="checkbox"/>	<input type="checkbox"/>
4. The Prime Contractor understands and will direct that all supervisors/coordinators must immediately report any apparent conflict as described above.	<input type="checkbox"/>	<input type="checkbox"/>
5. The Prime Contractor agrees that their supervisor shall immediately notify the consulting Engineer's representative of any reported conflict.	<input type="checkbox"/>	<input type="checkbox"/>
6. The Prime Contractor has requested and received information from the Owner regarding any known hazards to the health and safety of persons pre-existing at the workplace.	<input type="checkbox"/>	<input type="checkbox"/>
7. The Prime Contractor has conducted an inspection of the workplace to verify the presence of any hazards.	<input type="checkbox"/>	<input type="checkbox"/>
8. The Prime Contractor will communicate hazards information to any persons who may be affected and ensure that appropriate measures are taken to effectively control or eliminate the hazards.	<input type="checkbox"/>	<input type="checkbox"/>
9. The Prime Contractor accepts that written documentation such as notes, records, inspections, meeting minutes, etc., on all health and safety issues must be available upon request to the PWGSC departmental representatives and/or to a WCB officer at the workplace.	<input type="checkbox"/>	<input type="checkbox"/>
10. The Prime Contractor will confirm that all workers are suitably trained and competent to perform the duties for which they have been assigned.	<input type="checkbox"/>	<input type="checkbox"/>
11. The Prime Contractor confirms that safety orientation of all new workers will be conducted.	<input type="checkbox"/>	<input type="checkbox"/>
12. The Prime Contractor's written Safety Program has been provided to the Owner's representative.	<input type="checkbox"/>	<input type="checkbox"/>
13. The Prime Contractor confirms that meetings to exchange information on any safety issues, concerns, hazards or safety directives will be conducted weekly or more often if required.	<input type="checkbox"/>	<input type="checkbox"/>
14. The Prime Contractor confirms that before the commencement of work, crews will attend a daily crew safety meeting.	<input type="checkbox"/>	<input type="checkbox"/>
15. The Prime Contractor confirms that their supervisor has assessed and will coordinate the workplace first-aid requirements	<input type="checkbox"/>	<input type="checkbox"/>
16. The Prime Contractor confirms that the procedure to transport injured workers is established	<input type="checkbox"/>	<input type="checkbox"/>

Prime Contractor Representative's Name: _____

Title: _____ Signature: _____ Date: _____

Prime Contractor's OH&S Coordinator Name: _____

Title: _____ Signature: _____ Date: _____

Environmental Protection Plan (EPP) – Checklist

Note: This checklist was developed to assist the Contractor in determining and mitigating environmental issues at site. It is considered a generic checklist and it is in the Contractor's best interest to review the PWGSC Environmental Effects Evaluation (EEE) and/or the Fish and Fish Habitat Report as supporting documents in the completion of the site Environmental Protection Plan (EPP). Applicable provincial and federal guidelines and regulations should be reviewed prior to submission of the EPP.

EPP Framework		Content Requirements	Yes	No	N/A
Project Setting and Site Activities					
<i>Project Description</i>	A brief description of the project and its location is provided.				
<i>Environmental Sensitivities</i>	Sensitive or protected features that could be impacted as a result of the Contractor's activities are described.				
<i>Site Activities</i>	A scope of work and a list of all construction or related activities to be undertaken during the project are provided.				
Project Schedule and Site Drawings					
<i>Project Schedule</i>	A project schedule is provided, including scheduled shut-downs and restricted work periods due to environmental requirements.				
<i>Site Drawing</i>	One or more site drawings(s) are provided, indicating the site location; site set-up and layout; erosion and sediment controls; in-stream work areas; and environmental sensitivities.				
Potential Environmental Impacts and Controls					
<i>Potential Environmental Issues and Impacts</i>	The potential environmental issues and impacts that may result from the construction activities are described. Environmental Reports (Environmental Effects Evaluation, Environmental Assessments; Fish and Fish Habitat and Compensation Reports, Aquatics Effects Evaluations etc) will be provided to the contractor especially with respect to any in-stream work procedures that will be required. For example, in-stream works will impact fish and fish habitat in the surrounding ecosystem and potentially upstream and downstream of proposed works. It is the Contractor's responsibility to ensure the work is completed in a manner that causes the least impact on the ecosystem (see section on Mitigation).				
<i>Permits, Approvals, and Authorizations</i>	List required permits, approvals and authorizations. As applicable, environmental mitigation measures prescribed by regulatory agencies and included in project permits, approvals and authorizations are described. NOTE: DFO, MOE and NWSA approvals and authorizations for in-stream works are PWGSC's responsibility however, the Contractor must be aware of the requirements of these approvals/authorizations. Permitting for water withdrawal from the water body as part of construction activities is part of the Contractor's responsibility. Scientific Collection Permits such as licences for Fish Salvage Permits are also the responsibility of the Contractor and are obtained by the Contractor's environmental monitor/consultant* who will be completing the salvage.				

Mitigation Strategies	Procedures, controls or best management practices (BMPs) to prevent or reduce adverse impacts on the environment are provided. For example, all work in BC must adhere to the BC MOE "Standards and Best Practices for Instream Works" for those works that are completed below the high water mark. DFO mitigation techniques under the Fisheries Act must also be followed. One useful document that contains information on Ministry of Environment's ecosystems, guidelines and mitigation techniques is from the MOE Ecosystems Branch – Develop With Care 2014 – Environmental Guidelines for Urban and Rural Land Development in BC.			
Erosion and Sediment Control	Erosion and sediment controls are provided, as appropriate for the jurisdiction.			
Waste Management and Hazardous Materials				
Waste Management and Hazardous Materials	Hazardous materials that will be used and/or stored on site are listed. Expected hazardous and non-hazardous waste materials along with proper handling, containment, storage, transportation and disposal methods are listed. As appropriate for the jurisdiction, estimated waste quantities and specific handling procedures are also provided. For example, re-fuelling of equipment will be conducted at least 30m away from any active drainage courses.			
EPP Implementation				
Site Representative	Name(s) and contact details for the person(s) who will be the Contractor's Site Representative(s) are provided.			
Training and Communication	Training and communication details are provided.			
Monitoring and Reporting	Monitoring and inspection procedures, including a schedule of monitoring activities and reporting procedures are provided. For example, this would include downstream monitoring activities for increased siltation during in-stream works.			
Documentation	Information and/or records that will be maintained relating to the EPP and end environmental matters on the project site are described.			
EPP Update	EPP review and update procedures are provided.			
Environmental Emergency Response Procedures				
Environmental Emergency Response Procedures	Potential incidents that may impact the environment are identified, and emergency response procedures to prevent and respond to incidents are provided. An environmental emergency response contact list is also provided.			

***Environmental Monitor/Qualified Professional as recognized by the province:** an applied scientist or technologist specializing in a relevant applied science or technology including, but not necessarily limited to, agronomy, forestry, biology, engineering, geomorphology, geology, hydrology, hydrogeology or landscape architecture, and who is registered in British Columbia with their appropriate professional organization, and acting under that association's Code of Ethics and subject to disciplinary action by that association, and who, through demonstrated suitable education, experience, accreditation and knowledge relevant to the particular matter, may be reasonably relied on to provide advice within their area of expertise.