

Peace River Project Water Use Plan

Boat Ramp Hudsons Hope

Reference: GMSWORKS-51

Dinosaur Boat Ramp Replacement Project

Study Period: Sep 4, 2012 – Jun 28, 2013

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May 16, 2013

**BC Hydro
PROJECT COMPLETION REPORT**

**Dinosaur Boat Ramp Replacement Project
Dinosaur Lake Campground, Hudson Hope BC**

Project Start: September 4, 2012

In-Service: November 22, 2012

Project Close-out: June 28, 2013

**Prepared for: BC Hydro, Water Licence Requirements
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Executive Summary

This completion report is limited to the work undertaken to complete construction on Dinosaur Lake Boat Ramp replacement following the user requirements and feasibility design resulting from the Peace Water Use Planning (WUP) process which was completed between 2001 and 2003. The implementation plan was time bound to see completion of the replacement ramp beginning in September 2012 and completing prior to winter conditions at the site and for upland work at the site to be complete prior to boating season opening on Dinosaur Reservoir in May 2013. In order to achieve this schedule, demolition and construction work needed to be complete before winter conditions made further work impossible. Construction of the boat ramp, rubble mound breakwater and test installation of the dock and gangway was complete on November 22, 2012 while parking lot completion, site seeding, signage installation and navigational buoy installation was completed May 17, 2013.

The user requirements for the replacement project specified the following:

- Removal and disposal of the existing single lane concrete ramp, dock and steel piles supporting the existing wooden gangway to the dock
- Dredging and disposal of material from the boat basin
- Install a new 25 year, double lane concrete ramp with a grade between 12% and 15%
- Purchase and install a new metal gangway and composite floating dock
- Refurbish the upstream breakwater
- Install navigational signage
- Supply and install slope protection along foreshore
- Complete landscaping and parking lot improvements on completion of ramp work

The project met the following objectives:

- Replacement of the existing boat ramp, dock and gangway, dredging of the boat basin and erosion control in order to provide:
 - o Access to the full dock at all water levels
 - o Two ramp launching lanes
 - o Tie up points around all sides of the dock to accommodate the size of watercraft specified in the user requirements
 - o Larger floating dock
 - o Extension and reconstruction of the rubble mound breakwater
 - o Minimizing erosion and ice scour at the site through placing rip rap along the impacted shoreline areas and in front of the new foreshore site

A key constraint during ramp construction was associated with water levels in Dinosaur Reservoir. With some variation, Dinosaur Reservoir goes through a daily cycle of lowest water to full pool with a difference of approximately 3 meters from lowest level to highest level. The highest water level in the reservoir is 502.98 meters above sea level (MASL) and this peak is generally achieved by 8:00 a.m. while the lowest operating level is 500.39 MASL achieved at 1:00 a.m.

Ramp design to support boat launching across all operating water levels required the toe of the ramp to be installed at elevation 498.8 which required excavation to 497.8 to place fill to support the concrete ramp structure. Resulting from the need to access elevations approximately 5 meters below peak daily water levels the project team worked with Generation Resource Management to hold reservoir levels to

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500.7 MASL over the course of construction and installed a temporary coffer dam to hold water out of the construction area.

4Evergreen Resources, a Saulteaux First Nation owned company, was contracted to develop their environmental protection plan, safety management plan and to implement the designed works. Environmental monitoring was undertaken daily throughout the construction period by Ecofor Consulting while BC Hydro provided construction management services.

Engineers drawings were developed by Moffatt and Nichol Engineering while Owner's Engineer reviews were completed by Klohn Crippen, on contract to BC Hydro. Site inspections prior to, during and at completion of the works were conducted by Moffatt and Nichol.

Project

1.1. Background

Pursuant to direction from the BC Comptroller of Water Rights, BC Hydro has carried out a province wide Water Use Planning (WUP) process for most of its existing hydroelectric facilities. The Peace Water Use Plan Consultative Committee recommended a package including scientific studies and physical works for the Peace Hydroelectric System that would result in enhanced recreational access to Williston Reservoir, Dinosaur Reservoir, and the Peace River below Peace Canyon Dam.

In response to Schedule B, Clauses 2 (a) and 4 of the Peace Water Use Plan implementation order, BC Hydro carried out a feasibility study to review options and to provide recommendations for such physical works.

The Deputy Comptroller of Water Rights reviewed this feasibility study and instructed BC Hydro to proceed with, among other boat ramp projects, upgrading the existing Dinosaur Reservoir Campground Public Boat Launch Site.

This project was a condition of the Water License as well as being ordered by the Comptroller of Water Rights. It was implemented in accordance with the Order to Implement the Peace Project Water Use Plan dated August 9, 2007 (the Order); and letters to BC Hydro dated May 7, 2010 and April 3, 2012 (the Letters) issued by the Deputy Comptroller of Water Rights instructing BC Hydro to commence the detailed design, costing, construction and maintenance for various boat access facilities, specifically Hudson's Hope/Dinosaur Reservoir (GMSWORKS #51 and #53).

1.2. Planning

A site visit was conducted in July 2012 with the Project Manager, Construction Manager, Engineer of Record, Environmental Manager, Environmental Monitor, Safety Management, the Ministry of Environment, Department of Fisheries and Oceans Canada and the Construction Contractor.

During the site visit all aspects of the project were discussed including permit requirements, site layout, environmental and safety protection planning. A second pre-construction site visit was undertaken in August 2012 with Construction Management, Environmental Management, Environmental Monitor and the contractor.

The combined agency site visit was an excellent way to familiarize everyone with the project at the same time and to exchange thoughts and requirements in a meaningful way. As a result, during construction, there were no lost time safety incidents and only a few minor environmental incidents that were quickly

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handled. There was one larger environmental incident involving the turbidity curtain which broke during a high wind, high wave event. Site work was suspended and turbidity monitoring was undertaken while the curtain was quickly repaired. The incident was reported to the appropriate agencies and work was authorized to continue to completion.

1.3. Location

The Dinosaur Lake boat launch facility is located on the North Shore of the section of the Peace River between the WAC Bennett Dam and the Peace Canyon Dam as shown below.



Site Location (Source: Google Earth)

1.4. Project Objectives

Replacement of the existing boat ramp, dock and gangway, dredging of the boat basin and erosion control in order to provide:

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- Access to the full dock at all water levels
- Double lane ramp
- Tie up points around all sides of the dock to accommodate the size of watercraft specified in the user requirements
- Larger floating dock
- Extension and reconstruction of the rubble mount breakwater
- Minimizing erosion and ice scour at the site through placing rip rap along the impacted shoreline areas and in front of the new foreshore site

1.5. Project Schedule

Project schedule objectives included ensuring the development of contingency plans for key issues including:

- ◆ Public safety through excluding access during construction
- ◆ Site security to prevent theft and vandalism
- ◆ Post construction public safety by utilizing Safety by Design during construction which resulted in the addition of a new sign on the access gangway and an increase in the size of the upstream rubble mound breakwater to ensure it remained visible at all water levels
- ◆ Environmental protection through the use of a turbidity curtain during dredging activities

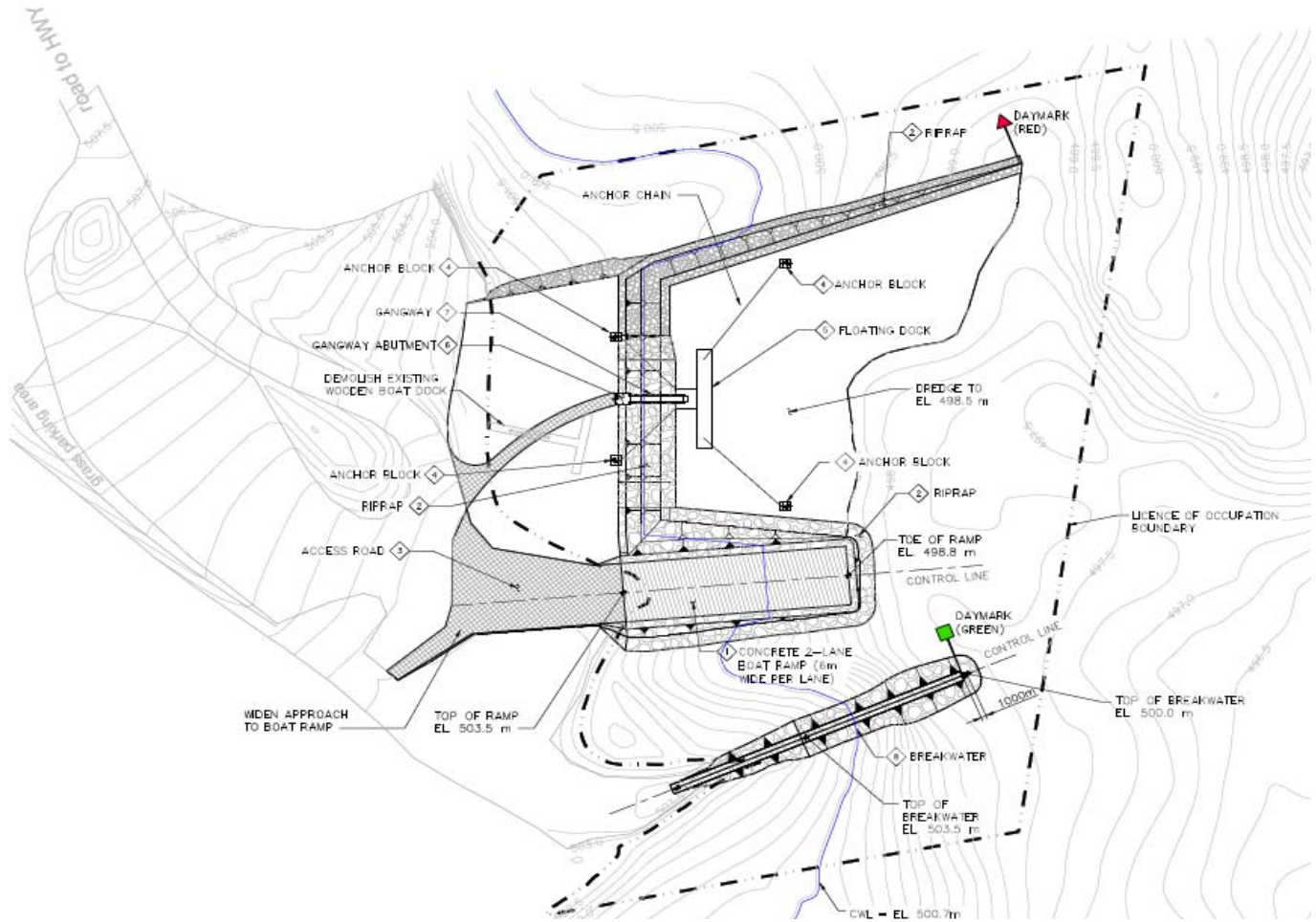
Other schedule objectives are summarized in the table below:

Table 1 – Schedule Milestones

Date	Key Milestone Dates and Decision Points
July 30, 2012	Secure Site Tenure
August 31, 2012	Definition Phase Complete
September 5, 2012	Contract Awarded for Construction
November 22, 2012	In Service
June 28, 2013	Project Completion/Documentation Close-out

1.6. Site Overview

The following figure shows the general arrangement of refurbished works juxtaposed onto the original site works.



Source: Extracted from Moffatt and Nichol's drawing 1007-C09-00024 – General Arrangement

1.6.1. Dredged Basin

The dredge basin is approximately trapezoidal shaped in plan with an approximate overall area of 2,788 sq. metres. The plan dimensions of the dredged basin are approximately 50m by 56m. The design dredged depth is El. 498.5m excluding an over dredge allowance of 0.3m.

During the dredging works, a rock shelf on the north-eastern side of the basin was discovered which extended from the shore into the lake. As a result, the outer perimeter of the northern dredge cut was confined to extent of the east-west alignment of the rock shelf.

1.6.2. Double Lane Concrete Boat Ramp

A new 12m wide double lane concrete surfaced boat ramp was installed at the vicinity of the existing boat ramp. Two rows of concrete panels each 6m wide x 2m long x 200mm thick with V-grooves on the surface were placed on two sets of a steel grade beams founded on a 300mm thick foundation of base

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course gravel and geotextile. The toe and sides of the ramp were protected with 250kg riprap and filter stone.

1.6.3. Rubble Mound Breakwater

The existing rubble mound breakwater was reconstructed with a constant crest at El. 503.5m. The first section from the shore to halfway along the total length was founded on a geotextile layer, and filled with a core made of filter stone overlain with 250kg riprap. The outer breakwater section comprised of a core layer with 5kg quarry stone, an under layer with 25kg armour rock and cover layer of 250kg riprap.

1.6.4. Dock and Gangway

The 6.7m by 3m wide float modules are timber framed and fitted with expanded polystyrene filled polyethylene shell Ace Roto-mold float billets and support a Moisture Shield composite decking. The overall dimensions of the assembled main float dock are 20m long and 3m wide. The dimensions of the landing float that supports the sliding end of the gangway are 3.9m by 3.9m. The float is tethered with 19mm diameter hot dip galvanized mooring chains fixed to concrete anchor blocks (two anchor blocks are located offshore and two are located on shore.)

The 10m long by 1.5m wide aluminum gangway is supported on a precast concrete abutment at the shore end and rests on a sliding plate on the landing float. The walkway surface of the gangway is fitted with a Thru-flow fiberglass reinforced polypropylene deck complete with transition plates at both the shore and float ends of the gangway.

1.6.5. Navigation Day Marks

Two day marks are provided to demark the navigation entrance to the boat ramp and the dredge area. A piled day mark is installed at the off shore end of the rubble mound breakwater and the other day mark is a floating buoy sited on the northern side of the dredged basin.

1.7. Project Organization

The project was organized with a mix of BC Hydro staff and contractors.

The following list identifies all personnel involved in project identification, definition and implementation activities.

Personnel Type	Description of Availability / Constraints
Project Sponsor	Edie Thome – BC Hydro
Project Delivery Team Lead	Mark Leng – BC Hydro
WLR Team Lead – Initiator	Aileen Grant – BC Hydro
Project Manager	Christine Boehringer, C. Boehringer & Associates
Engineer of Record	Paul Hoo – Moffatt Nichol
Geotechnical Engineer of Record	Walt Dengler – EXP Environmental
Owner's Engineer	Geoff Cooper – Klohn Crippen
Construction Officer	Dave McLorie
Construction Manager	Randy Grelson - Randstad
Construction Manager	Wayne Clarke – BC Hydro
Environmental Monitor	Kevin Wilson – Ecofor
Construction Contractor	Blair Smith – 4Evergreen Resources LP
Community Relations	Bob Gammer – BC Hydro
Procurement	Grant Grinnell/Barb Trathen – BC Hydro
Safety	Tom Hansen, Tyler Grohs – BC Hydro Chris Caryula - Contractor
Contract Management	Naveed Nadri - Contractor
Environment	Cindy Powell – BC Hydro
Properties	Allison Elliott/Holly Pommier – BC Hydro
Commercial Manager	Brad Samis – BC Hydro
Aboriginal Relations	Stewart Dill – BC Hydro

1.8. Status

The replacement Dinosaur Boat Ramp has been successfully completed in accordance with the Project Management Procedures of BC Hydro and went into service on November 22, 2012 while signage and landscaping was complete May 17, 2013.

Appendices

Document Reference	Date on Document
Project Documentation	
• Construction Photographs	Various
• Record Drawings	January 14, 2013

Turbidity curtain install around site



Dredging the boat basin



View of double lane ramp behind coffer dam during construction





Foreshore preparation



Breakwater



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Dock and gangway



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Daymarks



Site overview with dock and gangway removed to winter storage



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