

From: edover@lowerchurchillproject.ca
Sent: Thursday, July 23, 2015 4:01 PM
To: ken.mcclintock@lowerchurchillproject.ca; John Mulcahy
Subject: Fw: CH0009 Site Interface Issues
Attachments: HJOC-Dragados Clarification Response July 23 2015.pdf

See e-mail below from Bidder 3.

Ed Over

Sr. Advisor-Commercial Strategies
PROJECT DELIVERY TEAM
Lower Churchill Project
t. 416-252-5315 Ext. 53675

e. EdOver@lowerchurchillproject.ca
w. muskratfalls.nalcorenergy.com

----- Forwarded by Ed Over/LCP/NLHydro on 07/23/2015 02:30 PM -----

From:

Leonard Knox <LKnox@hjoc.com>

To:

"EdOver@lowerchurchillproject.ca" <EdOver@lowerchurchillproject.ca> ,

Cc:

Nolan Jenkins <NJenkins@hjoc.com>, Don Strickland <don.strickland@bird.ca>

Date:

07/23/2015 02:19 PM

Subject:

RE: CH0009 Site Interface Issues

Ed

Please attached response. Any questions please advise.

Len

From: EdOver@lowerchurchillproject.ca [mailto:EdOver@lowerchurchillproject.ca]
Sent: Tuesday, July 21, 2015 2:45 PM
To: Nolan Jenkins; Leonard Knox
Cc: ken.mcclintock@lowerchurchillproject.ca; JohnMulcahy@lowerchurchillproject.ca
Subject: CH0009 Site Interface Issues

Gentlemen,

We refer to our communication of July 15 related to possible interface issues with other contractors on site. The issues relate to:

1. The need to share a portion of Laydown Area J, and to allow unobstructed access across Area J. A roadway of approximately 10 meters width must be shared with other project contractors. All maintenance of the roadway will be responsibility of Bidder.
2. The need to give up access to the area immediately East of the Intake Cofferdam. Minor adjustments to the cofferdam layout may be possible to facilitate access to the upstream temporary bridge.

The attached information has been provided to describe the specific areas related to these two issues. Bidder will no longer have access to the areas identified.

Accordingly, Bidder is requested to determine the impacts on its current execution plan, and to provide Company with the following:

1. Describe the impacts on Bidder's current execution plan
2. Describe the changes Bidder will make to its execution plan to accommodate these issues, and
3. Provide an assessment of any cost, schedule, safety and other impacts on Bidder's proposal.

We are anticipating Bidder's response by COB Thursday, July 23. Please advise if you require more time.

Ed

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HJOC-Dragados Clarification Response July 23 2015.pdf

**DRAGADOS CANADA**

July 23, 2015

Muskrat Falls Corporation
c/o Nalcor Energy
350 Torbay Road Plaza, Suite 2
St. John's, NL, Canada
A1A AE1

Dear Mr. Over

We acknowledge receipt of your email dated July 21, 2015 relating to CH009 Interface Issues.

The first question was:

The need to share a portion of Laydown Area J, and to allow unobstructed access across Area J. A roadway of approximately 10 meters width must be shared with other project contractors. All maintenance of the roadway will be responsibility of Bidder.

Response:

We do not see any issue with allowing access across Area J. This will have to be coordinated to minimize interruptions as we will have a lot of truck traffic to and from the North Dam. The access road construction and maintenance will be done on a "fit for purpose" standard for our requirements. This does not include any maintenance for shut down periods for winters, diversion delays causing us to demobilize, etc. Should you require us to do the maintenance during these shut down periods, we would do so on a cost reimbursable basis.

We also would like to point out the following:

The access to Area J will change once the existing cofferdams and rock section is removed. Please refer to Annex 13-4 and 13-11 drawings. A copy of each has been attached.

We are building the access road to suit our anticipated vehicle loads only. Should any third party require heavier load requirements, they would have to compensate us to make the structural modifications required.

The second question was:

**DRAGADOS CANADA**

The need to give up access to the area immediately East of the Intake Cofferdam. Minor adjustments to the cofferdam layout may be possible to facilitate access to the upstream temporary bridge.

Response:

We have reviewed this requirement and we can minimize our impact to this area by realigning the upstream bridge. We will now utilize the intake cofferdam as the launching pad. However we will require some fill on the east side of the cofferdam in order to allow a straight launch. The construction of the Intake cofferdam will have to be completed in the fall of 2015 in order to accommodate a bridge installation in the spring of 2016. This will cause some access interference to the intake area of the powerhouse however we will do our best to minimize this disruption.

The additional cost for this adjustment at the bridge abutments and launching area is \$300,000.00. This cost is based on the realignment we have chosen. If a different alignment is required that lengthens the span then there would be additional costs for the extra length of bridge and potential extra pier installation and removal. This cost could be substantial.

We have also attached an updated execution plan for the temporary bridge.

We respectfully remind Nalcor that the Tender Validity Period ends on July 31, 2015.

We trust this satisfactory and we are available at any time to discuss these responses.

A handwritten signature in blue ink, appearing to read "L. Knox", written over a horizontal line.

Leonard Knox
Executive Vice President
H.J. O'CONNELL CONSTRUCTION LIMITED

1. TEMPORARY BRIDGE DESIGN AND INSTALLATION

The temporary bridge across the spillway approach channel will consist of one 80m span and one 20m (+/-) span as illustrated on the attached drawing. We will realign the bridge to match up closer to the intake cofferdam. This will minimize any encroachment into the intake area as requested in your email to Mr. Leonard Knox dated July 21, 2015. We may require some fill on the inside of the cofferdam in order to create a straight launching area. This can be removed after the bridge is installed.

In order to utilize the cofferdam as the launching area, we will advance the construction of the intake cofferdam to the fall (September and October) of 2015.

Originally the 20m span was going to be either a truss system or steel girder system, however we will now have to adjust the pier design to allow for a flared 20m section in order for the bridge to align properly with the starter groins. Therefore the 20m section will now consist of steel girders rather than a truss system.

The south abutment will be established in an area of competent rock with minimal overbreak. This may require some realignment of the bridge. It will consist of a concrete retaining wall structure on the edge of the spillway channel. The area between the south abutment and the transition dam will be filled with rock fill. The existing bank in-situ rock will be structurally secured with rock bolts.

An intermediate pier will be established on the north edge of the spillway channel. This will consist of structurally securing the existing rock with rock bolts. A concrete foundation will be poured. A steel pier will be designed and fabricated off site which will be bolted to the concrete. The steel pier now will be in a wedge shape to allow for the flare of the bridge. When the bridge is eventually removed, the steel pier will be unbolted and removed. The concrete abutments and retaining wall will be installed outside of the limits of the spillway approach channel and therefore will remain in place.



Figure 1: Spillway Bridge, Long-Sault Rapids, ON (Algonquin Bridge)

The existing RCC cofferdam will be utilized for the north abutment.

The bridge will utilize Mabey Universal panels or equivalent in a double-double reinforced configuration for the 80m span. The width will be 5m with a wooden deck. Concrete for the abutment and pier foundation will be obtained from a local supplier in Goose Bay or from the existing on-site concrete batch plant (if available).

The bridge will be assembled on rollers on the access ramp and pushed across the channel with a launching nose into position. It is imperative that the access ramp and bridge line up in a straight line to facilitate launching of the bridge.

The assembly crew will primarily consist of:

- 1 – 80T crane
- 1 – Cat 336 excavator
- 1 - Foreman
- 4 – Ironworkers
- 2 – Labourers

The bridge will have a 75T capacity, but will have the potential for higher capacities for future shorter spans.

The upstream spillway bridge will be removed in the same manner in which it was launched. A nose section will be installed and the bridge will be placed on rollers. The bridge will be pulled back on the intake cofferdam and dismantled. The final disassembly and storage will be done

on site. There will be additional costs to the Company should the bridge have to be transported off of the project site.

During the dismantling of the bridge the steel section only of the intermediate pier will be removed as explained earlier.

Once the dismantling of the bridge is complete, the intake cofferdam will be removed. The material will be excavated with 75t excavator and loaded into 40T articulated trucks. A 35t excavator will assist with machine cleaning. The material will be hauled to disposal.

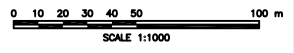


- NOTES:**
1. ALL DIMENSIONS IN MILLIMETRES AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE.
 2. TOPOGRAPHIC GRID IS BASED ON UTM NAD 83, ZONE 20 SYSTEM
 3. THE GROUND TOPOGRAPHY CONTOURS ARE BASED ON A SITE-SPECIFIC LIDAR SURVEY COMPLETED IN 2006.
 4. THE RIVER BATHYMETRY CONTOURS ARE BASED ON AN AIRBORNE BATHYMETRIC SURVEY COMPLETED IN 1998.
 5. THE CONTOUR INTERVAL OF THE GROUND TOPOGRAPHY AND THE RIVER BATHYMETRY IS 2 METRES.
 6. FOR FOUNDATION PREPARATION, SEE DRAWING 2300-CV-DD-0004-01.

- LEGEND:**
- BATHYMETRIC CONTOUR
 - TOPOGRAPHIC CONTOUR
 - SHORELINE (JULY-OCTOBER FOR AVERAGE FLOW OF 1830 m³/s)
 - BENCHMARK
 - LOCATION POINT
 - NATURAL STREAM
 - DITCH
 - CULVERT
 - TRANSMISSION LINE TOWERS NIC
 - ROCK STOCKPILE AREA
 - LAYDOWN AREA
 - STOCKPILE AND LAYDOWN BOUNDARIES
 - EXCAVATION TO BEDROCK
 - EXCAVATION ON OVERBURDEN ACCEPTABLE FOUNDATION
 - EXISTING ROCKFILL
 - NIC NOT IN CONTRACT

COFFERDAMS		
LOCATION POINTS		
POINT No	COORDINATES	
	EASTING	NORTHING
1	648 983.966	5 901 855.142
2	648 881.015	5 901 912.266
3	648 658.735	5 902 168.373
4	649 011.367	5 901 862.416
5	648 908.883	5 901 936.453
6	648 680.144	5 902 200.000
7	649 027.668	5 901 872.707
8	648 937.525	5 901 961.312
9	648 730.361	5 902 200.000
10	649 098.511	5 901 944.661
11	648 957.946	5 902 106.622
12	648 992.059	5 901 582.467
13	649 022.178	5 901 734.585
14	649 067.559	5 901 755.704

NOT FOR CONSTRUCTION



C:\Users\lavelin\OneDrive\Desktop\2014\1447_LCP_040009\Draws for Brad\July 22\ Bridge Realignment Option 1.dwg

***** FOR INTERNAL USE ONLY *****

DESIGNED BY: R. LEMIEUX
 DRAWN BY: R. MERRI
 VERIFIED BY: A. EL BENSJ
 DATE: 6-MAY-2013

APPROVED: R. BOUCHARD
 APPROVED: G. SNYDER

REVISIONS:

NO.	DATE	REVISION

SNC-LAVALIN

naacor

CLIENT: LOWER CHURCHILL PROJECT

TITLE: MUSKRAT FALLS NORTH AND SOUTH DAMS COFFERDAMS LOCATION AND EXCAVATION PLAN

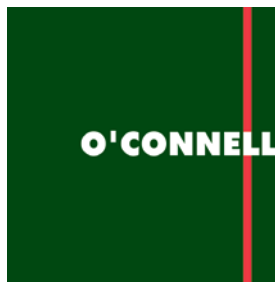
DESIGNED BY: R. LEMIEUX
 DRAWN BY: R. MERRI
 VERIFIED BY: A. EL BENSJ
 DATE: 6-MAY-2013

APPROVED: R. BOUCHARD
 APPROVED: G. SNYDER

SCALE: 1:1000

PROJECT NO: 506573-3232-4GDD-0002_00
 DRAWING NO: MFA-SN-CD-2340-CV-PL-0005-01 B1
 SHEET NO: 0009-4G05 PLATE 01

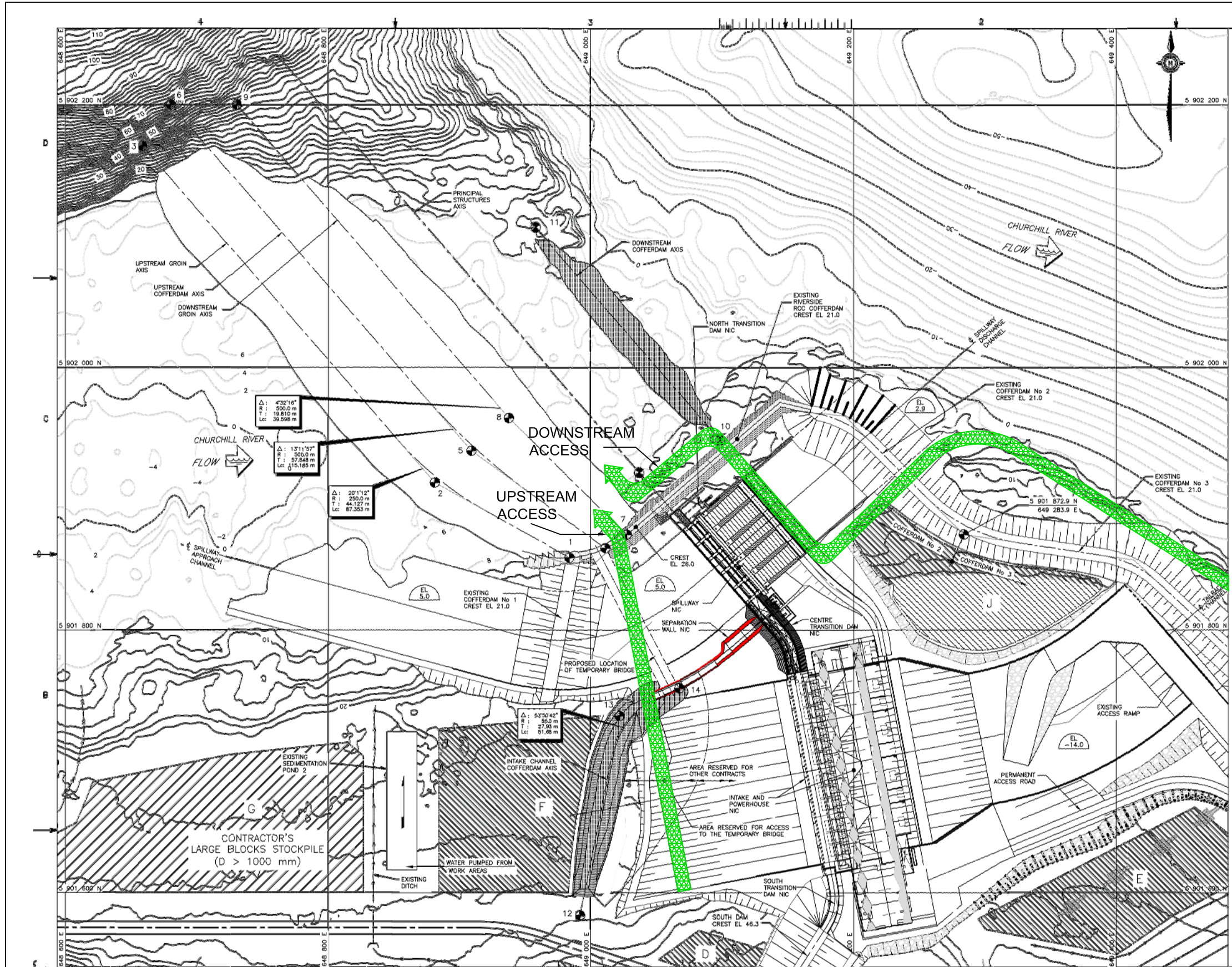
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1	B1	20-MAY-2014	ISSUED FOR BID												



A DIVISION OF
BIRD
CONSTRUCTION

CH0009 – CONSTRUCTION OF NORTH AND SOUTH DAMS
Request for Proposal

Annex A13-11



- NOTES:**
1. ALL DIMENSIONS IN MILLIMETRE AND ELEVATIONS IN METRES UNLESS NOTED OTHERWISE.
 2. TOPOGRAPHIC GRID IS BASED ON UTM NAD 83, ZONE 90 SYSTEM.
 3. THE GROUND TOPOGRAPHY CONTOURS ARE BASED ON A SITE-SPECIFIC LIAR SURVEY COMPLETED IN 2008.
 4. THE RIVER BATHYMETRY CONTOURS ARE BASED ON AN SURVEYING BATHYMETRIC SURVEY COMPLETED IN 1996.
 5. THE CONTOUR INTERVAL OF THE GROUND TOPOGRAPHY AND THE RIVER BATHYMETRY IS 2 METRES.
 6. FOR FOUNDATION PREPARATION, SEE DRAWING 8300-CV-02-0004-01.

- LEGEND:**
- BATHYMETRIC CONTOUR
 - TOPOGRAPHIC CONTOUR
 - SHORELINE (JULY-OCTOBER FOR AVERAGE FLOW OF 1830 m³/s)
 - BENCHMARK
 - LOCATION POINT
 - NATURAL STREAM
 - DITCH
 - OUVERT
 - TRANSMISSION LINE TOWERS NIC
 - ROCK SPOILPILE AREA
 - LAYDOWN AREA
 - STONEPILE AND LAYDOWN ENCLOSURES
 - EXCAVATION TO BEDROCK
 - EXCAVATION ON OVERBURN ACCEPTABLE FOUNDATION
 - EXISTING ROCKFILL
 - NIC NOT IN CONTRACT

COFFERDAMS		
LOCATION POINTS		
POINT No	COORDINATES	
	EASTING	NORTHING
1	848 953.896	8 901 855.142
2	848 951.615	8 901 812.208
3	848 958.735	8 902 168.373
4	849 011.267	8 901 892.416
5	848 928.853	8 901 838.453
6	848 950.144	8 902 300.000
7	849 027.588	8 901 872.707
8	848 937.825	8 901 861.312
9	848 790.261	8 902 200.000
10	848 028.211	8 901 844.881
11	848 857.946	8 902 108.832
12	848 858.058	8 901 582.487
13	849 028.178	8 901 734.586
14	849 067.893	8 901 783.704

NOT FOR CONSTRUCTION



PROFESSIONAL STAMP

CLIENT: MUSHRAT FALLS NORTH AND SOUTH DAMS COFFERDAMS LOCATION AND EXCAVATION PLAN

DESIGNED BY: S. LEMBLUX

DRAWN BY: M. MERR

VERIFIED BY: A. EL BEHBI

DATE: 8-MAY-2013

PROJECT: Lower Churchill Project

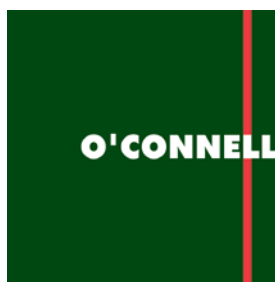
ROLE: Electrical Lead Engineer

ENGINEERING MANAGER: S. SWEDER

SCALE: 1:1000

PROJECT NO.: MFA-SN-CD-2340-CV-PL-0005-01

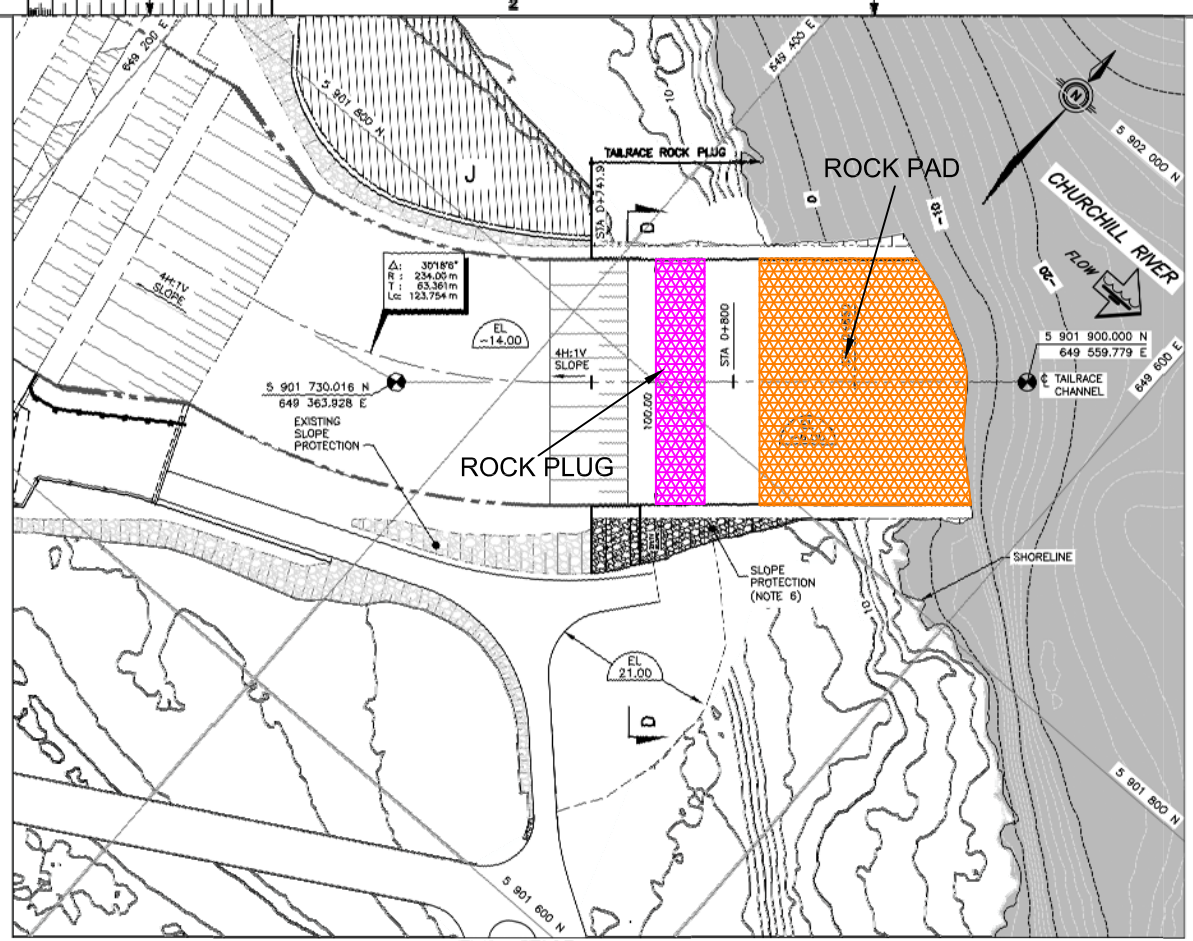
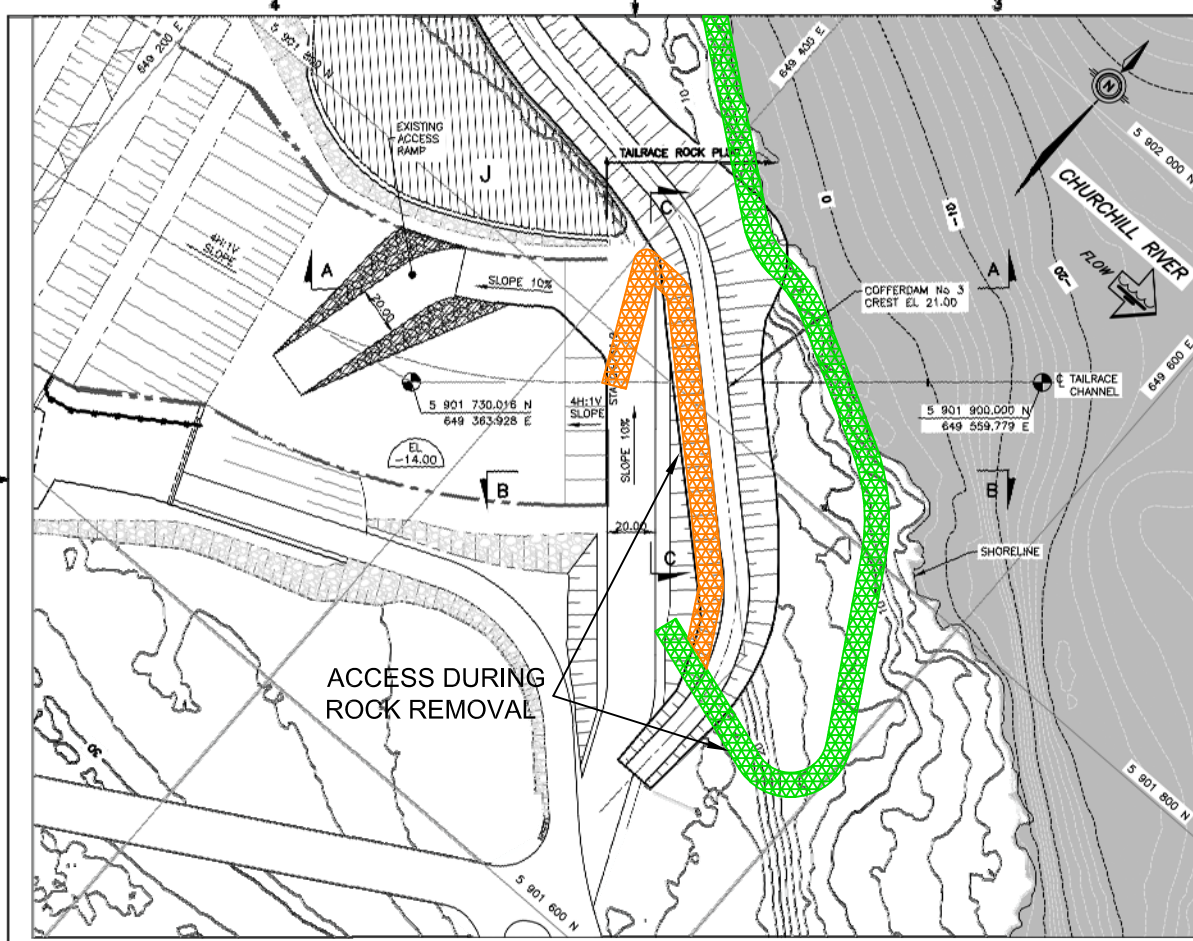
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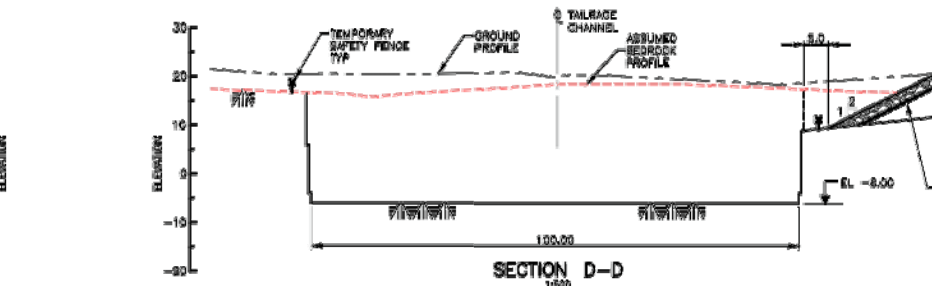
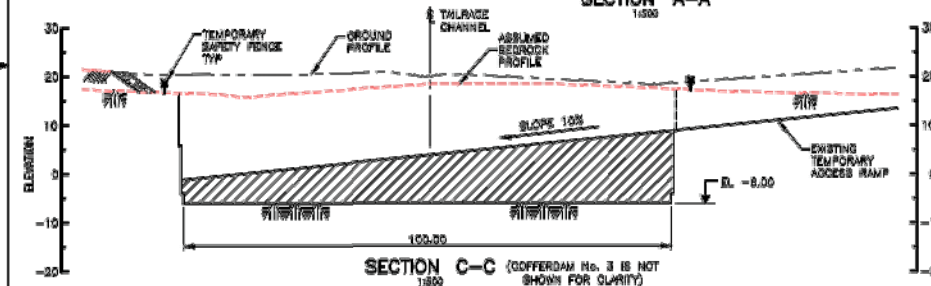
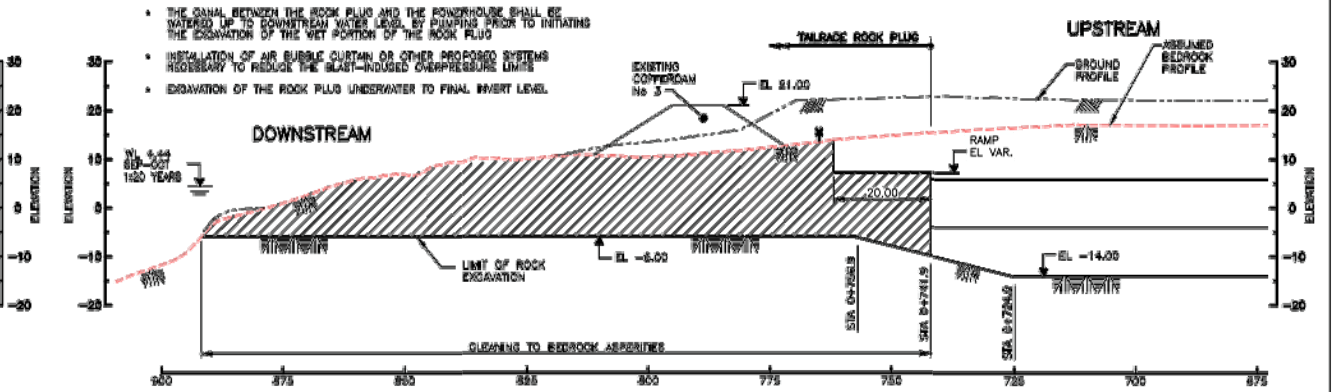
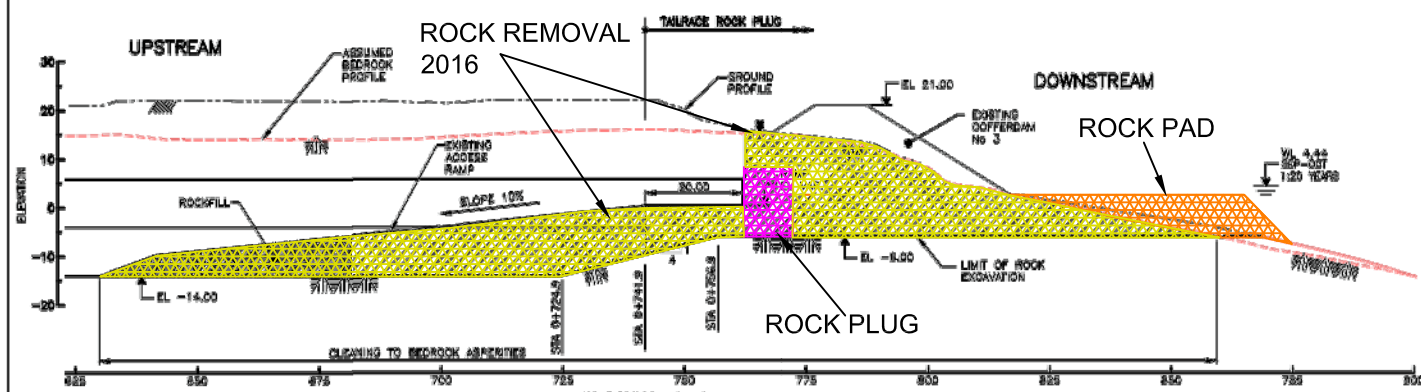
CH0009 – CONSTRUCTION OF NORTH AND SOUTH DAMS
Request for Proposal

Annex A13-4



- NOTES:**
- ELEVATIONS AND DIMENSIONS ARE IN METRES.
 - THE UTM20 NAD83 CONTOURS OF THE GROUND TOPOGRAPHY SHOWN ON THE DRAWING WERE GENERATED FROM THE 2008 LIDAR SURVEY DATA.
 - THE UTM20 NAD83 CONTOURS OF THE RIVER BATHYMETRY SHOWN ON THE DRAWING WERE GENERATED FROM THE 1988 AIRBORNE BATHYMETRIC SURVEY DATA.
 - THE CONTOUR INTERVAL OF THE GROUND TOPOGRAPHY AND THE RIVER BATHYMETRY IS 2 METRES.
 - THE ASSUMED BEDROCK PROFILE HAS BEEN GENERATED FROM THE INTERPRETATION OF AVAILABLE INVESTIGATIVE DATA. THE ASSUMED BEDROCK HAS AN APPROXIMATE PROFILE.
 - SLOPE SHALL BE PROTECTED WITH ROCKFILL ZONE 3E, 500 MM THICK OVER A NON-WOVEN GEOTEXTILE, MIN 400 G/M².
 - THE REMOVAL OF THE ACCESS RAMP, COFFERDAM 3 AND TAILRACE ROCK PLUG SHALL NOT BE STARTED BEFORE OBTAINING ENGINEER'S WRITTEN APPROVAL.

- LEGEND:**
- BATHYMETRY
 - TOPOGRAPHY
 - SHORELINE
 - ASSUMED BEDROCK
 - GROUND PROFILE NOT EXCAVATED
 - WATER LEVEL
 - EXISTING ROCKFILL
 - ROCKFILL FOR SLOPE PROTECTION
 - ROCK TO BE EXCAVATED
 - ROCKFILL TO BE EXCAVATED
 - LAYDOWN AREA



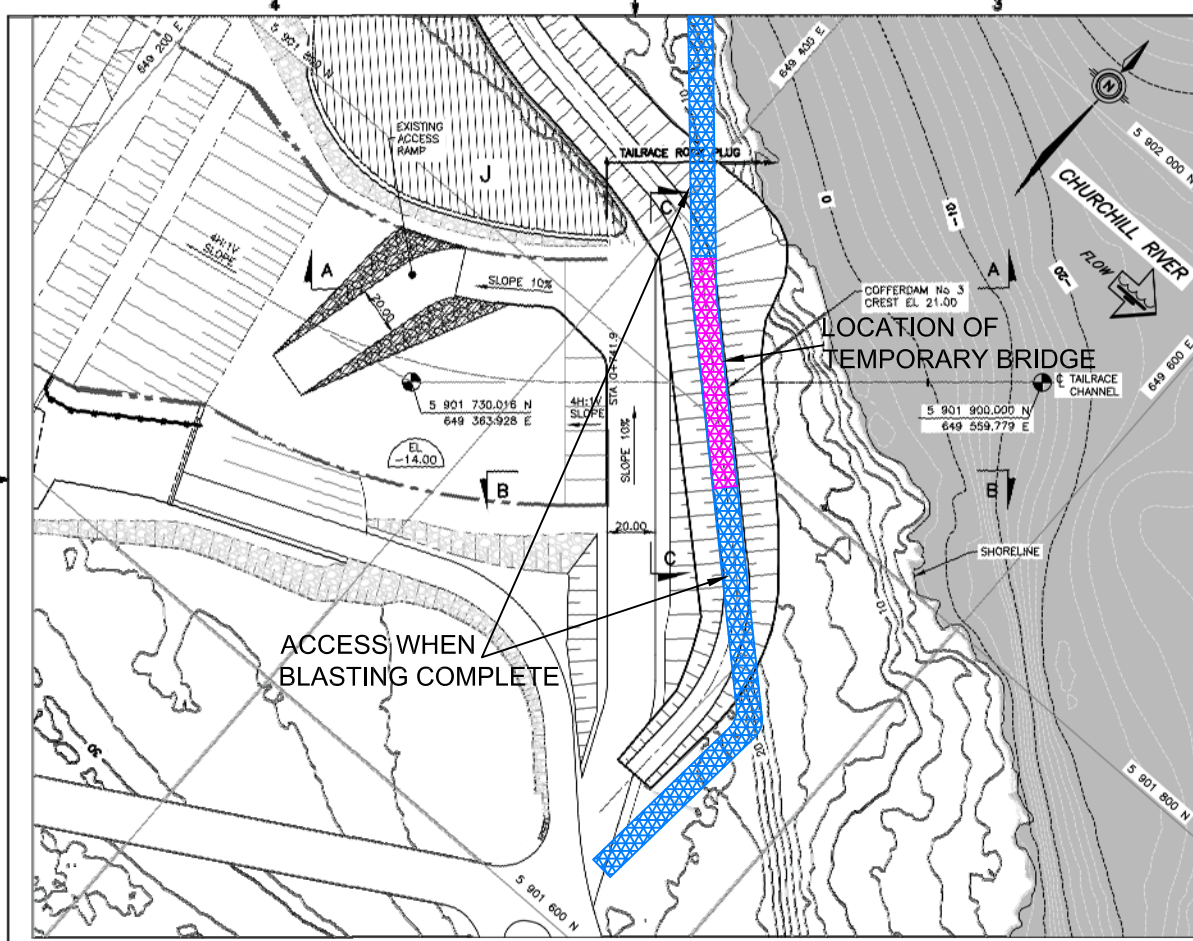
- REMOVAL OF THE COFFERDAM No. 3 AND EXISTING ACCESS RAMPS
- ROCK PLUG EXCAVATION IN DRY CONDITIONS. EXCAVATION METHOD AND SEQUENCING SHALL BE DONE TO MAXIMIZE THE EXCAVATION OF THE ROCK PLUG IN DRY CONDITIONS
- THE CANAL BETWEEN THE ROCK PLUG AND THE POWERHOUSE SHALL BE WATERED UP TO DOWNSTREAM WATER LEVEL, BY DIVERTING PRIOR TO INITIATING THE EXCAVATION OF THE WEST PORTION OF THE ROCK PLUG
- INSTALLATION OF AIR BURST CUSTAN OR OTHER PROPOSED SYSTEMS NECESSARY TO REDUCE THE SLANT-INDUCED OVERPRESSURE LIMITS
- EXCAVATION OF THE ROCK PLUG UNDERWATER TO FINAL INVERT LEVEL.

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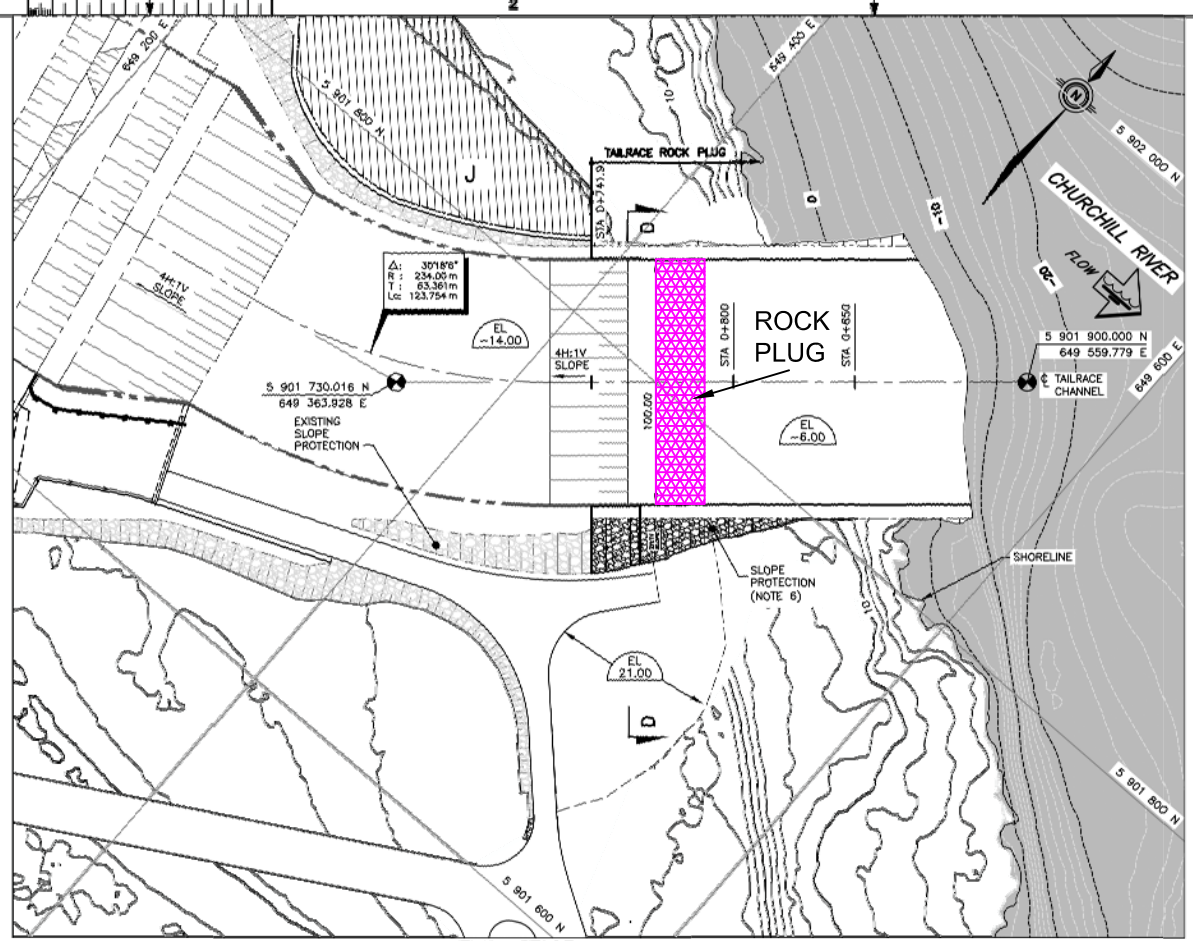


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<p>PROFESSIONAL STAMP</p> <p>APPROVED: R. LEWIS Disruptive Lead Engineer R. LEWIS</p> <p>DESIGNED BY: R. LEWIS Approved Engineering Manager G. SYMNER</p> <p>DATE: 1-APR-2012</p> <p>PROJECT: MFA-SN-CD-3120-CV-PL-0003-01 B1</p>	<p>CLIENT</p> <p>LOWER CHURCHILL PROJECT</p> <p>MUSKRAT FALLS POWERHOUSE - TAILRACE ROCK PLUG EXCAVATION SECTIONS AND SECTIONS</p>
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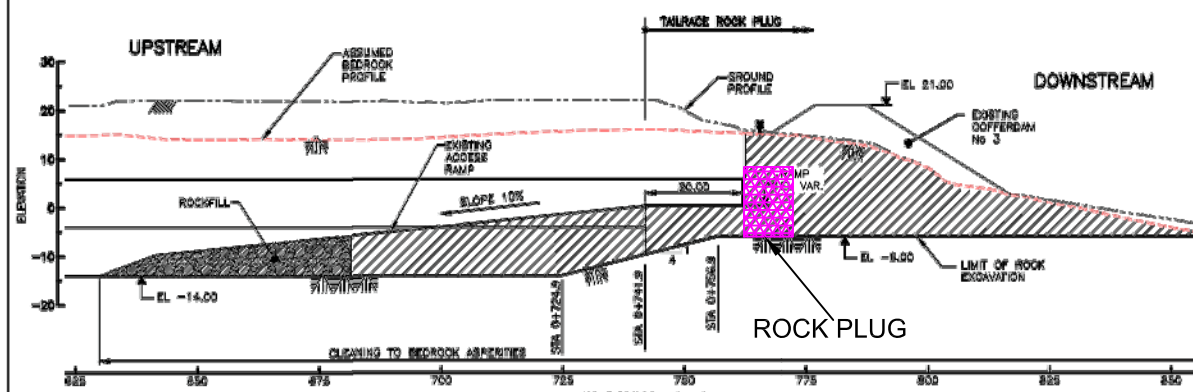
EXISTING CONDITIONS
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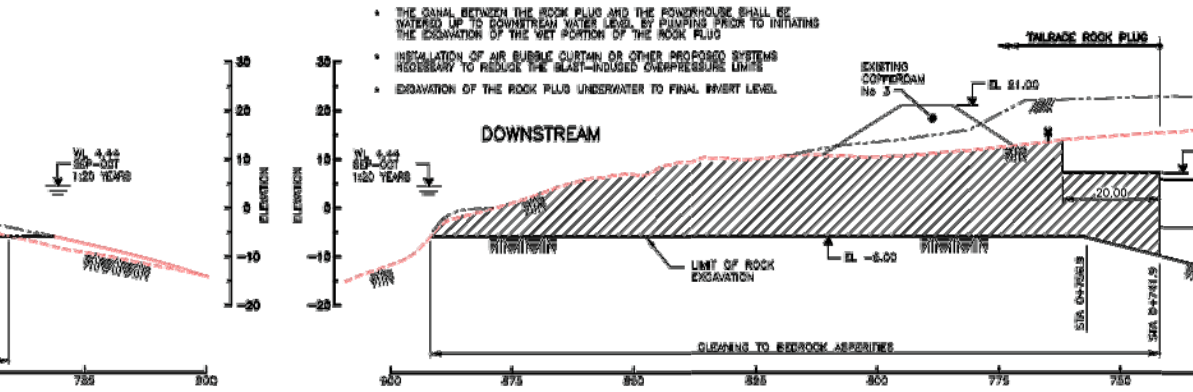
FINAL STAGE
1:1000

- NOTES:**
- ELEVATIONS AND DIMENSIONS ARE IN METRES.
 - THE UTM80 MGRS CONTOURS OF THE GROUND TOPOGRAPHY SHOWN ON THE DRAWING WERE GENERATED FROM THE 2008 LIDAR SURVEY DATA.
 - THE UTM80 MGRS CONTOURS OF THE RIVER BATHYMETRY SHOWN ON THE DRAWING WERE GENERATED FROM THE 1998 AIRBORNE BATHYMETRIC SURVEY DATA.
 - THE CONTOUR INTERVAL OF THE GROUND TOPOGRAPHY AND THE RIVER BATHYMETRY IS 2 METRES.
 - THE ASSUMED BEDROCK PROFILE HAS BEEN GENERATED FROM THE INTERPRETATION OF AVAILABLE INVESTIGATIONS DATA. THE ASSUMED BEDROCK HAS AN APPROXIMATE PROFILE.
 - SLOPE SHALL BE PROTECTED WITH ROCKFILL ZONE 3E, 500 MM THICK OVER A NON-WOVEN GEOTEXTILE, MIN 400 G/M².
 - THE REMOVAL OF THE ACCESS RAMP, COFFERDAM 3 AND TAILRACE ROCK PLUG SHALL NOT BE STARTED BEFORE OBTAINING ENGINEER'S WRITTEN APPROVAL.

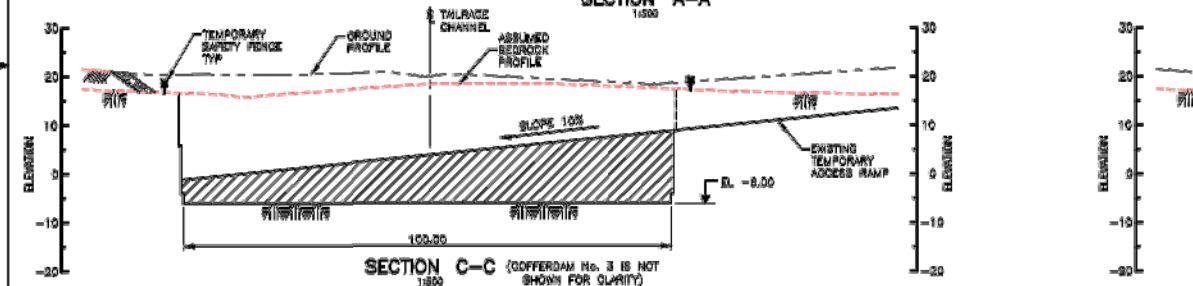
- LEGEND:**
- BATHYMETRY
 - TOPOGRAPHY
 - SHORELINE
 - ASSUMED BEDROCK
 - GROUND PROFILE NOT EXCAVATED
 - WATER LEVEL
 - EXISTING ROCKFILL
 - ROCKFILL FOR SLOPE PROTECTION
 - ROCK TO BE EXCAVATED
 - ROCKFILL TO BE EXCAVATED
 - LAYDOWN AREA



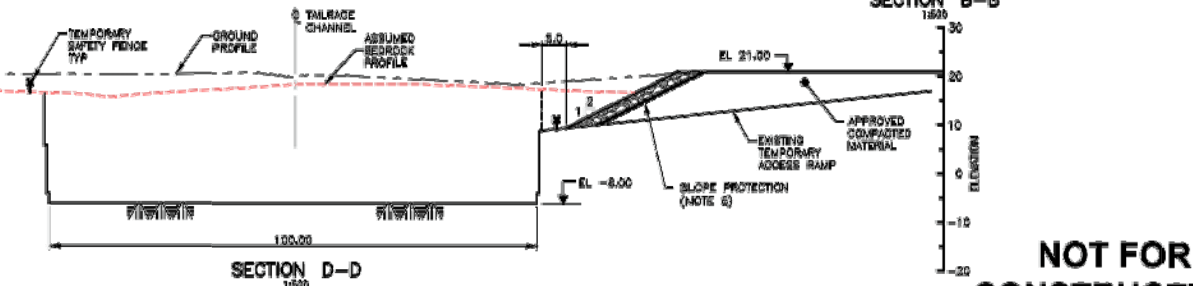
SECTION A-A
1:500



SECTION B-B
1:500



SECTION C-C (COFFERDAM No. 3 IS NOT SHOWN FOR CLARITY)
1:500



SECTION D-D
1:500

NOT FOR CONSTRUCTION



<p>***** FOR REFERENCE ONLY *****</p> <p>REVISIONS:</p> <p>NO. DATE DESCRIPTION</p>				<p>PROFESSIONAL STAMP</p> <p>DESIGNED BY: A. EL MEHDI</p> <p>DRAWN BY: A. MEHDI</p> <p>CHECKED BY: R. LEWIS</p> <p>DATE: 1-AUG-2012</p>		<p>APPROVED: [Signature]</p> <p>DISCIPLINE: Lead Engineer</p> <p>PROJECT: LOWER CHURCHILL PROJECT</p> <p>TITLE: MUSKRAT FALLS POWERHOUSE - TAILRACE ROCK PLUG EXCAVATION SECTIONS</p>	
<p>REVISIONS:</p> <p>NO. DATE DESCRIPTION</p>				<p>PROJECT: MFA-SN-CD-3120-CV-PL-0003-01 B1</p> <p>SCALE: AS NOTED</p>		<p>CLIENT: [Logo]</p>	