



**SUPPLY AND INSTALL AGREEMENT
LOWER CHURCHILL PROJECT
MUSKRAT FALLS HYDROELECTRIC DEVELOPMENT
Agreement No.: CH0032-01**

**REVISED PROPOSAL FOR ACCELERATION OF SPILLWAY INSTALLATION
SCHEDULE
(TO MEET RIVER DIVERSION REQUIREMENTS ON OR BEFORE 15 JUNE 2016)**

Prepared by:

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**Revision 2
December 18, 2015**





**ANDRITZ HYDRO REVISED PROPOSAL FOR ACCELERATION OF SPILLWAY INSTALLATION
SCHEDULE
TO MEET RIVER DIVERSION REQUIREMENTS ON OR BEFORE 15 JUNE 2016**

References:

1. Company Request Contractor Acceleration Proposal, evidenced by June 12, 2015 minutes.
2. Contractor Preliminary Acceleration Schedule Proposal letter, dated August 19, 2015
3. Company's Change Order No. 010, dated November 10, 2015
4. Contractor Letter Response, dated November 24, 2015
5. Contractor Spillway Acceleration Presentation, dated November 27, 2015
6. Muskrat Gates Contract inter alia Exhibit 9 Milestones I1A, M4

1) Background Overview

This proposal is a revision and supersedes Contractor's proposal issued on December 4th 2015. The main changes included in this revision is the spillway partial completion date that has been changed to June 15th 2016, and the revised schedule also impacts the proposal costs.

The Muskrat Gates Contract, Exhibit 9, Interface and Milestone Schedule I1A, Upstream of Spillway ready for start of hydro-mechanical works, indicates the ready for start for February 16, 2015. This is a responsibility of the Company. The delay in the upstream spillway civil works ready for start is at least 258 days to November 1, 2015 (additional days delay in November).

The Company requested in July, 2015 a proposal from the Contractor to accelerate the hydro-mechanical spillway installation work to allow the Company to be ready for river diversion in July 2016. The Contractor provided the Company a preliminary Acceleration Proposal on August 19, 2015 for 47,320 hours for \$8,251,973, on a lump sum basis.

The Company responded with a Change Order 010, dated November 10, 2015, for a lump sum of \$3,370,314



The Contractor provided updated acceleration plan parameters including subcontracting parameters from CANMEC, GRIMARD, CRT, AH, and HEMI for a total of \$11,435,917. Discussions were held in St. John’s on November 27, 2015. The Company requested the Contractor to formally submit the Acceleration Proposal for December 4, 2015 for discussions December 8, 2015 at Contractor’s office in Pointe-Claire, Montreal.

During this meeting Company deemed the spillway ready for river diversion date of June 30th 2016 not acceptable. Thus, Contractor has reviewed the project execution plan to meet the June 15th 2016 date, all of which is reflected in the current proposal revision 2.

In good faith, the Parties acknowledge that it is in the best interests of successfully completing the Project to resolve these pricing discussions without further dispute resolution pursuant to Article 26.6. Both parties acknowledge these discussions are without prejudice to any and all other contract rights and remedies.

2) Summary of Proposal

The Contractor has initiated acceleration on November 12th as directed by Company and proposes that acceleration be completed on a best efforts basis by June 15, 2016. The Scope of Work will be described in Section 3 herein below.

The amounts of the Acceleration Proposal will be detailed in the detailed cost estimate with assumptions and pre-requisites in Section 6.

Following discussions on November 27, 2015, the Contractor is proposing a three-part pricing for the acceleration period of 7 months as follows:

PART A	FIXED PORTION	\$11,754,920
PART B	VARIABLE PORTION	\$1,270,116
PART C	INCENTIVE	\$3,000,000 BONUS/\$1,240,000 LD

3) Method of Payment

The Company will pay the Contractor in seven (7) equal monthly payments invoiced at the end of each month and paid pursuant to the Agreement.



4) Description of Scope of Work

The scope of work for river diversion includes but is not limited to the following;

Requirements For River Diversion

- 1) Five spillway gates dry testing completed. Gates can be raised and lowered by manual controls and temporary power:
 - a) Embedded guides (S1, S2, Spillway Roller Gate (SRG), S4) installed, embedded, and finished to tolerance;
 - b) SRG sections installed, assembled and dry tested;
 - c) SRG towers (tower cladding can be later), bridge, hoist house, hoists installed;
 - d) SRG hoists assembled and reeved, and;
 - e) Hoist 125% load tested for Bay 1 to 4. Bay 5 to be performed during operation phase with stoplogs installed;
 - f) SRG and Hoists mechanically complete;
 - g) Spillway stop logs dry testing completed.

- 2) Mechanical and electrical hoist protection systems are operational in local mode:
 - a) Gate MCC's and Gate local control panels installed with power and control cabling to SRG hoists (cable from Spillway Electrical Building can be installed later);
 - b) Connection of Gate MCC's with permanent power feeder cable to temporary power (portable generator) or partial permanent power (25kV Construction Power or Backup Diesel Generator);
 - c) Hoist power, control, and protection systems tested and operational in local mode.



- 3) Re-engineering and any additional engineering to support the temporary configuration to support the river diversion scope of work until the balance of the work to meet Milestone M4 is completed.
- 4) Design, supply and installation of all temporary facilities.

Completion

For the activities listed above, defined as being required for partial completion of the spillway for river diversion, the following minimum scope is required:

- 1) Work scopes / sub-systems must be clearly defined in the Project Completions System with processes to support formal Company acceptance as being Complete.
- 2) All installation / testing activities are supported by installation / pre-commissioning checks and / or Dynamic Commissioning procedures as agreed with Company.
- 3) All above work scopes are considered Mechanically Complete, Commissioned and available for Handover as per the Project Completions System.
- 4) Re-commissioning will be required after the spillway electrical building has been completed to test and prove electrical and controls systems operation between the electrical building and the hoist house.
- 5) Load testing requirements as per the Contract remain in effect. Company may agree to load testing after river diversion if Contractor can provide Company suitable supporting documentation that load testing can be completed safely. If done during operation phase due to accelerated schedule (Bay 5), it needs to be done with stoplogs in place and prior to rollway construction due to height limitation.
- 6) All construction equipment and temporary facilities shall be removed from the upstream and downstream spillway channels.



Remaining Scope (for achieving M4)

All requirements as defined in the Contract shall be completed as per the approved schedule to meet Milestone M4.

- 1) Gate Heating System; all components are installed in gates prior to river diversion readiness but are not operational (guide heaters can be installed later).
- 2) Electrical Load Management System.
- 3) Spillway Electrical Building and all associated equipment internal and external to the building.
- 4) Hoist house building electrical and mechanical services completed.
- 5) PLC and HMI controls.
- 6) Trash Cleaning Machine hoist
- 7) Telecom (SAC S camera) equipment

4) Revised Schedule for Acceleration and Assumptions**Revised Schedule**

Please refer to Figure 1 which shows a high level schedule summary of the Proposed Spillway Acceleration Schedule to the June 15th 2016 partial spillway ready for river diversion milestone. A detailed complete P6 schedule in .pdf is included in Appendix A of this proposal, and the .XER file is submitted to Company via Aconex, together with this proposal.



SPILLWAY ACCELERATED SCHEDULE SUMMARY													
Accelerated Schedule (15-Jun-16)	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16
Installation of Upstream Embedded Parts		●	—————	—————	—————	—————	●						
Installation of SRG, Hoist, Bridge and Towers				●	—————	—————	—————	●					
Installation of Downstream Embedded Parts				●	—————	—————	●						
Gates Dry Testing / Commissioning							●	—————	—————	●			
Ready for River Diversion Milestone Achieved									◆				
Remaining Scope Up to M4 Milestone									●	—————	—————	—————	◆

Figure 1 Spillway Accelerated Schedule Summary

Contractor reduced the end date from June 30th 2016 to June 15th 2016 by rearranging the sequence of guide installation and adding an additional labour and staff team to ensure a full time 7/24 presence at site during the second stage concrete work as opposed to the more economical sequencing which was planning for a single team leaving site at each turnaround. Contractor has also been able to optimize specific activities in order to reduce the previous schedule duration as compared to the previous revision of this proposal.

The previous plan was to pour the secondary concrete from June to September. With the acceleration plan, the concrete works is performed from January until May. Figure 2 shows the differences between the previous and the revised accelerated plan. The previous plan was based on a single team of staff and labor, synchronized together and operating on a 14 days work and 7 days off, with no work performed during the days off. In the current acceleration plan, the work is performed on a full time basis with full time presence at site. This requires an additional team of staff, supervision and labor. The labour teams A and B are working 14 days on and 14 days off in alternance to increase throughput. The staff A and B teams are working on a 14 days on and 7 days off allowing team overlaps to ensure required continuity between both teams. This revised plan allows us to reduce the concreting work activities to 12 weeks. This additional personnel requires additional training, testing, travelling, etc... and vehicles and adjustment of the baseline labour effort to account for loss of productivity due to the loss of learning associated to 2 teams instead of one.



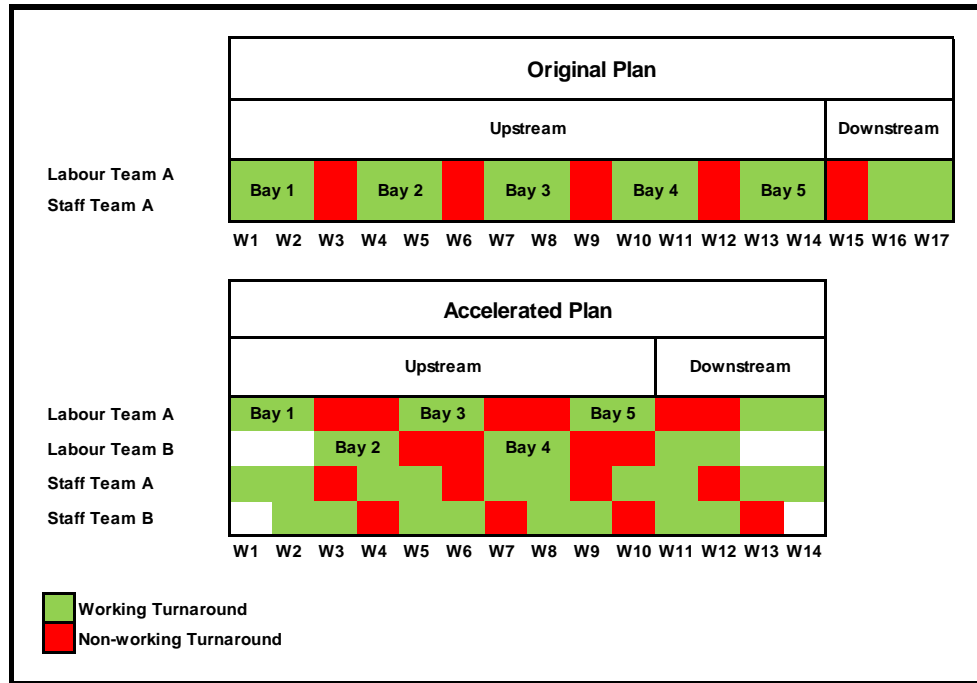


Figure 2 Accelerated Plan

The concreting work as per the new schedule requires us to add a shelter to maintain a controlled environment during the pouring of the concrete into the concrete bucket. This shelter is equipped with lighting and heating provided by a generator and kerosene frost fighter. This shelter will also need to be moved from one bay to the other as the work progress.

The plan is to use a mobile crane located on the spillway bridge to ensure an efficient relocation of the lifting equipment from one bay to the other since the pouring will be performed on a continuous basis. This crane will need to be lifted and installed on the bridge, therefore needing the mobilization of an additional 250T mobile crane for a few days for this lifting operation.

The upstream bridge will need to be kept clear of ice and snow to ensure a safe working environment and Contractor needs to add additional labour and equipment associated to these tasks for the duration of the second stage concrete works. Furthermore, there are presently no guard rails on the bridge and Company needs to install these prior to Contractor mobilizing its mobile crane on the bridge.





Given the timing of the concrete pouring activities, roof doors needs to be installed on the hoarding to avoid heat losses as to maintain constant temperatures in the hoarding for guide alignment stability. The doors will be operated by two additional labourers on a full time basis. An additional labourer is also required to radio dispatch the crane operator, roof door labourers and workers performing the pouring on the hydromobile platform. If a more economical method is found for this activity, Company will be given the full economic benefit.

Due to the increased manpower required for the acceleration, Contractor added one additional HSE officer for both the day and night shifts up until June 15th 2016.

Please note that the attached Primavera P6 schedule .XER version is current as of December 6th 2015 (completion efforts) and includes all day and night shifts.

Proposal Assumptions

- a) Contractor is provided free and unfettered access to Work fronts as specified and/or implied in attached Proposed Spillway Accelerated Schedule.
- b) Repair of damaged embedded anchor work, per LCP CHR 3001, is assumed to have a schedule duration as indicated in the attached Proposed Spillway Acceleration Schedule.
- c) Contractor is provided free and unfettered access to Work fronts and equipment for Contractor to complete punchlist type or incomplete work that may be required after the minimum completion requirements for river diversion have been achieved.
- d) Company will coordinate and make provisions for commissioning activities to be completed after the minimum completion requirements have been achieved.
- e) Crawler Crane assembly is planned for November 30, 2015. Upstream of Bay #5 shall be clear of all obstructions.
- f) Hydro Mobile installation in Bay #1 is planned to be completed by November 30, 2015. Bay #1 shall be clear of obstructions for mast installation.
- g) Embedded anchor repairs in Bay #1 shall be completed by December 3, 2015.
- h) Erection of Bay #1 Embedded Parts planned to start on December 4, 2015. Guide blockouts shall be clear of obstructions and accessible from the top of the pier. All anchors shall be repaired.



- i) Erection of Bay #2 Embedded Parts planned to start on December 9, 2015. Guide blockouts shall be clear of obstructions and accessible from the top of the pier. All anchors shall be repaired.
- j) Erection of Bay #3 Embedded Parts is planned to start on January 5, 2016. Guide blockouts shall be clear of obstructions and accessible from the top of the pier. All anchors shall be repaired.
- k) Erection of Bay #4 Embedded Parts is planned to start on January 14, 2016. Guide blockouts shall be clear of obstructions and accessible from the top of the pier. All anchors shall be repaired.
- l) Erection of Bay #5 Embedded Parts is planned to start on January 27, 2016. Guide blockouts shall be clear of obstructions and accessible from the top of the pier. All anchors shall be repaired.
- m) The spillway upstream laydown area shall be free for occupation by December 7th, 2015.
- n) No overhead Works by Company's Other Contractors shall prevent Contractor from executing mechanical Works.
- o) The Proposed Spillway Acceleration Schedule does not reflect schedule impacts of ongoing delays in achieving Interface Milestone I1A milestone.
- p) The Proposed Spillway Acceleration Schedule reflects durations of 14 days per bay for anchor inspections and repairs.
- q) All I1A and I1B milestone requirements set out in Exhibit 9 shall be fully completed by Company at, or prior to the dates established in the attached acceleration schedule (e.g. spillway electrical building slab, bridge guard rails, etc...)
- r) Contractor assumes that Company will provide concrete to Contractor in sufficient quantities and in a timely manner to avoid any delays in the execution of Contractor's work.
- s) This proposal includes the staff and indirect costs associated to the acceleration up until June 15th 2016. These costs will be charged on a reimbursable basis for any extension of work beyond this date, regardless of the cause of such delay.
- t) Due to extremely compressed schedule, Contractor cannot accept coordination risks between its subcontractors associated to the acceleration.
- u) In case of discrepancies between the efforts listed in Appendix C and the efforts in the Primavera P6 schedule, the efforts listed in Appendix C shall prevail.

5) **Basic Principles forming basis of the Contractor Acceleration Proposal (all based on work experience from previous projects):**

The basic principles discussed herein below are important to understand and be agreed upon by the parties. The acceleration of work changes the implementation conditions and significantly increases the costs.

Carrying out more work in severe winter conditions, introducing a night shift, learning curve problems, and crowding all lead to higher inefficiencies in labour productivity and result in higher costs. The start of the acceleration work is deemed to be November 12, 2015 and best effort completion by June 15th, 2016.

a) Winter conditions – Cold weather reduces work efficiency

The ability of a worker to carry out a task is optimal when the ambient temperature is between 10°C and 21°C. Any deviation from this zone has an unfavourable impact on productivity.

Many studies have confirmed the negative impact of cold on productivity, including that of the N.R.C. which proposes different productivity loss coefficients depending on the effective temperature and type of work (involving fine or gross motor skills).

The changes to the execution conditions will result in a larger portion of the work being carried out under winter conditions, compared to that planned under the Agreement schedule. This will result in reduced productivity therefore increased labour costs.

Although it is noted that portable heaters may improve the work conditions, the extreme cold weather in 2014 and 2015 winters clearly reduced work efficiency in the region.

b) Overstaffing

Increasing additional staff and increasing the number of team may exceed the optimal team size and will reduce productivity according to NRC's studies. The quality of supervision will also be impacted negatively. Therefore, the Contractor's proposed Acceleration Plan will require significant increase in staff and the number of teams with the corresponding reduction in productivity.

c) Night shift-less productive

The evidence indicates that night shifts are less productive than regular shifts for reasons of interruption to work patterns, eating and sleeping. Night shift workers may be less alert, less accurate, slower, and more concerned about safety.

d) Learning curve

The first time a task is carried-out, personnel assigned to this task perform it slower in order to learn the various steps. After repetition, the time necessary to carry out the same task decreases with the number of repetitions (learning curve). To optimize productivity, it is thus preferable to assign tasks repeatedly to the same person rather than change worker.

The phenomenon of learning applies when activities are carried out in sequence, otherwise we observe a phenomenon of unlearning; a greater number of workers having to learn a task, results in a decreased efficiency compared to that which could have been achieved under optimal circumstances.

Several studies have shown the effect of the learning curve on productivity, including the N.R.C. which offers coefficients for productivity gain based on number of repetitions.

The implementation of acceleration measures in the spillway works will alter the execution sequences of the work and thus deprive the Contractor of a portion of productivity gain to be obtained through learning.

e) Crowding

The multiplication of work teams, which must complete their tasks within a limited space, creates congestion and a loss of productivity.

Several studies confirm the impact of crowding on productivity, notably that of the N.R.C which proposes different productivity loss coefficients depending upon the degree of crowding.

The implementation of the Acceleration Program require the mobilization of a greater number of workers within the same limited space, thus creating congestion with a



negative impact on productivity. Contractor's subcontractor, CANMEC, has extensive experience in the North with crowding.

f) Additional Equipment and Tooling

Refer to Appendix A-1 for list of additional equipment and tooling required for the accelerated schedule.





6) Detailed Cost Estimate

ACCELERATION PROPOSAL COSTS BREAKDOWN			FIXED COSTS	VARIABLE COSTS (capped)
SUPERVISION (ANDRITZ HYDRO)	AH Staff	Technical Advisor	\$ 185,340	
		Health and Safety	\$ 642,111	
		Site Quality Assurance	\$ 128,308	
		Site Administration	\$ 113,779	
		Sub-Total	\$ 1,069,539	\$ -
MECHANICAL INSTALLATION (CANMEC)	Direct Labour	Winter Conditions	\$ 708,517	
		Loss of Learning	\$ 471,986	
		Overstaffing	\$ 763,481	
		Crowding	\$ 1,272,469	\$ 922,079
		Sub-Total	\$ 3,216,453	\$ 922,079
	Indirect and Equipment	Indirect Labour Adjustment	\$ 732,719	\$ 73,566
		Equipment over \$1500	\$ 1,325,371	\$ 134,276
		Lifting Equipment	\$ 1,377,755	\$ 140,194
		Sub-Total	\$ 3,435,845	\$ 348,037
		Sub-Total	\$ 6,652,298	\$ 1,270,116
SECONDARY CONCRETING (CRT)	Direct Labour	Loss of Learning	\$ 369,141	
		Winter Conditions	\$ 78,639	
		Shelter Moving	\$ 101,608	
		Snow Removal and Sanding on Bridge	\$ 204,885	
		Roof Door Management	\$ 731,577	
	Sub-Total	\$ 1,485,850	\$ -	
	Indirect and Equipment	Indirect Labor Adjustment	\$ 769,583	
		250T Lifting Crane	\$ 44,089	
		Shelter Heating and Lighting	\$ 30,130	
		Bridge Light Tower	\$ 41,440	
Equipment		\$ 176,552		
Sub-Total	\$ 1,061,794	\$ -		
Sub-Total	\$ 2,547,644.45	\$ -		
ELECTRICAL BUILDING (GRIMARD)		\$ 577,587.50	\$ -	
ELECTRICAL INSTALLATION (TBD)		\$ -	\$ -	
EPS, TEMPORARY ELECTRICAL, COMMISSIONING (HEMI)		\$ 217,500.00	\$ -	
CONTINGENCY AND RISK	6.2%	\$ 690,351		
ACCELERATION PROPOSAL COST			TOTAL \$ 11,754,920	\$ 1,270,116

a) The assumptions for the cost estimate of the acceleration plan are based on the scope of work in section 3), schedule assumptions listed in section 4) above, site conditions as stipulated in the Agreement. Any deviations thereof may give rise to additional cost and schedule impacts.



b) Contractor proposes the incentive plan as per Figure 3.

INCENTIVE	Bonus if delivery before July 15th 2016	\$ 3,000,000
	Bonus reduction per calendar days, starting July 16th 2016	\$ (150,000)
	Neutral on August 4th 2016	-
	LD increase par calendar day, starting Aug 5th 2016	\$ (100,000)
	LD cap on August 16th 2016	\$(1,240,000)

Figure 3 Incentive Plan

7) **Explanation for Variable Costs**

Contractor has decided to apply fifty (50) percent of the estimated crowding costs to a variable portion. In the Company’s and Contractor’s opinion , it is difficult to estimate the actual additional hours of labour resulting from overcrowding, so Contractor proposes that the additional crowding hours should be reimbursable to Contractor up to the cap of fifty (50) percent of the crowding additional hours/price estimate.

Contractor proposes that the following methodology be applied for measuring the Crowding efforts on a weekly basis:

- Actual effort will be measured and compared to the baseline estimated effort for reaching the completion level achieved during that week;
- The difference between the actual effort and the baseline effort will be deemed to be due to Crowding effect, and reimbursable to Contractor;
- To the extent Company can demonstrate and Contractor agrees that specific work portions were due to effects other than Crowding, then such amounts will be deducted from the reimbursable amount;
- The finer details of the benchmarking procedure will be agreed at a later date.





8) Conclusion

Contractor has mobilized and diligently carried-out the planned activities in the revised acceleration plan starting November 12, 2015 and into December. In adjusting Contractor's Acceleration Proposal to reflect progress in recent discussions, Contractor is demonstrating its good faith efforts to resolve amicably the pricing differences and to highlight the increased risks in the Acceleration Proposal resulting from the large increase in winter work to achieve the Company's target date, on a best efforts basis, on June 15, 2016 for ready for river diversion. The acceleration work performed by contractor prior to agreement between the parties as to the Change Order is carried-out in reservation of all rights and remedies in the Contract.

The parties intend to finalize the acceleration proposal in the change order by mid-January.





APPENDIX A

PROPOSED SPILLWAY ACCELERATED SCHEDULE (.PDF)

(Please refer to separate attachment)



APPENDIX B

LIST OF ADDITIONAL EQUIPMENT AND TOOLING

DESCRIPTION	NUMBER OF UNITS		
	CONTRACTURAL TIMETABLE	ACCELERATED TIMETABLE	ADDITIONAL
Temporary Shelter for concrete slab	0	1	1
Temporary Shelter for material storage	0	1	1
Concrete mix truck shelter	0	1	1
Small gas powered generator	0	1	1
Heating equipment for concrete slab shelter	0	6	6
Heating equipment for material storage shelter	0	1	1
130T Crawler	1830	2880	1050
Crawler 300 tonnes	660	840	180
Scaffolding (Hydro Mobile F-300 Platform)	8	12	4
Shelter Panel 10'x45' (Hoarding)	108	165	57
Electrical heater 600V/30 KVA	8	16	8
PureHeat system 8 diffusers	1	2	1
Frostfighter 500 000 Btu	4	8	4
Light towers	0	2	2
Electrical distribution center	1	2	1
Welding machine 350A	8	14	6
Pick up F-250	3	6	3
12' x 60' Complex	2	3	1
Pickup F-150	4	7	3
Bus 15 passengers	1	2	1
Manlift 85'	1	2	1



APPENDIX C

COSTS DETAIL BREAKDOWN





CANMEC DIRECT LABOUR - ACCELERATED SCHEDULE - SPILLWAY									
MONTH	Nov'15	Dec'15	Jan'16	Feb'16	Mar'16	Apr'16	May'16	June'16	
Week/month	4	3	4	4	4	4	5	2	
ACCELERATED SCHEDULE UPSTREAM + DOWNSTREAM PRODUCTIVITY AT 75%									
Foreman	280	420	1120	1680	1680	1680	1750	420	9,030
Craft	1680	2520	7280	10080	10080	10080	11200	2520	55,440
Teamster/operator	560	420	1120	1120	1120	1120	1400	560	7,420
TOTAL HOURS	2520	3360	9520	12880	12880	12880	14350	3500	71,890
Foreman on day shift	1	2	3	4	4	4	4	2	
Foreman on night shift			1	2	2	2	1	1	
Craft on day shift	6	12	18	24	24	24	24	12	
Craft on night shift			8	12	12	12	8	6	
Teamster/operator on day shift	2	2	2	2	2	2	2	2	
Teamster/operator on night shift			2	2	2	2	2	2	
ACCELERATED SCHEDULE UPSTREAM + DOWNSTREAM PRODUCTIVITY AT 75%									
MONTH	Nov'15	Dec'15	Jan'16	Feb'16	Mar'16	Apr'16	May'16	June'16	TOTAL
Craft hours:	1680	2520	7280	10080	10080	10080	11200	2520	55,440
Craft on day shift:	6	12	18	24	24	24	24	12	
Craft on night shift:			8	12	12	12	8	6	
Total Craft:	6	12	26	36	36	36	32	18	
Monthly progress :	3%	5%	13%	18%	18%	18%	20%	5%	100%
Cumulative progress :	3%	8%	21%	39%	57%	75%	95%	100%	-





CRT DETAILED PROPOSAL										
<i>Muskrat Falls Gates - Second stage concrete</i>										Proposal #: 03 CRT File #: 06 AndritzFile #:
Contract Description : Muskrat Falls Gates - Second stage concrete										Contract No: CH0032-03
Contractor: CRT Construction Inc.										Document Ref.:
Proposal Title: Acceleration schedule - SPILLWAY / 12 consecutive weeks										
Description	Qty	Units	Labour		Equipment		Material		Sub-Contractor	
			Rate	Total	Rate	Total	\$Units	Total	\$Units	Total
A) ACCELERATION:										
1) Medical Exams: (for turn-around team)										
STAFF (Physimed)	5	person							325.00 \$	325.00 \$
WORKERS (Sure Hire)	20	person							325.00 \$	6,500.00 \$
2) LCP and Andritz Orientations: (for turn-around team)										
STAFF (5 person) (include in art. 5 above)										
WORKERS (20 person)	200	hours	105.00 \$	21,000.00 \$						
3) Fall Protection training : 10 workers (1/2) + staff (5)										
	300	hours	100.00 \$	30,000.00 \$						6,075.00 \$
4) Flight transportation: (for turn-around team)										
STAFF (5 person) - 4 turn-around 14/7 x 5 person	20	units							1,500.00 \$	30,000.00 \$
WORKERS (20 person) - 3 turn around 14/14 x 20 person	60	units							1,000.00 \$	60,000.00 \$
5) Second STAFF team (for turn-around) (12 hours/day)										
Project manager	14	weeks	5,500.00 \$	77,000.00 \$						
QA (night and day) 2 person	28	weeks	4,500.00 \$	126,000.00 \$						
Superintendent (night and day) 2 person	28	weeks	6,000.00 \$	168,000.00 \$						
2 Foreman cross-shift (1 day, 1 night) x 2 team	240	hours	105.00 \$	25,200.00 \$						
6) Loss in the learning curve generated by the presence of a second team:										
8% x 28 500 hours	2280	hours	105.00 \$	239,400.00 \$						
7) Risk associated to acceleration of work, addition of extra workers and movement of personnel between our sites										
Risk	1	LS	150,000.00 \$	150,000.00 \$						
8) Additional pick-truck for 2 superintendent (turn-around)										
2 pick-up 14 weeks each	28	weeks			750.00 \$	21,000.00 \$				
Transportation	2	unit							8,000.00 \$	16,000.00 \$
B) WINTER CONDITIONS (OPTIONAL AND IF OUR MANPOWER ARE AVAILABLE ONLY)										
9) Temporary shelter for the concrete mixer : 5,5m x 9m x 4.8 m de haut										
Design and drawings	1	LS							7,500.00 \$	7,500.00 \$
Shop Fabrication 24 wall panels (8'x8') + roof	190	sq.m.					200.00 \$	38,000.00 \$		
Transport	4	unit							8,000.00 \$	32,000.00 \$
TOTAL (with out adm & Profits)					836,600.00 \$		21,000.00 \$		38,000.00 \$	158,400.00 \$
Prepared by: _____	Date: _____	Verified by: _____	Date: _____	Page: 2 of 2						
Contractor Representative				Client Representative						

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PRICING SHEET

CUSTOMER:	<u>Muskrat Falls Corporation</u>	DATE:	<u>12/Dec/2015</u>
SITE:	<u>Lower Churchill Project CH0032 - 001</u>	CURRENCY:	<u>CAD</u>
CHANGE REQUEST (CR) NUMBER:	<u>N/A</u>	REV:	<u>00</u>
CVR NUMBER (ANDRITZ):	<u>N/A</u>		

DESCRIPTION: CRT acceleration proposal - lighting for bridge work

Engineering & Office Staff	Description	Hours	Hourly Rate	Total
N/A				
TOTAL - Engineering & Office Staff				\$0

Materials and Transportation	Description	Qty	Unit Price	Total
Light tower 1	Daily rate for light tower/generator for lights	80	\$170	\$13,600
Light tower 2	Daily rate for light tower/generator for lights	80	\$170	\$13,600
				\$0
TOTAL - MATERIALS & TRANSPORTATION				\$27,200

Installation and Commissioning	Description	QTY	Unit Price	Total
Electrician to hook up and move generator and lights	Light will be relocated 10 times (1 time per bay upstream & 1 time per bay downstream) (8 hours per generator setup)	80	\$110	\$8,835
				\$0
TOTAL - Installation and Commissioning				\$8,835

Note:
Trade rate is based on 70hrs/week

GRAND TOTAL	\$36,035
	(HST extra)

Justification
Light will be required on top of bridge to ensure safe working environment during night shift





PRICING SHEET

CUSTOMER:	<u>Muskrat Falls Corporation</u>	DATE:	<u>12/Dec/2015</u>
SITE:	<u>Lower Churchill Project CH0032 - 001</u>	CURRENCY:	<u>CAD</u>
CHANGE REQUEST (CR) NUMBER:	<u>N/A</u>	REV:	<u>00</u>
CVR NUMBER (ANDRITZ):	<u>N/A</u>		

DESCRIPTION: CRT acceleration proposal - crane lift to lift RT crane on top of the bridge

Engineering & Office Staff	Description	Hours	Hourly Rate	Total
N/A				
TOTAL - Engineering & Office Staff				\$0

Materials and Transportation	Description	Qty	Unit Price	Total
Crane Mob	250T crane mob			\$12,000
Crane demob	250T crane mob			\$15,300
Daily rate		2	\$5,519	\$11,037.80
TOTAL - MATERIALS & TRANSPORTATION				\$38,338

Installation and Commissioning	Description	QTY	Unit Price	Total
				\$0
TOTAL - Installation and Commissioning				\$0

Note:
Trade rate is based on 70hrs/week

GRAND TOTAL	\$38,338
(HST extra)	

Justification
A shelter is required when the concrete is transferred from the concrete mix truck to the concrete bucket to ensure above freezing working temperature during this operation.
This shelter will need to be heated and lighted in order to provide a safe environment





PRICING SHEET

CUSTOMER:	<u>Muskrat Falls Corporation</u>	DATE:	<u>12/Dec/2015</u>
SITE:	<u>Lower Churchill Project CH0032 - 001</u>	CURRENCY:	<u>CAD</u>
CHANGE REQUEST (CR) NUMBER:	<u>N/A</u>	REV:	<u>00</u>
CVR NUMBER (ANDRITZ):	<u>N/A</u>		

DESCRIPTION: CRT acceleration proposal - roof opening management during 2nd stage concrete

Engineering & Office Staff	Description	Hours	Hourly Rate	Total
N/A				
TOTAL - Engineering & Office Staff				\$0

Materials and Transportation	Description	Qty	Unit Price	Total
N/A				\$0
TOTAL - MATERIALS & TRANSPORTATION				\$0

Installation and Commissioning	Description	QTY	Unit Price	Total
Labourer	Labourer to manage roof openings for concrete bucket inside shelter due to winter condition (2 labourer on each shift)	5,760	\$110	\$636,154
				\$0
TOTAL - Installation and Commissioning				\$636,154

Note:

GRAND TOTAL	\$636,154
(HST extra)	

Justification

These workers are required to manage roof openings to let concrete buckets inside the shelter during winter time. Since work is performed during winter, control of roof is required to prevent heat loss. These workers will remain at elevation 45.5 on 12 hrs shift to manage roof openings. A additional radio dispatcher will be required to coordinate the crane operator, worker at the guides level and worker on top





PRICING SHEET

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SITE:	<u>Lower Churchill Project CH0032 - 001</u>	CURRENCY:	<u>CAD</u>
CHANGE REQUEST (CR) NUMBER:	<u>N/A</u>	REV:	<u>00</u>
CVR NUMBER (ANDRITZ):	<u>N/A</u>		

DESCRIPTION: CRT acceleration proposal - condition snow clearing and sanding on upstream bridge and piers at elevation 45.5 fo

Engineering & Office Staff	Description	Hours	Hourly Rate	Total
N/A				
TOTAL - Engineering & Office Staff				\$0

Materials and Transportation	Description	Qty	Unit Price	Total
Snow blower	Weekly fees for snow blower and gas	12	\$305	\$3,660
TOTAL - MATERIALS & TRANSPORTATION				\$3,660

Installation and Commissioning	Description	QTY	Unit Price	Total
Labourer	Labourer for snow clearing on upstream bridge and pier at elevation 45.5 for duration of the upstream concreting work	1,580	\$110	\$174,501
				\$0
TOTAL - Installation and Commissioning				\$174,501

Note:
Trade rate is based on 70hrs/week

GRAND TOTAL	\$178,161
(HST extra)	

Justification
Upstream bridge need to be clear of snow for pedestrian and worker during winter 2nd stage concreting work to ensure safe work and efficient environnement
Snow blower and shovel will be used. Sanding will also be required to prevent ice related fall and trips.
Snow clearing will also be required on the piers for safe access.





PRICING SHEET

CUSTOMER:	<u>Muskrat Falls Corporation</u>	DATE:	<u>12/Dec/2015</u>
SITE:	<u>Lower Churchill Project CH0032 - 001</u>	CURRENCY:	<u>CAD</u>
CHANGE REQUEST (CR) NUMBER:	<u>N/A</u>	REV:	<u>00</u>
CVR NUMBER (ANDRITZ):	<u>N/A</u>		

DESCRIPTION: CRT Acceleration proposal - shelter moving from one bay to another prior to concrete work

Engineering & Office Staff	Description	Hours	Hourly Rate	Total
N/A				
TOTAL - Engineering & Office Staff				\$0

Materials and Transportation	Description	Qty	Unit Price	Total
				\$0
TOTAL - MATERIALS & TRANSPORTATION				\$0

Installation and Commissioning	Description	QTY	Unit Price	Total
Labourer	Shelter will be relocated 10 times (1 time per bay upstream & 1 time per bay downstream)	800	\$110	\$88,355
				\$0
TOTAL - Installation and Commissioning				\$88,355

Note:
Trade rate is based on 70hrs/week

GRAND TOTAL	\$88,355
(HST extra)	

Justification

A shelter is required when the concrete is transferred from the concrete mix truck to the concrete bucket to ensure above freezing working temperature during this operation.
This shelter will need to be relocated in front of each bay prior to work start (10 times) in order to have the concrete mix truck in front of each bay





PRICING SHEET

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SITE:	<u>Lower Churchill Project CH0032 - 001</u>	CURRENCY:	<u>CAD</u>
CHANGE REQUEST (CR) NUMBER:	<u>N/A</u>	REV:	<u>00</u>
CVR NUMBER (ANDRITZ):	<u>N/A</u>		

DESCRIPTION: CRT acceleration proposal - lighting and heat for shelter for concrete mix truck

Engineering & Office Staff	Description	Hours	Hourly Rate	Total
N/A				
TOTAL - Engineering & Office Staff				\$0

Materials and Transportation	Description	Qty	Unit Price	Total
Gas generator 110V	Daily rate for gas generator for lights	80	\$76	\$6,042
Heater and fuel	Kerosene frost heater	80	\$220	\$17,600
Lights	Set of light rental	1	\$350	\$350
TOTAL - MATERIALS & TRANSPORTATION				\$23,992

Installation and Commissioning	Description	QTY	Unit Price	Total
Electrician to hook up generator and lights	Shelter will be relocated 10 times (1 time per bay upstream & 1 time per bay downstream) (2 hours per generator setup)	20	\$110	\$2,209
				\$0
TOTAL - Installation and Commissioning				\$2,209

Note:
Trade rate is based on 70hrs/week

GRAND TOTAL	\$26,200
(HST extra)	

Justification
A shelter is required when the concrete is tranfered from the concrete mix truck to the concrete bucket to ensure above freezing working temperature during this operation.
This shelter will need to be heated and lighten in order to provide a safe environnement

