ASTALDI CANADA Inc.

LOWER CHURCHILL PROJECT – MUSKRAT FALLS

CH0007: CONSTRUCTION OF INTAKE AND POWER HOUSE, SPILLWAY AND TRANSITION DAMS

10-Oct-2016

ACI- MFC-0832

Muskrat Falls Corporation
350 Torbay Road, Suite 2
St. John's, NL Canada

Attention: **Mr. Scott O'Brien, Company Representative**

Agreement No.: **CH0007-001**
Title: **Construction of Intake Powerhouse, Spillway and Transition Dams**
Subject: **Critical Path**
Reference: **LTR-CH0007001-1448 and 1449**

Dear Mr. O' Brien:

Contractor acknowledges receipt of Company's letters LTR-CH0007001-1448 and 1449 and responds as follows:

The ongoing series of inaccurate, self-serving letters from Company's site personnel serves only to create an unreliable record wholly at odds with Company's obligations and on-going discussions between Company and Contractor's most senior officers.

Contractor's many requests for the full Project Integrated Schedule, documented in 'Weekly Progress Meeting Minutes' over the past year, have been ignored. Company has provided Contractor with none of this essential schedule information and data.

Even at the important workshops of 27 and 28 September 2016, while Contractor presented a detailed analysis of critical path aimed at optimizing Contractor's portion of the Project Integrated Schedule for the good of the project, Company withheld the logic behind its assertion that the intake is on the critical path. Contractor explained the real critical path related to Contractor's scope of work expecting constructive comments/feedback from Company, not positional correspondence.

Company's allegation in LTR-CH0007001-1448, of unilateral change of key contract milestones by Contractor and particularly in relation to the downstream intake works, is artificial and false. As Company is well aware, events outside of Contractor's control, such as the draft tube occurrence (which is the subject of a joint claim by both Company and Contractor), unexpectedly late release of the draft tubes and outlets work areas, and constraints on camp accommodation imposed by Company, all negatively affected logistics in this area and impacted milestone dates.

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Company's self-serving reference to Contractor's June 2016 schedule submission appears to be an effort to create problems rather than resolve them. Company is well aware that Company is referring to early curves to which Contractor has never committed, as confirmed among other places in Contractor's correspondence LTR-CH0007001-1236 dated 19 June 2016. The claim in LTR-CH0007001-1448 that the contemplated changes to Project milestones might have any potential effect on first power is unsupportable.

LTR-CH0007001-1448 also falsely alleges that Contractor selects pours that provide a short term commercial benefit at the expense of the critical path. As Company well knows, the locations of pours were determined by Company's requirements at the time of the Bridge Agreement, not by Contractor. Company has repeatedly issued written directives (see, for example, LTR-CH0007001-1380 dated 24 August 2016, responded to by LTR-CH0007001-1390 dated 30 August 2016) requiring Contractor to work in areas suitable to Company, regardless of the impact of such directions on Contractor's work plan.

Company's letter LTR-CH0007001-1449 asserts falsely that Company has continually provided accommodation to all of Contractor's personnel as requested by Contractor and that Company has at no time impacted Contractor's operations in any way. The opposite is true. Company's persistent failures regarding camp accommodation were the subject of a formal Notice of Default, which was rescinded only on the basis of the good faith cooperative strategy contemplated by the Bridge Agreement. Company's failure to respond to timely notices from Contractor on this issue is a matter of record, explained and documented in previous correspondence.

Company's 7 October 2016 deadline is therefore arbitrary and unreasonable. Contractor will continue to work with Company to achieve the intent and purpose of the Bridge Agreement.

Sincerely,
Astaldi Canada Inc.

Don Delarosbil
Project Manager
Lower Churchill Project – Muskrat Falls

cc: MFC – Mr. Mike Harris, Mr. Mel Melhem, Ms. Vivian Wang
Astaldi – Mr. Georges Bader, Mr. Riccardo Rocci, Mr. Robert Gregoire, Mr. James Walsh, Mr. Martin Duquet, File

Attachment: Critical Path Presentation

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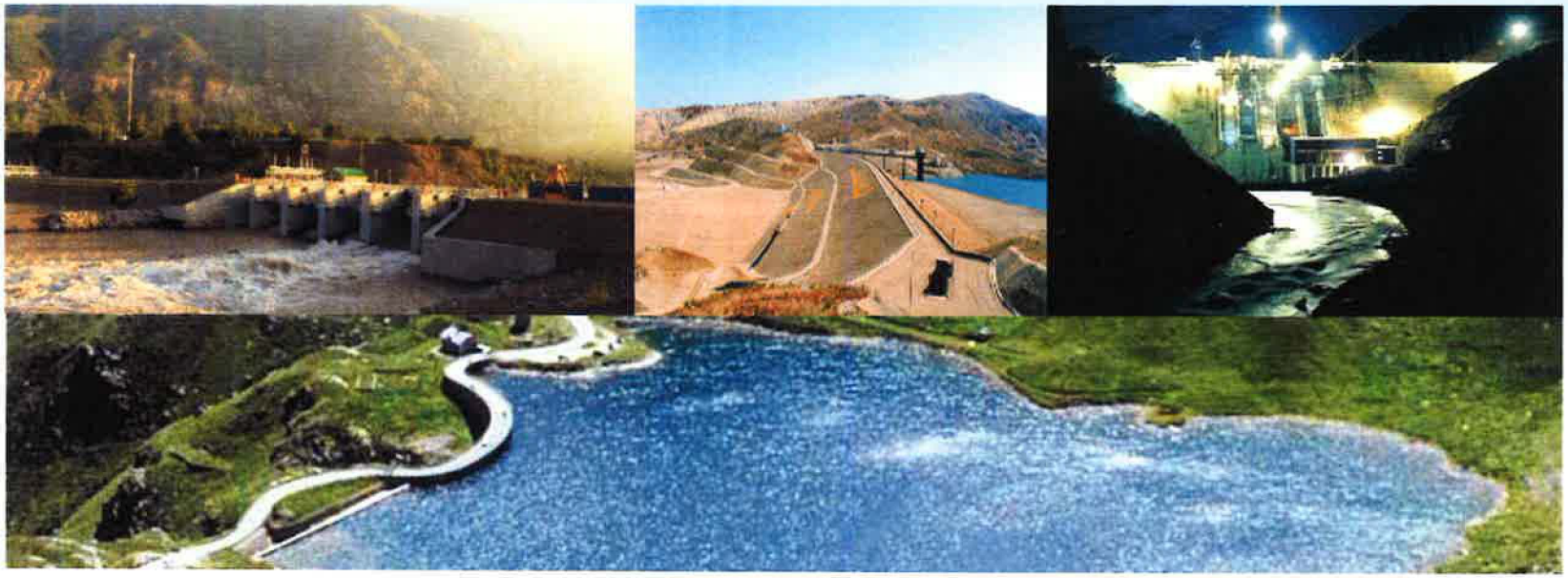
Muskrat Falls Generation

(Lower Churchill Project, Labrador, Canada)



Critical Path Presentation

nalcor energy

Without Prejudice

ASTALDI CANADA Inc.

Agenda

1. OBJECTIVES
2. P6 BASIS FOR SCHEDULE DEVELOPMENT
3. CONSTRUCTION PLANNING AND STRATEGY
4. STRUCTURAL STEEL CRITICAL PATH
5. CURVES

Without Prejudice

Objectives

I. MEETING OBJECTIVES

- Review and agree on the schedule assumptions
- Agree on milestones incentives and their application
- Agree on critical path
- Review and agree on winter work fronts and quantities

P6 Assumptions

a) Calendars

b) Curing Time

c) Contractual Milestones Constraints

d) Tracking Milestones Constraints

e) Schedule Additional Constraints

f) Lags

P6 Assumptions: Cont.

➢ Calendars

Calendar	Description	Main assigned activities
CH0007-7 days offices working time 8 Hours	A 7 days calendar with statutory holidays of NL and 2 weeks shutdown for Christmas period (8 hours a day).	Contractual milestones Engineering
CH0007-7 days - No Holidays	A 7 days calendar used mainly for non-production activities	Supply and procurement activities Resumption of work milestones
CH0007-7 days 2 shifts (20 hours/day)	A 7 days calendar with 20 working hours per day mainly assigned to non-concrete activities	Erect and dismantle shoring/soffit Erect Superstructure work
CH0007-7 days 2 shifts - winter effect	A 7 days calendar with 20 working hours per day during warm months and a variation of working hours per day for the other month (winter inefficiency effect). Used for all concrete work.	All Concrete work
winter plan (max 12days cure) - curing <300	Curing calendar for the pours with volume less than 300m3	winter protection activities
winter plan (max 12days cure) - curing >300	Curing calendar for the pours with volume more than 300m3	winter protection activities

P6 Assumptions: Cont.

- Calendars:

Inefficiency	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17
Temperature	22%	38%	50%	45%	35%
Site Shutdown (Weather)	4%	4%	4%	4%	4%
H & H	6%	6%	6%	6%	6%
Mob & Demob Impact	0%	17%	17%	0%	0%
Total Inefficiency	34%	52%	65%	60%	49%
Forecasted efficiency	66%	48%	35%	40%	51%
Adjusted efficiency	66%	40%	29%	40%	51%
P6 Calendar Assumption	70%	40%	30%	40%	60%
Forecasted Efficiency is adjusted according to Mob and Demob impact for December and January					

P6 Assumptions: Cont.

➢ Calendars

The curing calendars settings are as per the below table:

Note: Any curing time beyond those periods will be considered as a change and deviation from the Baseline assumptions. Hence, a change order with cost and schedule impact needs to be issued in such a case.

		Standard				
		Activity duration (d)	1	hours/day	13	
Month	15 days period	Heating and Hording protection time	Theoretical Calendar values (hours/day)	Calendar values set	Variance	Actual Schedule Durations
<300						
1	1st	12	1.083	1.0	0.1	13.00
1	2nd	12	1.083	1.0	0.1	13.00
2	1st	12	1.083	1.0	0.1	13.00
2	2nd	12	1.083	1.0	0.1	13.00
3	1st	12	1.083	1.0	0.1	13.00
3	2nd	12	1.083	1.0	0.1	13.00
4	1st	11	1.182	1.0	0.2	13.00
4	2nd	9	1.444	1.5	-0.1	8.67
5	1st	4	3.250	3.5	-0.3	3.71
5	2nd	0.54	24.000	24.0	0.0	0.54
6	1st	0.54	24.000	24.0	0.0	0.54
6	2nd	0.54	24.000	24.0	0.0	0.54
7	1st	0.54	24.000	24.0	0.0	0.54
7	2nd	0.54	24.000	24.0	0.0	0.54
8	1st	0.54	24.000	24.0	0.0	0.54
8	2nd	0.54	24.000	24.0	0.0	0.54
9	1st	0.54	24.000	24.0	0.0	0.54
9	2nd	6	2.167	2.0	0.2	6.50
10	1st	8	1.625	1.5	0.1	8.67
10	2nd	12	1.083	1.0	0.1	13.00
11	1st	12	1.083	1.0	0.1	13.00
11	2nd	12	1.083	1.0	0.1	13.00
12	1st	12	1.083	1.0	0.1	13.00
12	2nd	12	1.083	1.0	0.1	13.00

Cure Times

- Opportunities to get to the assumptions taken for the heating and hoarding are available.
- Practical approaches need to be taking place and a reliable tracking and monitoring process should be developed by the team Astaldi-Nalcor to make these assumptions valid.

P6 Assumptions: Cont.

Contractual Milestones Constraints

The below table represents the original contractual milestones, they only have one predecessor and successor (M1 and M2):

Snapshot sample

Activity ID	Activity Name	Primary Constraint	Primary Constraint Date
LNT E9 Milest-04	M1 - CONTRACT FINALIZATION & SIGNATURE - Original Milestone	Start On	29-Nov-13
LNT E9 SiteCon-22	18 - SPILLWAY SITE READY FOR UNRESTRICTED WORK - Original Milestone	Start On	01-Jan-14
LNT E9 SiteCon-23	78 - POWERHOUSE SITE READY FOR UNRESTRICTED WORK - Original Milestone	Start On	01-Jan-14
SPW.E9.General-64	21 - SPILLWAY SLABS - PRIMARY ANCHORS DELIVERED TO SITE - Original Milestone	Start On	28-Mar-14
SPW.09 General-79	21 - SPILLWAY SOUTH PIER - PRIMARY ANCHORS DELIVERED TO SITE Phase 1 - Original Milestone	Start On	28-Mar-14
PWH.09 General-65	21 - INTAKE UNIT 1 - PRIMARY ANCHORS DELIVERED TO SITE - Original Milestone	Start On	16-Apr-14
PWH.09 General-82	17 - TURBINE-GENERATOR UNIT 1 - PRIMARY ANCHORS DELIVERED TO SITE - Original Milestone	Start On	16-Apr-14
SPW.09 General-80	21 - SPILLWAY PIER 1 - PRIMARY ANCHORS DELIVERED TO SITE Phase 1 - Original Milestone	Start On	25-Apr-14
SPW.09 General-81	21 - SPILLWAY PIER 2 - PRIMARY ANCHORS DELIVERED TO SITE Phase 1 - Original Milestone	Start On	17-May-14
SPW.09 General-82	21 - SPILLWAY PIER 3 - PRIMARY ANCHORS DELIVERED TO SITE Phase 1 - Original Milestone	Start On	31-May-14
PWH.09 General-85	21 - INTAKE UNIT 2 - PRIMARY ANCHORS DELIVERED TO SITE - Original Milestone	Start On	10-Jun-14
PWH.09 General-83	17 - TURBINE-GENERATOR UNIT 2 - PRIMARY ANCHORS DELIVERED TO SITE - Original Milestone	Start On	10-Jun-14
SPW.09 General-83	21 - SPILLWAY PIER 4 - PRIMARY ANCHORS DELIVERED TO SITE Phase 1 - Original Milestone	Start On	23-Jun-14
SPW.09 General-84	21 - SPILLWAY NORTH PIER - PRIMARY ANCHORS DELIVERED TO SITE Phase 1 - Original Milestone	Start On	14-Jul-14
PWH.09 General-87	21 - INTAKE UNIT 3 - PRIMARY ANCHORS DELIVERED TO SITE - Original Milestone	Start On	16-Jul-14
PWH.09 General-84	17 - TURBINE-GENERATOR UNIT 3 - PRIMARY ANCHORS DELIVERED TO SITE - Original Milestone	Start On	16-Jul-14
PWH.09 General-78	16 - DRAFT TUBE UNIT 1 - PRIMARY ANCHORS DELIVERED TO SITE - Original Milestone	Start On	18-Aug-14

P6 Assumptions: Cont.

Tracking Milestones Constraints

The contractual Constraints for the Milestones are placed in a way to reflect the contractor`s projections.

Snapshot sample

Activity ID	Activity Name	Primary Constraint	Primary Constraint Date
SPW.E9.General-04	M12 - MILESTONE: ROLLWAY BAY 1 READY FOR START OF HYDRO MECHANICAL WORKS	Finish On or Before	06-Jan-18
SPW.E9.General-05	M13 - MILESTONE: ROLLWAY BAY 2 & 4 READY FOR START OF HYDRO MECHANICAL WORKS	Finish On or Before	14-Jul-19
SPW.E9.General-06	M14 - MILESTONE: ROLLWAY BAY 3 & 5 READY FOR START OF HYDRO MECHANICAL WORKS	Finish On or Before	31-Mar-19
SPW.E9.General-07	M16A - MILESTONE: COMPLETION OF PHASE 2 OF SPILLWAY DISCHARGE CHANNEL LINING (TBC)	Finish On	20-Dec-18
PWH.E9.General-13	M18/M18A - SOUTH SERVICE BAY ENCLOSED AND HIGH BAY LIGHTING INSTALLED AND READY FOR START OF WORK BY OTHER CONTRACTORS	Finish On or Before	21-Mar-17
PWH.E9.General-156	M18B - SOUTH SERVICE BAY ? MAIN POWERHOUSE DOOR INSTALLATION COMPLETE	Finish On or Before	21-Mar-17
PWH.E9.General-146	M18C - SOUTH SERVICE BAY/UNIT 1 ADMINISTRATIVE BLOCK/BACKUP POWER BLOCK COMPLETED	Finish On or Before	21-Mar-17
PWH.E9.General-86	M18D - SOUTH SERVICE BAY CONCRETE IN ELEVATOR BLOCK	Finish On or Before	10-Dec-17
LNT.E9.Milesto-03	M2 - SUBSTANTIAL COMPLETION OF THE WORK	Finish On or Before	14-Jul-19
PWH.E9.General-14	M22 - UNIT 1 - READY FOR INSTALLATION OF DRAFT TUBE CONE 1	Finish On or Before	28-Jun-17
PWH.E9.General-15	M23 - UNIT 1 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	Finish On or Before	26-Sep-17
PWH.E9.General-16	M24 - UNIT 1 - GENERATOR FLOOR COMPLETED INCLUDING PIT FREE	Finish On or Before	17-Oct-18
PWH.E9.General-17	M26 - UNIT 1 - UNIT 1 BUILDING ENCLOSED AND HIGH BAY LIGHTING INSTALLED	Finish On or Before	28-Jun-17
PWH.E9.General-96	M26A - UNIT 1 - BUILDING ENCLOSED & HIGH BAY LIGHTING INSTALLED FOR CONTRACTORS CH0032 & CH0031 MECH. WORK	Finish On or Before	27-Feb-18

P6 Assumptions: Cont.

Schedule Constraints

The following constraints and activities were created in order to level the concrete work between the units and winter fronts:

Activity ID	Activity Name	Primary Constraint	Primary Constraint Date
INT.1U.General-11	Intake 1, Upper Part - Resumption of Work Feb 6th ,2017	Finish On or After	06-Feb-17
INT.2U.General-21	Intake 2, Upper Part - Resumption of Work March 25th, 2017	Finish On or After	25-Mar-17
INT.3U.General-1	Intake 3, Upper Part - Resumption of Work June 1st,2017	Finish On or After	01-Jun-17
INT.4U.General-31	Intake 4, Upper Part - Resumption of Work May 8 ,2017	Finish On or After	08-May-17
NSB.GN.General-85	North Service Bay - Resumption of work April 15th, 2017	Finish On or After	15-Apr-17
SSB.GN.General-85	South Service Bay - Resumption of work April 15th, 2017	Finish On or After	15-Apr-17
STD.GN.General-75	South Transition Dam - Resumption of work June 25th, 2017	Finish On or After	25-Jun-17
TAR.2W.General-95	Tailrace 2 - Resumption of work April 1st, 2017	Finish On or After	01-Apr-17

Schedule Constraints Cont.

Area	Milestone	Milestone Description	Orig. Contractual dates	Late Finish	variance between late	Variance between contractual Milestones
Unit 1	M22	M22 - UNIT 1 - READY FOR INSTALLATION OF DRAFT TUBE CONE 1	28-Mar-16	28-Jun-17		
Unit 2	M30	M30 - UNIT 2 - READY FOR INSTALLATION OF DRAFT TUBE CONE 2	04-May-16	21-Oct-17	3.8	1.2
Unit 3	M38	M38 - UNIT3 - READY FOR INSTALLATION OF DRAFT TUBE CONE 3	10-Jun-16	6-Dec-17	1.5	1.2
Unit 4	M46	M46 - UNIT4 - READY FOR INSTALLATION OF DRAFT TUBE CONE 4	19-Jul-16	20-Jan-18	1.5	1.3

Area	Milestone	Milestone Description	Orig. Contractual dates	Late Finish	variance between late	Variance between contractual Milestones
Unit 1	M23	M23 - UNIT 1 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	22-May-16	26-Sep-17		
Unit 2	M31	M31 - UNIT 2 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	27-Jun-16	4-Dec-17	2.3	1.2
Unit 3	M39	M39 - UNIT3 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	03-Aug-16	13-Feb-18	2.4	1.2
Unit 4	M47	M47 - UNIT4 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	10-Sep-16	19-Apr-18	2.7	1.3

Schedule Constraints Cont.

Lags:

No lags are currently used in the schedule

CONSTRUCTION PLANNING ASSUMPTIONS AND STRATEGY

Rollways:

Rollways milestones: M12 for Bay1; M13 for Bay 2&4; M14 for Bay 3&5. Contractor has postponed the start date for the rollways as per LTR-1399 received from Company witch created a significant delay on the completion of that work as compared to the original plan (Baseline). It is to noted also that the mentioned change has extended the project duration and completion milestones M2 and M2A.

Activity ID	Activity Name	Finish	At Completion	2019 Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
ROW.F	ROLLWAY: LIFT SWR5A-08 - Construct	10-Nov-18		112								
ROW.F	ROLLWAY: LIFT SWR2A-01 - Construct	14-Nov-18		330								
ROW.F	ROLLWAY: LIFT SWR2A-02 - Construct	27-Nov-18		288								
ROW.F	ROLLWAY: LIFT SWR4A-01 - Construct	27-Nov-18		330								
ROW.F	ROLLWAY: LIFT SWR2C-01 - Construct	30-Nov-18		198								
ROW.F	ROLLWAY: LIFT SWR2A-03 - Construct	11-Dec-18			262							
ROW.F	ROLLWAY: LIFT SWR4A-02 - Construct	14-Dec-18			288							
ROW.F	ROLLWAY: LIFT SWR4C-01 - Construct	18-Dec-18			198							
ROW.F	ROLLWAY: LIFT SWR2B-01 - Construct	18-Dec-18			408							
ROW.F	ROLLWAY: LIFT SWR2A-04 - Construct	07-Jan-19				236						
ROW.F	ROLLWAY: LIFT SWR4A-03 - Construct	15-Jan-19				262						
ROW.F	ROLLWAY: LIFT SWR2B-02 - Construct	25-Jan-19				351						
ROW.F	ROLLWAY: LIFT SWR4B-01 - Construct	25-Jan-19				408						
ROW.F	ROLLWAY: LIFT SWR2A-05 - Construct	26-Jan-19				206						
ROW.F	ROLLWAY: LIFT SWR4A-04 - Construct	02-Feb-19					236					
ROW.F	ROLLWAY: LIFT SWR4B-02 - Construct	18-Feb-19					351					
ROW.F	ROLLWAY: LIFT SWR4A-05 - Construct	19-Feb-19					206					
ROW.F	ROLLWAY: LIFT SWR2B-03 - Construct	20-Feb-19					312					
ROW.F	ROLLWAY: LIFT SWR2B-04 - Construct	07-Mar-19						285				
ROW.F	ROLLWAY: LIFT SWR4B-03 - Construct	07-Mar-19						312				
ROW.F	ROLLWAY: LIFT SWR2B-05 - Construct	20-Mar-19						259				
ROW.F	ROLLWAY: LIFT SWR4B-04 - Construct	21-Mar-19						285				
ROW.F	ROLLWAY: LIFT SWR4B-05 - Construct	02-Apr-19							259			
ROW.F	ROLLWAY: LIFT SWR2A-06 - Construct	02-Apr-19							351			
ROW.F	ROLLWAY: LIFT SWR2A-07 - Construct	11-Apr-19							294			
ROW.F	ROLLWAY: LIFT SWR4A-06 - Construct	13-Apr-19							351			
ROW.F	ROLLWAY: LIFT SWR2A-08 - Construct	19-Apr-19							112			
ROW.F	ROLLWAY: LIFT SWR4A-07 - Construct	22-Apr-19							294			
ROW.F	ROLLWAY: LIFT SWR4A-08 - Construct	30-Apr-19							112			

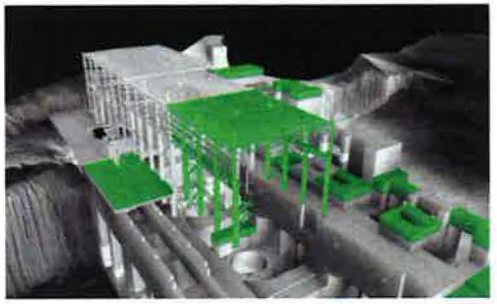
Powerhouse

-Powerhouse Structural Steel and architectural

SSB

Unit1

Tailrace 1



Unit 2

-Overhead cranes to be installed with conjunction of the SSB steel erection.
-Tailrace steel erection is not a predecessor for the next unit main frame erection.
-Cladding to follow the steel erection of each area as well as roofing activities
-Roof drains and high bay lighting to follow roofing activities
-The precast fire walls are scheduled to start after the GSU basins are poured to not interfere with the pours taking place on the tailrace.

Horizontal links between pours

Horizontal links between pours are recommended when an update is done on a 120-Day basis.

In the re-baseline development those links are kept to a minimum to avoid any misleading identification of the critical path or the multiple critical paths.

As Astaldi is planning to share some sets of formwork/shoring between the units, some natural levelling is taking place.

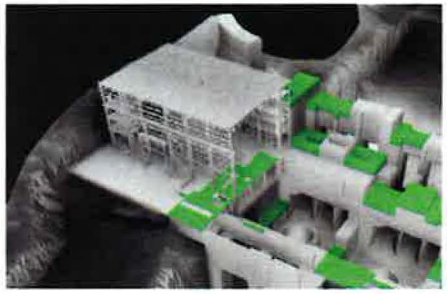
South Service Bay Milestones:

Powerhouse Milestones

- **M18A, M18B/C and M18 D:**

			Sep 25th schedule	
Area	Milestone	Milestone Description	Early Finish	Late
SSB	M18	M18/M18A - SOUTH SERVICE BAY ENCLOSED AND HIGH BAY LIGHTING INSTALLED AND READY FOR START OF WORK BY OTHER CONTRACTORS	03-Dec-16	21-Mar-17
SSB	M18	M18B - SOUTH SERVICE BAY ? MAIN POWERHOUSE DOOR INSTALLATION COMPLETE	18-Dec-16	21-Mar-17
SSB	M18	M18C - SOUTH SERVICE BAY/UNIT 1 ADMINISTRATIVE BLOCK/BACKUP POWER BLOCK COMPLETED	18-Dec-16	21-Mar-17
SSB	M18	M18D - SOUTH SERVICE BAY CONCRETE IN ELEVATOR BLOCK	22-Jul-17	10-Dec-17

The gap between M18B/C and M18D is due to stopping the elevator Shaft concrete work from Nov 2016 to Spring 2017 as suggested by Company.



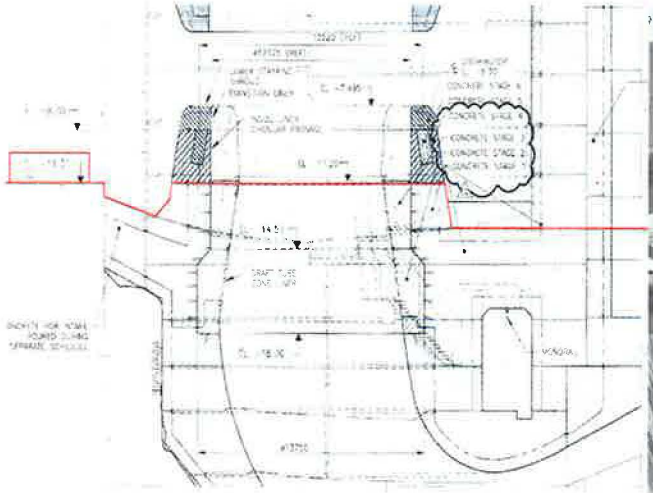
Without Prejudice

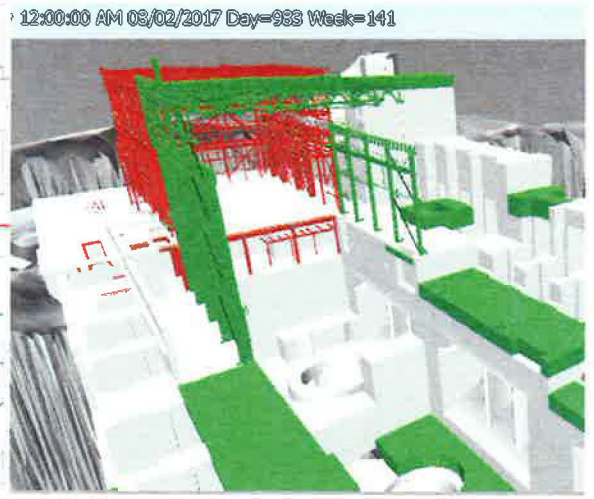
Draft Tube Cone Milestones:

- **Milestones M22, M30 M38 and M46:**

Are all driven by Powerhouse main frame Steel erection. It is to be noted that contractor is expected to have the OH crane rails erected and company to have the crane use extended from south to north, tested and ready to be used.

Also, high bay lighting installation and roofing work is a predecessor for these milestones





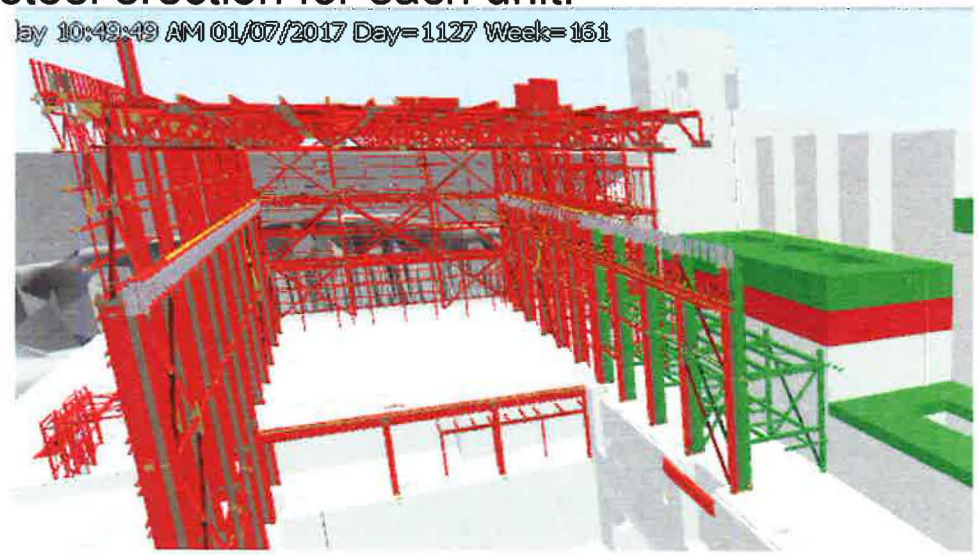
Stay Ring Milestones:

- **Milestones M23, M31 M39 and M467**

The Stayring installation is now driven by Mezzanine 1 steel erection for each unit (up to elevation 24). This is a change as compared to contractor`s initial sequence as per ECN052 (*Update of powerhouse structural steel, concrete and reinforcement drawings to support upcoming powerhouse staged erection requirements*).

The second requirement (predecessor) driving the installation of the Stayring, as per ECN047, is the concreting of the first donut (PxY1A-01). In each Unit, this pour will be completed before the mezzanine steel (up to EL.24) is completed.

As a conclusion, the change from ECN052 modified the critical path for M23, M31, M39 and M47 to run through mezzanine steel erection for each unit.



Spiral case milestones and Sequence change

(ECN-047 and ECN-52) Cont.

M22: Ready for DT Cone Installation

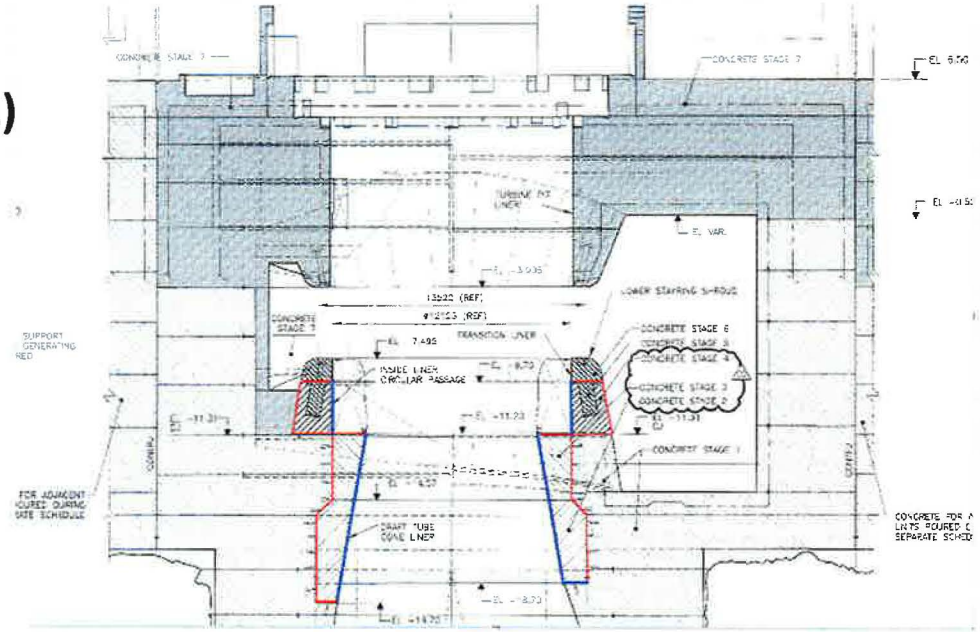
DT Cone installation

Secondary Concrete around Cone

CPL Installed and First Donut poured (PxY1A-01)

M23: Ready for Stayring Installation

Erect Unit x mezzanine 1 (el.24)



Legend:

Driving relationship

Not driving relationship

Spiral case milestones and Sequence change

(ECN-047 and ECN-52) Cont.

Draft tube Milestones

			Sep 25th schedule	
Area	Milestone	Milestone Description	Early Finish	Late
Unit 1	M22 -	M22 - UNIT 1 - READY FOR INSTALLATION OF DRAFT TUBE CONE 1	13-Mar-17	28-Jun-17
Unit 2	M30	M30 - UNIT 2 - READY FOR INSTALLATION OF DRAFT TUBE CONE 2	12-Aug-17	21-Oct-17
Unit 3	M38 -	M38 - UNIT3 - READY FOR INSTALLATION OF DRAFT TUBE CONE 3	25-Sep-17	6-Dec-17
Unit 4	M46	M46 - UNIT4 - READY FOR INSTALLATION OF DRAFT TUBE CONE 4	23-Oct-17	20-Jan-18

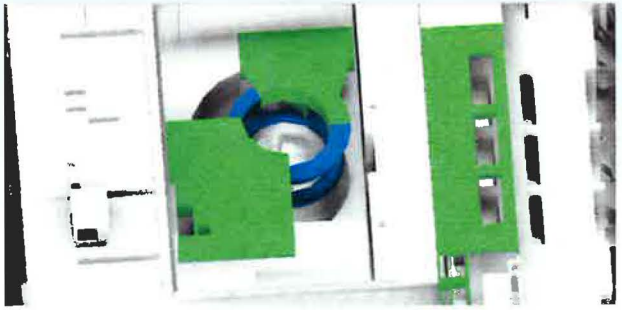
Stayring Milestones

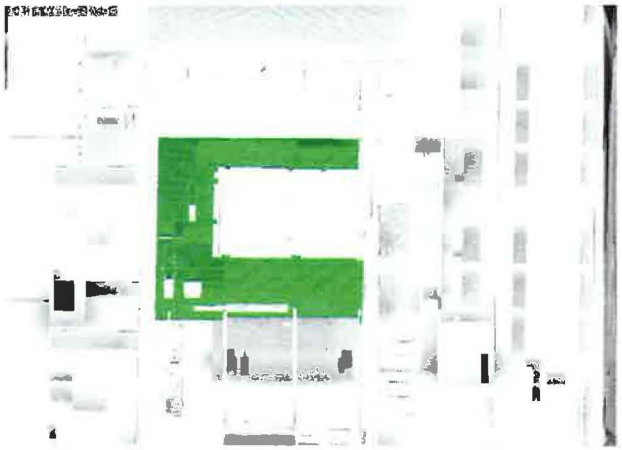
			Sep 25th schedule	
Area	Milestone	Milestone Description	Early Finish	Late
Unit 1	M23	M23 - UNIT 1 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	06-Jul-17	26-Sep-17
Unit 2	M31	M31 - UNIT 2 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	29-Sep-17	4-Dec-17
Unit 3	M39	M39 - UNIT3 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	25-Nov-17	13-Feb-18
Unit 4	M47	M47 - UNIT4 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	21-Jan-18	19-Apr-18

Unit	Concrete Ready (PxY1A-01)	Mez 1 completed (el. 24)	Previous unit StayRing installed
1	12-May-17	06-Jul-17	
2	29-Sep-17	11-Sep-17	24-Aug-17
3	14-Nov-17	25-Nov-17	17-Nov-17
4	21-Jan-18	05-Dec-17	29-Jan-18

Generator pit free Milestones:

			Sep 25th schedule	
Area	Milestone	Milestone Description	Early Finish	Late
Unit 1	M24	M24 - UNIT 1 - GENERATOR FLOOR COMPLETED INCLUDING PIT FREE	17-Jul-18	17-Oct-18
Unit 2	M32	M32 - UNIT 2 - GENERATOR FLOOR COMPLETED INCLUDING PIT FREE	30-Aug-18	17-Nov-18
Unit 3	M40	M40 - UNIT3 - GENERATOR FLOOR COMPLETED INCLUDING PIT FREE	11-Oct-18	25-Jan-19
Unit 4	M48	M48 - UNIT4 - GENERATOR FLOOR COMPLETED INCLUDING PIT FREE	06-Dec-18	18-Feb-19

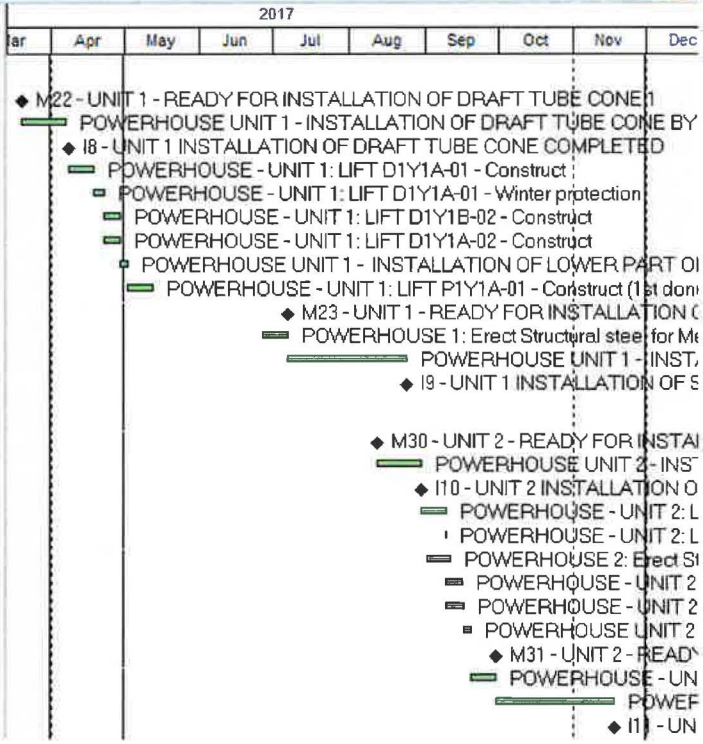




Without Prejudice

T&G related work:

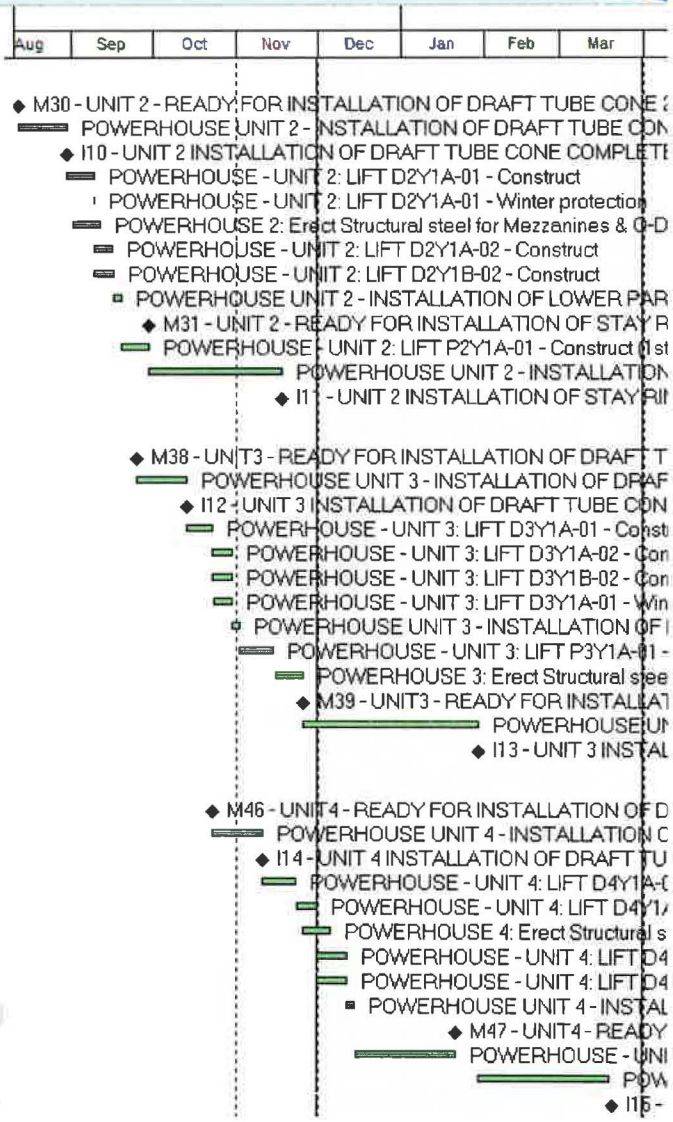
Activity Name	Original Duration	Start	Finish
Unit1	152	19-Mar-17	24-Aug-17
M22 - UNIT 1 - READY FOR INSTALLATION OF DRAFT TUBE CONE 1	0		19-Mar-17*
POWERHOUSE UNIT 1 - INSTALLATION OF DRAFT TUBE CONE BY OTHERS (OD:24)	18	20-Mar-17	06-Apr-17
I8 - UNIT 1 INSTALLATION OF DRAFT TUBE CONE COMPLETED	0	08-Apr-17	
POWERHOUSE - UNIT 1: LIFT D1Y1A-01 - Construct	10	08-Apr-17	18-Apr-17
POWERHOUSE - UNIT 1: LIFT D1Y1A-01 - Winter protection	1	18-Apr-17	22-Apr-17
POWERHOUSE - UNIT 1: LIFT D1Y1B-02 - Construct	7	22-Apr-17	29-Apr-17
POWERHOUSE - UNIT 1: LIFT D1Y1A-02 - Construct	7	22-Apr-17	29-Apr-17
POWERHOUSE UNIT 1 - INSTALLATION OF LOWER PART OF LOWER PIT LINER (OD:14)	3	29-Apr-17	02-May-17
POWERHOUSE - UNIT 1: LIFT P1Y1A-01 - Construct (1st donut)	10	02-May-17	12-May-17
M23 - UNIT 1 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	0		06-Jul-17*
POWERHOUSE 1: Erect Structural steel for Mezzanines & q-decking (EL 15 to 24) **200T Crane	10	26-Jun-17	06-Jul-17
POWERHOUSE UNIT 1 - INSTALLATION OF STAYRING & SPIRAL CASE (Pit Liner+Transition Line	49	06-Jul-17	24-Aug-17
I9 - UNIT 1 INSTALLATION OF STAY RING & UPPER PIT LINER COMPLETED	0	24-Aug-17	
Unit 2	95	12-Aug-17	17-Nov-17
M30 - UNIT 2 - READY FOR INSTALLATION OF DRAFT TUBE CONE 2	0		12-Aug-17*
POWERHOUSE UNIT 2 - INSTALLATION OF DRAFT TUBE CONE BY OTHERS (OD:24)	18	12-Aug-17	30-Aug-17
I10 - UNIT 2 INSTALLATION OF DRAFT TUBE CONE COMPLETED	0	30-Aug-17	
POWERHOUSE - UNIT 2: LIFT D2Y1A-01 - Construct	10	30-Aug-17	09-Sep-17
POWERHOUSE - UNIT 2: LIFT D2Y1A-01 - Winter protection	1	09-Sep-17	09-Sep-17
POWERHOUSE 2: Erect Structural steel for Mezzanines & Q-Decking (EL 15 to 24) **200T Crane	10	01-Sep-17	11-Sep-17
POWERHOUSE - UNIT 2: LIFT D2Y1A-02 - Construct	7	09-Sep-17	16-Sep-17
POWERHOUSE - UNIT 2: LIFT D2Y1B-02 - Construct	7	09-Sep-17	16-Sep-17
POWERHOUSE UNIT 2 - INSTALLATION OF LOWER PART OF LOWER PIT LINER (OD:14)	3	16-Sep-17	19-Sep-17
M31 - UNIT 2 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	0		29-Sep-17*
POWERHOUSE - UNIT 2: LIFT P2Y1A-01 - Construct (1st donut)	10	19-Sep-17	29-Sep-17
POWERHOUSE UNIT 2 - INSTALLATION OF STAYRING & SPIRAL CASE (Pit Liner+Transition Line	49	29-Sep-17	17-Nov-17
I11 - UNIT 2 INSTALLATION OF STAY RING & UPPER PIT LINER COMPLETED	0	17-Nov-17	



Without Prejudice

T&G related work:

Activity Name	Original Duration	Start	Finish
Unit 2	95	12-Aug-17	17-Nov-17
M30 - UNIT 2 - READY FOR INSTALLATION OF DRAFT TUBE CONE 2	0		12-Aug-17*
POWERHOUSE UNIT 2 - INSTALLATION OF DRAFT TUBE CONE BY OTHERS (OD:24)	18	12-Aug-17	30-Aug-17
I10 - UNIT 2 INSTALLATION OF DRAFT TUBE CONE COMPLETED	0	30-Aug-17	
POWERHOUSE - UNIT 2: LIFT D2Y1A-01 - Construct	10	30-Aug-17	09-Sep-17
POWERHOUSE - UNIT 2: LIFT D2Y1A-01 - Winter protection	1	09-Sep-17	09-Sep-17
POWERHOUSE 2: Erect Structural steel for Mezzanines & Q-Decking (EL 15 to 24) **200T Crane	10	01-Sep-17	11-Sep-17
POWERHOUSE - UNIT 2: LIFT D2Y1A-02 - Construct	7	09-Sep-17	16-Sep-17
POWERHOUSE - UNIT 2: LIFT D2Y1B-02 - Construct	7	09-Sep-17	16-Sep-17
POWERHOUSE UNIT 2 - INSTALLATION OF LOWER PART OF LOWER PIT LINER (OD:14)	3	16-Sep-17	19-Sep-17
M31 - UNIT 2 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	0		29-Sep-17*
POWERHOUSE - UNIT 2: LIFT P2Y1A-01 - Construct (1st donut)	10	19-Sep-17	29-Sep-17
POWERHOUSE UNIT 2 - INSTALLATION OF STAYRING & SPIRAL CASE (Pit Liner+Transition Line	49	29-Sep-17	17-Nov-17
I11 - UNIT 2 INSTALLATION OF STAY RING & UPPER PIT LINER COMPLETED	0	17-Nov-17	
Unit 3	109	25-Sep-17	29-Jan-18
M38 - UNIT3 - READY FOR INSTALLATION OF DRAFT TUBE CONE 3	0		25-Sep-17*
POWERHOUSE UNIT 3 - INSTALLATION OF DRAFT TUBE CONE BY OTHERS (OD:24)	18	25-Sep-17	13-Oct-17
I12 - UNIT 3 INSTALLATION OF DRAFT TUBE CONE COMPLETED	0	13-Oct-17	
POWERHOUSE - UNIT 3: LIFT D3Y1A-01 - Construct	10	13-Oct-17	23-Oct-17
POWERHOUSE - UNIT 3: LIFT D3Y1A-02 - Construct	7	23-Oct-17	30-Oct-17
POWERHOUSE - UNIT 3: LIFT D3Y1B-02 - Construct	7	23-Oct-17	30-Oct-17
POWERHOUSE - UNIT 3: LIFT D3Y1A-01 - Winter protection	1	23-Oct-17	30-Oct-17
POWERHOUSE UNIT 3 - INSTALLATION OF LOWER PART OF LOWER PIT LINER (OD:14)	3	30-Oct-17	02-Nov-17
POWERHOUSE - UNIT 3: LIFT P3Y1A-01 - Construct (1st donut)	10	02-Nov-17	14-Nov-17
POWERHOUSE 3: Erect Structural steel for Mezzanines & Q-Decking (EL 15 to 24) **200T Crane	10	15-Nov-17	25-Nov-17
M39 - UNIT3 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	0		25-Nov-17*
POWERHOUSE UNIT 3 - INSTALLATION OF STAYRING & SPIRAL CASE (Pit Liner+Transition Line	49	25-Nov-17	29-Jan-18
I13 - UNIT 3 INSTALLATION OF STAY RING & UPPER PIT LINER COMPLETED	0	29-Jan-18	
Unit 4	130	23-Oct-17	20-Mar-18
M46 - UNIT4 - READY FOR INSTALLATION OF DRAFT TUBE CONE 4	0		23-Oct-17*
POWERHOUSE UNIT 4 - INSTALLATION OF DRAFT TUBE CONE BY OTHERS (OD:24)	18	23-Oct-17	10-Nov-17
I14 - UNIT 4 INSTALLATION OF DRAFT TUBE CONE COMPLETED	0	10-Nov-17	
POWERHOUSE - UNIT 4: LIFT D4Y1A-01 - Construct	10	10-Nov-17	22-Nov-17
POWERHOUSE - UNIT 4: LIFT D4Y1A-01 - Winter protection	1	23-Nov-17	30-Nov-17
POWERHOUSE 4: Erect Structural steel for Mezzanines & Q-Decking (EL 15 to 24) **200T Crane	10	25-Nov-17	05-Dec-17
POWERHOUSE - UNIT 4: LIFT D4Y1A-02 - Construct	7	30-Nov-17	11-Dec-17
POWERHOUSE - UNIT 4: LIFT D4Y1B-02 - Construct	7	30-Nov-17	11-Dec-17
POWERHOUSE UNIT 4 - INSTALLATION OF LOWER PART OF LOWER PIT LINER (OD:14)	3	11-Dec-17	14-Dec-17
M47 - UNIT4 - READY FOR INSTALLATION OF STAY RING & UPPER PIT LINER	0		21-Jan-18*
POWERHOUSE - UNIT 4: LIFT P4Y1A-01 - Construct (1st donut)	10	15-Dec-17	21-Jan-18
POWERHOUSE UNIT 4 - INSTALLATION OF STAYRING & SPIRAL CASE (Pit Liner+Transition Line	49	29-Jan-18	19-Mar-18
I15 - UNIT 4 INSTALLATION OF STAY RING & UPPER PIT LINER COMPLETED	0	20-Mar-18	



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Building Enclosed Milestones

These milestones are broken into two parts M26 and M26A (for unit1) because of the mezzanines that cannot be delivered with the structure.

M26 is driven by all Structural Steel erection downstream of axis D including tailrace concrete work.

The same applies to the similar Milestones of the other units which are broken down the same way as M26:

- **M34 Unit 2 building enclosed**
- **M42 Unit 3 building enclosed**
- **M50 Unit 4 building enclosed**

			Sep 25th schedule	
Area	Milestone	Milestone Description	Early Finish	Late
SSB	M18	M18/M18A - SOUTH SERVICE BAY ENCLOSED AND HIGH BAY LIGHTING INSTALLED AND READY FOR START OF WORK BY OTHER CONTRACTORS	03-Dec-16	21-Mar-17
Unit 1	M26	M26 - UNIT 1 - UNIT 1 BUILDING ENCLOSED AND HIGH BAY LIGHTING INSTALLED	15-Apr-17	28-Jun-17
Unit 2	M34	M34 - UNIT 2 - UNIT 2 BUILDING ENCLOSED AND HIGH BAY LIGHTING INSTALLED	19-Aug-17	21-Oct-17
Unit 3	M42	M42 - UNIT3 - UNIT 3 BUILDING ENCLOSED AND HIGH BAY LIGHTING INSTALLED	03-Oct-17	3-Dec-17
Unit 4	M50	M50 - UNIT4 - UNIT 4 BUILDING ENCLOSED AND HIGH BAY LIGHTING INSTALLED	08-Nov-17	31-Dec-17

Without Prejudice

Building Enclosed Milestones

M26A requires intake mezzanine structure to be completed between axis D and E.
Since Contractor will be delivering the intake mezzanine structure in two steps:
Step1: mezzanine 1 up to EL. 24
Step2: remaining mezzanine up to the top (original milestone A)

Contractor suggested to split the deliveries of this milestone in the two above steps allowing the BOP contractor to access the area by stages as early as possible. It is to be noted that the scope of in mezzanine 1 (EL. 24), is critical for power generation.

			Sep 25th schedule	
Area	Milestone	Milestone Description	Early Finish	Late
Unit 1	M26A	M26A - UNIT 1 - BUILDING ENCLOSED & HIGH BAY LIGHTING INSTALLED FOR CONTRACTORS CH0032 & CH0031 MECH. WORK	05-Dec-17	27-Feb-18
Unit 2	M34A	M34A - UNIT 2 - BUILDING ENCLOSED & HIGH BAY LIGHTING INSTALLED FOR CONTRACTORS CH0032 & CH0031 MECH. WORK	29-Apr-18	30-Jul-18
Unit 3	M42	M42A - UNIT3 - BUILDING ENCLOSED & HIGH BAY LIGHTING INSTALLED FOR CONTRACTORS CH0032 & CH0031 MECH. WORK	03-Jul-18	22-Aug-18
Unit 4	M50	M50A - UNIT4 - BUILDING ENCLOSED & HIGH BAY LIGHTING INSTALLED FOR CONTRACTORS CH0032 & CH0031 MECH. WORK	23-Jul-18	31-Aug-18
NSB	M53	M53 - NORTH SERVICE BAY BUILDING ENCLOSED & HIGH BAY LIGHTING INSTALLED FOR CONTRACTORS TO START WORKS	17-Nov-17	31-Jan-18
NSB	M53A - N	M53A - NORTH SERVICE BAY BUILDING ENCLOSED & HIGH BAY LIGHTING INCLUDING CONCRETE OUTSIDE THE STRUCTURE	17-Nov-17	27-Jan-18

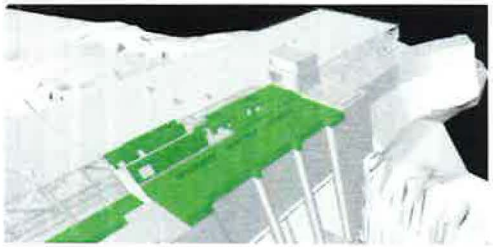
Intake Milestones

Intake Milestones: M28A, M28B/C and M28D of Intake 1.

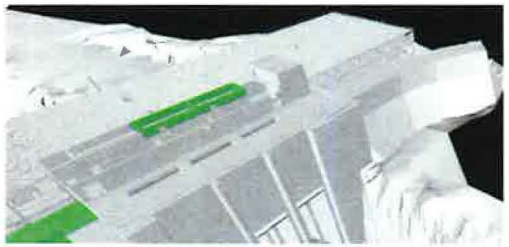
Company has requested the intake for each unit to be delivered once all related work completed instead of making it in steps. Therefore, the concerned milestone for intake is M28D.

Milestone B/C and A are still in the schedule and can be deleted if requested by company.

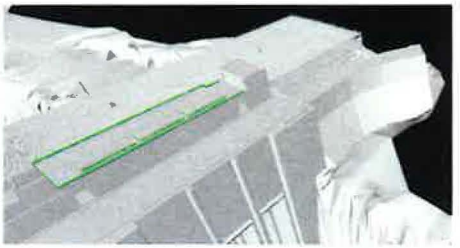
			Sep 25th schedule	
Area	Milestone	Milestone Description	Early Finish	Late
Unit 1	M28D	M28D - UNIT 1 - INTAKE STRUCTURE COMPLETE GATE HOIST HOUSE	28-Mar-18	11-Jul-18
Unit 2	M36D	M36D - UNIT 2 - INTAKE STRUCTURE COMPLETE GATE HOIST HOUSE	16-Jun-18	21-Aug-18
Unit 3	M44D	M44D - UNIT3 - INTAKE STRUCTURE COMPLETE GATE HOIST HOUSE	11-Aug-18	21-Sep-18
Unit 4	M52D	M52D - UNIT4 - INTAKE STRUCTURE COMPLETE GATE HOIST HOUSE	10-Aug-18	4-Oct-18



M28A



M28B/C



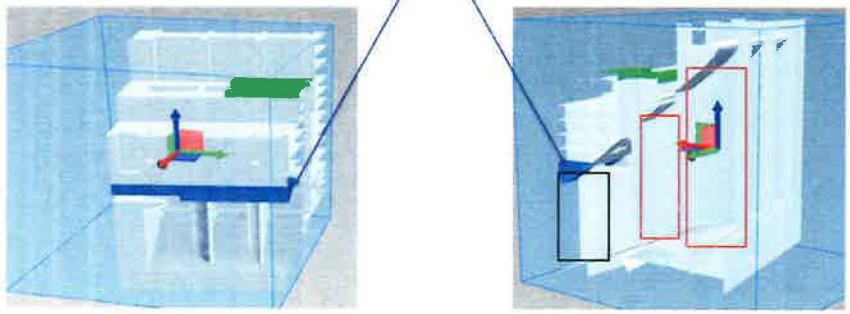
M28D

Without Prejudice

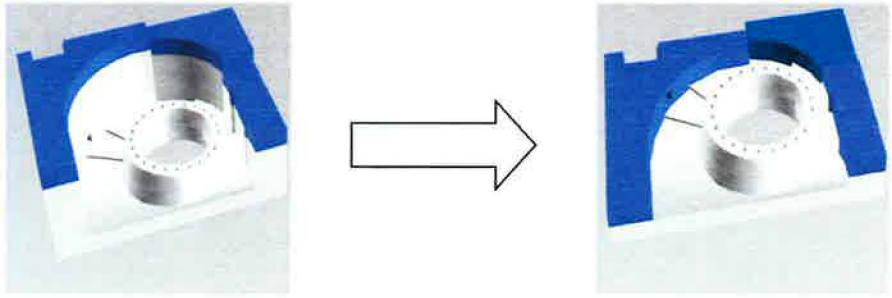
Formwork Planning

Formwork strategy and sharing between units:

- Intake US and middle Shoring: (3 sets: U1 → U3)
  - Intake Unit1 middle and upper part shoring to be re-used for Unit3
  - An extra set of panel for I4UNB-01 to be ordered to not delay IN3 lower part.



- Scroll Case Walls Formwork: (3 sets)
  - Unit1 SC walls (after P1LSA-05, UNA-01, UNB-01, USB-01) to be re-used for Unit3 SC walls (pour P3LNA-02, LNB-02, LSB-02, LSA-03)



Unit 1 Unit 3

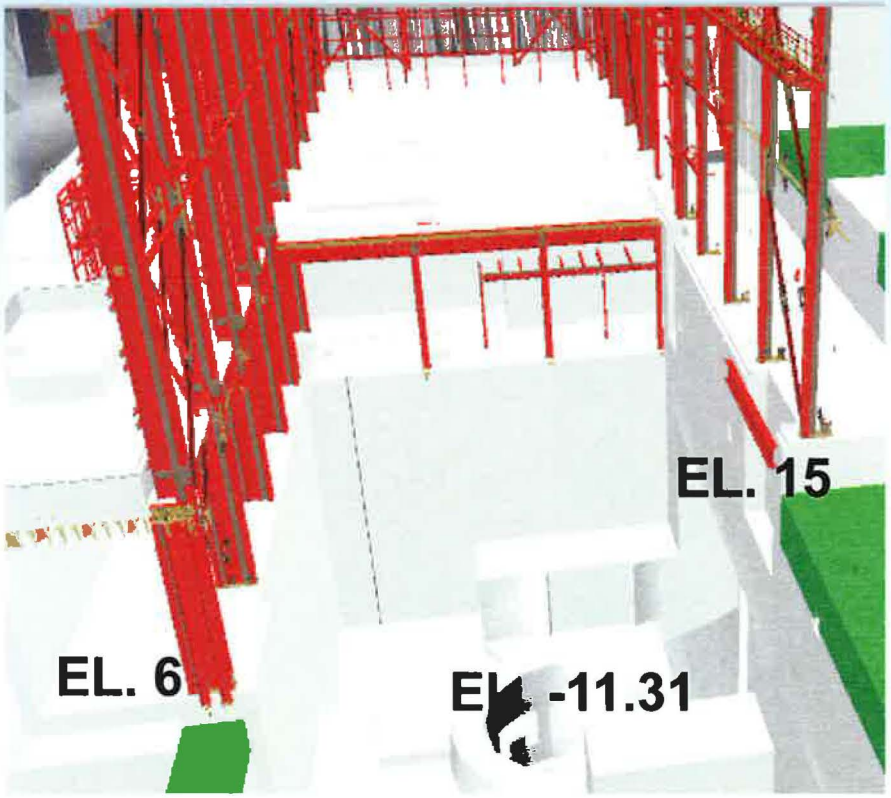
Structural steel Critical Path

Critical Path

The multiple critical path approach for each Milestone was followed and units were leveled in a way to respect a turnover of units in an order and the gaps provided in the original schedule.

Assumptions:

- Most of the contractual schedule milestones are related or driven by the steel structure erection due to the requirement of the overhead crane to install the Turbine and Generator pieces.
- In this study the focus will be on what's driving the Powerhouse steel erection for each unit.
- In order to start the structural steel erection, for each unit, all the below conditions need to be satisfied:
  - Tailrace concrete completed up to elevation 6.5
  - Intake concrete completed up to elevation 15
  - Powerhouse concrete completed up to elevation -11.31
- In addition to the above conditions, in order to start the steel erection for any unit, the steel structure in the predeceasing unit should be completed as well.
- The steel erection sequence is from south to north: SSB, U1, U2, U3, U4, NSB



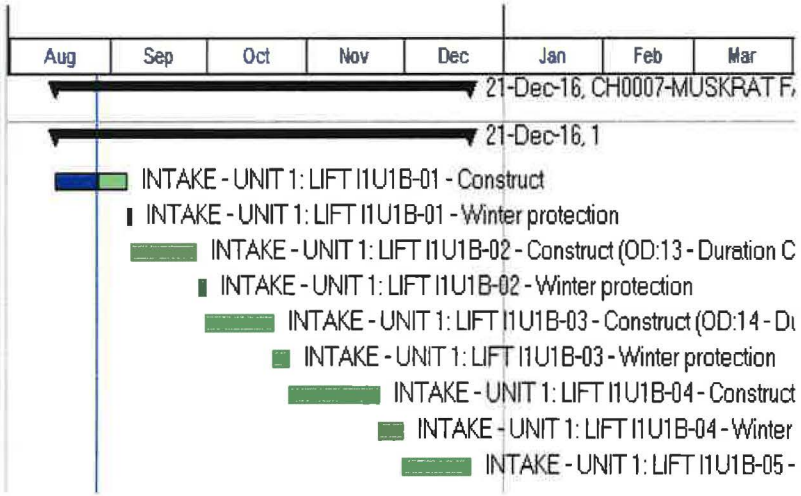
Unit 1:

Critical Path:

Unit	TR - Concrete (el 6.5)	IN - Concrete (el 15)	PH - Concrete (el - 11.31)
1	25-Oct-16	21-Dec-16	22-Oct-16

Based on the above table (exported from contractor's current schedule), the steel structure in Unit 1 is driven by the Intake Downstream structure up to elevation 15 (lift-05).

Activit ID	Activity Name	Original Duration	Start	Finish
	CH0007-MUSKRAT FALLS - EXECUTION DETAILED SCHI	104	15-Aug-16 A	21-Dec-16
	1	104	15-Aug-16 A	21-Dec-16
	INTAKE - UNIT 1: LIFT I1U1B-01 - Construct	17	15-Aug-16 A	05-Sep-16
	INTAKE - UNIT 1: LIFT I1U1B-01 - Winter protection	1	06-Sep-16	07-Sep-16
	INTAKE - UNIT 1: LIFT I1U1B-02 - Construct (OD:13 - Duration Changed to	20	07-Sep-16	27-Sep-16
	INTAKE - UNIT 1: LIFT I1U1B-02 - Winter protection	1	28-Sep-16	30-Sep-16
	INTAKE - UNIT 1: LIFT I1U1B-03 - Construct (OD:14 - Duration Changed to	21	30-Sep-16	21-Oct-16
	INTAKE - UNIT 1: LIFT I1U1B-03 - Winter protection	1	21-Oct-16	26-Oct-16
	INTAKE - UNIT 1: LIFT I1U1B-04 - Construct (OD:14 - Duration Changed to	21	26-Oct-16	23-Nov-16
	INTAKE - UNIT 1: LIFT I1U1B-04 - Winter protection	1	23-Nov-16	30-Nov-16
	INTAKE - UNIT 1: LIFT I1U1B-05 - Construct (OD:14 - Duration Changed to	21	30-Nov-16	21-Dec-16

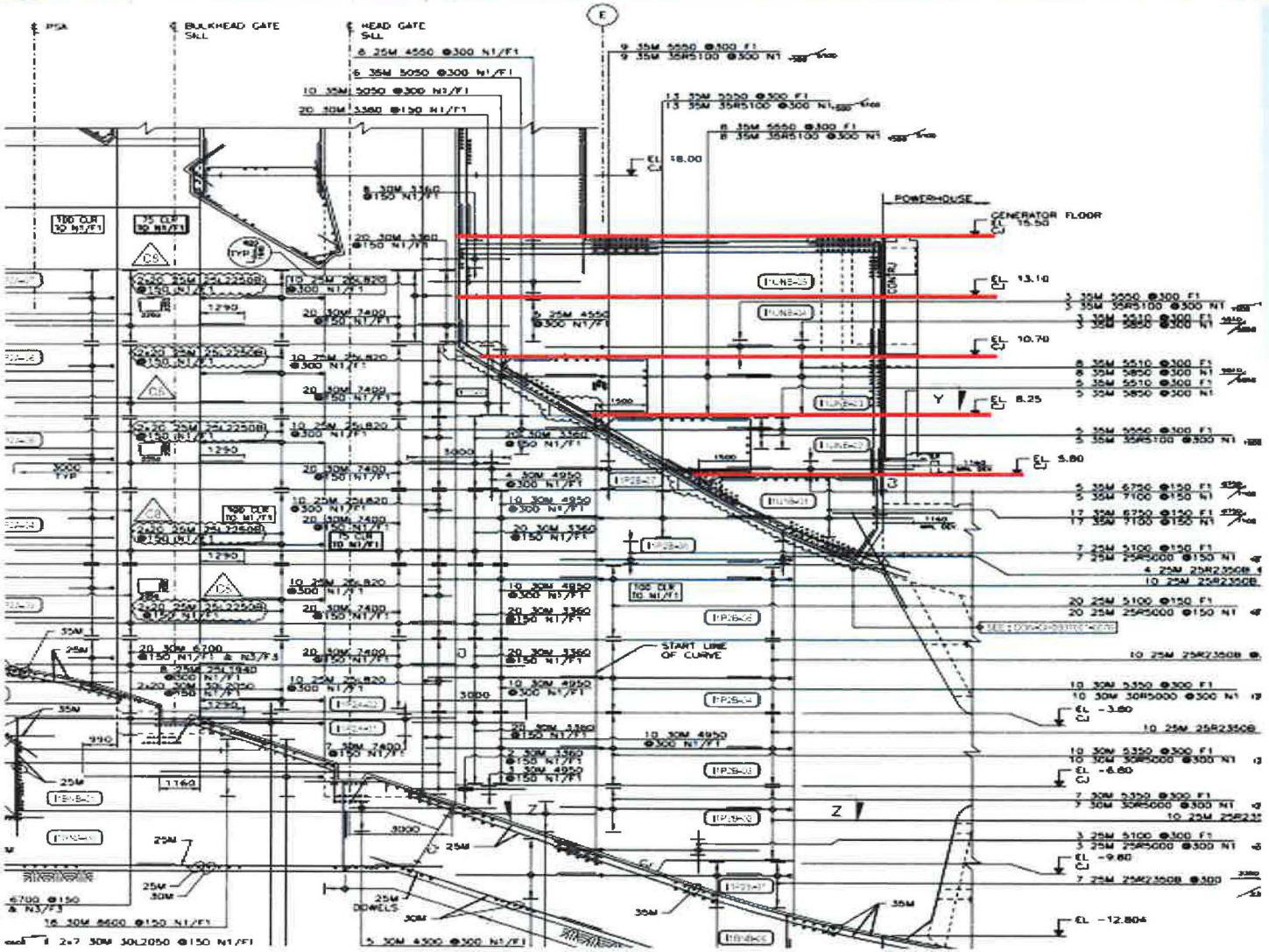


Unit 1:

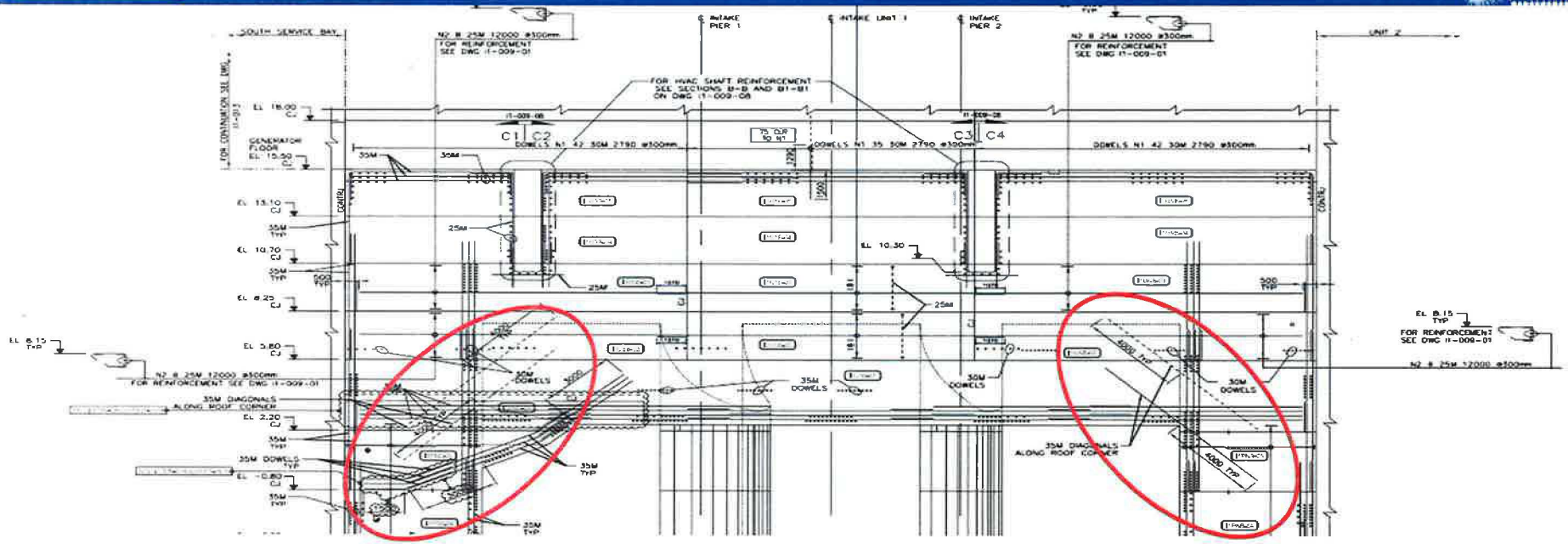
Challenges:

- More shoring and soffit panels from lift -02 to lift -04 to be installed
- Rebar top mat extension for pour setup. Use of steel mesh for safety purpose. Couple shift extension in rebar duration.
- After each lift, upstream panels have to be stripped and soffit panels installed in order to start rebar (Huge amount of rebar – numerous layers)
- Lift -01 to lift -02: Horizontal bars going from DS intake to US Scroll case and Baffle Vane are passing through the DS DOKA panels. Challenging stripping procedure. Potentially need to cut bars and use couplers. Under discussion. Will BIP for now for lift -02.
- Change in FW system between lift -02 and lift -03 for access purposes and panels jumping cycle optimization (use of D22) on the upstream and downstream.
- Clashes between soffit panels installation and 45 degree rebar coming from north and south piers. Double picking and lifting time.
- Massive amount of pre-assembly work: shoring towers, beams and platforms etc.
- Qualified manpower for this type of work: work at heights, technical specs and sequence of work, numerous hardware, similar parts.

Unit 1:


POWERHOUSE
GENERATOR FLOOR
EL 15.50
EL 13.10
EL 10.70
EL 8.25
EL 5.80
EL -3.80
EL -6.80
EL -9.80
EL -12.804
START LINE OF CURVE
DOWELS

Unit 1:


SOUTH SERVICE BAY
INTAKE PIER 1
INTAKE Unit 1
INTAKE PIER 2
UNIT 2
FOR HVAC SHAFT REINFORCEMENT SEE SECTIONS B-B AND B1-B1 ON DWG 11-009-08
C1 C2
C3 C4
DOWELS N1 42 35M 2790 @300mm
DOWELS N1 35 35M 2790 @300mm
GENERATOR FLOOR
EL 10.30
35M DOWELS
35M DIAGONALS ALONG ROOF CORNER
FOR REINFORCEMENT SEE DWG 11-009-01

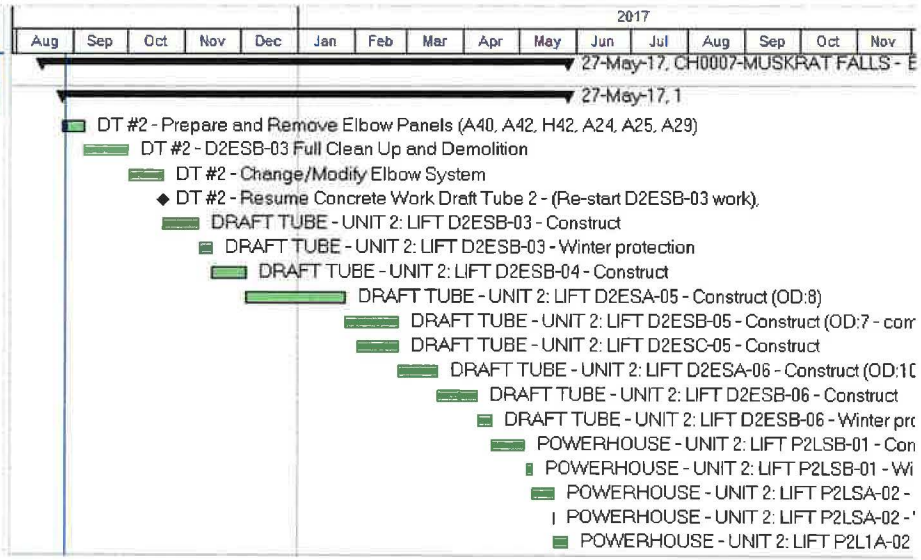
Unit 2:

Critical Path:

Unit	TR - Concrete (el 6.5)	IN - Concrete (el 15)	PH - Concrete (el - 11.31)
2	27-Apr-17	08-May-17	25-May-17

Based on the above table (exported from contractor's current schedule), the steel structure in Unit 2 is driven by the powerhouse concrete up to elevation -11. This level is required to set the cone (first T&G piece).

Activity ID	Activity Name	Original Duration	Start	Finish
	CH0007-MUSKRAT FALLS - EXECUTION DETAILED SCHEDU	242	15-Aug-16 A	27-May-17
	1	241	26-Aug-16 A	27-May-17
	DT #2 - Prepare and Remove Elbow Panels (A40, A42, H42, A24, A25, A29)	4	26-Aug-16 A	06-Sep-16
	DT #2 - D2ESB-03 Full Clean Up and Demolition	24	07-Sep-16	30-Sep-16
	DT #2 - Change/Modify Elbow System	19	01-Oct-16	19-Oct-16
	DT #2 - Resume Concrete Work Draft Tube 2 - (Re-start D2ESB-03 work)	0		19-Oct-16
	DRAFT TUBE - UNIT 2: LIFT D2ESB-03 - Construct	17	20-Oct-16	08-Nov-16
	DRAFT TUBE - UNIT 2: LIFT D2ESB-03 - Winter protection	1	08-Nov-16	15-Nov-16
	DRAFT TUBE - UNIT 2: LIFT D2ESB-04 - Construct	12	15-Nov-16	03-Dec-16
	DRAFT TUBE - UNIT 2: LIFT D2ESA-05 - Construct (OD:8)	11	03-Dec-16	26-Jan-17
	DRAFT TUBE - UNIT 2: LIFT D2ESB-05 - Construct (OD:7 - combine)	11	26-Jan-17	24-Feb-17
	DRAFT TUBE - UNIT 2: LIFT D2ESC-05 - Construct	9	02-Feb-17	24-Feb-17
	DRAFT TUBE - UNIT 2: LIFT D2ESA-06 - Construct (OD:10 - Combine)	12	24-Feb-17	18-Mar-17
	DRAFT TUBE - UNIT 2: LIFT D2ESB-06 - Construct	16	18-Mar-17	08-Apr-17
	DRAFT TUBE - UNIT 2: LIFT D2ESB-06 - Winter protection	1	09-Apr-17	16-Apr-17
	POWERHOUSE - UNIT 2: LIFT P2LSB-01 - Construct	18	16-Apr-17	04-May-17
	POWERHOUSE - UNIT 2: LIFT P2LSB-01 - Winter protection	1	05-May-17	08-May-17
	POWERHOUSE - UNIT 2: LIFT P2LSA-02 - Construct (EL.-11.31)	12	08-May-17	20-May-17
	POWERHOUSE - UNIT 2: LIFT P2LSA-02 - Winter protection	1	20-May-17	20-May-17
	POWERHOUSE - UNIT 2: LIFT P2L1A-02 - Construct (EL.-11.31)	7	20-May-17	27-May-17



Unit 2:

Challenges:

- The critical path for unit2 runs through the Draft Tube 2 demolition and remediation work.
- The second longest path, after the draft tube work, to start the steel erection is the intake downstream section up to elevation 15 (lift -05). Same challenges and sequence of work as unit1.

Unit 3:

Critical Path:

Unit	TR - Concrete (el 6.5)	IN - Concrete (el 15)	PH - Concrete (el - 11.31)	Completion of previous unit steel erection
3	08-Jul-17	28-Jun-17	03-Jul-17	24-Jun-17

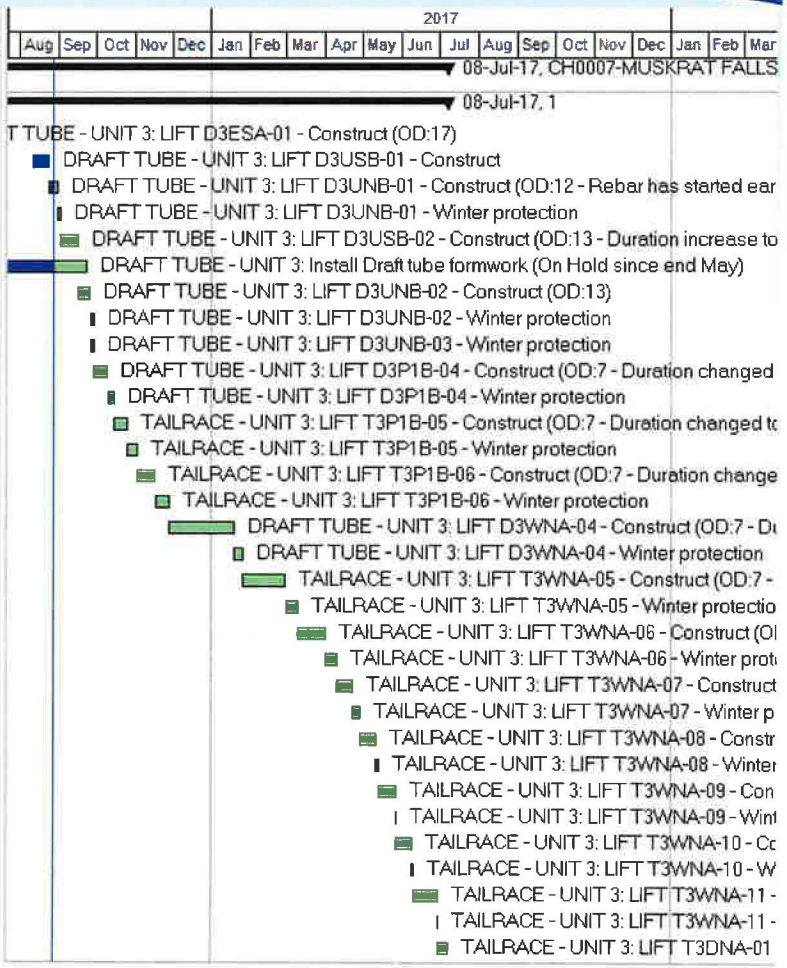
Based on the above table (exported from contractor's current schedule), the steel structure in Unit 3 is driven by the tailrace concrete up to elevation 6.5.

In the case of unit3, the dates we will reach the required elevations for Intake and powerhouse will be very close as well. But, currently, the critical path runs through the tailrace (longest path).

Also, the steel erection in unit 2 will have to be completed before the steel erection in unit3 starts – current forecast completion date: June 24th 2017.

Unit 3:

Activity ID	Activity Name	Original Duration	Start	Finish
	CH0007-MUSKRAT FALLS - EXECUTION DETAILED SCHEDULE	368	05-May-16 A	08-Jul-17
	1	368	05-May-16 A	08-Jul-17
	DRAFT TUBE - UNIT 3: LIFT D3ESA-01 - Construct (OD:17)	14	13-May-16 A	27-May-16 A
	DRAFT TUBE - UNIT 3: LIFT D3USB-01 - Construct	12	12-Aug-16 A	24-Aug-16 A
	DRAFT TUBE - UNIT 3: LIFT D3UNB-01 - Construct (OD:12 - Rebar has started ear	7	24-Aug-16 A	31-Aug-16
	DRAFT TUBE - UNIT 3: LIFT D3UNB-01 - Winter protection	1	31-Aug-16	02-Sep-16
	DRAFT TUBE - UNIT 3: LIFT D3USB-02 - Construct (OD:13 - Duration increase to c	15	02-Sep-16	16-Sep-16
	DRAFT TUBE - UNIT 3: Install Draft tube formwork (On Hold since end May)	42	05-May-16 A	23-Sep-16
	DRAFT TUBE - UNIT 3: LIFT D3UNB-02 - Construct (OD:13)	9	17-Sep-16	25-Sep-16
	DRAFT TUBE - UNIT 3: LIFT D3UNB-02 - Winter protection	1	26-Sep-16	29-Sep-16
	DRAFT TUBE - UNIT 3: LIFT D3UNB-03 - Winter protection	1	26-Sep-16	29-Sep-16
	DRAFT TUBE - UNIT 3: LIFT D3P1B-04 - Construct (OD:7 - Duration changed to cor	10	29-Sep-16	09-Oct-16
	DRAFT TUBE - UNIT 3: LIFT D3P1B-04 - Winter protection	1	10-Oct-16	15-Oct-16
	TAILRACE - UNIT 3: LIFT T3P1B-05 - Construct (OD:7 - Duration changed to combi	10	15-Oct-16	25-Oct-16
	TAILRACE - UNIT 3: LIFT T3P1B-05 - Winter protection	1	25-Oct-16	02-Nov-16
	TAILRACE - UNIT 3: LIFT T3P1B-06 - Construct (OD:7 - Duration changed to combi	10	02-Nov-16	16-Nov-16
	TAILRACE - UNIT 3: LIFT T3P1B-06 - Winter protection	1	17-Nov-16	27-Nov-16
	DRAFT TUBE - UNIT 3: LIFT D3WNA-04 - Construct (OD:7 - Duration changed to cc	12	27-Nov-16	18-Jan-17
	DRAFT TUBE - UNIT 3: LIFT D3WNA-04 - Winter protection	1	18-Jan-17	25-Jan-17
	TAILRACE - UNIT 3: LIFT T3WNA-05 - Construct (OD:7 - Duration changed to comb	13	25-Jan-17	28-Feb-17
	TAILRACE - UNIT 3: LIFT T3WNA-05 - Winter protection	1	01-Mar-17	10-Mar-17
	TAILRACE - UNIT 3: LIFT T3WNA-06 - Construct (OD:7 - Duration changed to comb	13	10-Mar-17	01-Apr-17
	TAILRACE - UNIT 3: LIFT T3WNA-06 - Winter protection	1	01-Apr-17	10-Apr-17
	TAILRACE - UNIT 3: LIFT T3WNA-07 - Construct (OD:7 - Duration changed to comb	13	10-Apr-17	23-Apr-17
	TAILRACE - UNIT 3: LIFT T3WNA-07 - Winter protection	1	23-Apr-17	28-Apr-17
	TAILRACE - UNIT 3: LIFT T3WNA-08 - Construct (OD:7 - Duration changed to comb	13	28-Apr-17	11-May-17
	TAILRACE - UNIT 3: LIFT T3WNA-08 - Winter protection	1	11-May-17	14-May-17
	TAILRACE - UNIT 3: LIFT T3WNA-09 - Construct (OD:7 - Duration changed to comb	13	14-May-17	27-May-17
	TAILRACE - UNIT 3: LIFT T3WNA-09 - Winter protection	1	27-May-17	27-May-17
	TAILRACE - UNIT 3: LIFT T3WNA-10 - Construct (OD:7 - Duration changed to comb	13	27-May-17	09-Jun-17
	TAILRACE - UNIT 3: LIFT T3WNA-10 - Winter protection	1	09-Jun-17	10-Jun-17
	TAILRACE - UNIT 3: LIFT T3WNA-11 - Construct (OD:7 - Duration changed to Walls	20	10-Jun-17	29-Jun-17
	TAILRACE - UNIT 3: LIFT T3WNA-11 - Winter protection	1	29-Jun-17	30-Jun-17
	TAILRACE - UNIT 3: LIFT T3DNA-01 - Construct	8	30-Jun-17	08-Jul-17



Unit 3:

Challenges:

- Keep working in winter time in tailrace of unit3, Draft Tube and D/S intake.
- Progress tailrace and intake D/S of unit2 and unit4 to stagger unit3 and build it in a cost and time efficient manner.

Unit 4:

Critical Path:

Unit	TR - Concrete (el 6.5)	IN - Concrete (el 15)	PH - Concrete (el - 11.31)	Completion of previous unit steel erection
4	27-Apr-17	06-Jun-17	16-May-17	**06-Aug-17**

Based on the above table (exported from contractor's current schedule), the steel structure in Unit 4 is driven by the Intake Downstream structure up to elevation 15 (lift-05). However, the steel erection in unit4 wont start before unit3 is completed (Aug 6th, 2016). Therefore, the critical path for unit4 runs through unit3 steel erection.

Unit 4:

Activity ID	Activity Name	Original Duration	Start	Finish
	CH0007-MUSKRAT FALLS - EXECUTION DETAILED SCHEDULE	424	05-May-16 A	02-Sep-17
	1	336	26-Aug-16 A	02-Sep-17
	DT #2 - Prepare and Remove Elbow Panels (A40, A42, H42, A24, A25, A29)	4	26-Aug-16 A	06-Sep-16
	DT #2 - D2ESB-03 Full Clean Up and Demolition	24	07-Sep-16	30-Sep-16
	DT #2 - Change/Modify Elbow System	19	01-Oct-16	19-Oct-16
	DT #2 - Resume Concrete Work Draft Tube 2 - (Re-start D2ESB-03 work)	0		19-Oct-16
	DRAFT TUBE - UNIT 2: LIFT D2ESB-03 - Construct	17	20-Oct-16	08-Nov-16
	DRAFT TUBE - UNIT 2: LIFT D2ESB-03 - Winter protection	1	08-Nov-16	15-Nov-16
	DRAFT TUBE - UNIT 2: LIFT D2ESB-04 - Construct	12	15-Nov-16	03-Dec-16
	DRAFT TUBE - UNIT 2: LIFT D2ESA-05 - Construct (OD:8)	11	03-Dec-16	26-Jan-17
	DRAFT TUBE - UNIT 2: LIFT D2ESB-05 - Construct (OD:7 - combine)	11	26-Jan-17	24-Feb-17
	DRAFT TUBE - UNIT 2: LIFT D2ENB-05 - Construct	11	24-Feb-17	16-Mar-17
	DRAFT TUBE - UNIT 2: LIFT D2ENB-05 - Winter protection	1	16-Mar-17	23-Mar-17
	DRAFT TUBE - UNIT 3: LIFT D3ESB-04 - Construct (keep an eye on D2 clash)	11	23-Mar-17	06-Apr-17
	DRAFT TUBE - UNIT 3: LIFT D3ENB-04 - Construct	12	06-Apr-17	18-Apr-17
	DRAFT TUBE - UNIT 3: LIFT D3ENA-05 - Construct (OD:8)	11	18-Apr-17	29-Apr-17
	DRAFT TUBE - UNIT 3: LIFT D3ESA-05 - Construct (OD:8)	11	18-Apr-17	29-Apr-17
	DRAFT TUBE - UNIT 3: LIFT D3ESB-05 - Construct	7	29-Apr-17	06-May-17
	DRAFT TUBE - UNIT 3: LIFT D3ENB-05 - Construct	11	06-May-17	17-May-17
	DRAFT TUBE - UNIT 3: LIFT D3ENC-05 - Construct (OD:7)	11	06-May-17	17-May-17
	DRAFT TUBE - UNIT 3: LIFT D3ENB-06 - Install Falsework (New)	6	17-May-17	23-May-17
	DRAFT TUBE - UNIT 3: LIFT D3ENB-06 - Construct	17	23-May-17	09-Jun-17
	DRAFT TUBE - UNIT 3: LIFT D3ENB-06 - Winter protection	1	09-Jun-17	10-Jun-17
	POWERHOUSE - UNIT 3: LIFT P3LNB-01 - Construct	14	10-Jun-17	24-Jun-17
	POWERHOUSE - UNIT 3: LIFT P3LNB-01 - Winter protection	1	24-Jun-17	24-Jun-17
	POWERHOUSE - UNIT 3: LIFT P3LNB-02 - Construct	14	24-Jun-17	08-Jul-17
	NEW Ph 3, Semi Spiral Case - Lower Parts - Works completion for M38 uo to (EL. -	0		08-Jul-17
	POWERHOUSE 3: Erect Structural steel main Frame with roof decking (excl. mezze	28	08-Jul-17	05-Aug-17
	POWERHOUSE 4: Erect Structural steel main Frame with roof decking (excl. mezze	28	05-Aug-17	02-Sep-17

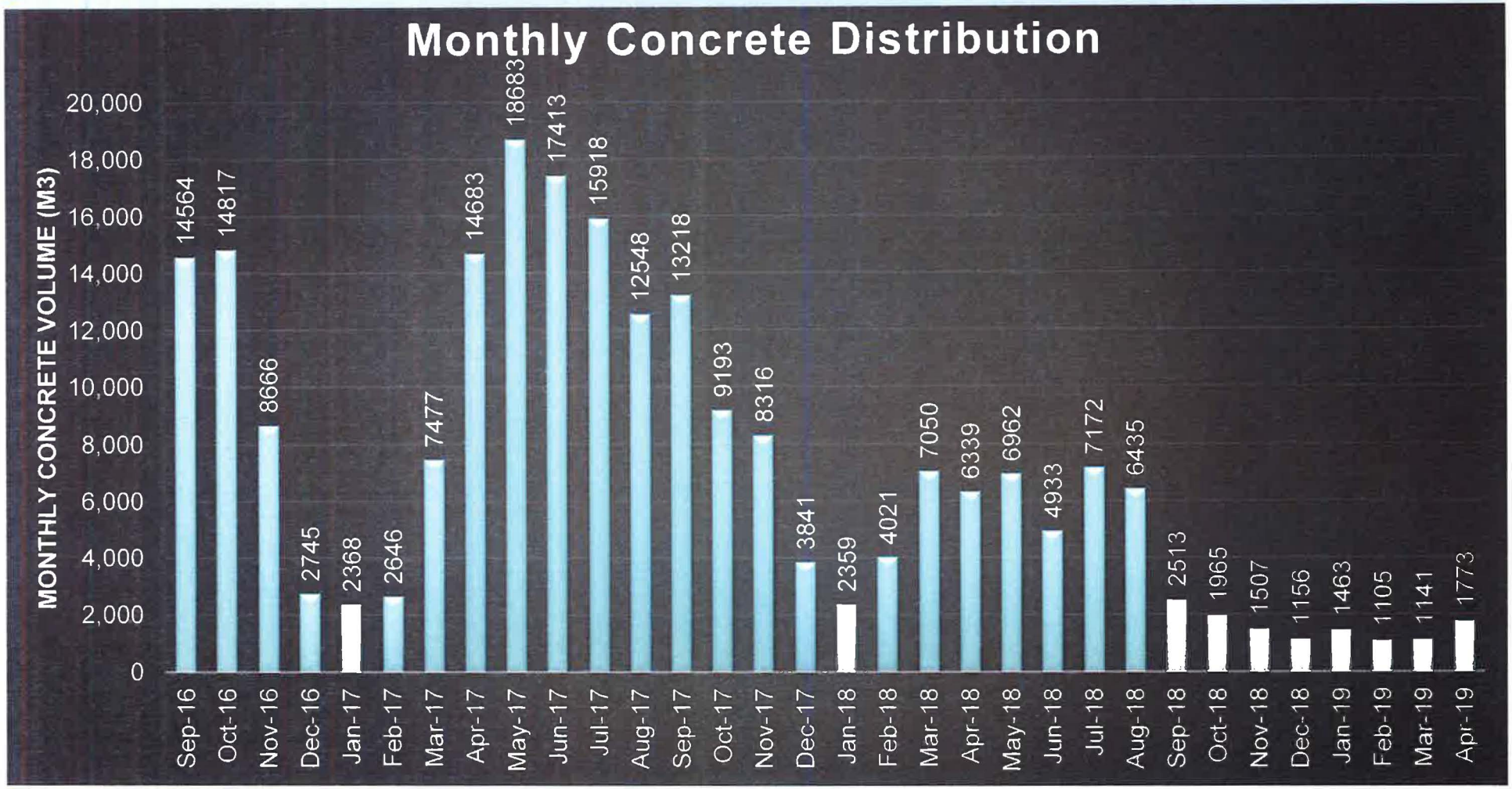
Conclusion:

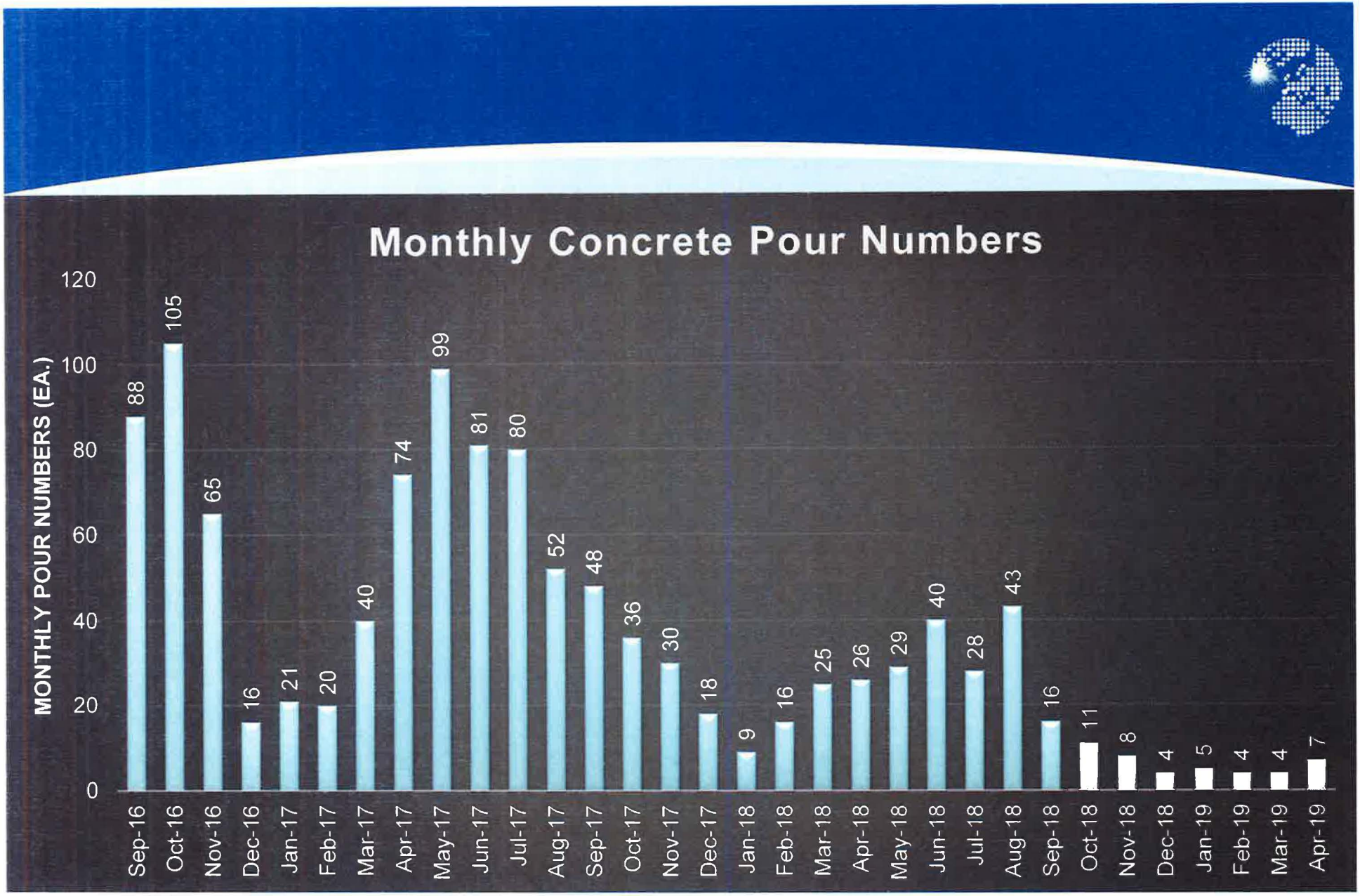
Contractor is focused on the critical path - and near critical path – for each unit in order to further advance the steel erection start date:

- Unit1 – Intake Downstream with the target to complete it before the end of the year and start the steel erection over unit1 in Jan 2017.
- Unit2 – Draft Tube Demolition work is progressing as planned. Also working on the second longest path: I2PSC-05 and shoring work for Intake Downstream.
- Unit3 – Tailrace work is progressing as planned with pour combination to further gain on the schedule.
- Unit4 – As the critical path runs through unit3 even though unit4 is more advanced than 3, contractor is looking for opportunities to construct unit3 in the best efficient way and avoid clashes with adjacent units/pours. Therefore, contractor is planning to keep working in tailrace, draft tube and intake of unit4 during the winter and keep it ahead of unit3.

Contractor is planning to keep working during winter months in all critical and near critical fronts.

Curves


Monthly Concrete Distribution
MONTHLY CONCRETE VOLUME (M3)
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Sep-16 14564
Oct-16 14817
Nov-16 8666
Dec-16 2745
Jan-17 2368
Feb-17 2646
Mar-17 7477
Apr-17 14683
May-17 18683
Jun-17 17413
Jul-17 15918
Aug-17 12548
Sep-17 13218
Oct-17 9193
Nov-17 8316
Dec-17 3841
Jan-18 2359
Feb-18 4021
Mar-18 7050
Apr-18 6339
May-18 6962
Jun-18 4933
Jul-18 7172
Aug-18 6435
Sep-18 2513
Oct-18 1965
Nov-18 1507
Dec-18 1156
Jan-19 1463
Feb-19 1105
Mar-19 1141
Apr-19 1773


Monthly Concrete Pour Numbers
MONTHLY POUR NUMBERS (EA.)
0
20
40
60
80
100
120
Sep-16 88
Oct-16 105
Nov-16 65
Dec-16 16
Jan-17 21
Feb-17 20
Mar-17 40
Apr-17 74
May-17 99
Jun-17 81
Jul-17 80
Aug-17 52
Sep-17 48
Oct-17 36
Nov-17 30
Dec-17 18
Jan-18 9
Feb-18 16
Mar-18 25
Apr-18 26
May-18 29
Jun-18 40
Jul-18 28
Aug-18 43
Sep-18 16
Oct-18 11
Nov-18 8
Dec-18 4
Jan-19 5
Feb-19 4
Mar-19 4
Apr-19 7

Thank you for your attention!