

From: davidgreen@nalcoreenergy.com
To: michellealexander@nalcoreenergy.com; markpeddle@nalcoreenergy.com
Subject: Fw: Component 1 - Engineering Execution
Date: Wednesday, January 11, 2012 9:39:26 AM
Attachments: [.png](#)
[L010-S011-200-170331-00148 - Component 1 - Engineering Execution.pdf](#)

FYI

David Green
Quality Assurance Manager (Consultant)
Lower Churchill Project

Nalcor Energy
Suite 2, 350 Torbay Road
St. John's, NL A1A 4E1 Canada
T: 709-737-4219 T: 1-888-576-5454
e: davidgreen@nalcoreenergy.com
website: www.nalcoreenergy.com

----- Forwarded by David Green/NLHydro on 01/11/2012 09:38 AM -----

From: Ron Power/NLHydro

To: Normand.Bechard@snclavalin.com

Cc: LCP - SNC, Francois.Couturier@snclavalin.com, Luc.Chausse@snclavalin.com, Afzal.Hussain@snclavalin.com, Mahmoud.Berjaoui@snclavalin.com, Luc.Turcotte@snclavalin.com, jean.gagnon@snclavalin.com, LowerChurchill@snclavalin.com

Date: 01/11/2012 08:06 AM

Subject: Component 1 - Engineering Execution
Rec. No. L010-S011-200-170331-00148

Component 1 - Engineering Execution

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Normand,

Please refer to attached letter regarding Component 1 - Engineering Execution

Regards



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Ron Power, P. Eng.
Project Manager - Generation
& Island Link (Consultant)
Nalcor Energy - Lower
Churchill Project



t. 709-737-4245 f. 709-737-1985

e.

RonPower@nalcorenergy.com

w. nalcorenergy.com

1.888.576.5454



Hydro Place, 500 Columbus Drive,
P.O. Box 12800, St. John's, NL
Canada A1B 0C9
t. 709.737.1833 or 1.888.576.5454
f. 709.737.1985

Rec. No.: L010-S011-200-170331-00148

January 11, 2012

SNC-Lavalin Inc.
272 Torbay Road
St. John's, NL A1A 4E1

Attention: Mr. Normand Bechard

**Subject: Lower Churchill Phase 1 Development
Agreement LC-G-002
Engineering, Procurement and Construction Management (EPCM) Services

Component 1 – Engineering Execution**

Dear Normand:

SLI's "Proposal for EPCM Services for the Lower Churchill Project" clearly expressed the intent to complete most Component 1 related, SLI-performed, detailed engineering during 2011 and 2012. That intent also included the requirement that most Approved for Construction (AFC) drawings would be completed during that time frame.

Attachment 1 herein contains the following excerpts from the Proposal that clearly demonstrate that intent.

- 1 – Project Summary and Project Engineering Histograms
- 2 – Figure 4.4.1 "Muskrat Falls Hydroelectric Development – Summary Program".
- 3 – Page 4-18, Section 4.3.3.1.

The SLI resource requirements (number of persons and assignment timing) to achieve the noted commitment were the basis of the engineering person-hours as presented in the Proposal document and in subsequent clarifications.

It is noted that the overall scope of Component 1 is essentially unchanged from that described in Nalcor's "Request for Proposal (RFP) No. LC-G-002".

MF1340

A significant study was performed by SLI, resulting in SLI technical report "MF1340 – Review and Confirmation of Muskrat Falls Layout, Structures and Interfaces". Most of the study work was carried out in Q3 and Q4, 2010 and Q1 2011. As part of that study, signification schedule work was carried out. As can be seen from the schedule excerpts contained in Attachment 2 herein, most SLI-



Hydro Place, 500 Columbus Drive,
P.O. Box 12800, St. John's, NL
Canada A1B 0C9
t. 709.737.1833 or 1.888.576.5454
f. 709.737.1985

led engineering work is to be carried out in 2011 and 2012. This schedule aligns, in general, with that provided in SLI's Proposal.

C1 Engineering Deliverables List

SLI transmittal "NE-LCP-TRANSMIT-000816: SLI Hydro Generation Document Register – PDF & Excel", dated 02 November 2011 contains the latest version of the SLI Component 1 engineering deliverables list that was formally issued to Nalcor. The list is very preliminary, and requires significant updating to reflect an accurate, complete listing of engineering documents required for Component 1. The requirement for a complete deliverables list is clearly stated in the Agreement in Exhibit 3, paragraph 3.2.4. The importance of this fundamental requirement cannot be overstated. All associated registers / packages (e.g. IWP's, EWP'S, Package Dictionaries, etc.) are secondary.

We request that completion of the list be given highest priority.

Engineering Progress Measurement and Reporting

In order to understand engineering progress, the physical progress / percent completion of each engineering deliverable listed in the approved register needs to be tracked and reported. The requirement for this Earned Value method of management is clearly articulated throughout the Agreement. It is also clearly documented in SLI's Proposal, and was discussed in detail in clarification meetings.

Engineering reporting to date, as contained in SLI Monthly Reports, does not provide this method of reporting. As a result, actual completion of engineering cannot be determined.

We request that tracking and reporting as described be implemented, and that this be given highest priority.

Engineering Organization

We refer to the Component 1 engineering organization charts issued to Nalcor to date, and, in particular to "Chart 4A Hydro Engineering.vsd" issued to Nalcor via transmittal 0000-CL-0417 dated 21 December 2011" as part of document "Gate 3 Deliverables EPCM Services – Stage 3".

In light of the fact that the comprehensive listing of deliverables has not yet been produced and resourced, we are not in a position to provide intelligent commentary on the organization. We do expect the resource assignment and associated organizational layout to be predicated on completion of most SLI-lead engineering by end of 2012, and with resource loading in line with SLI's commitments described herein. We look forward to completion and formal documentation of the above exercise, and advise that Nalcor's approval of the organization will be predicated on the above being in place.




Hydro Place, 500 Columbus Drive,
P.O. Box 12800, St. John's, NL
Canada A1B 0C9
t. 709.737.1833 or 1.888.576.5454
f. 709.737.1985

Summary

In conclusion, it is Nalcor's expectation that Component 1 engineering work be executed as committed. We are confident that SLI, considering the experience and history of its Hydro Division, and its knowledge of the Muskrat Falls development, is fully capable to meet or exceed Nalcor's expectation.

Sincerely,



Ron Power
Project Manager – Generation / Island Link
RP/rp

cc: Paul Harrington



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Canada A1B 0C9
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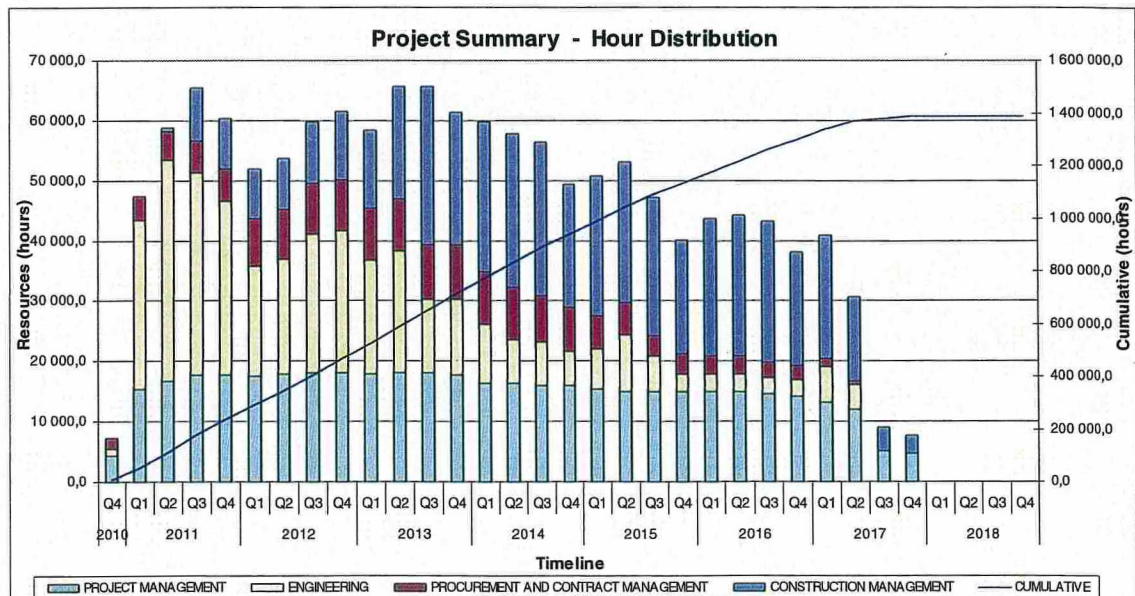
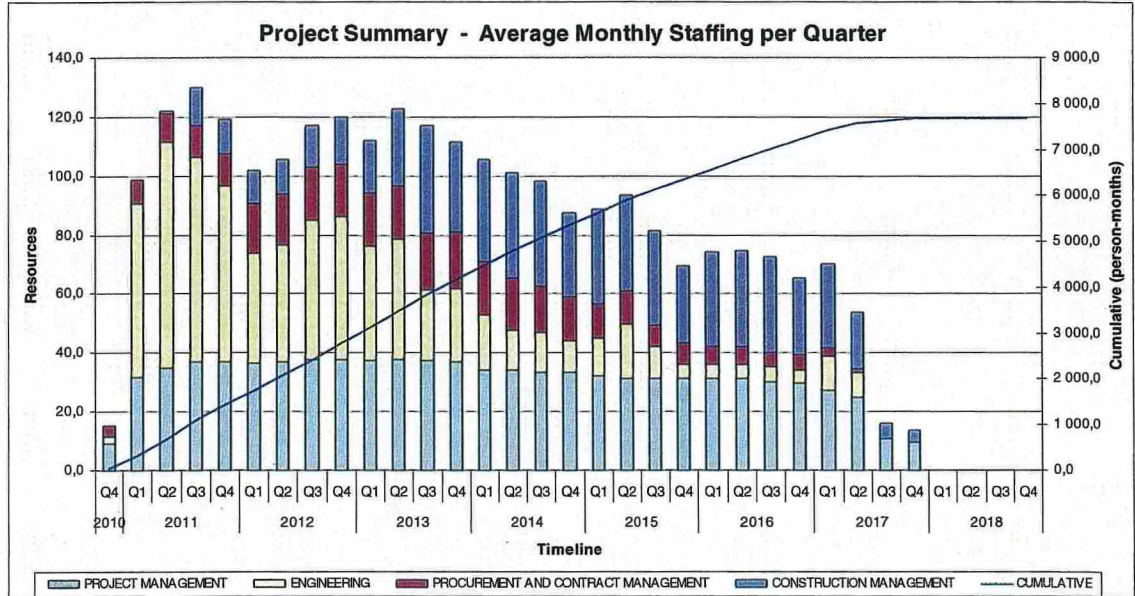
ATTACHMENT 1

Excerpts from SLI's "Proposal for EPCM Services for the Lower Churchill Project"

- 1 – Project Summary and Project Engineering Histograms
- 2 – Figure 4.4.1 "Muskrat Falls Hydroelectric Development – Summary Program".
- 3 – Page 4-18, Section 4.3.3.1.



**Component 1 – Muskrat Falls Hydroelectric Development
Project Summary Histograms**





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**Component 1 – Muskrat Falls Hydroelectric Development
Project Engineering Histograms**

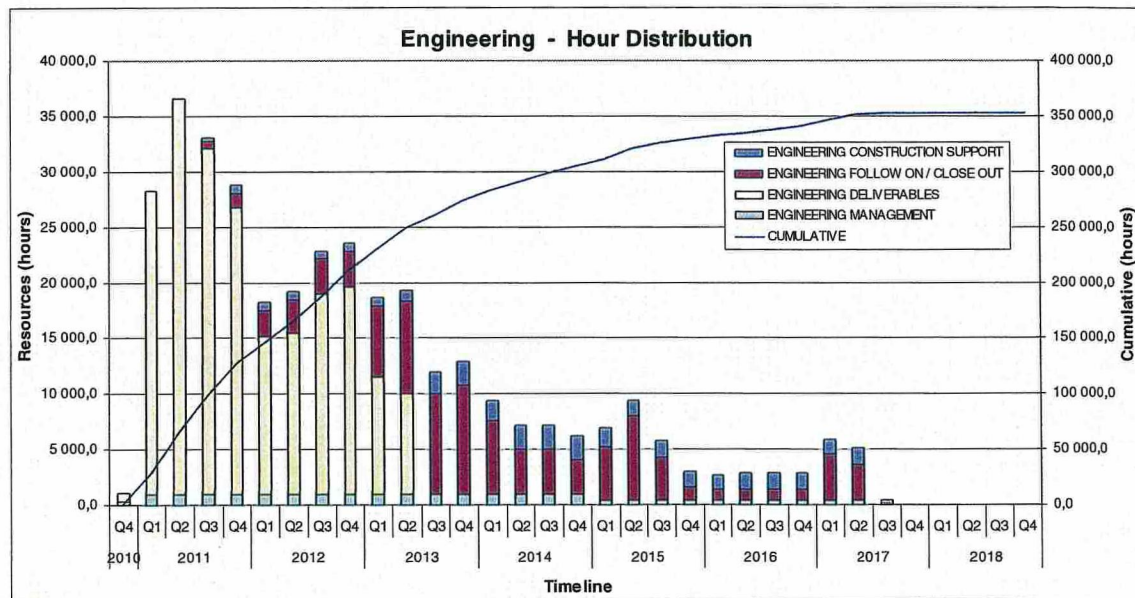
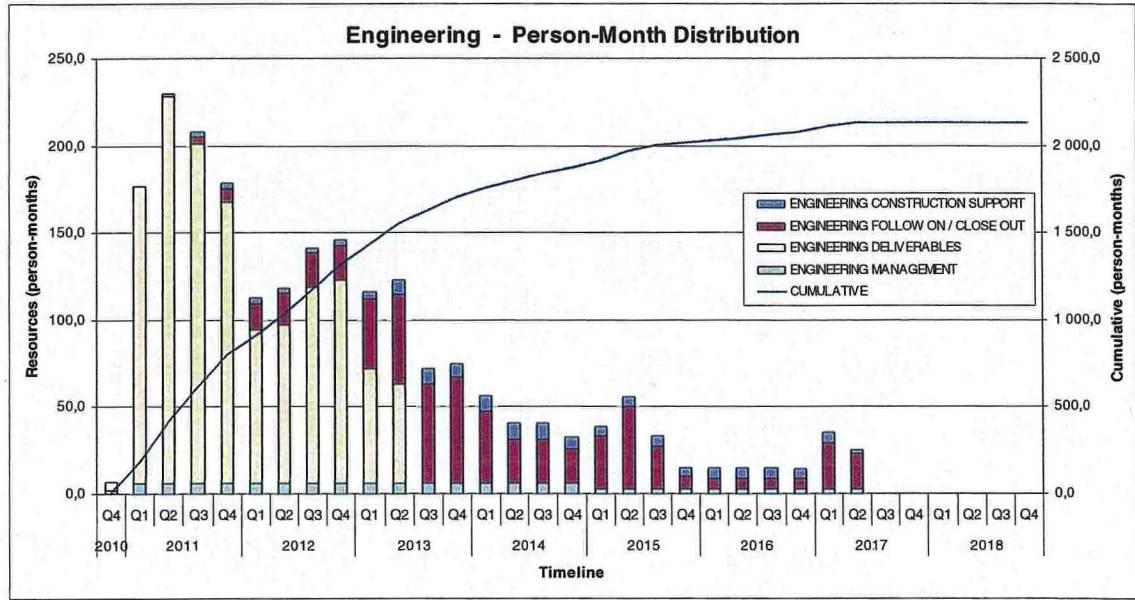




FIGURE 4.3.b-2 - RISK MATRIX

		Consequences				
		VL	L	M	H	VH
P R O B A B I L I T Y	VH	LOW	MEDIUM	HIGH	VERY HIGH	VERY HIGH
	H	LOW	MEDIUM	HIGH	HIGH	VERY HIGH
	M	LOW	LOW	MEDIUM	HIGH	HIGH
	L	VERY LOW	LOW	LOW	MEDIUM	MEDIUM
	VL	VERY LOW	VERY LOW	LOW	LOW	LOW

4.3.3 c) Project Organization and Execution Strategy

c) Project Organization and Execution Strategy

SNC-Lavalin will mobilize a project team of specialists and support staff as required to perform the EPCM services, generally as shown in the organization charts contained in Attachment 6.2-1 in Section 6 of this proposal.

All full time staff will be located in the St. John’s project office or at the site. Personnel based outside of Newfoundland and Labrador will be relocated to the St. John’s project office as required. Specialized staff working on a part time basis over the design period will generally be based in their home offices, but will carry out short-term assignments in St. John’s.

Each contract package will have a staff member designated to be responsible for that package for the design and construction phases.

4.3.3.1 Resource Requirements

SNC-Lavalin has the necessary in-house resources to carry out Component 1. Peak numbers could reach 130 fulltime engineers and technical support staff in St. John’s. Part time specialist staff from different centres of excellence within SNC-Lavalin will be available during the project time frame to support the full time team.

The peak staff will be required during the latter part of Phase 3 and the initial part of Phase 4, during which time it is expected that about two-thirds of the detailed engineering work will be completed.



Hydro Place, 500 Columbus Drive,
P.O. Box 12800, St. John's, NL
Canada A1B 0C9
t. 709.737.1833 or 1.888.576.5454
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ATTACHMENT 2

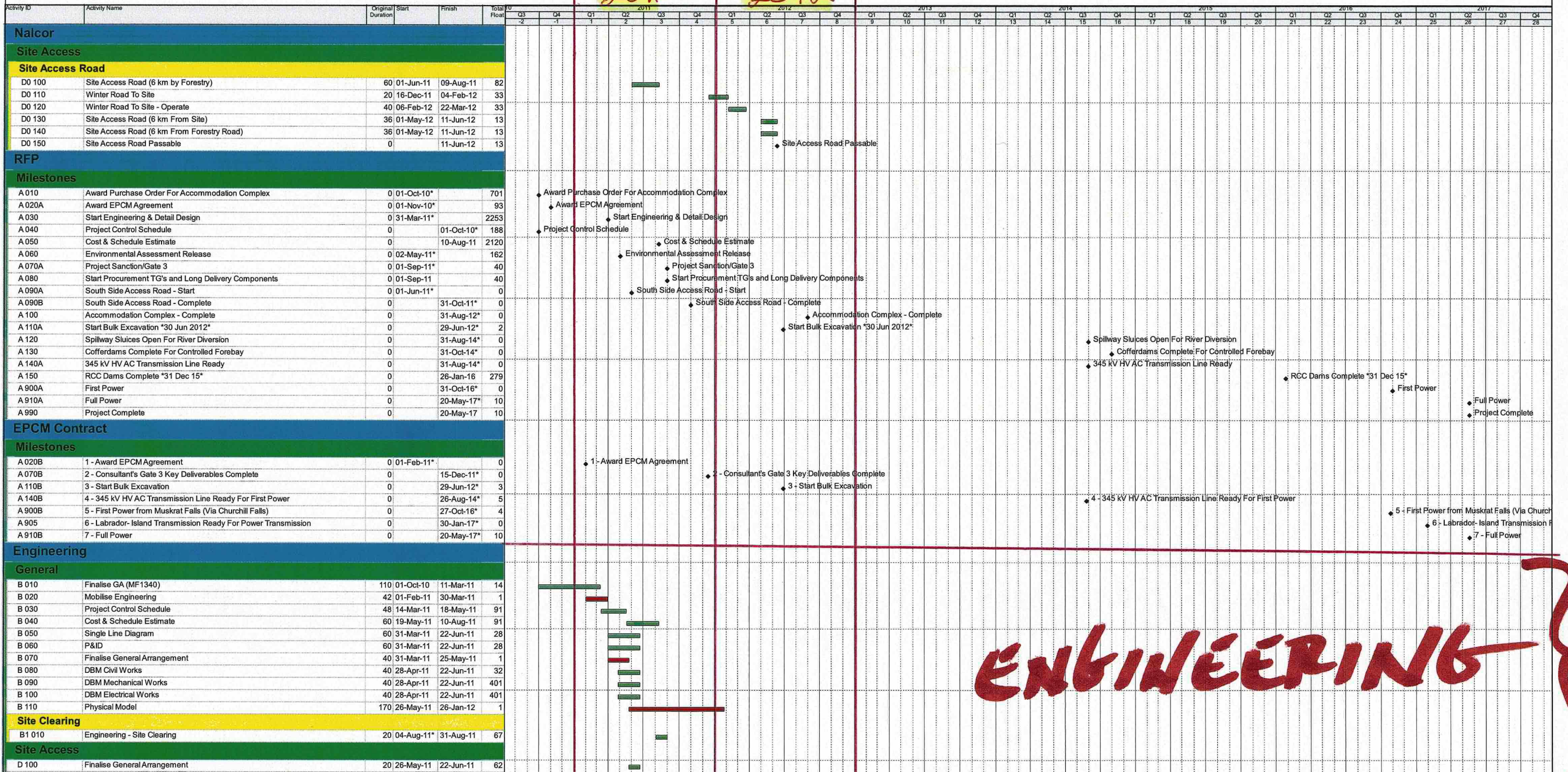
Excerpts from "MF1340 – Review and Confirmation of Muskrat Falls Layout, Structures and Interfaces"

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Muskrat Falls Hydroelectric Project
MF1340 Schedule By EPC Rev 1

2011 2012



ENGINEERING

2011 2012

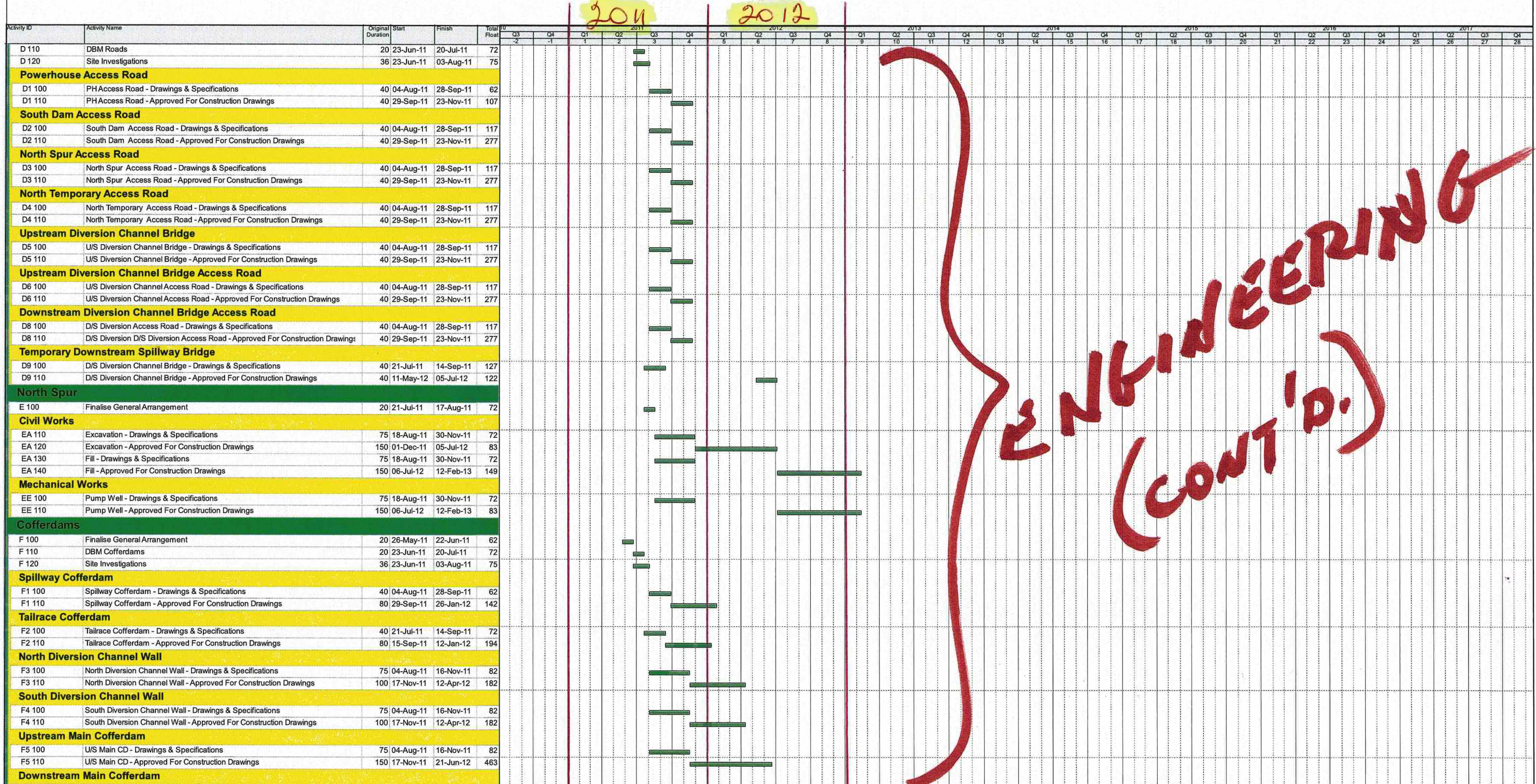
█ Remaining Level of Effort █ Critical Remaining Work
█ Actual Work ◆ Milestone
█ Remaining Work

Note:
 1) Based on 5 gate overflow Spillway
 2) Based on conventional Turbine-generator contract packaging
 3) Revised for actual EPCM award date and revised Project Sanction date

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Muskrat Falls Hydroelectric Project
MF1340 Schedule By EPC Rev 1



■ Remaining Level of Effort ■ Critical Remaining Work
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▬ Remaining Work

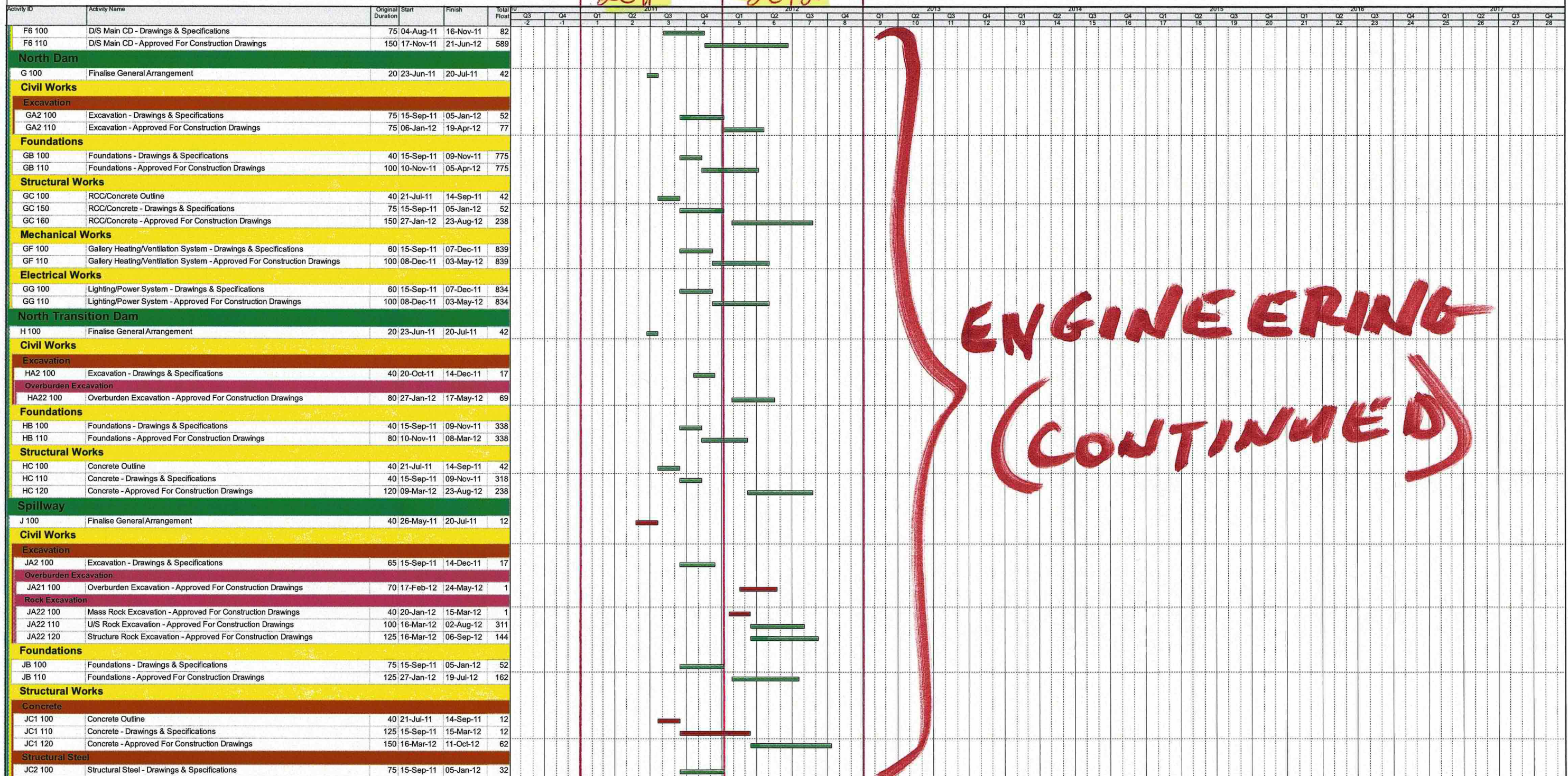
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2011 2012

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Muskrat Falls Hydroelectric Project
MF1340 Schedule By EPC Rev 1



Remaining Level of Effort
 Critical Remaining Work
 Actual Work
 ◆ Milestone

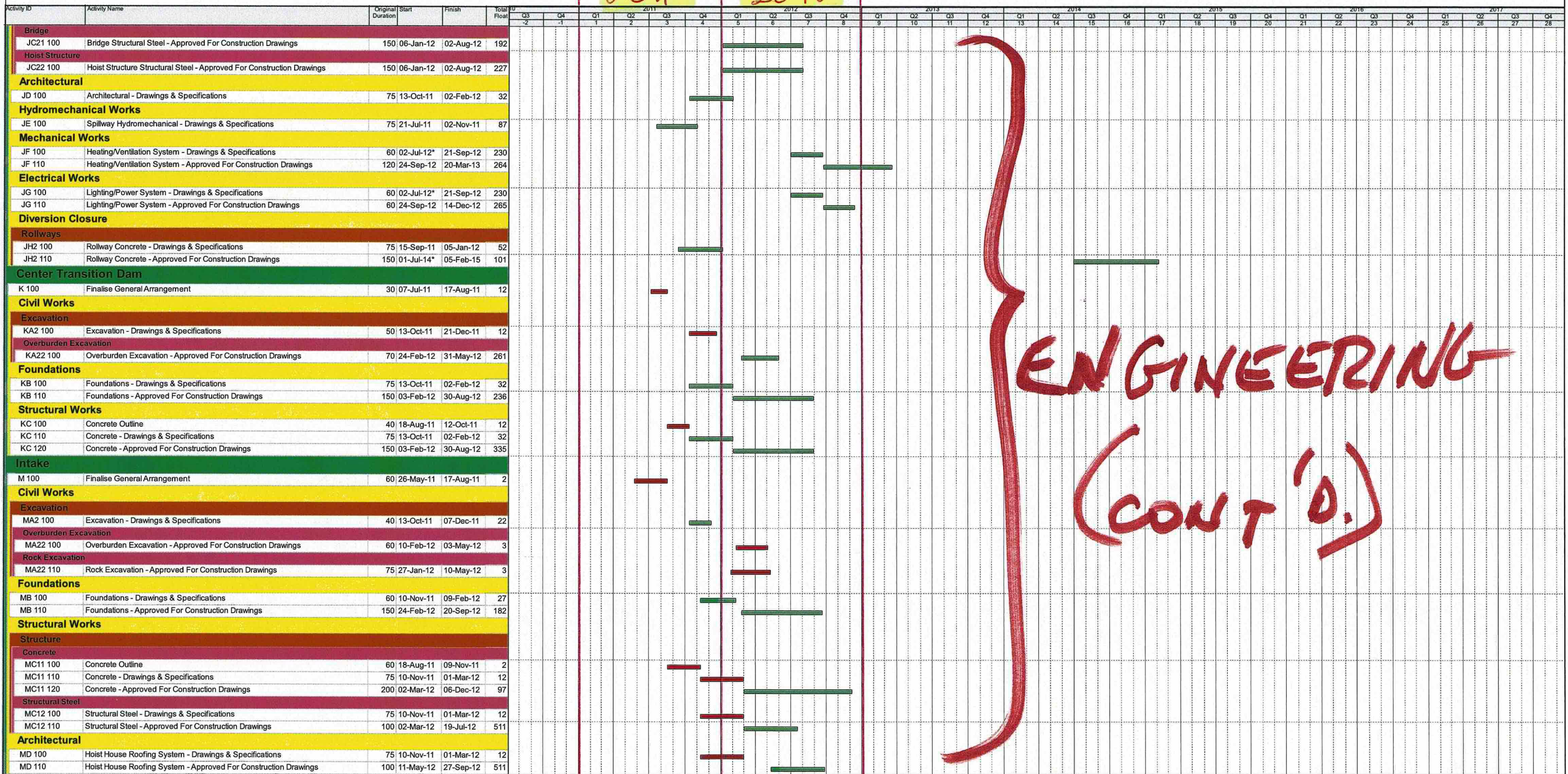
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Muskrat Falls Hydroelectric Project
MF1340 Schedule By EPC Rev 1



ENGINEERING
(CONT'D.)

■ Remaining Level of Effort ■ Critical Remaining Work
■ Actual Work ◆ Milestone
— Remaining Work

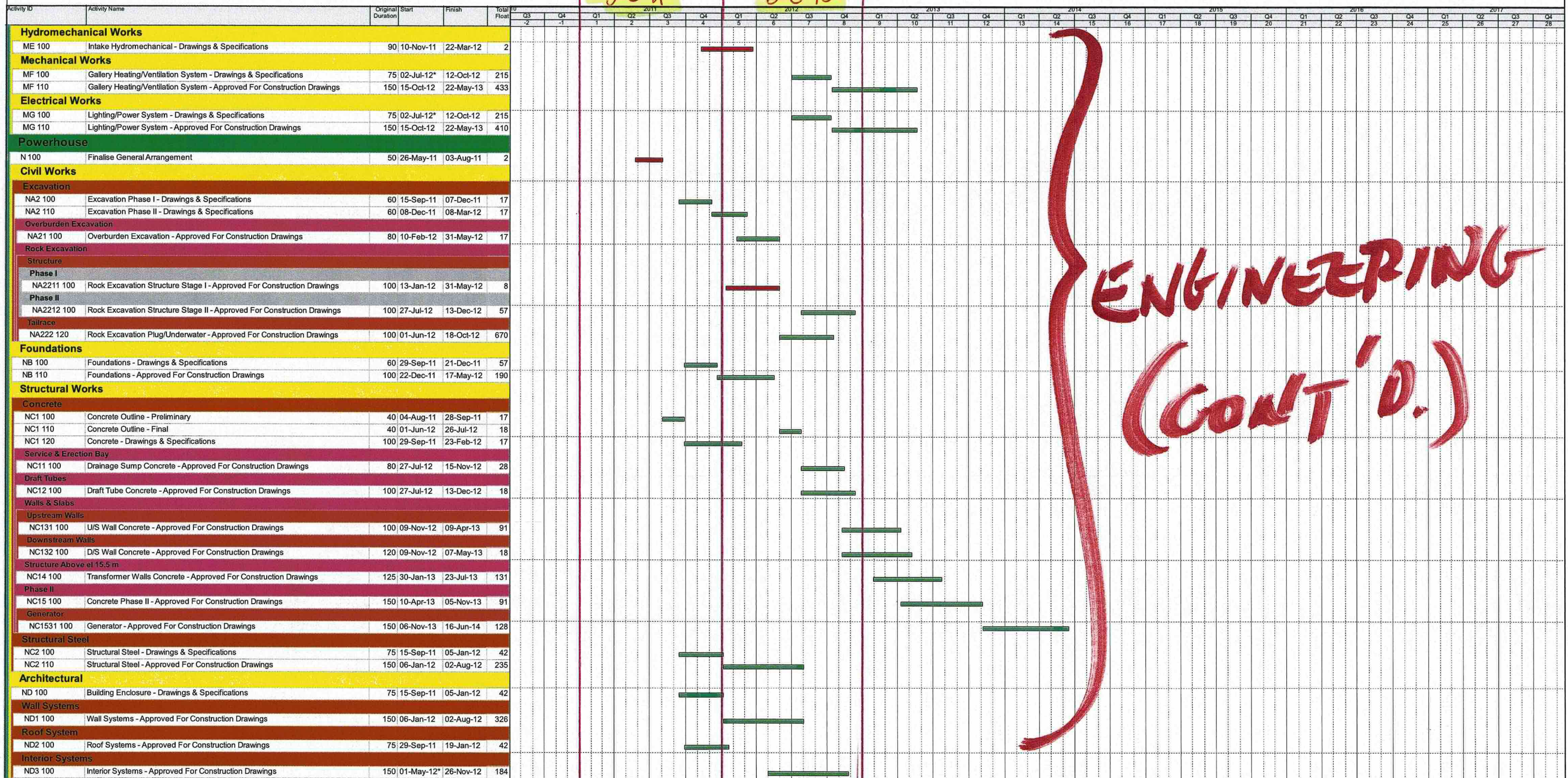
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Muskrat Falls Hydroelectric Project
MF1340 Schedule By EPC Rev 1



ENGINEERING
(CONT'D.)

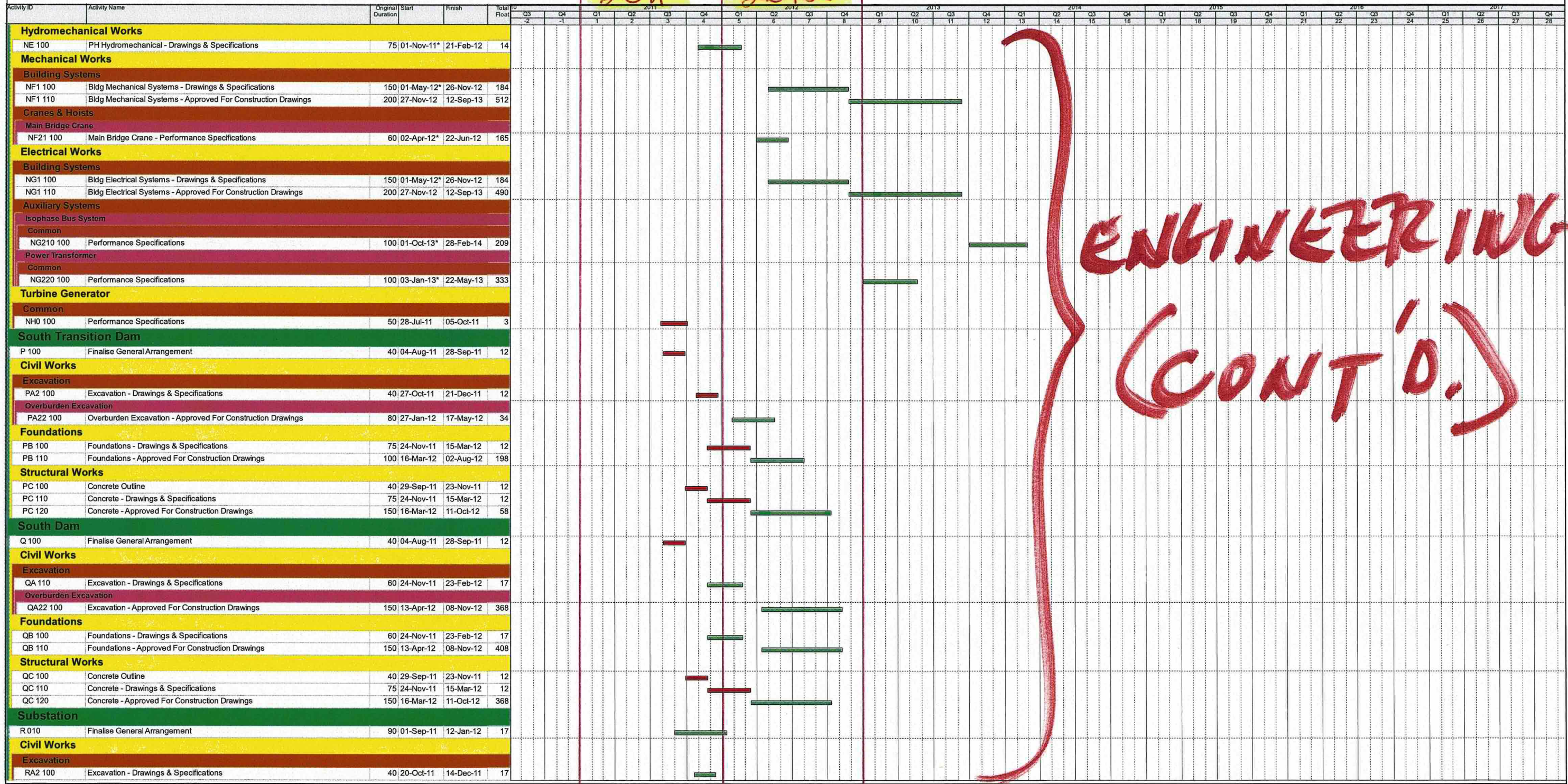
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Muskrat Falls Hydroelectric Project
MF1340 Schedule By EPC Rev 1



ENGINEERING
(CONT'D.)

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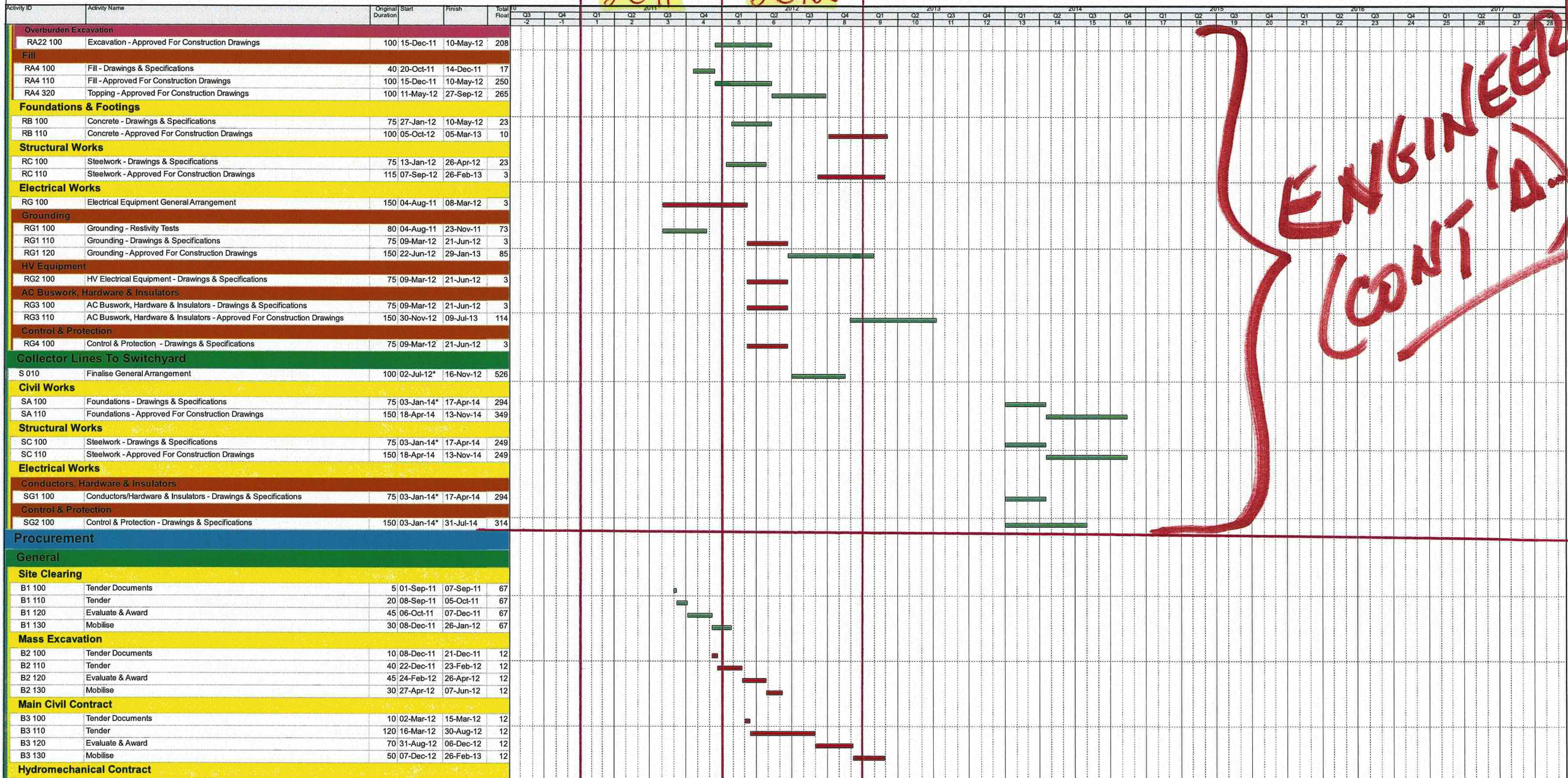
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Muskrat Falls Hydroelectric Project
MF1340 Schedule By EPC Rev 1

2011 2012



ENGINEERING (CONT'D)

█ Remaining Level of Effort █ Critical Remaining Work
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