

2014 FRA Rail Program Delivery



Scheduling 101

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Scheduling 101

FRA Monitoring Procedures references:

- **MP 01 – MTAC Administrative Conditions and Requirements**
- **MP 20 – Project Management Plan (PMP) Review**
- **MP 23 – Real Estate Acquisition and Management Plan Review**
- **MP 33 – Capital Cost Estimate Review**
- **MP 34 – Project Schedule Review**
- **MP 40 – Risk and Contingency Review**

Common Scheduling Rules

- *The first 90% of a project takes 90% of the time. The last 10% takes the other 90%.*
- *A badly planned project will take three times longer than expected. A well planned project only twice as long as expected.*
- *Schedules are made to be broken.*

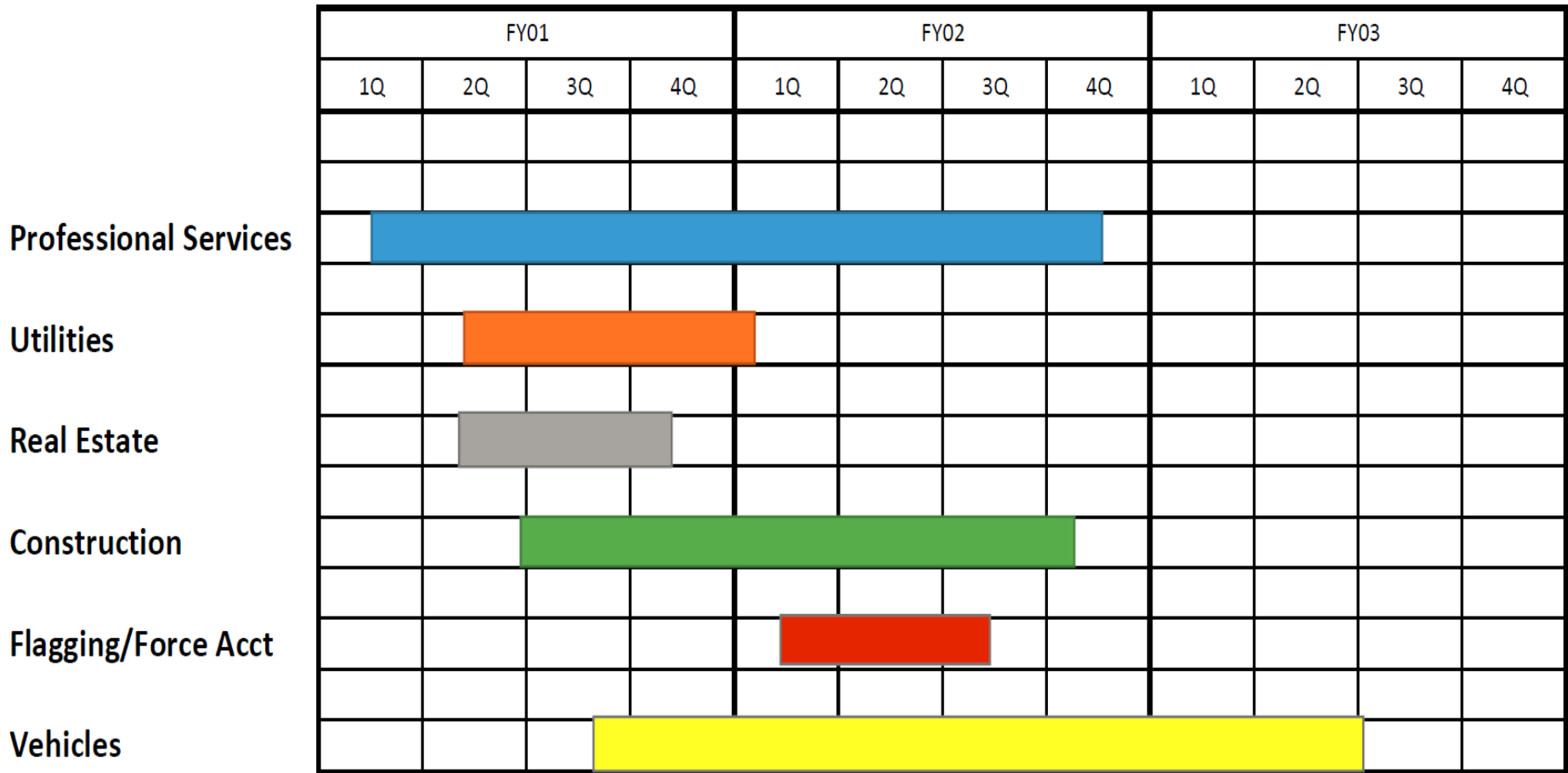
Why Scheduling?

- **Management**
- **Communication**
- **Coordination**
- **Monitoring**
- **Mitigation**

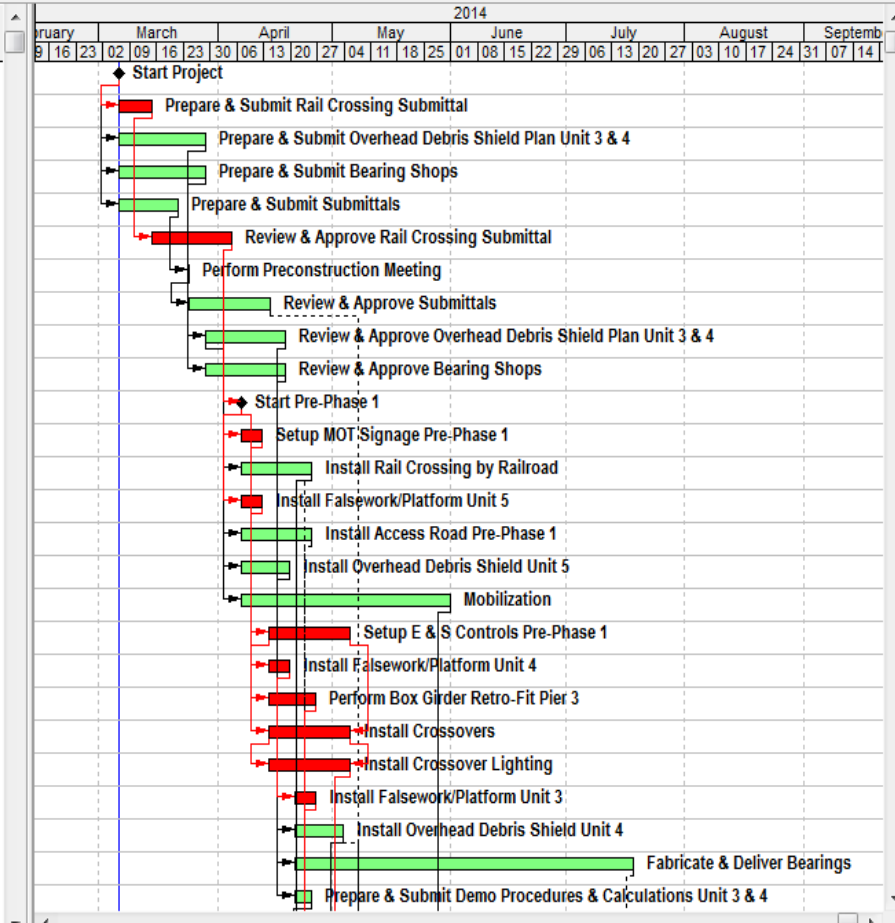
Two Common Schedules Types

- **Bar Chart**
- **Critical Path Method**

BAR CHART Schedule



Layout: Classic Schedule Analysis		Filter: All Activities					
Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish	Total Float
A1000	Start Project	0	0	100%	06-Mar-14		0
A1010	Prepare & Submit Rail Crossing Submit	7	7	0%	06-Mar-14	14-Mar-14	0
A1022	Prepare & Submit Overhead Debris Shie	17	17	0%	06-Mar-14	28-Mar-14	5
A1030	Prepare & Submit Bearing Shops	17	17	0%	06-Mar-14	28-Mar-14	16
A1002	Prepare & Submit Submittals	12	12	0%	06-Mar-14	21-Mar-14	19
A1020	Review & Approve Rail Crossing Submi	21	21	0%	14-Mar-14	04-Apr-14	3
A1005	Perform Preconstruction Meeting	1	1	0%	24-Mar-14*	24-Mar-14	19
A1007	Review & Approve Submittals	21	21	0%	24-Mar-14	14-Apr-14	28
A1024	Review & Approve Overhead Debris Shi	21	21	0%	28-Mar-14	18-Apr-14	10
A1040	Review & Approve Bearing Shops	21	21	0%	28-Mar-14	18-Apr-14	25
B2000	Start Pre-Phase 1	0	0	0%	07-Apr-14		0
B2020	Setup MOT Signage Pre-Phase 1	4	4	0%	07-Apr-14	12-Apr-14	0
B2050	Install Rail Crossing by Railroad	15	15	0%	07-Apr-14	25-Apr-14	0
B2060	Install Falsework/Platform Unit 5	4	4	0%	07-Apr-14	12-Apr-14	0
B2040	Install Access Road Pre-Phase 1	13	13	0%	07-Apr-14	25-Apr-14	1
B2132	Install Overhead Debris Shield Unit 5	9	9	0%	07-Apr-14	19-Apr-14	5
B2010	Mobilization	37	37	0%	07-Apr-14	31-May-14	16
B2030	Setup E & S Controls Pre-Phase 1	16	16	0%	14-Apr-14	05-May-14	0
B2070	Install Falsework/Platform Unit 4	5	5	0%	14-Apr-14	19-Apr-14	0
B2110	Perform Box Girder Retro-Fit Pier 3	10	10	0%	14-Apr-14	26-Apr-14	0
B2140	Install Crossovers	16	16	0%	14-Apr-14	05-May-14	0
B2145	Install Crossover Lighting	16	16	0%	14-Apr-14	05-May-14	0
B2080	Install Falsework/Platform Unit 3	5	5	0%	21-Apr-14	26-Apr-14	0
B2134	Install Overhead Debris Shield Unit 4	10	10	0%	21-Apr-14	03-May-14	5
A1050	Fabricate & Deliver Bearings	63	63	0%	21-Apr-14	18-Jul-14	16
A1026	Prepare & Submit Demo Procedures & C	5	5	0%	21-Apr-14	25-Apr-14	19
A1028	Review & Approve Demo Procedures & C	21	21	0%	25-Apr-14	16-May-14	28



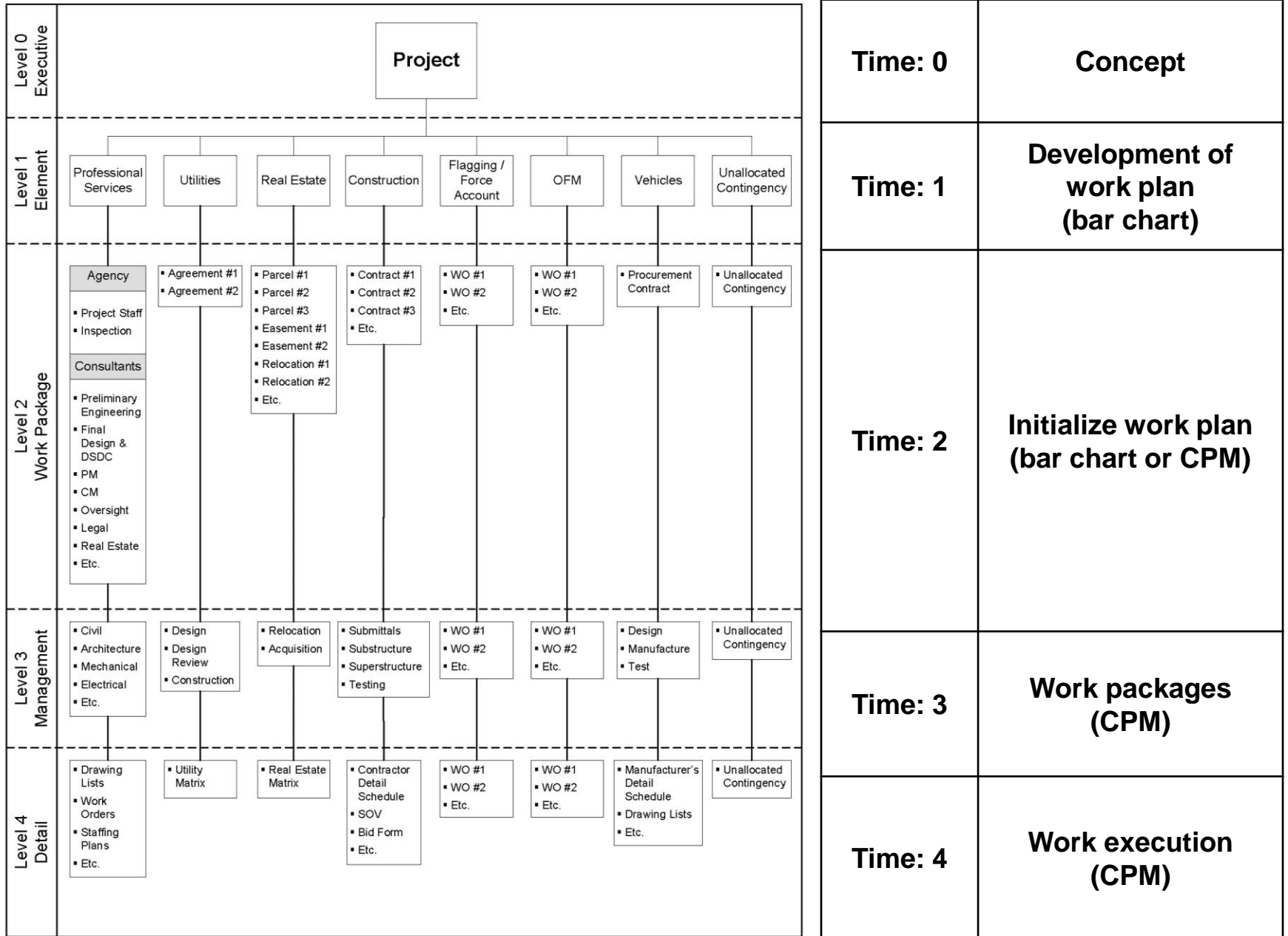
Predecessors		Successors					
Project ID	WBS	Activity ID	Activity Name	Relations	Lag	Activity Status	Primary Resou
1400372B	1400372B AB 1	B2060	Install Falsework/Platform Unit 5	FS	0	Not Started	
1400372B	1400372B AB 1	B2080	Install Falsework/Platform Unit 3	FS	0	Not Started	

CPM Schedule

Schedule Evolution / Refinement

- Planning/Conceptual – little detail & large contingency
- Preliminary Engineering – some detail & less contingency
- Final Design – more detail & some contingency
- Construction – most detail & small contingency

Work Breakdown Structure & Schedule



Within the Schedule

- **Activities (ID, description & duration)**
- **Logic relationships**
- **Calendars**
 - Weather, Environmental, Political
- **Resources (labor & equipment)**
- **Cost & Productivity**

Within the Schedule

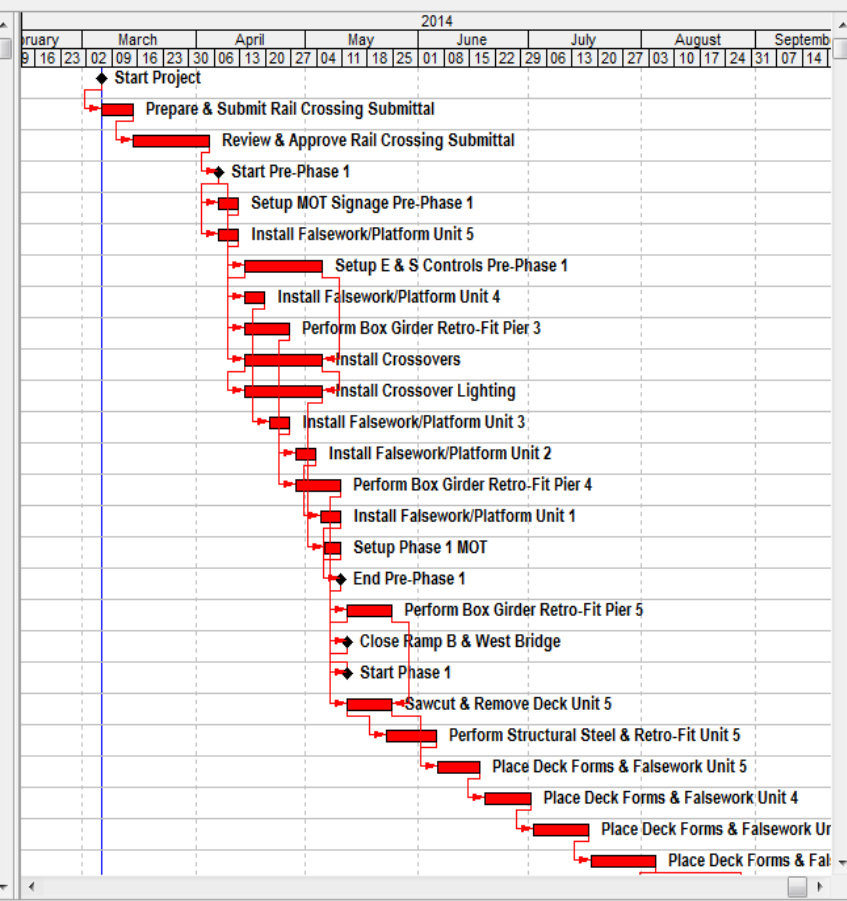
- **Critical path - earliest a project can be completed**
- **Near critical path**
- **Float**
 - Total Float
 - Positive / Negative float
 - Delays



Activities

Projects Activities

Layout: Classic Schedule Analysis		Filter All: Critical			Start	Finish	Total Float
Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete			
A1000	Start Project	0	0	100%	06-Mar-14		0
A1010	Prepare & Submit Rail Crossing Submit	7	7	0%	06-Mar-14	14-Mar-14	0
A1020	Review & Approve Rail Crossing Submit	21	21	0%	14-Mar-14	04-Apr-14	3
B2000	Start Pre-Phase 1	0	0	0%	07-Apr-14		0
B2020	Setup MOT Signage Pre-Phase 1	4	4	0%	07-Apr-14	12-Apr-14	0
B2060	Install Falsework/Platform Unit 5	4	4	0%	07-Apr-14	12-Apr-14	0
B2030	Setup E & S Controls Pre-Phase 1	16	16	0%	14-Apr-14	05-May-14	0
B2070	Install Falsework/Platform Unit 4	5	5	0%	14-Apr-14	19-Apr-14	0
B2110	Perform Box Girder Retro-Fit Pier 3	10	10	0%	14-Apr-14	26-Apr-14	0
B2140	Install Crossovers	16	16	0%	14-Apr-14	05-May-14	0
B2145	Install Crossover Lighting	16	16	0%	14-Apr-14	05-May-14	0
B2080	Install Falsework/Platform Unit 3	5	5	0%	21-Apr-14	26-Apr-14	0
B2090	Install Falsework/Platform Unit 2	5	5	0%	28-Apr-14	03-May-14	0
B2120	Perform Box Girder Retro-Fit Pier 4	10	10	0%	28-Apr-14	10-May-14	0
B2100	Install Falsework/Platform Unit 1	5	5	0%	05-May-14	10-May-14	0
B2150	Setup Phase 1 MOT	4	4	0%	06-May-14	10-May-14	0
B2170	End Pre-Phase 1	0	0	0%		10-May-14	0
B2130	Perform Box Girder Retro-Fit Pier 5	9	9	0%	12-May-14	24-May-14	0
C3005	Close Ramp B & West Bridge	0	0	0%	12-May-14		0
C3000	Start Phase 1	0	0	0%	12-May-14		0
C3020	Sawcut & Remove Deck Unit 5	9	9	0%	12-May-14	24-May-14	0
C3240	Perform Structural Steel & Retro-Fit Uni	9	9	0%	23-May-14	05-Jun-14	0
C3290	Place Deck Forms & Falsework Unit 5	8	8	0%	06-Jun-14	17-Jun-14	0
C3300	Place Deck Forms & Falsework Unit 4	10	10	0%	19-Jun-14	01-Jul-14	0
C3310	Place Deck Forms & Falsework Unit 2	11	11	0%	02-Jul-14	17-Jul-14	0
C3320	Place Deck Forms & Falsework Unit 3	13	13	0%	18-Jul-14	04-Aug-14	0
C3330	Place Deck Forms & Falsework Unit 1	14	14	0%	05-Aug-14	23-Aug-14	0



General Status Relationships Codes Resources

Activity: B2070 Install Falsework/Platform Unit 4 Project: 1400372B

Predecessors

Project ID	WBS	Activity ID	Activity Name	Relations	Lag	Activity Status	Primary Resou
1400372B	1400372B-AB-1-20000	B2060	Install Falsework/Platform Unit 5	FS	0	Not Started	

Successors

Project ID	WBS	Activity ID	Activity Name	Relations	Lag	Activity Status	Primary Resou
1400372B	1400372B-AB-1-20000	B2090	Install Falsework/Platform Unit 2	FS	0	Not Started	

CPM Schedule – Critical Path

Schedule Management

- **Review and Update**
 - Planning & Design – prefer monthly, no greater than quarterly
 - Construction - monthly

Schedule Management

- **Monitor Milestones & Completion Dates**
- **Coordination Elements**
 - Utilities
 - Real Estate
 - Procurement
 - Vehicles
 - Technology

Risk Management

- **Identify & evaluate potential & impact of schedule risks**
- **“What if” scenarios / solutions**
 - Material, labor, & equipment
 - Real estate
 - Other external forces

Risk Management

- **Summary v. Detailed Schedules**
- **Development of a schedule contingency to mitigate**
 - Controllable & non-controllable events

Summary

- **Management**
- **Communication tool**
- **Coordination**
- **Monitoring**
- **Mitigation**

