

CPM AND THE SUBMITTAL SCHEDULE

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WHAT IS A SUBMITTAL SCHEDULE?

- A list of submittals expected by the Owner. Or
- A group of activities within the CPM Schedule to track all submittals through their progression of preparation by the Contractor and approval by the Owner before the materials and/or equipment can be ordered, and how they affect the construction progress. Or
- A little bit of both



THE TERM “SCHEDULE” USED IN TYPICAL AIA SPECIFICATIONS

- Progress Schedule
- Wage Rate Schedule
- Bid Schedule
- Equipment Schedule
- Schedule of Values
- Meeting Schedule
- Delivery Schedule
- Fabrication Schedule
- Submittal Schedule
- Finish Schedule
- Shut-Down Schedule
- Unit Prices Schedule
- QA/QC Schedule
- Parts Lists (within Shop Drawings)
- HVAC Equipment Schedule
- Implementation & Termination Schedule
- Schedule of Maintenance Material Items
- Maintenance & Service Schedule
- Close-Out Schedule
- Instructional, Demonstration & Training Schedule
- Administration Schedule & Forms
- Schedule of Principal Product
- Schedule of Air Samples (Abatement)
- Paint Schedule
- Door Schedule
- Panel Schedule
- SWPPP Schedule
- And on, and on, and on.....



“SCHEDULE” IS DEFINED AS:

1. a plan of procedure, usually written, for a proposed objective, especially with reference to the sequence of and time allotted for each item or operation necessary to its completion: *The schedule allows three weeks for this stage.*
2. a series of things to be done or of events to occur at or during a particular time or period: *He always has a full schedule.*
3. a timetable.
4. a written or printed statement of details, often in classified or tabular form, especially one forming an appendix or explanatory addition to another document.
5. *Obsolete* . a written paper.



WORLD ENGLISH DICTIONARY

SCHEDULE ('ΣɛDJU:l, (ESP US) 'SKɛDʒʊəl)

-noun

1. a plan of procedure for a project, allotting the work to be done and the time for it
2. a list of items: *a schedule of fixed prices*
3. a list of times, esp of arrivals and departures; timetable
4. a list of tasks to be performed, esp within a set period
5. *law* a list or inventory, usually supplementary to a contract, will, etc
6. **on schedule** at the expected or planned time

-verb

- to make a schedule of or place in a schedule
- to plan to occur at a certain time

[C14: earlier *cedule*, *sedule* via Old French from Late Latin *schedula* small piece of paper, from Latin *scheda* sheet of paper]

Word Origin & History

schedule

1397, *sedule*, *cedule* "ticket, label, slip of paper with writing on it," from O.Fr. *cedule*, from L.L. *schedula* "strip of paper," dim. of L. *schida* "one of the strips forming a papyrus sheet," from Gk. *skhida* "splinter," From stem of *skhizein* "to cleave, split" (see *shed* (v.)

<http://www.thefreedictionary.com/schedule>



WHAT DOES A CPM SUBMITTAL SCHEDULE LOOK FOR?

- The submittal process is progressing and all required submittals are being forwarded for review in a timely manner.
- The Owner's Representatives are processing and approving submittals in a timely manner in order to allow the materials and equipment to be ordered, purchased, and delivered to the project site
- The key materials and equipment required to build the project will be ordered, fabricated, and delivered without impacting the CPM Schedule



WHO IS RESPONSIBLE FOR SUBMITTALS

- The Contractor is ultimately responsible for the timely submittal process
- However, Owners, Architects, and Engineers need to be responsible for assisting the Contractor in Timely review, rejection, and resubmittal Process
- The Project Team needs to work together to ensure the Submittal Process DOES NOT IMPACT the Construction Progress



TEAMWORK

- Many times Teamwork and Cooperation cease to exist when dealing with Submittals & Schedules
 - Contractors fail to review submittals often wasting the Architectural Team's time with submittals not meeting the specification requirements
 - Architectural Teams let nearly all of the Review Period pass before starting the review, losing valuable time if Resubmittal is Required.
 - Requests for Information, Responses, and Rejected Submittals sent on a Friday via slow delivery instead of sending email, fax, or even a courtesy phone call



SUBMITTAL:

TO PRESENT FOR THE APPROVAL, CONSIDERATION, OR DECISION OF ANOTHER OR OTHERS:

Typical Submittals

- Product Data
- Shop Drawings
- Samples
- Qualifications
- Certifications
- Maintenance Recommendations
- Design/Calculations
- Working Drawings
- Mix Designs
- Test Reports
- LEED Documentation
- Manufacturer's Instructions
- Etc.

Deferred Submittals

- Curtain Walls
- Stairs
- Trusses
- Fire Sprinkler Systems
- Elevators & Lifts
- Etc.



CRITICAL SUBMITTALS

- The use of the terms “critical” or “non-critical” within the submittal schedule becomes confusing when dealing with CPM
- Instead prioritize the submittals:
 - **High**
 - High priority submittals either on or will affect the Critical Path
 - needed in the beginning of the project
 - Have extremely long lead time
 - **Medium**
 - Medium priority submittals are not on the critical path, but are needed in the near future
 - **Low**
 - Low priority submittals are not needed until later in the project (finishes)
- Submittal Priority can be separated and sorted by using activity codes



SUBMITTAL ACTIVITIES

My Typical Submittal Activities

- Prepare
- Review & Approval
- Fabrication and/or Order
- Delivery (\$)

Additional Submittal Activities

- Resubmittals
- GC Review Between Submittal & Returns
- Shipping (Travel Time)
- Additional Review & Approval for Deferred Submittals



NUMBER OF ACTIVITIES

Submittals:

- Product Data
- Shop Drawings
- Samples

Activities for Each Submittal:

- Prepare
- Review & Approve
- Fabrication/Order
- Delivery

16-23 CSI Divisions

12 Submittals per Section

132 Typical Sections

1584 Submittal Schedule Activities



SUBMITTAL SCHEDULE

Definition 5: a list or inventory, usually supplementary to a contract, will, etc

- List all required submittals in every section in separate software (Excel, Oracle Contract [Expedition], Word, etc.)
- Track all submittals for what is required by the subcontractor, submitted for review, and when approved. Also track resubmittals easily until full approval by the Architect/Engineer.
- Review All Specified Submittals with the Architect/Engineer in order to eliminate non-applicable submittals listed in the specifications.



SUBMITTAL SCHEDULE ACTIVITIES

Definition 4: a list of tasks to be performed, esp within a set period - or Part of CMP Schedule

- Group submittals within a specified section together and create schedule activities within the CPM to tie into the Project Schedule
- Create additional submittal groups within the same specification section for specific material/equipment you wish to track (e.g. Kitchen Equipment and Walk-In Coolers)
- Optional Order/Delivery Activities if the materials are readily available and can be picked up or delivered within a short period. (within 1-2 weeks)

16-23 CSI Divisions

1 Submittal per Section

132 Typical Sections

528 Submittal Schedule Activities



GROUPING ACTIVITIES WITHIN A SECTION

Instead of 3 Separate Activities

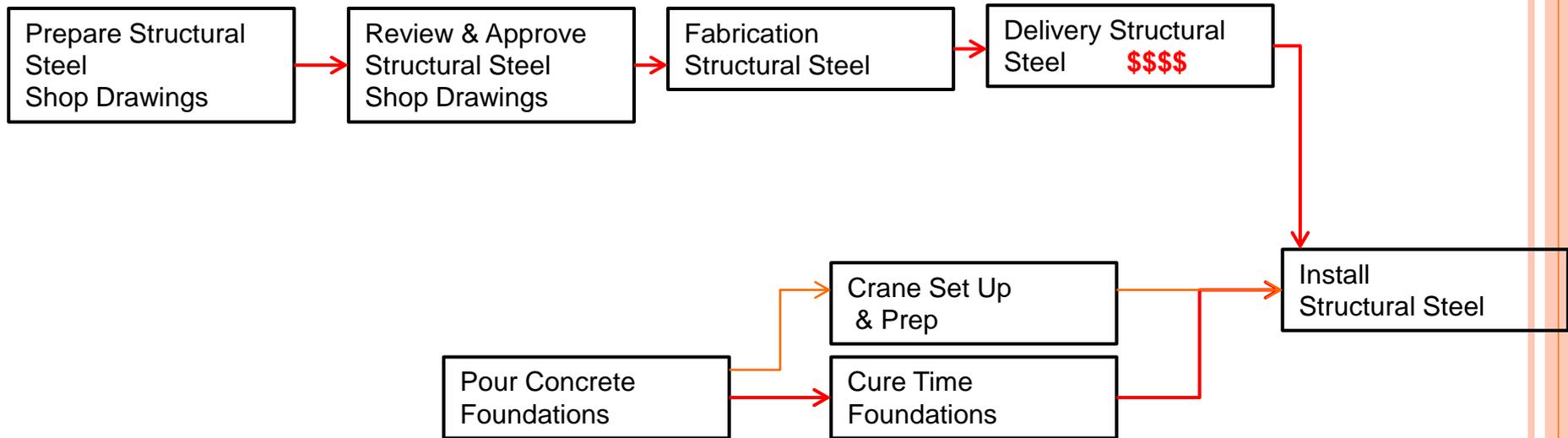
- Prepare CMU Product Data
- Prepare CMU Shop Drawings
- Prepare CMU Samples

Create a Single Activity

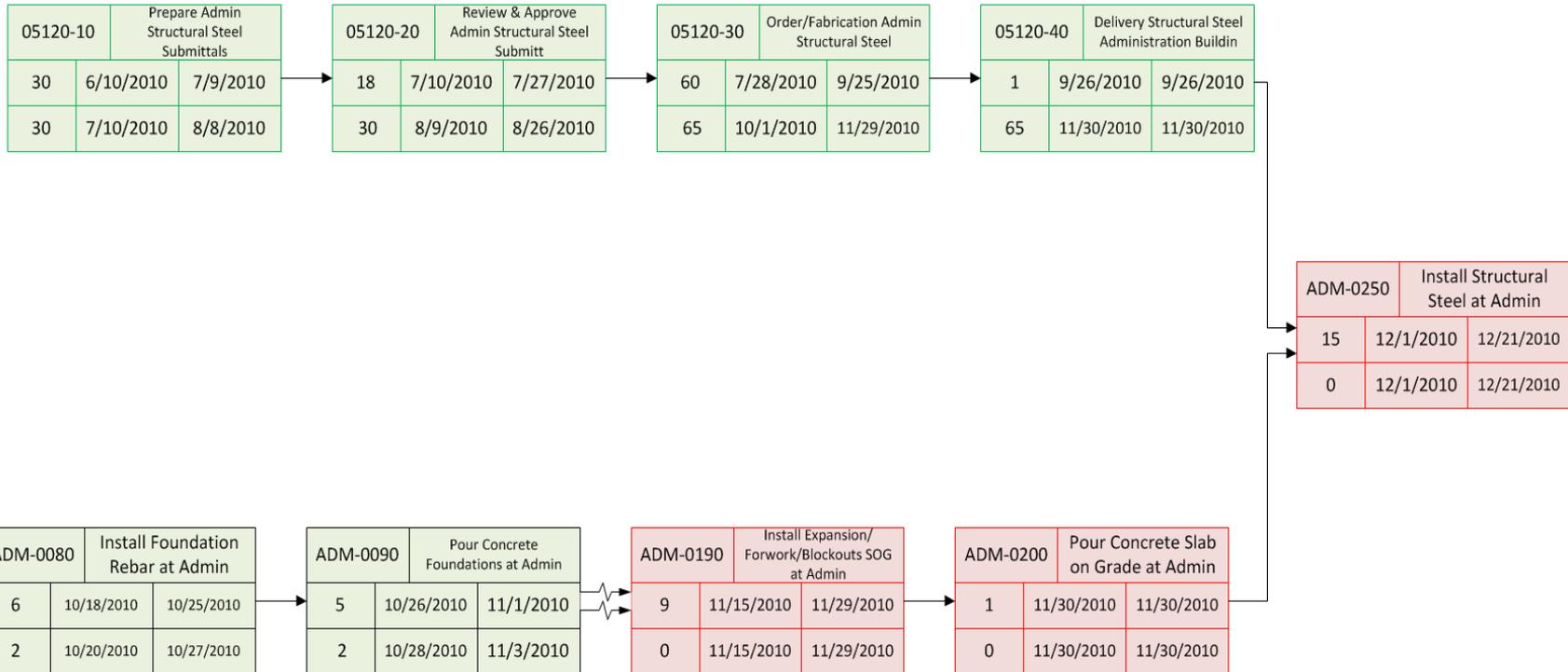
- Prepare CMU Submittals



SUBMITTALS TIED TO CPM



BASELINE SCHEDULE



Activity ID	Activity Description	
OD	ES	EF
TF	LS	LF



COST LOADING SUBMITTAL ACTIVITIES

- Specifications often prohibit cost loading submittal activities including:
 - Creation of Shop Drawings
 - Engineering Costs
 - Administration Costs
 - Production Costs
- However, many specifications allow for the payment of Material and/or Equipment when Delivered to the Project under Special Conditions



DELIVERY ACTIVITIES

- Have a Single Day Activity for the Delivery of Materials and/or Equipment that can hold the costs associated and allow the Contractor to Bill for the Materials and/or Equipment

Example:

Activity:	Cost:
Prepare Structural Steel Shop Drawings & Submittals	\$0
Review & Approve Structural Steel Shop Drawings & Submittals	\$0
Fabrication Structural Steel	\$0
Delivery Structural Steel	\$835,250



TIMING OF DELIVERIES

- Best to have Just in Time (JIT) deliveries
- Some long lead items may need to be delivered early and stored on site or a close by storage facility
- Drywall or other large materials and/or equipment should be delivered before closing up of the building or large open spaces
- Link your deliveries to the CPM activities when you need them and when delivery can be accepted



ALLOW FOR RESUBMITTALS?

- What if a Submittal is Rejected, Sent Back for Corrections, and Required to be Resubmitted?
 - What is the Time Impact to the Delivery and Installation?
 - Can the Engineer work out a resolution with a phone call or face-to-face meeting with the Subcontractor?
 - How much time will be lost on a High Priority Submittal from Rejection to Make Corrections to New Review to Final Approval
 - Can fabrication begin or is it halted?



DEFERRED APPROVAL BY A GOVERNMENT AGENCY

- Required Approval from Agency as a process of the Building Permit
 - Is it required to be approved by the Architect/Engineer prior to submittal to the Agency?
 - How to estimate the OD for a Government Agency
 - DSA – Specs state 6 weeks,
 - Personal Experience Minimum 8-12 weeks



DSA APPROVAL CURTAIN WALLS

469 Days for Final DSA Approval

Act ID		Act Description			
08411-10		Prepare Aluminum windows, doors & frames Submitt			
OD	RD	AD	%	TF	Baseline-TF
25	0	39	100		0
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
8/27/2010	9/20/2010	8/27/2010	9/20/2010		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
27AUG10A	04OCT10A	27AUG10A	04OCT10A		

Act ID		Act Description			
08411-20		R/A Aluminum windows, doors and frames Submittal			
OD	RD	AD	%	TF	Baseline-TF
18	0	45	100		0
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
9/21/2010	10/8/2010	9/21/2010	10/8/2010		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
04OCT10A	17NOV10A	04OCT10A	17NOV10A		

Act ID		Act Description			
08411-20		DSA Review/Approve Curtain Walls			
OD	RD	AD	%	TF	Baseline-TF
90	0	469	100		276
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
10/9/2010	1/6/2011	7/12/2011	10/9/2011		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
04NOV10A	15FEB12A	04NOV10A	15FEB12A		

Act ID		Act Description			
08411-30		Order/Fabrication Aluminum windows, doors & fram			
OD	RD	AD	%	TF	Baseline-TF
60	0	175		100	152
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
4/3/2011	5/30/2011	8/31/2011	10/29/2011		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
11MAR11A	01SEP11A	11MAR11A	01SEP11A		

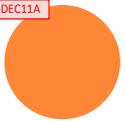
Act ID		Act Description			
08411-40		Delivery Aluminum windows, doors and frames			
OD	RD	AD	%	TF	Baseline-TF
1	0	1	100		152
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
5/31/2011	5/31/2011	10/30/2011	10/30/2011		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
09OCT11A	09OCT11A	09OCT11A	09OCT11A		

Act ID		Act Description			
ADME-3013		Install Curtain Walls & Glazing East Elev			
OD	RD	AD	%	TF	Baseline-TF
8	0	2	100		59
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
8/9/2011	8/18/2011	11/1/2011	11/10/2011		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
20DEC11A	21DEC11A	20DEC11A	21DEC11A		

Act ID		Act Description			
ADMN-3013		Install Curtain Walls & Glazing North Ext Wall			
OD	RD	AD	%	TF	Baseline-TF
15	0	15	100		43
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
8/9/2011	8/29/2011	10/10/2011	10/28/2011		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
30NOV11A	20DEC11A	30NOV11A	20DEC11A		

Act ID		Act Description			
ADMS-3013		Install Curtain Walls & Glazing South Ext Wall			
OD	RD	AD	%	TF	Baseline-TF
12	0	2	100		52
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
8/9/2011	8/24/2011	10/21/2011	11/7/2011		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
20DEC11A	21DEC11A	20DEC11A	21DEC11A		

Act ID		Act Description			
ADMW-3013		Install Curtain Walls & Glazing West Ext Wall			
OD	RD	AD	%	TF	Baseline-TF
6	0	4	100		58
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Late Start	Late Finish		
8/9/2011	8/16/2011	10/31/2011	11/7/2011		
Current	Current	Current	Current	Current	Current
Early Start	Early Finish	Late Start	Late Finish		
19DEC11A	22DEC11A	19DEC11A	22DEC11A		



SCHEDULE MAINTENANCE

- Provide Actual Dates when All Submittals within a Group are actually started/finished.
- Provide the remaining duration for Review activities using the remaining time allowed in the specification.
 - If the specified review period is 18 days and the Architect/Engineer has had the submittal for 15 days –
RD = 3 Days
- Do Not Shorten Order/Fabrication activities in order to reduce negative float
 - Negative Float in Submittal Activities should be Lights & Sirens for the Project Team



SCHEDULE UPDATE WITH SUBMITTALS IN TROUBLE

Data Date: 01JUN12

Act ID		Act Description				
064100-10		Prepare Architectural Wood Casework Submittals				
CO	RD	AD	%	TF	Baseline	TF
30	0	97	100		49	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
1/3/2012	2/13/2012	3/12/2012	4/20/2012			
Current	Current	Current	Current	Current	Current	Current
03JAN12A	16MAY12A	03JAN12A	16MAY12A			

Act ID		Act Description				
064100-20		Review/Approve Architectural Wood Casework Submittals				
CO	RD	AD	%	TF	Baseline	TF
15	15	30		-28	49	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
2/14/2012	3/5/2012	4/23/2012	5/1/2012			
Current	Current	Current	Current	Current	Current	Current
17MAY12A	21JUN12	17MAY12A	11MAY12			

Act ID		Act Description				
064100-30		Order Architectural Wood Casework				
CO	RD	AD	%	TF	Baseline	TF
30	30	0	0	-28	49	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
3/6/2012	4/16/2012	5/14/2012	6/25/2012			
Current	Current	Current	Current	Current	Current	Current
22JUN12	03AUG12	18MAY12	25JUN12			

Act ID		Act Description				
064100-40		Delivery Architectural Wood Casework				
CO	RD	AD	%	TF	Baseline	TF
1	1	0	0	-28	49	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
4/17/2012	4/17/2012	6/26/2012	6/26/2012			
Current	Current	Current	Current	Current	Current	Current
06AUG12	06AUG12	26JUN12	26JUN12			

Act ID		Act Description				
064150-10		Prepare Countertops Submittals				
CO	RD	AD	%	TF	Baseline	TF
30	0	97	100		49	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
1/3/2012	2/13/2012	3/12/2012	4/20/2012			
Current	Current	Current	Current	Current	Current	Current
03JAN12A	16MAY12A	03JAN12A	16MAY12A			

Act ID		Act Description				
064150-20		Review/Approve Countertops Submittals				
CO	RD	AD	%	TF	Baseline	TF
15	15	30	0	-28	49	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
2/14/2012	3/5/2012	4/23/2012	5/1/2012			
Current	Current	Current	Current	Current	Current	Current
17MAY12A	21JUN12	17MAY12A	11MAY12			

Act ID		Act Description				
064150-30		Order Countertops				
CO	RD	AD	%	TF	Baseline	TF
30	30	0	0	-28	49	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
3/6/2012	4/16/2012	5/14/2012	6/25/2012			
Current	Current	Current	Current	Current	Current	Current
22JUN12	03AUG12	18MAY12	25JUN12			

Act ID		Act Description				
064150-40		Delivery Countertops				
CO	RD	AD	%	TF	Baseline	TF
1	1	0	0	-28	49	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
4/17/2012	4/17/2012	6/26/2012	6/26/2012			
Current	Current	Current	Current	Current	Current	Current
06AUG12	06AUG12	26JUN12	26JUN12			

Act ID		Act Description				
1102-005		Install Drywall Rooms 102				
CO	RD	AD	%	TF	Baseline	TF
6	6	0	0	-9	0	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
5/4/2012	5/11/2012	5/4/2012	5/11/2012			
Current	Current	Current	Current	Current	Current	Current
05JUN12	12JUN12	22MAY12	30MAY12			

Act ID		Act Description				
1102-006		Tape & Finish Drywall Rooms 102				
CO	RD	AD	%	TF	Baseline	TF
8	8	0	0	-4	17	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
5/14/2012	5/23/2012	6/7/2012	6/12/2012			
Current	Current	Current	Current	Current	Current	Current
13JUN12	22JUN12	07JUN12	18JUN12			

Act ID		Act Description				
1102-007		Interior Painting Rooms 102				
CO	RD	AD	%	TF	Baseline	TF
3	3	0	0	-4	17	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
5/24/2012	5/29/2012	6/19/2012	6/21/2012			
Current	Current	Current	Current	Current	Current	Current
25JUN12	27JUN12	19JUN12	21JUN12			

Act ID		Act Description				
1102-008		Install Ceiling Grid Rooms 102				
CO	RD	AD	%	TF	Baseline	TF
3	3	0	0	-9	0	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
6/22/2012	6/26/2012	6/22/2012	6/26/2012			
Current	Current	Current	Current	Current	Current	Current
06AUG12	10AUG12	22JUN12	26JUN12			

Act ID		Act Description				
1102-012		Drop Ceiling Tiles Rooms 102				
CO	RD	AD	%	TF	Baseline	TF
2	2	0	0	-4	5	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
7/2/2012	7/3/2012	7/30/2012	7/11/2012			
Current	Current	Current	Current	Current	Current	Current
16JUL12	17JUL12	10JUL12	11JUL12			

Act ID		Act Description				
1102-013		Install Casework/Milwork Rm 102				
CO	RD	AD	%	TF	Baseline	TF
3	3	0	0	-18	5	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
7/5/2012	7/9/2012	7/12/2012	7/16/2012			
Current	Current	Current	Current	Current	Current	Current
07AUG12	09AUG12	12JUL12	16JUL12			

Act ID		Act Description				
1109-005		Install Drywall Rooms 109				
CO	RD	AD	%	TF	Baseline	TF
6	6	0	0	-9	0	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
4/18/2012	4/25/2012	4/18/2012	4/26/2012			
Current	Current	Current	Current	Current	Current	Current
06JUN12	11JUN12	21MAY12	29MAY12			

Act ID		Act Description				
1109-006		Tape & Finish Drywall Rooms 109				
CO	RD	AD	%	TF	Baseline	TF
8	8	0	0	-9	21	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
4/26/2012	5/7/2012	5/16/2012	6/26/2012			
Current	Current	Current	Current	Current	Current	Current
12JUN12	21JUN12	30MAY12	08JUN12			

Act ID		Act Description				
1109-007		Interior Painting Rooms 109				
CO	RD	AD	%	TF	Baseline	TF
3	3	0	0	-9	21	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
5/8/2012	5/10/2012	6/11/2012	6/13/2012			
Current	Current	Current	Current	Current	Current	Current
22JUN12	26JUN12	11JUN12	13JUN12			

Act ID		Act Description				
1109-008		Install Ceiling Grid Rooms 109				
CO	RD	AD	%	TF	Baseline	TF
3	3	0	0	-9	0	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
6/14/2012	6/18/2012	6/14/2012	6/18/2012			
Current	Current	Current	Current	Current	Current	Current
27JUN12	29JUN12	14JUN12	16JUN12			

Act ID		Act Description				
1109-012		Drop Ceiling Tiles Rooms 109				
CO	RD	AD	%	TF	Baseline	TF
2	2	0	0	-4	5	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
6/22/2012	6/25/2012	6/29/2012	7/2/2012			
Current	Current	Current	Current	Current	Current	Current
06JUL12	09JUL12	29JUN12	02JUL12			

Act ID		Act Description				
1109-013		Install Casework/Milwork Rm 109				
CO	RD	AD	%	TF	Baseline	TF
3	3	0	0	-24	5	
Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Early Start	Early Finish	Early Start	Early Finish	Early Start	Early Finish	Early Start
6/26/2012	6/28/2012	7/3/2012	7/6/2012			
Current	Current	Current	Current	Current	Current	Current
07AUG12	09AUG12	03JUL12	06JUL12			



CHANGE ORDERS

- Include the submittal process and delivery of newly required materials/equipment in your fragments in order to demonstrate additional time that may be needed for delivery and how it may affect the overall project and critical path.



COST PROJECTIONS & EARNED VALUE

- Using “Just in Time” Deliveries, how is your Earned Value and Projected Project Costs going to be reflected correctly?

- Metal Studs & Drywall Submittals Completed: • Day 92
- Order & Delivery for Metal Studs & Drywall: • 14 Days
- Desired Delivery – After Slab on Deck & Start Layout • Day 156
- Early Scheduled Delivery Variance • 50 Days

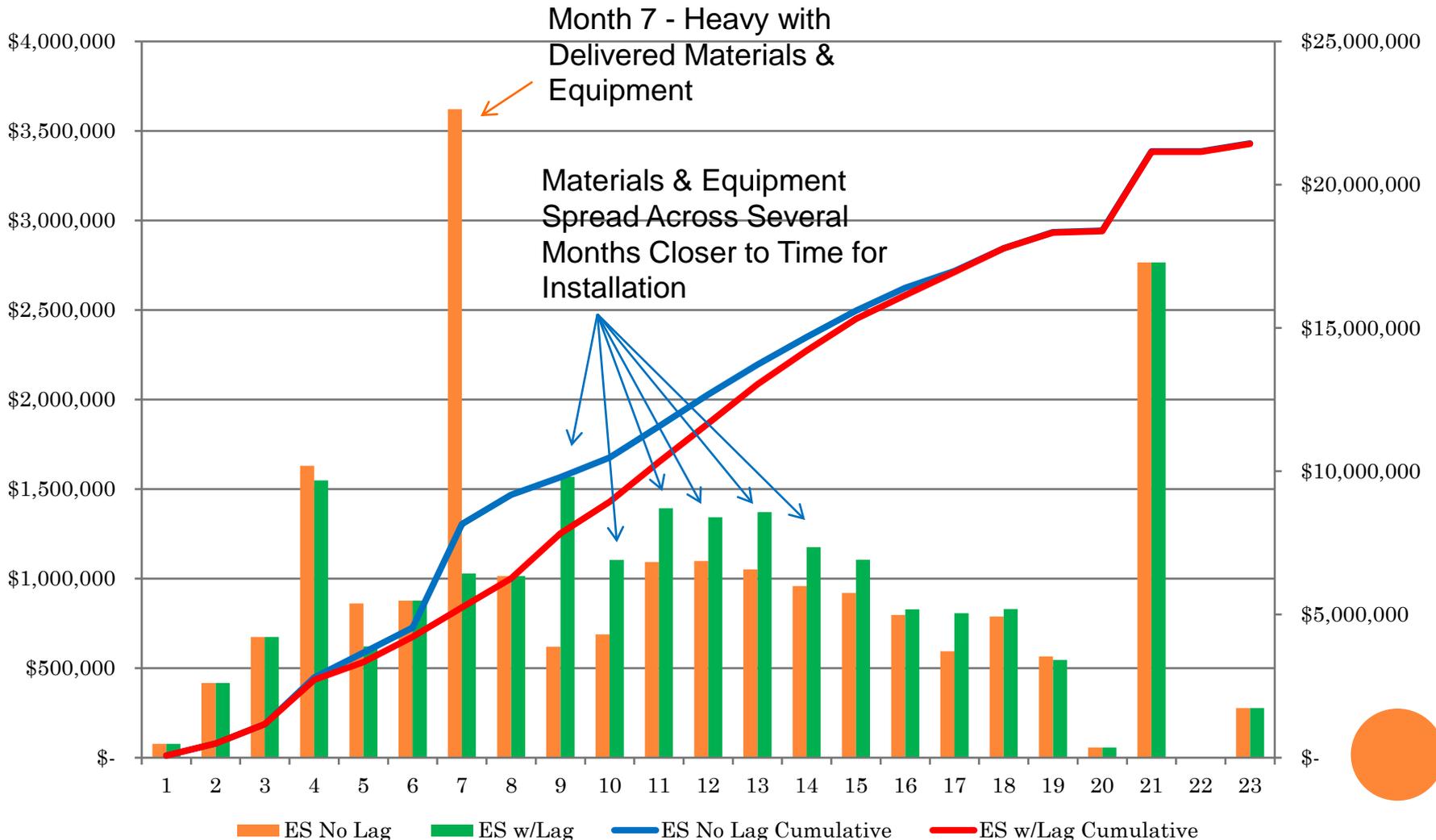


COST PROJECTIONS & EARNED VALUE

- Casework Submittals Complete: ○ Day 121
- Fabrication Casework ○ 60 Days
- Start Installation Casework ○ Day 271
- Early Delivery Variance: ○ 90 Days



COST PROJECTIONS & EARNED VALUE



COST PROJECTIONS & EARNED VALUE

Without Lag

- Order, Fabrication, and Delivery Activities are able to Start after the Submittals are Approved.
- Projected Cost and Earned Value figures are calculated on an Early Start that is Inaccurate because Delivery is indicated Months Earlier Than Actually Needed
- Projected Early Start Dates will remain on the Data Date during Schedule Maintenance; Extending when the Material and/or Equipment will be delivered and payment expected after Each Update

With Lag

- Order, Fabrication, and Delivery Activities wait to start until a date later in the project closer to when the Material and/or Equipment will be Actually Needed, but allowing realistic time needed for the fabrication & delivery.
- Projected Cost and Earned Value figures are calculated on more realistic dates of when the Material and/or Equipment will be delivered to the Project Site



HOW TO CREATE LAG?

Using a Lag in the Predecessor's Finish/Start Relationship

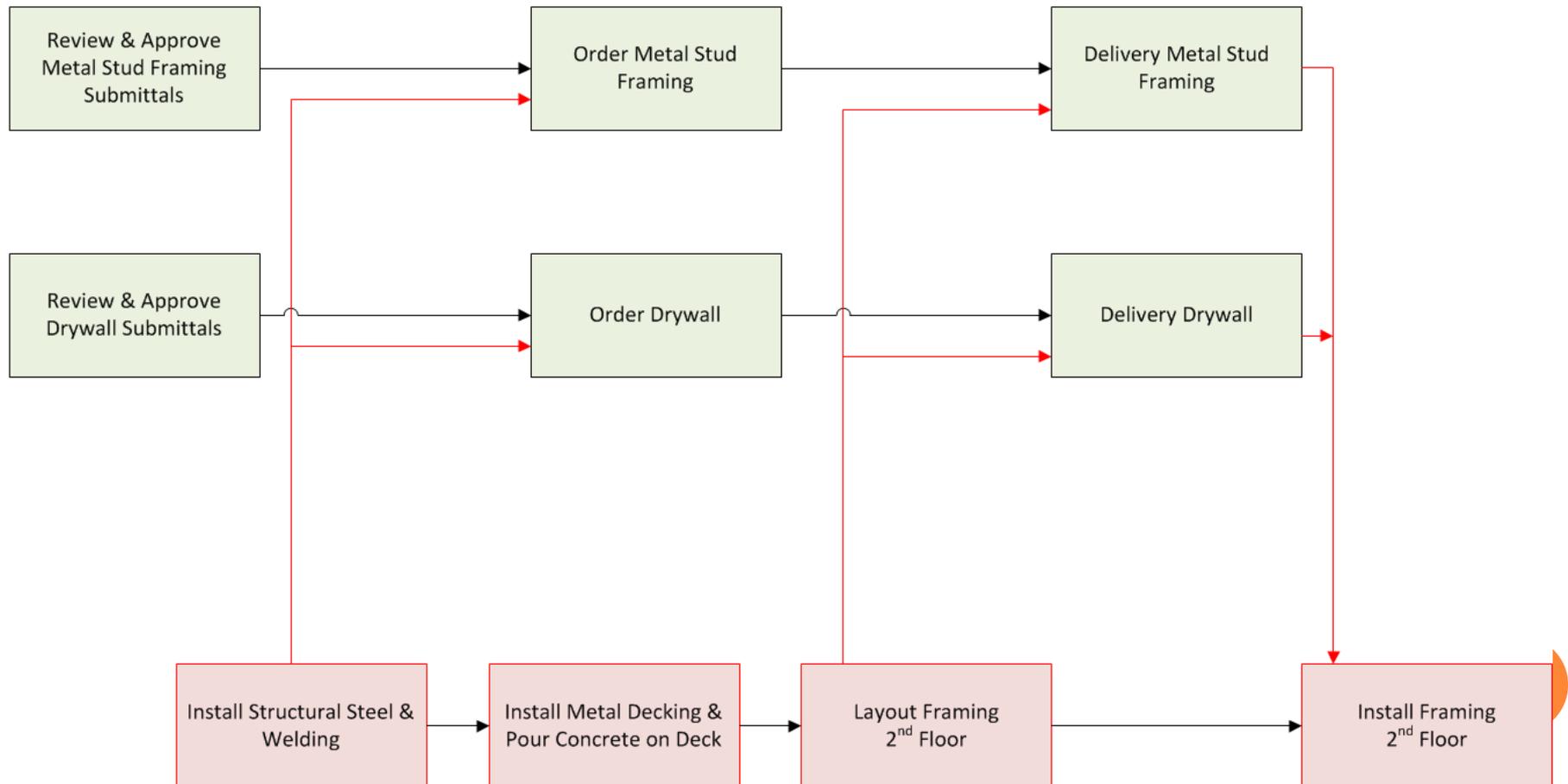
Predecessor	Successor	Type	Lag
Review & Approve Metal Stud Framing & Drywall Submittals	Order Delivery Metal Studs & Drywall	FS	+90

The Lag can be Adjusted During Schedule Maintenance in order to Reflect a Realistic Delivery Date



HOW TO CREATE LAG?

Using Logical Relationships When the Material and/or Equipment Will Be Ready for Delivery



IS THERE A RIGHT OR WRONG WAY?

That Would Depend on Who You Ask:

You would have 3 choices:

- Have no lag on the Fabrication/Order/Delivery activities and constantly have inaccurate Early Start dates, affecting both the material and/or equipment delivery dates and projected costs
- Create a lag within the relationship between the predecessor and successor activity giving what would be the best guess of the time between approval of the submittal and when the material and/or equipment should be ordered and delivered
- Create logic relationships between actual work activities and the Fabrication/Order/Delivery activities giving an approximate dates when material and/or equipment should be Ordered/Delivered depending on progress in the field



BEST PRACTICES

- Contractor should work to complete all submittals as early as possible (within the first 25% of the project duration)
- Remove ambiguous terminology that can be defined differently by different parties
- Prioritize submittals by when the materials and/or equipment are needed and the duration of the order/fabrication/delivery time
- Group submittals in the CPM by specification unless separate tracking is needed
- Be sure the schedule is not over-burdened with submittal activities in proportion to the actual work activities
- Track all submittals separately from the CPM in order to document the complete submittal process
- The Project Team should work together in ensuring all submittals are approved as early as possible to ensure materials & equipment are ordered/delivered so as to not impact the project
- Work with Subcontractors/Suppliers on Realistic Delivery Durations after Submittals are Approved
- Provide appropriate time for review of the submittals by the Architect/Engineer (or as specified)
- Cost loading of submittal schedule activities should be on Delivery Activities Only, preparation of submittals and administrative costs should not be loaded into preparation activities.
- Schedule maintenance should ensure Submittal activities are correctly tracked
- Do Not manipulate the delivery durations in order to reduce Negative Float.
- Negative Float on Submittal/Delivery Activities should Sound Off Alarms to the Project Team
- Once submittals are approved, Order/Fabrication/Delivery activities should be lagged in order to reflect a Realistic Cost Projection and Earned Value



QUESTIONS?

