Short Interval Production Schedule – Research

Background

Nationals Park has multiple highly repeatable tasks that can be scheduled as efficiently as possible by the development of a Short Interval Production Schedule (SIPS). SIPS is a highly detailed way to schedule a repetitive construction project. Many construction projects go over budget and over schedule due to poor detailed scheduling and with the use of a SIPS it can make sure the project gets completed on time and on budget.

A SIPS is developed to detail the necessary day-to-day production or task-to-task production during any repeatable construction project. It details scheduling at the crew level and must rely on exact information that is vital to the successful completion of any construction task. The most usefully cases where a SIPS can be beneficial is for a project that has many highly repeatable activities, such as apartments, hotels, office buildings and even schools. Typically, these projects will have a standardized interior floor or wing layout that makes the use of a SIPS desirable. The ballpark has just that with 58 of the same exact luxury suite. The interior build out of the suites will gain a great deal of scheduling time if SIPS was used to construct the luxury suites.

There are 3 main ideas that differentiate SIPS from any other standard scheduling methods:

- Only one major specific operation is detailed
- A higher level of detail is developed then typically seen
- There must be personnel involvement and commitment from everyone contributing to the operation

There are 5 steps that need to be taken to develop a SIPS:

1. Break the operation into specific activities
2. Assign production rates to each activity
3. Calculate extensions and set goals
4. Develop a time-scaled, resource loaded bar chart

The major benefits that will be seen throughout the project will only be achieved if every participant involved had at least a general understanding of the SIPS that will be utilized. The superintendents and the subcontractors must have firsthand knowledge of the minor details that will go into the construction of the building. The crew members must be given a very detailed schedule of the general building sequencing and time period the tasks needs to be completed before the job can even begin.

Burkhart, A. (1989). "The use of SIPS as a productivity improvement tool." Construction Congress 1989, Concrete Construction Publications, Inc. 381-386.

Problem Statement

Due to the repeatability of the 58 luxury suites, how can the use of a Short Interval Production Schedule benefit the completion of the ballpark?

Proposal

The development of a SIPS will have major time implications if it is properly designed and executed for the interior build out for the 58 luxury suites.

Methodology

There are 5 steps that need to be taken to develop a SIPS (Burkhart):

1. Break the operation into specific activities
2. Assign production rates to each activity

3. Calculate extensions and set goals
4. Develop a time-scaled, resource loaded bar chart

Step 1 – Break the operation into specific activities

The first step is to break the selected tasks into a list of activities that will be necessary to complete all of the work at hand. One great way to come up with activities is by sitting down with the all of the supervisors and have a brainstorming session about the order of tasks. This is the finishing sequence of the 58 luxury suites that was developed.

- Subroof
- GWB Framing
- Tie-in Conduit/Pull Wire
- Hang GWB Walls
- Paint Walls
- Acoustic Ceiling Grid
- GWB Ceiling Framing
- GWB Ceilings
- Light Fixtures and MEP Drops
- Millwork
- Plumbing Fixtures
- Flooring
- Doors and Architectural Trim
- Toilet Accessories
- Finish Painting and Wall Covering
- Ceiling Pads
- MEP Devices
- FF & E

Step 2 – Assign production rates to each activity

Assigning the right production rate to each activity is the most important and difficult step to complete properly. As seen on the this page, each task is broken into manageable groups and each production rate is assigned to each individual activity. Grouping of the activities was necessary to make sure each task would fit well into allotted time constraint of a 2 day activity group.

Production Rates				
ID	Interior Buildout	# days to complete 10 Suites	# of days to complete 1 suite	# of suites completed per day
1	Subroof	5	0.5	2
	GWB Framing	15	1.5	0.666667
2	Suite Exterior Slider System	15	1.5	0.666667
	Tie-in Conduit/Pull Wire	5	0.5	2
3	Hang GWB Walls	10	1	1
	Paint Walls	5	0.5	2
	Acoustic Ceiling Grid	5	0.5	2
4	GWB Ceiling Framing	5	0.5	2
	GWB Ceilings	5	0.5	2
	Light Fixtures and MEP Drops	10	1	1
5	Millwork	15	1.5	0.666667
	Plumbing Fixtures	5	0.5	2
6	Flooring	10	1	1
	Doors and Architectural Trim	5	0.5	2
	Toilet Accessories	5	0.5	2
7	Finish Painting and Wall Covering	5	0.5	2
	Ceiling Pads	5	0.5	2
	MEP Devices	5	0.5	2
	FF & E	5	0.5	2

Step 3 – Calculate extensions and set goals

This is the step were you try to figure out any setbacks that might occur throughout the construction of the suites. Because this is being done in the beginning of the suites scheduling process there are no unforeseen setbacks currently. It is important however to brainstorm any unanticipated incidents because it can help serve as a guideline giving you ideas about what to look out for during the installation process.

Step 5 – Develop a time-scaled, resource loaded bar chart

This is the last step in the development of a SIPS. This is where you take all of the information that you have gathered in the previous steps and combine it to create your Short Interval Production Schedule. Below is a sample of the SIPS that was developed for the interior suites build out. The more detail and complete schedule can be found in appendix C.

Level	Zone	Area	Room Number	Room Name	Month 1																	
					Week 1					Week 2					Week 3					Week 4					
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3	B	2	3.22.04	Suite 1	1		2		3		4		5		6		7							
3	B	2	3.24.01	Suite 2			1		2		3		4		5		6		7					
3	B	2	3.24.04	Suite 3					1		2		3		4		5		6		7			
3	B	2	3.26.01	Suite 4							1		2		3		4		5		6		7	
3	B	2	3.26.04	Suite 5									1		2		3		4		5		6	
3	B	3	3.28.01	Suite 6											1		2		3		4		5	
3	C	3	3.31.02	Suite 7													1		2		3		4	
3	C	3	3.33.01	Suite 8															1		2		3	
3	C	3	3.33.04	Suite 9																	1		2	
3	C	3	3.34.01	Suite 10																			1	
3	C	3	3.35.01	Suite 11																				
3	C	3	3.36.01	Suite 12																				
3	C	3	3.36.04	Suite 13																				

Conclusion and Recommendation

After the development of the SIPS for the interior suites it was discovered that it will only take the suites a total of 123 days to complete the interior build out. The project schedule gave the suites 157 days to complete the entire suites. That is a saving of 34 important days that can be saved due to the repeatability of the suites as well as the very detailed scheduling that occurred. Since many construction projects go over budget and over schedule due to poor detailed scheduling and SIPS will not only help keep it on schedule it can also help reduce the overall time that a activity can take due to the high level of detail and repetition that can occur.

Appendix C

Detailed Short Interval Production Schedule

Level	Zone	Area	Room Number	Room Name	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6				Month 7	
					Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26
3	B	2	3.22.04	Suite 1	1 2 3 4 5 6 7																									
3	B	2	3.24.01	Suite 2	1 2 3 4 5 6 7																									
3	B	2	3.24.04	Suite 3	1 2 3 4 5 6 7																									
3	B	2	3.26.01	Suite 4	1 2 3 4 5 6 7																									
3	B	2	3.26.04	Suite 5	1 2 3 4 5 6 7																									
3	B	3	3.28.01	Suite 6	1 2 3 4 5 6 7																									
3	C	3	3.31.02	Suite 7	1 2 3 4 5 6 7																									
3	C	3	3.33.01	Suite 8	1 2 3 4 5 6 7																									
3	C	3	3.33.04	Suite 9	1 2 3 4 5 6 7																									
3	C	3	3.34.01	Suite 10	1 2 3 4 5 6 7																									
3	C	3	3.35.01	Suite 11	1 2 3 4 5 6 7																									
3	C	3	3.36.01	Suite 12	1 2 3 4 5 6 7																									
3	C	3	3.36.04	Suite 13	1 2 3 4 5 6 7																									
3	C	3	3.37.01	Suite 14	1 2 3 4 5 6 7																									
3	C	3	3.37.03	Suite 15	1 2 3 4 5 6 7																									
3	C	4	3.38.01	Suite 16	1 2 3 4 5 6 7																									
3	C	4	3.38.04	Suite 17	1 2 3 4 5 6 7																									
3	C	4	3.40.01	Suite 18	1 2 3 4 5 6 7																									
3	C	4	3.43.01	Suite 19	1 2 3 4 5 6 7																									
3	C	4	3.45.01	Suite 20	1 2 3 4 5 6 7																									
3	C	4	3.45.04	Suite 21	1 2 3 4 5 6 7																									
3	C	4	3.47.01	Suite 22	1 2 3 4 5 6 7																									
4	B	2	4.22.01	Suite 23	1 2 3 4 5 6 7																									
4	B	2	4.22.03	Suite 24	1 2 3 4 5 6 7																									
4	B	2	4.22.05	Suite 25	1 2 3 4 5 6 7																									
4	B	2	4.24.01	Suite 26	1 2 3 4 5 6 7																									
4	B	2	4.24.03	Suite 27	1 2 3 4 5 6 7																									
4	B	2	4.24.05	Suite 28	1 2 3 4 5 6 7																									
4	B	2	4.26.01	Suite 29	1 2 3 4 5 6 7																									
4	B	2	4.26.03	Suite 30	1 2 3 4 5 6 7																									
4	B	2	4.26.05	Suite 31	1 2 3 4 5 6 7																									
4	B	3	4.28.01	Suite 32	1 2 3 4 5 6 7																									
4	B	3	4.28.03	Suite 33	1 2 3 4 5 6 7																									
4	C	3	4.28.05	Suite 34	1 2 3 4 5 6 7																									
4	C	3	4.31.01	Suite 35	1 2 3 4 5 6 7																									
4	C	3	4.31.03	Suite 36	1 2 3 4 5 6 7																									
4	C	3	4.31.05	Suite 37	1 2 3 4 5 6 7																									
4	C	3	4.33.01	Suite 38	1 2 3 4 5 6 7																									
4	C	3	4.33.03	Suite 39	1 2 3 4 5 6 7																									
4	C	3	4.34.01	Suite 40	1 2 3 4 5 6 7																									
4	C	3	4.34.03	Suite 41	1 2 3 4 5 6 7																									
4	C	3	4.36.01	Suite 42	1 2 3 4 5 6 7																									
4	C	3	4.36.03	Suite 43	1 2 3 4 5 6 7																									
4	C	4	4.38.01	Suite 44	1 2 3 4 5 6 7																									
4	C	4	4.38.03	Suite 45	1 2 3 4 5 6 7																									
4	C	4	4.38.05	Suite 46	1 2 3 4 5 6 7																									
4	C	4	4.40.01	Suite 47	1 2 3 4 5 6 7																									
4	C	4	4.40.03	Suite 48	1 2 3 4 5 6 7																									
4	C	4	4.40.05	Suite 49	1 2 3 4 5 6 7																									
4	C	4	4.43.01	Suite 50	1 2 3 4 5 6 7																									
4	C	4	4.43.03	Suite 51	1 2 3 4 5 6 7																									
4	C	4	4.43.05	Suite 52	1 2 3 4 5 6 7																									
4	C	4	4.45.01	Suite 53	1 2 3 4 5 6 7																									
4	C	4	4.45.03	Suite 54	1 2 3 4 5 6 7																									
4	C	4	4.45.05	Suite 55	1 2 3 4 5 6 7																									
4	C	4	4.47.01	Suite 56	1 2 3 4 5 6 7																									
4	C	4	4.47.03	Suite 57	1 2 3 4 5 6 7																									
4	C	4	4.47.05	Suite 58	1 2 3 4 5 6 7																									