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Integrating Visual Aids to Look-Ahead Schedules to Improve Communication

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Abstract

Look-Ahead schedules are a powerful tool used by construction project teams for forecasting and tracking actual project progress and the remaining plan. Unfortunately, on many construction projects, the Look-Ahead schedules are not consistently updated, do not include accurate project information, are not well maintained, and (worst of all) are not clearly understood by project stakeholders. This leads to misalignment between the master project schedule, Look-Ahead schedules, forecasted remaining plan, and actual field progress.

This paper provides an overview of effective methods for bridging this gap by using visual aids to enhance the schedule management Look-Ahead plans. Using actual construction projects, and examples of effective visual aids, this paper shares methods to effectively manage Look-Ahead schedules. The paper provides a system for effectively managing Look-Ahead schedules at all stages of a project, from project initiation to project closeout. Lessons learned from actual projects illustrate how to best communicate the Look-Ahead schedule data to all project stakeholders.

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1. Introduction

The list of failed mega projects is a long one. For instance, the Honolulu rail line is widely considered a failed project due to significant cost overruns, major schedule delays, and technical and contractual issues. The project's cost has ballooned to over $10 billion, far exceeding the initial $5 billion estimate, and its completion date has been pushed back from 2020 to 2031. Problems have included archaeological challenges, issues with contractor management, construction flaws like cracked piers and ill-fitting wheels, and legal disputes. In addition to the Honolulu rail line project, there is a long list of failed mega projects over the past 20 years which include the Ryugyong Hotel (North Korea), Ciudad Real Central Airport (Spain), Dubai's World Islands, Mirabel Airport (Canada), Alai Minar (India), Cross-Florida Barge Canal, and The Bid Dig (Boston), to name a few.

One of the primary reasons for the high percentage of failed mega projects is not strategic, but tactical. They lack proactive near-term planning, effective communication of Look-Ahead schedule information, and consistent updating and maintenance of the project's Look-Ahead schedule. Most construction scheduling specs include an extensive list of requirements pertaining to the master project schedule but lack specific and robust guidelines for Look-Ahead schedule management. This leads to Look-Ahead schedules that are not updated on a regular basis and information that does not align with what's reflected in the master project schedule. On some projects, Look-Ahead schedules are not used at all. Furthermore, many project teams experience challenges related to clearly and effectively communicating the information from the Look-Ahead schedule to all project stakeholders. When used effectively, Look-Ahead schedules are a powerful tool used by construction project teams for forecasting and tracking actual project progress and the remaining plan.

This paper provides practical methods for using Look-Ahead schedules to effectively forecast project progress, review the remaining plan, communicate schedule information, and pro-actively avoid delays before they occur. A paper by Devang B. Dedhia, PSP was published by AACE in 2018 [1] on this subject but did not focus on the visual communication aspect of communicating immediate plans. The authors believe that the famous saying "A picture is worth a thousand words" could not be more true as it relates to managing Look-Ahead schedules.

This paper defines what Look-Ahead schedules are, explains the common challenges teams experience while utilizing Lookahead schedules, and provides an overview of effective visual aids and other tools that can be used to bridge these gaps and deliver successful projects.

2. What are Look-Ahead Schedules?

Before critical path method (CPM) schedules, workplans mainly focused upon the work to be accomplished in the near future without worrying about the end of the project. CPM expanded the tactical planning to encompass the entire work to be performed in order to complete the project. This change in focus allows project management to anticipate future needs and also to better understand the importance of various current work packages toward completing the project in minimum time. Achieving minimum project duration requires optimum execution of the current work necessary to meet the plan and leave less critical work for later when time permits.

This does not mean that CPM schedules remove the need for the traditional, near-future tactical schedules. AACE defines these types of schedules as Look-Ahead schedules. [2] A Look-Ahead schedule should only encompass the work to be performed for the next two or three weeks as well as document the completed work for the past week. The work plan should be organized by primary resources controlling each task and need not cover non-critical or offsite work. These excluded tasks can be monitored using the CPM schedule. These types of schedules can also be thought of as, Look-Ahead schedules.

Look-Ahead schedules are meant to communicate and coordinate the current work to be done on the field. The Look-Ahead schedule should not contain any more complexity than necessary, as it is to be used by construction supervisors who are good at their job but not experts in CPM scheduling. It should not contain any activities that are being performed elsewhere, such as shop drawings or offsite manufacturing. It also should not contain special

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scheduling activities such as summary bars, level-of-effort, or even milestones. The Look-Ahead schedule should not be cluttered showing logical relationships.

3. Types of Look-Ahead Schedules

Look-Ahead schedules can vary in time periods covered. Schedulers typically call them "3-week schedules" but the time period represented can be 1 day, 3 weeks, 4 weeks or even 90 days. Special events such as opening ceremonies may need to be scheduled by the hour, and are hence called "1-day schedules." The standard work schedule depicts the actual work completed for the last week and the planned work for the next 3 weeks and are typically called "3-week schedules." The 3-week schedule is usually presented on the Friday construction meeting of the first week so that the next work day is the first planned workday. 4-week schedules are usually presented on the last workday of each month and depict the work plan for the next month. The 90-day schedule is more of a general plan depicting the various trades as a means of resource planning.

A notable part of the standard 3-week schedule is looking back on the past week's progress. This progress is going to be input into the CPM schedule as actual progress. It will become a public record of project progress. The stakeholders of the project are given a chance to review and object to this progress record (if needed). Memory fades over time, so reviewing this progress on the same week it was made is the optimum opportunity to review this information.

4. The Challenges of Look-Ahead Schedules

4.1. Projects Without Look-Ahead Schedules

There are a variety of issues which may be encountered with Look-Ahead schedules. On some projects the owner's representative does not receive them on a regular basis, if ever. Not receiving a Look-Ahead schedule every week can cause many challenges related to effectively planning and executing project scope.

Without an available Look-Ahead schedule that can be reviewed by the project team it is hard to determine if the information in the master project schedule presents an accurate representation of the actual project progress and remaining plan. Furthermore, the master project schedule typically does not include the amount of detail necessary to review and plan project scope that will take place in the next few weeks. It is often the case that Look-Ahead schedules are not received because contractors lack the necessary project resources needed to create and maintain weekly or bi-weekly Look-Ahead schedules. In other words, the schedules are too complex or take too long to produce.

4.2. Quality of Look-Ahead Schedules

Not all Look-Ahead schedules are created equal, the quality of the organization can spell disaster or success in communicating your intent. Not maintaining high quality standards for Look-Ahead schedules makes it harder to use them to effectively manage project scope that is anticipated to be completed in the next few weeks. The following are common issues pertaining to the quality of Look-Ahead schedules:

4.2.1. Lack of Detail

On some projects, the Look-Ahead schedule is generated directly from the master project schedule file. This can lead to Look-Ahead schedules that lack the appropriate amount of detail necessary for effectively planning and executing project scope that is anticipated to take place in the next few weeks.

A good example that demonstrates why it is crucial that Look-Ahead schedules contain a sufficient amount of detail is a schedule that includes the construction of columns for a bridge superstructure. The bridge superstructure may include columns with electrical conduit that needs to be installed prior to the concrete pour. Structural and electrical scope is often performed by two different subcontractors. A typical master project schedule will usually include an

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activity for building the column forms, placing the rebar, and an activity for the concrete pour. Ideally, the Look-Ahead schedule should include activities for placing the electrical conduit within the column forms before the concrete is poured.

If the Look-Ahead schedule is missing the detail for placement of the electrical conduit before the concrete pour, it is challenging for the project team to coordinate effectively between the subcontractor performing the structural work and the subcontractor preforming the electrical work. This can lead to columns being constructed prematurely which can result in increased project costs and schedule delays.

4.2.2. Activity IDs

Its often the case that a Look-Ahead schedule does not include a reference to the activity IDs that exist in the master project schedule. Missing activity ID references in the Look-Ahead schedule makes it difficult to cross check between the information in the master project schedule and the Look-Ahead schedule which ultimately creates a situation where a project has multiple schedules that may show conflicting information. On the other hand, some CPM scheduling software allow for extremely long activity IDs, as many as 40 characters. Undisciplined schedulers forget that IDs should be short to prevent report information being squeezed to the side to make room for these unruly IDs. It is important to leave as much display space for the actual schedule information.

AACE defines project completion as a projection of status. If the project is running late, then project completion will be shown as a date later than the required project completion date. In the author's experience, most Look-Ahead schedules do not include columns for total float, identification of critical activities, or other helpful information that indicate whether activities in the Look-Ahead schedule that are delayed may cause critical impacts to the project's contractual milestones. There are alternative methods of communicating the criticality of a particular work, such as color coding or otherwise displaying an emoji or exclamation character. [3]

4.2.3. Tracking Changes

AACE recommends that the reviewer of a schedule update should concern itself with changes made to the schedule since the last accepted schedule update. In the author's experience, most Look-Ahead schedules do not include a report that highlights the changes made since the last schedule was submitted. This effects the quality of the Look-Ahead schedule because it makes it hard to identify which activities have been added or deleted and why, what logic changes have been made and why, and what other important changes were made to the Look-Ahead schedule since the last schedule was submitted. [3]

4.2.4. Schedule Format

In the author's experience, many Look-Ahead schedules are created using Microsoft Excel. Because Microsoft Excel is not primarily a scheduling software it lacks important features and capabilities that exist in scheduling software programs such as Primavera P6 and Microsoft Project. This challenge effects the quality of Look-Ahead schedules due to the fact that relationships, calendars, constraints, data dates, and resources cannot be added to a Microsoft Excel file. Additionally, backward and forward pass calculations cannot be performed using Microsoft Excel.

4.3. Look-Ahead Schedule Updates

Look-ahead schedules contain a number of different parts that make up the whole. Foremost is the issue of activity status in relationship to the data date. Completed work should be only noted before (or to the left) of the data date and remaining work yet to be accomplished to the right.

4.3.1. Activity Status

AACE standards separate an activity's status into one of three conditions: not started, in progress, or completed. This should also apply to Look-Ahead schedules. Some look-ahead schedules only concern themselves with work to

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be accomplished and not the past, but it is recommended to also include last week's actual work so that the reviewer has a chance to confirm the accuracy of the status. What complicates matters further is the fact Look-Ahead schedules, which are often created in Microsoft Excel, cannot be easily progressed. The various activities depicted are not actively connected and modifying one does not affect the placement of the others. [4]

4.3.3. Data Date

AACE recommends that the status for activities should be assessed through the end of schedule update period. Since many Look-Ahead schedules are created in Microsoft Excel a project data date cannot be updated when the Look-Ahead schedule is statused. This increases the likelihood that the dates reflected in the Look-Ahead schedule are inaccurate, especially start dates for activities that have been delayed. [4]

4.3.4. Remaining Duration

AACE defines negative progress as the case where remaining duration increases from the previous update instead of remaining the same or decreasing. In the authors' experience, Look-Ahead schedules usually do not include columns for "original duration" and "remaining duration" which makes it difficult to accurately status the schedule and verify that the remaining activity durations are accurate. It is also difficult to verify if original durations have been changed and why. This is why narratives explaining these occurrences should accompany the publishment of a Look-Ahead schedule. [4]

4.3.5. Project Delay

AACE recommends that every time that an owner is notified of potential delay, both the contractor and owner's representatives should make a special status assessment. Due to the fact that Look-Ahead schedules only reflect work that is anticipated to take place in the next few weeks, it is difficult to update a Look-Ahead schedule with project delay information. [4] A footnote or other textual attachment can be added indicating the current recovery plan.

4.3.6. Project Status

The standard timeline for updating progress in a master project schedule is once a month. However, Look-Ahead schedules are typically submitted on a weekly basis which creates misalignment between the status shown in the master project schedule and the Look-Ahead schedule. The more frequent (and hopefully more accurate) status can be helpful for documenting where delays occurred for forensic analysis.

AACE recommends that once the status of every activity has been entered the schedule can be recalculated. Because most Look-Ahead schedules are created in Microsoft Excel the schedule status cannot be recalculated. This leads to Look-Ahead schedules that show inaccurate planned start and finish dates. [4]

4.4. Communicating the Look-Ahead Schedule

Communicating the Look-Ahead schedule in a way that is clear and efficient is the single most important aspect of Look-Ahead schedule management. There are many challenges related to communicating the information in the Look-Ahead schedule including but not limited to: clearly communicating the planned scope of work anticipated to take place in the next few weeks; communicating the dependencies between the activities; highlighting how delays affect the rest of the activities in the master project schedule; communicating important logistical and safety related information that is not shown; and explaining how the Look-Ahead schedule relates to the scope of work shown on the drawings.

4.4.1. Clearly Communicating the Planned Scope

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Most of the time Look-Ahead schedules only include activity names and dates for when the work is anticipated to take place. This creates a challenge for teams trying to dive deeper into the information presented in the Look-Ahead schedule because visuals highlighting the locations of where work is taking place are usually not shown in the Look-Ahead schedule. As a result, logistical constraints and potential safety issues are often hard to identify. Additionally, this makes it harder to identify and fix issues related to resources that are overallocated.

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4.4.2. Activity Dependencies

Because Look-Ahead schedules are often managed in MS Excel it is not possible to add dependencies between activities in the schedule. This results in a schedule that is very labor intensive to manage and update resulting in logic ties that may not be reflected in the Look-Ahead schedule. One critical missing logic tie can result in changes to the critical path which is why its important to verify that activities in the Look-Ahead schedule are sequenced accurately.

4.4.3. Highlighting Delays

Look-Ahead schedules only show work that is anticipated to take place in the next few weeks. Since Look-Ahead schedules are usually stand alone schedules that are not linked to the master project schedule it is hard to determine how activities that are delayed in the Look-Ahead schedule impact the overall master project schedule. What complicates this issue further is the fact it is hard to filter out critical activities from a Look-Ahead schedule. This makes it challenging to track and control the projects critical path.

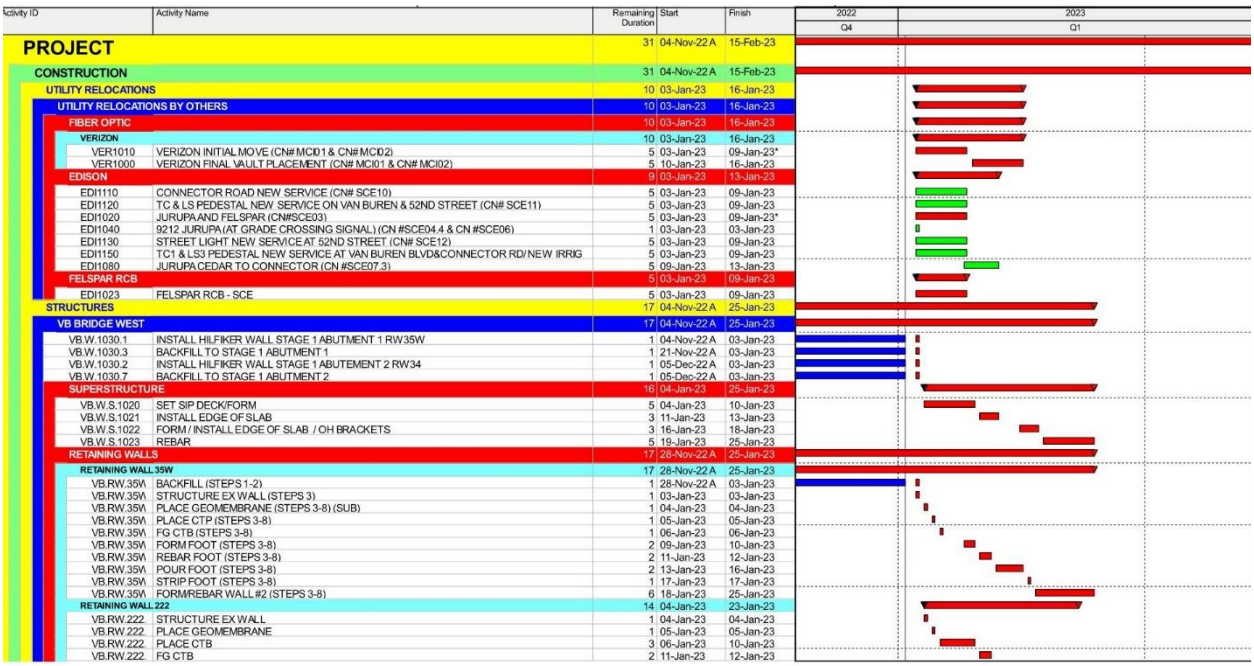
4.4.4. Scope and Drawings

One of the issues involved in briefing the near-term work to be performed is the scope of the work. One question to ask is: “Does this activity cover the entire scope or is this merely a part of a larger task to be completed?” Layouts showing the work to be performed can rectify this confusion even before someone needs to be asked.

5. Examples of Working Schedules

5.1. Using CPM Scheduling Software

Many schedulers on large construction projects use the Oracle/Primavera P6 scheduling software. For ease of use and availability, P6 is often used to create the Look-Ahead schedule with filters to only show the activities in the planned window period.. There are inherent issues in this regard, as demonstrated by Figure 1 below.



Activity ID	Activity Name	Remaining Duration	Start	Finish
PROJECT		31	04-Nov-22 A	15-Feb-23
CONSTRUCTION		31	04-Nov-22 A	15-Feb-23
UTILITY RELOCATIONS		10	03-Jan-23	16-Jan-23
UTILITY RELOCATIONS BY OTHERS		10	03-Jan-23	16-Jan-23
FIBER OPTIC		10	03-Jan-23	16-Jan-23
VERIZON		10	03-Jan-23	16-Jan-23
VER1010	VERIZON INITIAL MOVE (CN# MCI01 & CN# MCI02)	5	03-Jan-23	09-Jan-23*
VER1000	VERIZON FINAL VAULT PLACEMENT (CN# MCI01 & CN# MCI02)	5	10-Jan-23	16-Jan-23
EDISON		9	03-Jan-23	13-Jan-23
EDI1110	CONNECTOR ROAD NEW SERVICE (CN# SCE10)	5	03-Jan-23	09-Jan-23
EDI1120	TC & LS PEDESTAL NEW SERVICE ON VAN BUREN & 52ND STREET (CN# SCE11)	5	03-Jan-23	09-Jan-23
EDI1020	JURUPA AND FELSPAR (CN#SCE03)	5	03-Jan-23	09-Jan-23*
EDI1040	9212 JURUPA (AT GRADE CROSSING SIGNAL) (CN #SCE04.4 & CN #SCE06)	1	03-Jan-23	03-Jan-23
EDI1130	STREET LIGHT NEW SERVICE AT 52ND STREET (CN# SCE12)	5	03-Jan-23	09-Jan-23
EDI1150	TC1 & LS3 PEDESTAL NEW SERVICE AT VAN BUREN BLVD&CONNECTOR RD/NEW IRRIG	5	03-Jan-23	09-Jan-23
EDI1080	JURUPA CEDAR TO CONNECTOR (CN #SCE07.3)	5	09-Jan-23	13-Jan-23
FELSPAR RCB		5	03-Jan-23	09-Jan-23
EDI1023	FELSPAR RCB - SCE	5	03-Jan-23	09-Jan-23
STRUCTURES		17	04-Nov-22 A	25-Jan-23
VB BRIDGE WEST		17	04-Nov-22 A	25-Jan-23
VB.W.1030.1	INSTALL HILFIKER WALL STAGE 1 ABUTMENT 1 RW35W	1	04-Nov-22 A	03-Jan-23
VB.W.1030.3	BACKFILL TO STAGE 1 ABUTMENT 1	1	21-Nov-22 A	03-Jan-23
VB.W.1030.2	INSTALL HILFIKER WALL STAGE 1 ABUTEMENT 2 RW34	1	05-Dec-22 A	03-Jan-23
VB.W.1030.7	BACKFILL TO STAGE 1 ABUTMENT 2	1	05-Dec-22 A	03-Jan-23
SUPERSTRUCTURE		16	04-Jan-23	25-Jan-23
VB.W.S.1020	SET SIP DECK/FORM	5	04-Jan-23	10-Jan-23
VB.W.S.1021	INSTALL EDGE OF SLAB	3	11-Jan-23	13-Jan-23
VB.W.S.1022	FORM / INSTALL EDGE OF SLAB / OH BRACKETS	3	16-Jan-23	18-Jan-23
VB.W.S.1023	REBAR	5	19-Jan-23	25-Jan-23
RETAINING WALLS		17	28-Nov-22 A	25-Jan-23
RETAINING WALL 35W		17	28-Nov-22 A	25-Jan-23
VB.RW.35W	BACKFILL (STEPS 1-2)	1	28-Nov-22 A	03-Jan-23
VB.RW.35W	STRUCTURE EX WALL (STEPS 3)	1	03-Jan-23	03-Jan-23
VB.RW.35W	PLACE GEOMEMBRANE (STEPS 3-8) (SUB)	1	04-Jan-23	04-Jan-23
VB.RW.35W	PLACE CTP (STEPS 3-8)	1	05-Jan-23	05-Jan-23
VB.RW.35W	FG CTB (STEPS 3-8)	1	06-Jan-23	06-Jan-23
VB.RW.35W	FORM FOOT (STEPS 3-8)	2	09-Jan-23	10-Jan-23
VB.RW.35W	REBAR FOOT (STEPS 3-8)	2	11-Jan-23	12-Jan-23
VB.RW.35W	POUR FOOT (STEPS 3-8)	2	13-Jan-23	16-Jan-23
VB.RW.35W	STRIP FOOT (STEPS 3-8)	1	17-Jan-23	17-Jan-23
VB.RW.35W	FORM/REBAR WALL #2 (STEPS 3-8)	6	18-Jan-23	25-Jan-23
RETAINING WALL 222		14	04-Jan-23	23-Jan-23
VB.RW.222	STRUCTURE EX WALL	1	04-Jan-23	04-Jan-23
VB.RW.222	PLACE GEOMEMBRANE	1	05-Jan-23	05-Jan-23
VB.RW.222	PLACE CTB	3	06-Jan-23	10-Jan-23
VB.RW.222	FG CTB	2	11-Jan-23	12-Jan-23

Figure 1 – **P6 3-Week Look-Ahead Schedule**

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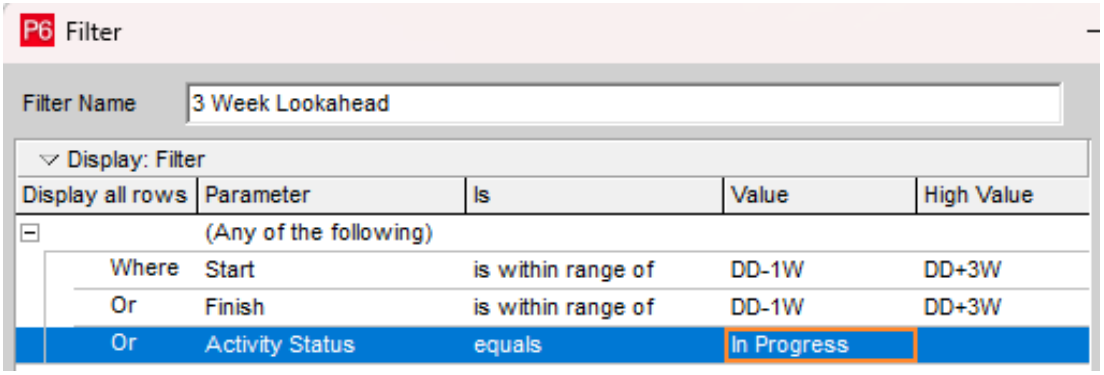
In the figure above, only the columns of Activity ID, Activity Description, Start, and Finish are displayed, along with the Gannt chart showing the planned work periods. Unlike with the P6 standard display, the Gannt chart is displayed without logic and in landscape format. The main problem with this approach is that a majority of the space is reserved for text when the point of a look-ahead schedule is to graphically depict the work to be performed.



3 Week Look-Ahead Filter

Due to the limited ability to filter out unnecessary non-construction related activities, the above figure is only page 1 of many pages. This is way too long to coordinate the significant work to be performed. No supervisor is going to walk around the project with 30 pages of paper in their hand. In addition, as it is in printed format, it cannot be adjusted or enhanced without returning to P6 to generate a new chart.

5.2. Using a Spreadsheet

What is needed is a different platform to allow for more selectivity and configurability. That is why many P6 schedulers export their schedule to a spreadsheet and organize the presentation from there. Figure 2 below is an example of that same Look-Ahead schedule after this procedure has been accomplished.

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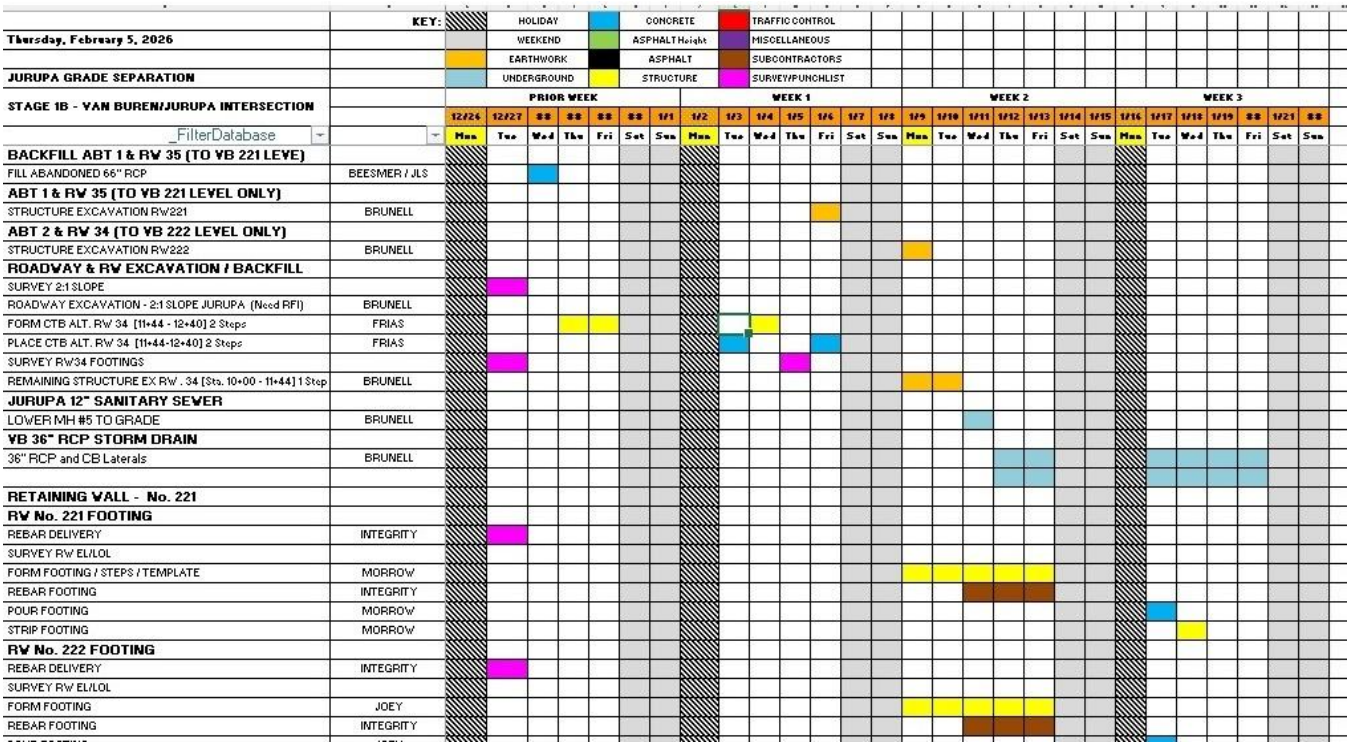

Figure 2 – Spreadsheet-Based Look-Ahead Schedule

This figure does not display every activity, only the significant work that needs to be coordinated amongst the participants of the current large crews. Some of the work is combined or simplified beyond that which was depicted in the CPM schedule. Because this graphic was produced using a spreadsheet, several built-in graphical items are also available to allow enhancement and improve the usefulness of the overall schedule. An example of this is shown in Figure 3 where the key is enhanced to show detail such as which contractor is responsible for what work being performed.

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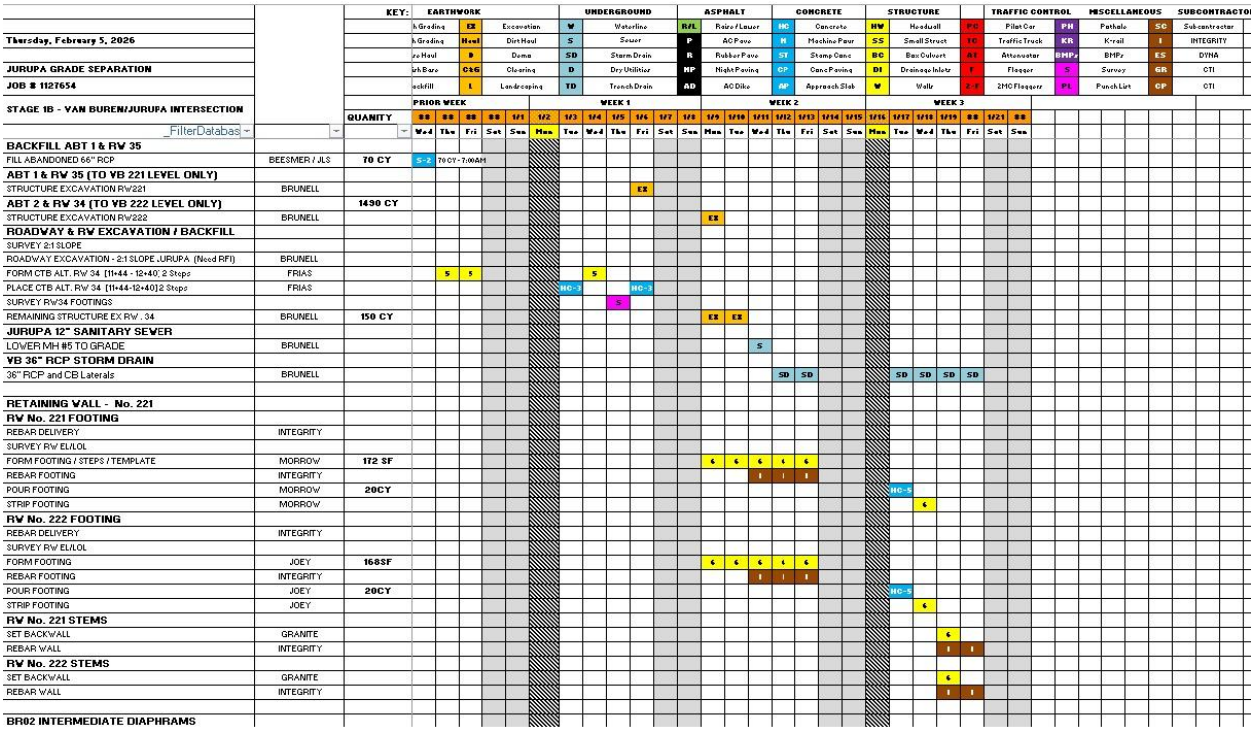
5.2.1. Improved Look-Ahead With Detailed Key



		KEY:	EARTHWORK			UNDERGROUND		ASPHALT		CONCRETE		STRUCTURE		TRAFFIC CONTROL		MISCELLANEOUS		SUBCONTRACTO
			h Grading	EX	Excavation	W	Waterline	RFL	Reinf Laver	HC	Concrete	HW	Headwall	PC	Pilot Car	PH	Pothole	SC	Subcontractor
Thursday, February 5, 2026			h Grading	Haul	Dirt Haul	S	Sewer	P	AC Pave	M	Machine Pour	SS	Small Struct	TC	Traffic Truck	KR	K-rail	I	INTEGRITY
			e Haul	D	Dump	SD	Storm Drain	R	Rubber Pave	ST	Stamp Conc	BC	Box Culvert	AT	Attenuator	BMPs	BMPs	ES	DYNA
JURUPA GRADE SEPARATION			ch Bare	CSG	Cle-aring	D	Dry Utilities	NP	Night Paving	CP	Conc Paving	DI	Drainage Inlets	F	Flagger	S	Survey	GR	CTI
JOB # 1127654			ackfill	L	Landscaping	TD	Trench Drain	AD	AC Dike	AP	Approach Slab	W	Walls	2-F	2 MC Flaggers	PL	Punch List	CP	CTI
STAGE 1B - VAN BUREN/JURUPA INTERSECTION			PRIOR WEEK			WEEK 1				WEEK 2				WEEK 3					
		QUANITY	00	00	00	00	1/1	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11	1/12	1/13	1/14	1/15	1/16	1/17	1/18	1/19	00	1/21	00
FilterDatabas			Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
BACKFILL ABT 1 & RW 35																												
FILL ABANDONED 66" RCP	BEESMER / JLS	70 CY	S-2	70 CY - 7:00AM																								
ABT 1 & RW 35 (TO YB 221 LEVEL ONLY)																												
STRUCTURE EXCAVATION RW221	BRUNELL											EX																
ABT 2 & RW 34 (TO YB 222 LEVEL ONLY)		1430 CY																										
STRUCTURE EXCAVATION RW222	BRUNELL														EX													
ROADWAY & RW EXCAVATION / BACKFILL																												
SURVEY 2:1 SLOPE																												
ROADWAY EXCAVATION - 2:1 SLOPE JURUPA (Need RFI)	BRUNELL																											
FORM CTB ALT. RW 34 [11+44 - 12+40] 2 Steps	FRIAS			S	S					S																		
PLACE CTB ALT. RW 34 [11+44-12+40] 2 Steps	FRIAS								HC-3			HC-3																
SURVEY RW34 FOOTINGS											S																	
REMAINING STRUCTURE EX RW . 34	BRUNELL	150 CY													EX	EX												
JURUPA 12" SANITARY SEWER																												
LOWER MH #5 TO GRADE	BRUNELL															S												
YB 36" RCP STORM DRAIN																												
36" RCP and CB Laterals	BRUNELL																	SD	SD			SD	SD	SD	SD			
RETAINING WALL - No. 221																												
RW No. 221 FOOTING																												
REBAR DELIVERY	INTEGRITY																											
SURVEY RW EL/LOL																												
FORM FOOTING / STEPS / TEMPLATE	MORROW	172 SF													6	6	6	6	6									
REBAR FOOTING	INTEGRITY															I	I	I										
POUR FOOTING	MORROW	20CY																				HC-5						
STRIP FOOTING	MORROW																						6					
RW No. 222 FOOTING																												
REBAR DELIVERY	INTEGRITY																											
SURVEY RW EL/LOL																												
FORM FOOTING	JOEY	168SF													6	6	6	6	6									
REBAR FOOTING	INTEGRITY															I	I	I										
POUR FOOTING	JOEY	20CY																				HC-5						
STRIP FOOTING	JOEY																						6					
RW No. 221 STEMS																												
SET BACKWALL	GRANITE																							6				
REBAR WALL	INTEGRITY																							I	I			
RW No. 222 STEMS																												
SET BACKWALL	GRANITE																							6				
REBAR WALL	INTEGRITY																							I	I			
BR02 INTERMEDIATE DIAPHRAMS																												

Figure 3 – Spreadsheet Look-Ahead Schedule with a Color-Coded Key

it is very useful for the readers to see projected weather days in the Look-Ahead schedule. The informative Look-Ahead schedule can list important events to occur such as delivery of major equipment. It can highlight project holidays and critical activities. A lot more can be added to a Look-Ahead schedule than the operational issues just mentioned. The key to enhancing Look-Ahead schedules is to anticipate the concerns of all project stakeholders.

5.3. Using Pictures and Graphics to Enhance Look-Ahead Schedules

5.3.1. Look-Ahead with Layout Map

One of the major headaches that project owners and construction managers encounter is local residents complaining about noise, dust, and construction traffic. The public relations department for the construction project would love to have a 'heads-up' notice when road construction is nearing a location where residents have previously complained about such things on this and earlier projects. The owner's public relations could then proactively alert the construction supervisors to take extra precautions or remediations to help lessen public impact. One such approach to be taken can be labeling 'hot-spots' on the layout map for reference.

Spreadsheets allow for added graphics and extensibility to other add-in programs. The easiest enhancement is the insertion of existing graphics such as work field layout schematics. Displaying a map of the worksite with the location of the work area for that particular work item highlighted is a boon to outside observers and job supervisors alike. It helps to orient the reader and make the schedule more visual and thus, understandable and memorable. Figure 4, below depicts a map pop-up that displays when the user clicks on the blue-coded work area listed in the left-most column.

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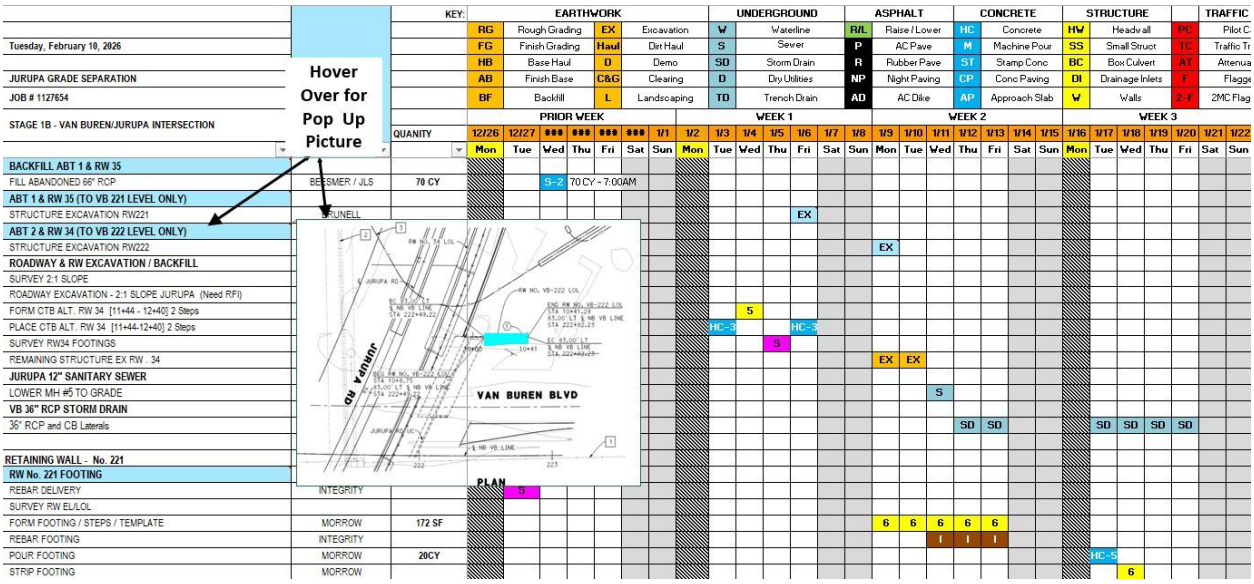

Figure 4 – Look-Ahead Schedule with Pop-Up Maps

Other layout sources are also easily available. The frugal scheduler can access and copy maps from Google Maps and paste them in as guides to orienting the user.

Another informative add-in is the insertion of a quick response (QR) code. A QR code is a machine readable graphic usually consisting of a matrix of black and white squares. QR codes are similar to bar codes, but more versatile. Most mobile device cameras recognize and decode the information coded in a QR code. [5] Figure 5 below shows such an example.

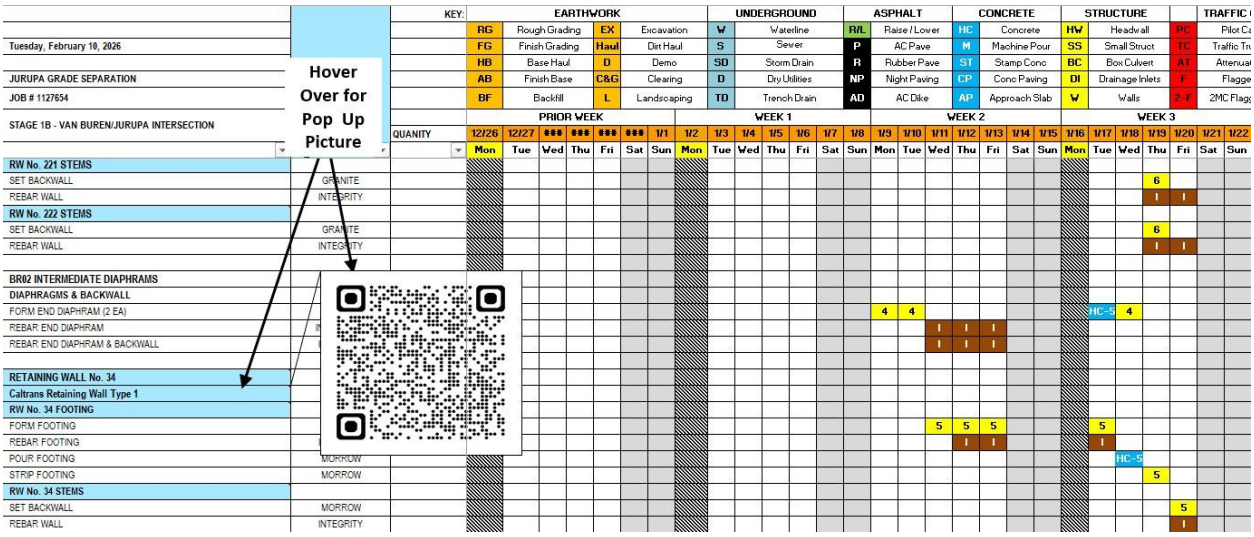

Figure 5 – Spreadsheet Look-Ahead Schedule with QR Code

Clicking on a particular blue-coded label in the left column of Figure 5 will cause a QR code to pop-up, ready for scanning. A smartphone user can scan that square and have their phone display an internet page with detailed information concerning the item in question. There is no need to hand-out a stack of printed pages as back-up to the briefing when a QR code can produce the same information at the click of a button. Figure 6 below shows a data page displayed after scanning a QR code.

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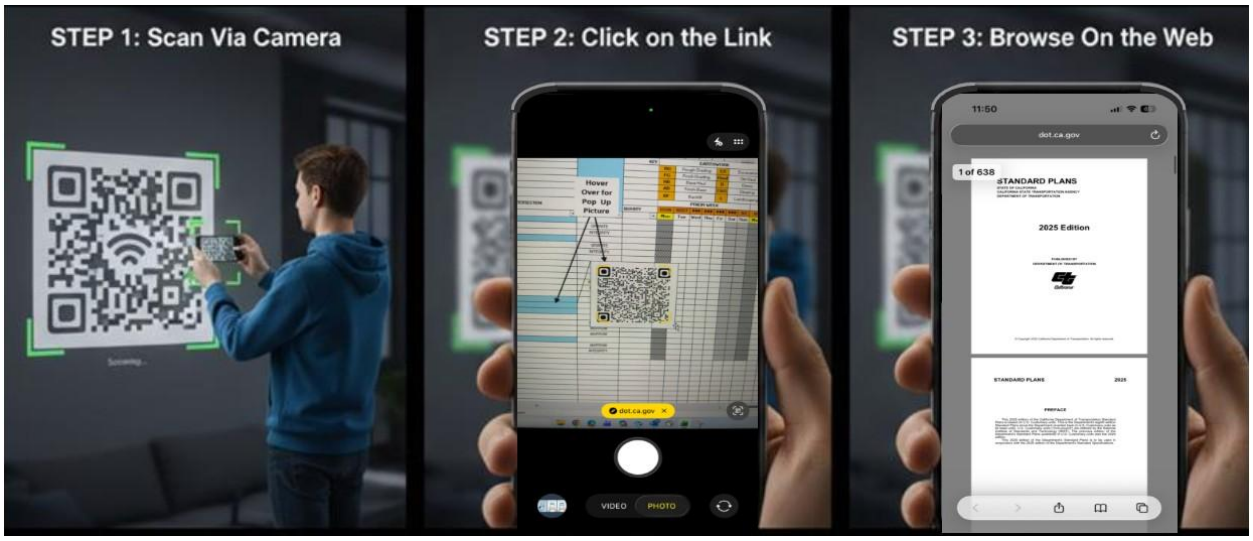

Figure 6 – QR Code Usage

5.3.2. How to Create a QR Code

To create a QR code, the desired information—such as a website link or text—is first entered into a QR code generator, which may be an online tool or software application. After the information is submitted, the generator automatically converts the input into a scannable matrix pattern. The resulting QR code can then be downloaded as an image file and inserted into documents, presentations, or printed materials for use. When scanned with a mobile device, the QR code directs the user to the encoded content.

5.3.3. Advanced Look-Ahead with Movie

The savvy scheduler has many other tools at her disposal to advance communication. Pictures may help display an object, but a movie can add depth and understanding to reviewing a project. It is quite simple to fly a camera-equipped drone over the construction site. That camera can take a video of the flight and convert it into a movie capable of display on most computers.

Many spreadsheets have the ability to insert a button in the page to display movies such as a drone flyover. It is especially helpful for linear projects to review the length of the work to be performed. Figure 7, below shows such a setup where the spreadsheet user sees a movie button.

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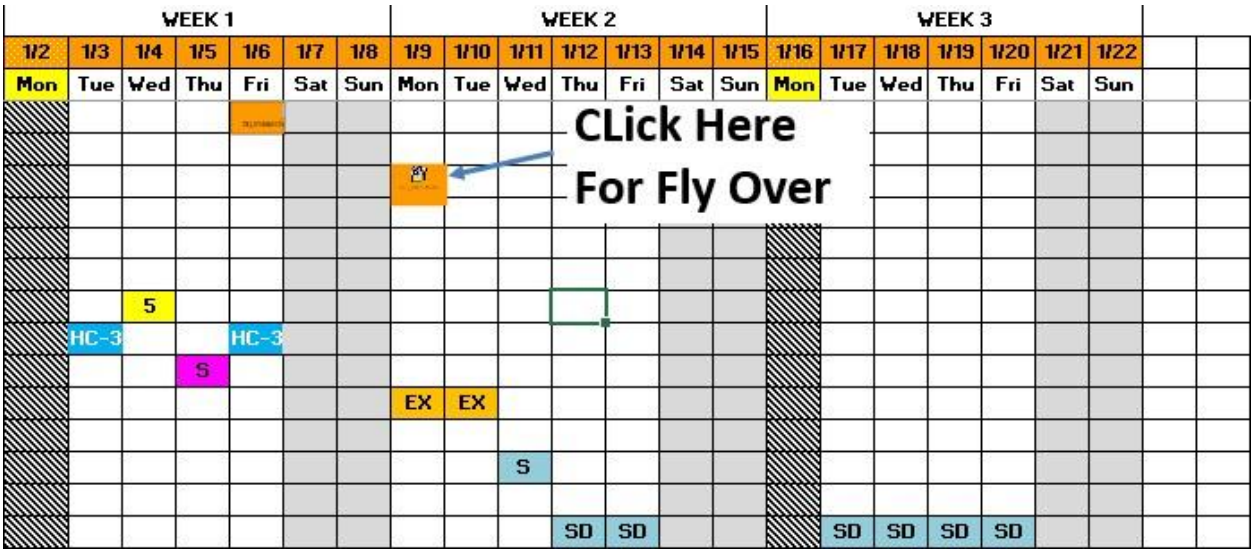

Figure 7 – Spreadsheet with a Movie File Button used as a Gantt Work Period

Once the movie button is clicked, the movie file (which must be packaged with the spreadsheet), can display the drone flyover, as shown in Figure 8, below.

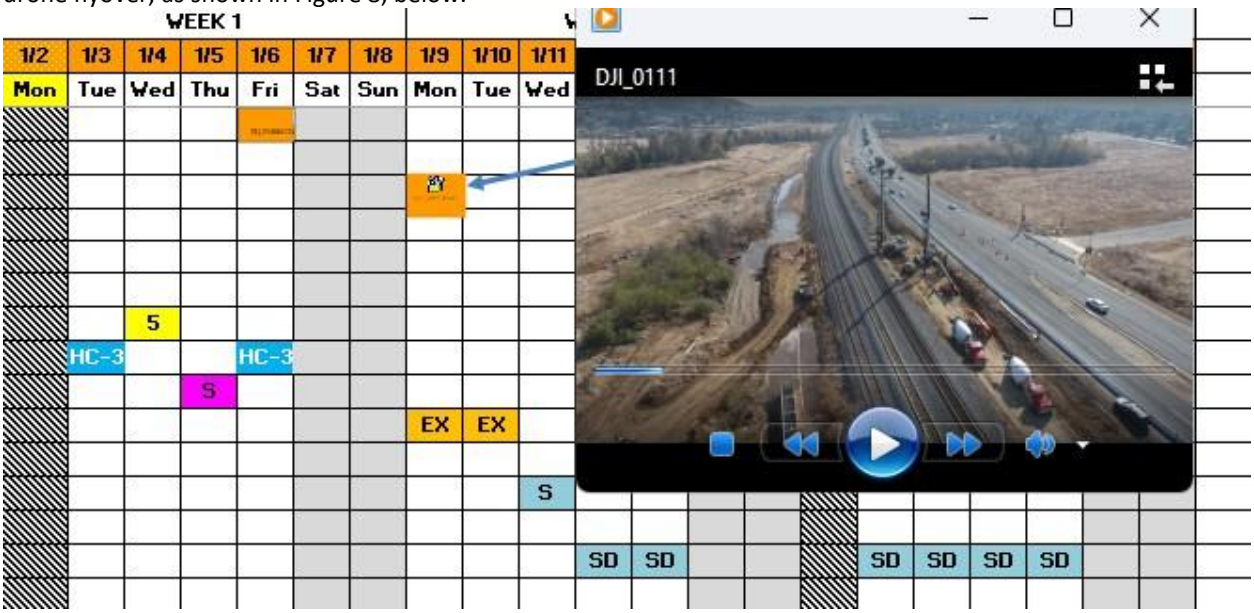

Figure 8 – Drone Flyover Movie Being Displayed after Activation

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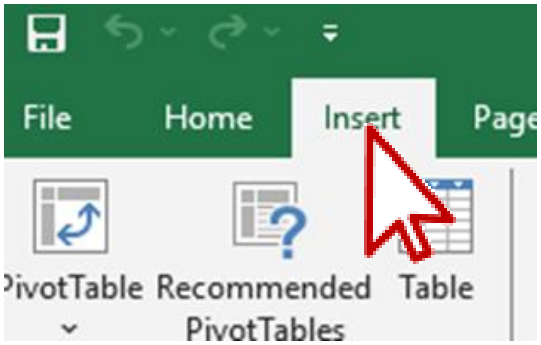
5.3.4. How to Add a Movie Visual to A Look-Ahead Schedule

To insert a file link into a spreadsheet, first click on the Insert tab, as shown in Figure 9, below.



Click on the Objects button:

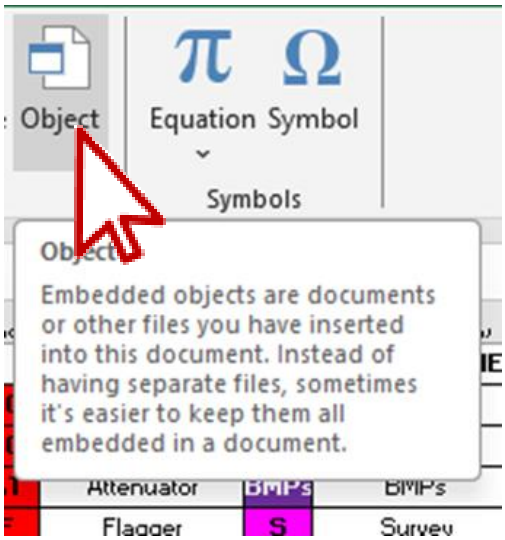


Figure 9 – Inserting a Movie File Activation, Step 1

In the dialogue box, select the "Create from File" option, as shown in Figure 10.

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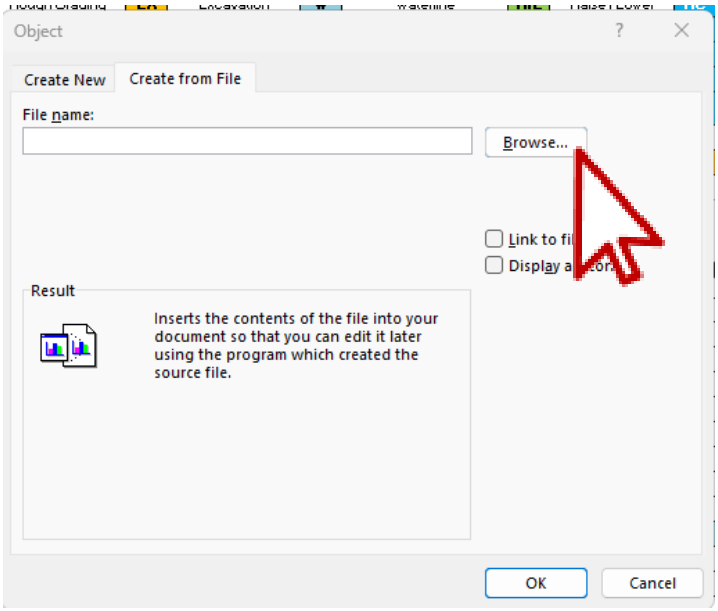

Figure 10 – Inserting a Movie File Activation, Step 2

Browse for the movie file name to add and highlight it by clicking on it. Then click on “Display as icon” as shown in Figure 11.

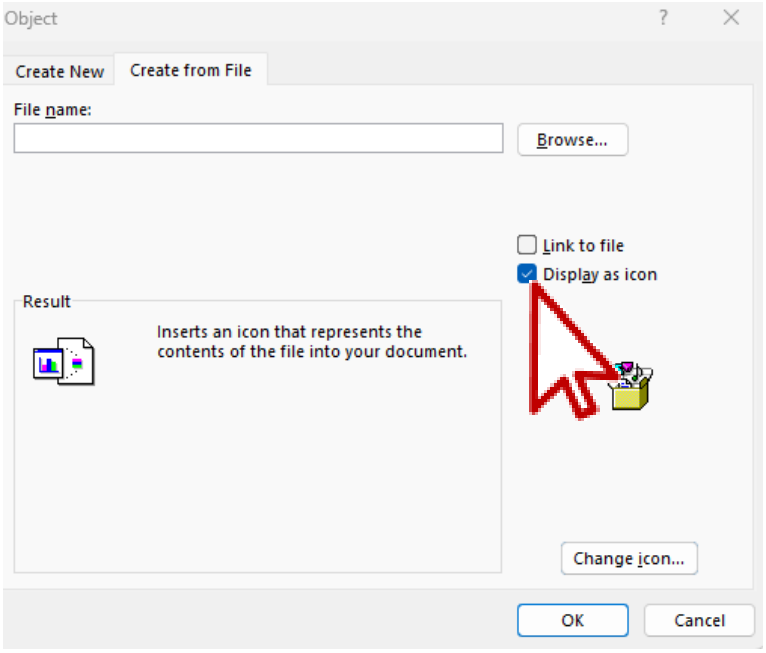

Figure 11 – Inserting a Movie File Activation, Step 3

Click OK and the visual object will be added, as shown in Figure 12.

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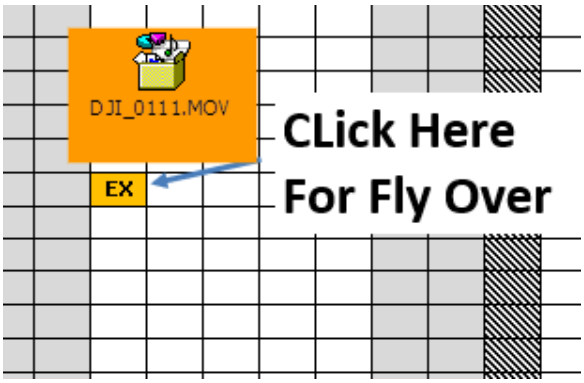

Figure 12 – Inserting a Movie File Activation, Step 4

Hover over the object with your cursor and right click, then choose “Format Object” for any desired changes to the object. It is recommended to change the displayed title from the movie file name to “Drone Fly-Over" or some other informative title, as shown in Figure 13.

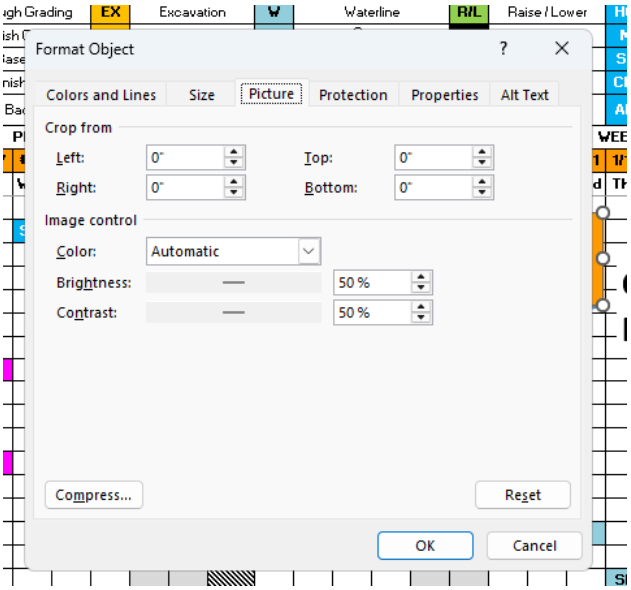

Figure 13 – Inserting a Movie File Activation, Step 5

Once the desired changes are done, the object can be moved to the desired location and resized.

5.3.5. Attaching 4D Schedule Files to the Look-Ahead Schedules

Part of the confusion caused on projects stems from coordinating the various crews to prevent them from interfering with each other. One way to do this is to employ linear schedules. The location of planned work is plotted over a time axis and crews are shown to interfere with others where the lines cross. This technique is somewhat esoteric to the uninitiated and, for this reason, is not widely used when communicating with others. Another way to get much of the same benefits is to include general layout charts with the Look-Ahead schedule and reference the location of the work to be performed on the map using arrows or just numbered labels.

Is the work proceeding from east to west or the other way around? The supervisors may know this ahead of time, but in terms of coordinating and better understanding the work, perhaps an illustration of the planned effort would

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do wonders for orienting the work to be performed in the minds of the reader. Advanced technology such as four dimension (4D) scheduling can be of great help in augmenting the Look-Ahead schedule.

Everyone is familiar with a 2D drawing showing the width and height of a plan on paper. 4D electronic drawings also depict the depth of the planed building or other structure in a way that can be manipulated to electronically 'walk-through' the structure and display what would be observed at particular location points in a desired direction. 4D scheduling is the melding of a 3D electronics schedule with the CPM schedule to depict what the structure would look like at various periods of time in a movie format. This movie can be saved in a format that most modern computers can play at a click of a button, or in this case, embedded in a Look-Ahead spreadsheet. The reviewer of the Look-Ahead spreadsheet can just click on a particular line of work and the short movie showing how the work will proceed can be played.

6. Creating Look-Ahead Schedules Using Artificial Intelligence

Creating good Look-Ahead schedules can require a lot of preparation time. Sometimes the harried scheduler does not have enough free time to be able to devote to this task. Computer artificial intelligence (AI) can be brought to bear on the problem to good measure. In fact, once the proper parameters are worked out, the AI set-up can be archived and shared with others for future projects.

Artificial intelligence is starting to change the way construction teams create and manage look ahead schedules. Traditionally, creating them has depended heavily on the experience and judgment of superintendents, planners, and trade partners. Because work on site changes quickly, these schedules often need constant updates, making the process time consuming and sometimes inconsistent. AI offers a way to make Look-Ahead planning more accurate, faster, and easier to manage.

AI tools can take information from the main project schedule and break it down into clear, practical steps that teams need to complete in the coming weeks. By analyzing factors like activity sequences, available resources, productivity rates, past performance, and most importantly the critical path, AI can help identify which tasks are most important to focus on and where potential problems may occur. For example, AI can detect when too many trades are scheduled in the same area or when materials might not arrive on time. This gives teams a chance to adjust early instead of reacting after delays occur.

A growing advantage of AI in look ahead scheduling is its ability to incorporate detailed weather data. Weather is one of the most common causes of short term delays, yet it is often difficult for planners to predict how conditions will affect specific activities. AI can automatically pull information from local weather forecasts, historical climate data, and real time monitoring devices. It then analyzes how upcoming weather patterns could affect outdoor tasks such as concrete placement, earthwork, roofing, or exterior finishes. When poor weather is expected, the AI system can recommend resequencing certain activities, shifting labor, or increasing resources to stay on track. This helps teams make informed decisions instead of relying only on assumptions or last minute adjustments.

One of the biggest benefits of AI is how quickly it reacts to real time information from the jobsite. Data from drones, sensors, progress tracking apps, and daily reports can be fed into AI systems, which then compare the planned schedule with what is actually happening. If the project starts to fall behind or conditions change, AI can automatically update the look ahead schedule to reflect the new reality. This rapid adjustment becomes even more powerful when combined with weather forecasting because the system can adjust plans before weather disruptions cause actual delays.

Over time, AI enabled look ahead scheduling can also help organizations improve their overall planning practices. By analyzing data from multiple projects, AI can identify recurring issues or patterns that consistently affect short term schedules, including weather related delays. Companies can use these insights to refine their planning methods, better estimate timelines, and develop strategies that reduce the impact of repeating challenges.

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Advances in AI-based simulation have also increased the speed and precision of schedule adjustments. When unexpected delays occur whether caused by material shortages, labor conditions, or design changes, AI programs can rapidly analyze updated inputs and regenerate revised timelines. Predictive and optimization algorithms allow these tools to explore multiple “what if” scenarios, helping teams understand the ripple effects of decisions before they commit to a particular strategy.

7. Conclusion

The paper begins by presenting examples of failed megaprojects resulting from insufficient short-term planning using Look-Ahead schedules. The paper continues with providing a list of the most common Look-Ahead schedules project teams use to manage project scope. Next, a significant portion of the paper is focused on explaining the challenges with Look-Ahead schedules which include: projects with missing Look-Ahead schedules, issues with the quality of the Look-Ahead schedule, lack of detail in the Look-Ahead schedule, issues with the format of the Look-Ahead schedule, and challenges with communicating the information within the Look-Ahead schedule.

The paper continues with providing a few examples of typical Look-Ahead schedules such as a Look-Ahead schedule generated directly from P6, and a simple spreadsheet based Look-Ahead schedule. The challenges with these Look-Ahead schedules are also explained in this section of the paper. Next, the paper presents a framework for enhancing Look-Ahead schedules in order to address the challenges mentioned in the previous section of the paper. This framework includes, a graphic showing an improved Look-Ahead schedule with a detailed key as a suggested way to enhance a spreadsheet based Look-Ahead schedule.

As a way to further enhance Look-Ahead schedules, the paper presents examples of Look-Ahead schedules that incorporate pictures and graphics including: a Look-Ahead schedule with an embedded layout map, a Look-Ahead schedule with an embedded QR code, and a Look-Ahead schedule with an embedded movie. In addition to showing examples of these Look-Ahead schedules, instructions are provided in the paper showing the reader how to add a picture, a QR code, and movie into a spreadsheet based Look-Ahead schedule.

The paper concludes with two sections discussing the future of Look-Ahead schedules. The first section is dedicated to attaching 4D schedule files to Look-Ahead schedules. The last section of the paper discusses the preparation of Look-Ahead schedules using artificial intelligence.

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