

## Calendars Effect on Schedules

February 25, 2015

### Purpose

The purpose of this document is to help Project Managers and Functional Groups understand how calendars affect schedule dates and float.

## Understanding Calendars in P6

In a P6 schedule, the calendar represents the days on which the work for a specific activity may occur. A calendar has work and non-work days.

An activity's duration is only applied to the work days on an individual calendar. This helps show the true impact of an activity's duration on the schedule dates. For example, if an activity has a duration of 5 working days, the start and end dates can vary based on whether it is during a holiday period or not.

A 5 day activity that begins on Monday on a week with no holidays will end on Friday.

Su 11/2	M 11/3	T 11/4	W 11/5	Th 11/6	Fr 11/7	Sa 11/8
NON WORK (WKND)	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5	NON WORK (WKND)

A 5 day activity that starts on Monday on a week with a two day holiday will end on the following Tuesday, accounting for the holiday and the weekend.

Su 11/23	M 11/24	T 11/25	W 11/26	Th 11/27	F 11/28	Sa 11/29
NON				NON	NON	NON
WORK	DAY 1	DAY 2	DAY 3	WORK	WORK	WORK
(WKND)				(HOLIDAY)	(HOLIDAY)	(WKND)
Su 11/30	M 12/1	T 12/2				
NON						
WORK	DAY 4	DAY 5				
(WKND)						

## Types of calendars

- 1. **5 Day Work Week with Holidays** This calendar is used on activities that can be worked on year-round during a regular MnDOT workday.
  - Common use: The majority of activities in a design schedule use this calendar.
  - Non-work days: Weekends and holidays.
- 7 Day Calendar or 5 Day Work Week with No Holidays This calendar is used on activities that are NOT affected by holidays or weather. The 7 day calendar is used on activities not affected by weekends (a 30 calendar day review period) and the 5 Day is used on activities that are affected by weekends (advertising).
  - *Common use*: Activities that represent a legally obligated period of time expressed in calendar days (e.g. 180 day MPCA permit review period; 90 day vacate notice); or, in construction, activities that do not require staff or labor (e.g. cure time)
  - Non-work days: None
- 3. Seasonal Calendar This calendar is used on activities that have seasonal restrictions on work.
  - *Common use*: Activities that cannot occur during the winter months (e.g. ADA field walks, wetland delineations, ESA drilling)
  - Non-work days: Weekends, holidays, and any weather-restricted days.



## Calendar Frequently Asked Questions

#### Why is my 10 day activity scheduled to occur over five months?

If an activity is on a seasonal calendar and begins just before a non-work period, the schedule will push the completion date of that activity to a date AFTER the non-work period. This significantly reduces project float and can even put a project into negative float. In the example below, ADA1010 Conduct ADA Field Walk has an original duration of 10 days, but it cannot occur between November 1<sup>st</sup> and April 1<sup>st</sup>. Therefore, even though it begins on 10/28/14, the schedule will say it cannot be completed until 4/8/15.

1351	4.0.4, 1978	Company.	Annual	forts merry	C Sarly Private	LOWFINE	100708+1	12 1								- 1	bill				
	and the second sec	Dealers	Denter	(Anisher)	( particular		Contraction of the	265 :	file:	(Dec)	1001	/HC	Br.	Apt	- Fer	34	-34	-146	540	100	her
LAPIGH	Propers Proteinery Geometry: Leynut & Profile	14.4	42	100144	101014	193/4	41		-	100.41	y Owner	the Lay	and & Pe	ute					-		
ASA/INT	Schebate 404 Peter them	11.1	16.8	101414	1907/14	10/1714	-68	-	Schel	ie ich	Fang in	4									
A24/018	Destant 404 Net That and Presen Druft Recommendation	19.8	16.8	192814	4015	102114	48 -		-	-				1 do	AC N	a Feb	10.0	( Property	- Destri	laise and	renderer.
ADA/IDE	Dents Review of AGA Falls link Recommendations	9.8	16.8	45/0	40215	21815	-44.8							-	Serie	in in	of salas	feed the	k fanse	-	diame .

#### Why do I have different float numbers on different activities on my critical path? \*OR\* Why do I have activities with less float (or more negative float) than my project float?

Having activities on different calendars in a single sequence of activities or "float path" can result in variances in the amount of float on each of those activities. If an activity is on a 7 day calendar it will have higher float values (both positive and negative) than an activity on a 5 day calendar because it will count weekends and holidays into the float calculation.

In the example below the WDP1010 Permit Review activity is on a 7 day calendar and is showing higher float values than the adjacent activities.

à	IVE D	Advity Neve	Original	Terening	Plyane's.	Early Dian	Early Firen	Lein Frinkt	TAMA Fical +					1					2018
			Caneton	Outstan	Contrates	(A+Actual)	(Andreas)			340	00	- Thire	Det.	dan	1.744	. Har	201	Hay.	1.164 1.1
	INDP1588	Prepare & Subret Watershed Detroit Pernet Applications	- 28.	- 26	2%	802/15	10/19/15	13/28/15	46	- 5		Papers	\$ Subm	Vision	theit Deb	nit Per	nt Applic	1010	1
	INDEPIDING	Permit Review by Waterahed Districts	60	60	2%	1535/15	10716115	2/26/16	10		. 5			ferrid R	them by	Walers	ned Dal	1015	
Ŀ	WDP1628	Watershed Owhitt Permits Received	8		2%		12/18/15	2/26/16	48				٠	Vateristi	ed Carri	d Permit	s Receiv	ed.	

If an activity along the path is on a seasonal calendar, there are two things that can happen.

1. The activities leading up to and including the non-work period may have less float (or more negative float) than the activities after the non-work period.

In the example below, ESA2520 Complete Drilling is on a seasonal calendar and has -2 days of negative float. It's predecessor, ESA2500 Develop Work Plan has -44 days negative float because the float is calculating the number of days it would have to recover to make ESA 2520 begin before the non-work period.

anay it	Auticity latere	linginger (	Persent of	Safy Hat	Early Fromit	Late Frink	Stat Face	2	Die Ins Des The Law Law Line Line Line Line Line Line Line
104,2511	Develop trust Plan For 12 Miles	10.0	10.8	1.8/10	1/19/16	11/18/19	-14.5		Envolue flort für for Stilling
(64333)	Congress Drilling & Discusse Field Findings With Consultant	00.0	44.8	6/1/16	60x16	60316	44		Complete Onling & Dears, ex Pelli Findings (199) Consulta
\$143638	Receive, Review and Tabulate Averytical Results	49.0	46.3	8/27/148	82216	81816	-4.8		Potente, Revenue And Takulake Analytic

2. The activities after the non-work period have less float (or more negative float) than the activities on or before the non-work period.

In the example below, ADA1010 Conduct ADA Walk is on a seasonal calendar. By completing the activity after the non-work period, it pushes the entire project into the next calendar year and increases the amount of negative float on subsequent activities.

	Altids tare	Couplest Strength	distance of	August &	Anis Dart	Early Prime	Loss Prints	THE PAR	201 202 Wei 201 200 700 800 400 800 500 500 500 500 800
and beautyperson	man a								
INCA THINK IN AN	exemption defines								
404.080	Televise ADA Pare that	10.6	18.8	15	IBNATA	1912110	Marcena.	.43	Stresse 40x Feet feet
4041010	Conduct ADA Failt Halk and Prepare Shaft Recommendate	18.0	18.8	15.	1000014	4515	1003114	44	Ended and her to be a set of the
404 1025	Statut Reverse of 2014 Parel Intel Resonant American	15.0	18.6	14	6910	40016	279414	.44.8	Exercit Review of AGA Part Viral: Recommendations
ALC: NO	Produce with Part that Recommendations	12.0	19.8	2%	42512	1815	stores	-44.0	Falation Julia, Hard Triade Revisionmentations



# What strategies can I use to reduce negative float on a float path that includes a seasonal calendar?

When you have activities with negative float along a float path that includes a seasonal calendar, it is important to look at the activities before AND after the non-work period for opportunities to gain float.

 In the example below, activity ESA2520 is on a seasonal calendar and cannot occur between Nov 1 and April 1. It has 2 days negative float because it will end 2 days past its deadline date if it starts on April 1. ESA2500 is showing 44 days of negative float because in order for ESA2520 to gain those two days, it has to end two days before the non-work period begins (Nov1).

unity E	E a (5-4) here		a (b-lp faire	Digital.	And and a local division of the	PARA	Dety Hart	Taris Treat	Lau/mar	Tau Fuet.		1.					2	10							
		Justic.	Garages.	Drope.	(And State)	(Arrest and				146	Fac	100	100	they'	34	1	And 1	344	Rt -	lani-	-0mi	201	100		
C. Phone B																									
\$14,500	Denses then April or Drilling	10.0	12.8	. Ph	1616	17976	757976	-86.5		-	the state of	141.74	0.110	100											
1542110	(Delan-Digit of Delma for Delma (REE))	18.8	16.8	P5.	87744	100314	1010.00	200.8																	
254252	Conserves Striking & Discuss Fald Fondings Killth Consultant	92.0	66.8	175	40.16	80416	ACC'N.	-22	14				-			Complete	-	\$ Den		-	n me o	-	6.00		
154210	Remove Revent, and Tanalate Aventical Results	401	45.8	PS.	502118	80016	87518	-28								-		-	laine.	cant1	anuaria -	10112	(Sec.)		
8542540	Report Results & Determine If Labely Protections are Rec.	10.0	19.8	75	40318	24916	8116	-24										1 700	the Rea		-	1.44	p-Prop.		

Solution: By reducing the duration of the successor activity (ESA2530) by 2 days (instead of trying to recover 44 days on ESA2500), it recovers the negative float on ESA2520 and puts ESA2500 into positive float because its deadline has moved to March 31<sup>st</sup>.

10141	Articly Hare	Orgenal	Summer of	Pipala h	Dety liter	tary Huan	Late front.	Describer		314
	A DEC	Canal of the second	C. Present	The state of	(analysis)	University of	-			Jan Fen the tep the Lin Lif. Aug Did Dif Ker Dat Jul Tak
These #										
IGA708	Decalling Work File File Delling	316	18.9	175	15/6	111018	2/04/98	01.6		Eryetta Visse Pier For Statig
8542578	Diffusio Right of Stirling. No 22-Reg. (70/82).	18.0	18.0	1%	arrian.	19/20/16	321/0	384.6		
8542528	Complete Drilling & Decuga Publi Findings (1991 Consultant)	85.0	48.0	1%	411/10	60416	60416	8.8	-1	Engene Initia & Decuse Feet Finituge Vite Consulant
\$10,425,28	Ascene, Neveril, and "Advate complete Results	38.0	38.8	2%	87719	01018	818/16	8.8	-	Receiver, Amount and Takalate Analytical Republic
554/54E	Geograp Geoude & Datamino (F), apply Photestone are Re-	18.0	18.0	15	8/10/18	811110	W-LHB	11		Hansing Results & Statement Plugsity Pros-

2. In this example, activity ADA1010 cannot occur between Nov. 1 and April 1 and is showing 6 days of negative float. Having the field walk activity complete in April places the successor activities (ADA1020 and ADA1030) in 44 days of negative float because they need to be completed in February and March to maintain the project on schedule.

ALC: BY	6	digitizity blane	(Indexe)	Automity	myana th	Term There	Tary fisiel	Adda Parame	Neer Plant	41 Jan 1
-			Distant:	Distance.	Careford .	(ALC: NO	Theorem and	_	-	10.6 New Disc tes Fig Hig Age Neg hig in the Sup 201 Nec
1.1.9	AN PROPERTY									
	AGA Field Wells 8	accountered at the second s								
	A0A3080	School at AGA Party Walk	18.8	18.8	175	10/10/14	18/07/14	101714		Strume ADA Fait Mak
	4041010	Conduct ADA Field Walk and Prepare Drief Hacomentality	10.0	18.8	1%	10/05/14	+515	1037514	-6.8	Conduct a Dial And Annual An
	ADA 1029	Chaired Review utilitie Parci Mast Reconstrainduments	18-0	18.8	- 14	4/810	40216	2/19/15	-44.5	Dienct Review of ADA Part Walk Recommendations
	AUA (110)	Proping ADA Part mak Recommendations	12.0	18.8	2%	4011115	545+8	505+18	-44.0	Finally alight real trial fragmentations

Solution: By reducing the duration on the predecessor activity (ADA1000) by 6 days (instead of trying to recover 44 days on the successor activities), it recovers the negative float on ADA1010 and puts the successor activities in positive float because they will now finish much earlier than the February and March deadline dates.

Addively ED Ad	Activity Name	Orgenal.	Assump	Physics 5	Larb Start	Early Finish	Late Frank	Total Pinal					1					1	le:	
			Samples.	Datafan.	Conpets	(Keldzk)	(A+ACEAN)			-	Det .	thre	Det	181	742	the -	Agt .	Thay .	100	T
8	ADA Recomment	dations		àil 12	1				1										-	1
	ADA Field Walk I	Recommendationa																		
	AD4(1900	Schebule ADA Field Well	4.0	4.8	2%	19/14/14	18117114	10/17/14	0.0		8.5	Cherthull	ADA PE	et tivels						
	AD4-1910	Conduct ADA Paeli Walk and Prepare Dreft Recommendate	10.0	10.0	2%	1900/14	1001114	18/21/14	8.D.		1.	Dave	ACT ADA	Field W	10.44	-	Disfi No.		-asters	į.
	ACA 1929	Detro: Review et ADA Feld Mak Recommendations	10.8	10.8	PN .	15/5/14	19113174	2/19/18	82.8				District R	evenie dr	ADAT	HE WAR	Retars	nendala	10.0	
	A214-1030	Finalize ADA Faild Vials Recommendations	10.8	10.0	2%	11/10/14	13/3/14	3645	42.0			-	Trees	tee ADA	Piete Vi	al Pace	rine 1de	densi.		

## For More Information

#### Visit: mndot.gov

Or contact: Jay Hietpas, MnDOT, 651-366-4698, jay.hietpas @state.mn.us