Innovation Tools

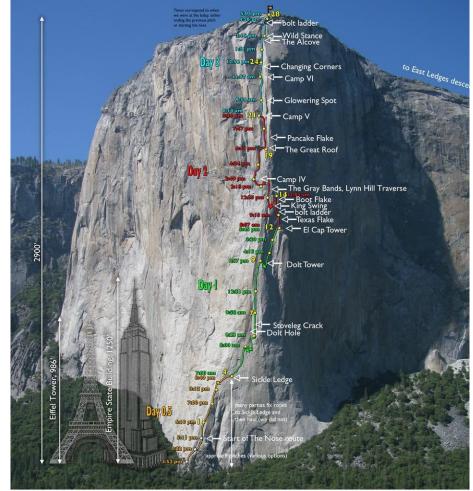




Steve Moore, PMP, PSP, PMI-SP, LEED AP Manager of Scheduling and Innovative Support

ROBINS & MORTON





THE NOSE (maday)

El Capitan, Yosemite Valley, California Trad & Aid, 28+ pitches, 2900', Grade VI, 5.14a or 5.9 C2, & lots of stami

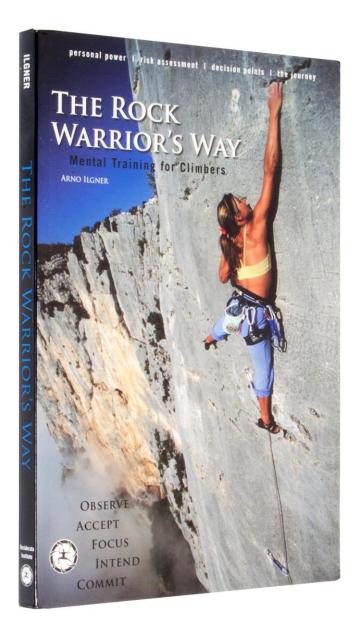
Photo and annotations by Steph Abegg, June 2017. Photo taken from Central Pillar of Frenzy. www.StephAbegg.com

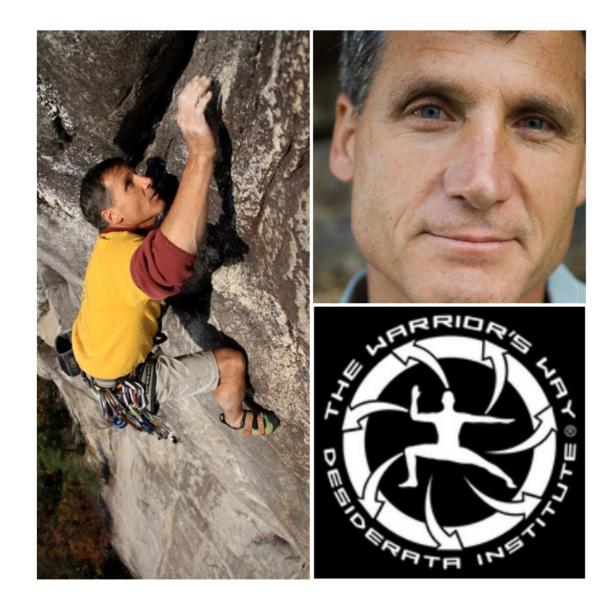


Overcoming my Fear of... Falling

...and

Failing



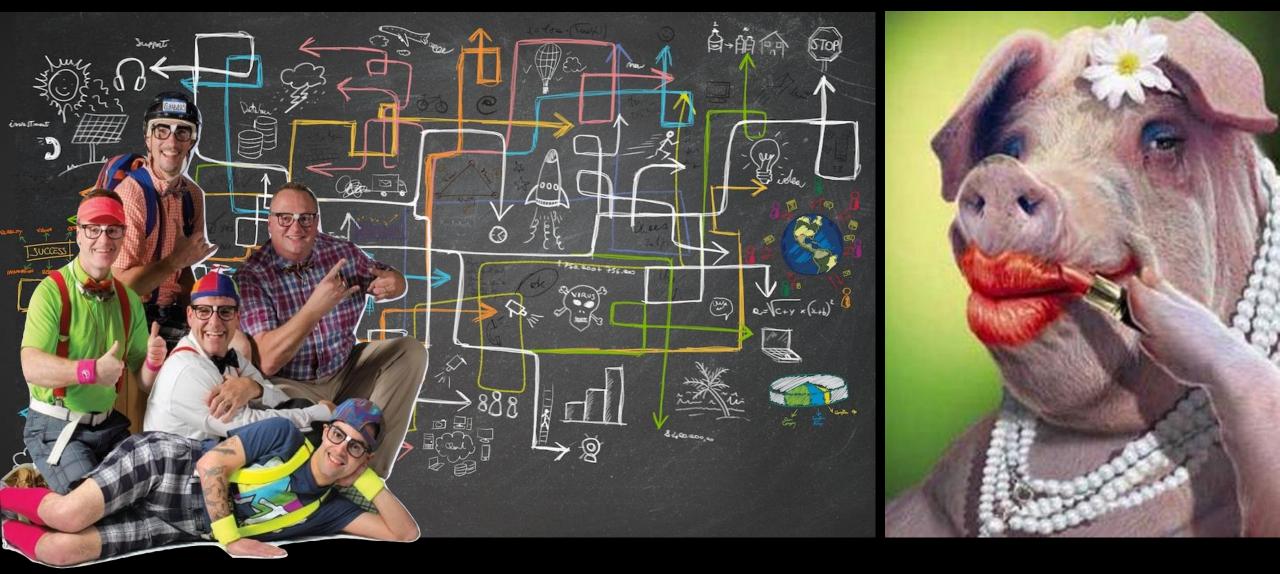








Current State of Construction Software



Current State of Construction Software



Current State of Construction Software



We Can't Continue Waiting...



INNOVATION DISTINGUISHES BETWEEN A LEADER AND A FOLLOWER

- STEVE JOBS



What can **WE** do about it?



BOX





Saves: 3 Hours/Week/Project 17,000 hours/year (110 projects) \$1.5M/year

•Costs:

•\$30K/year







4D Scheduling

- Clear Communication
- Schedule validation
- Easily understood
- Retain benefits of CPM

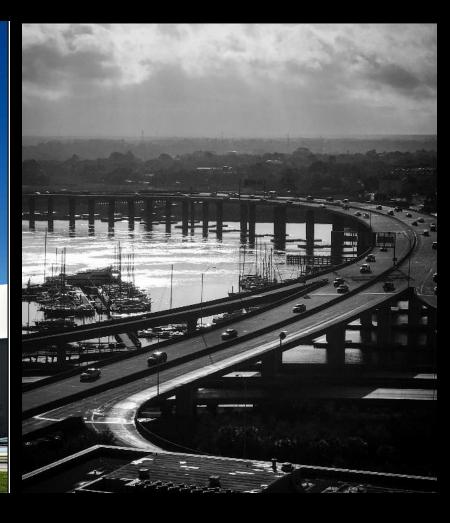


4D Scheduling

MUSC CHILDREN'S HOSPITAL/WOMEN'S PAVILION

Charleston, South Carolina

Program \$385M Construction \$250M 11 Stories 626,000SF 30 Month Schedule



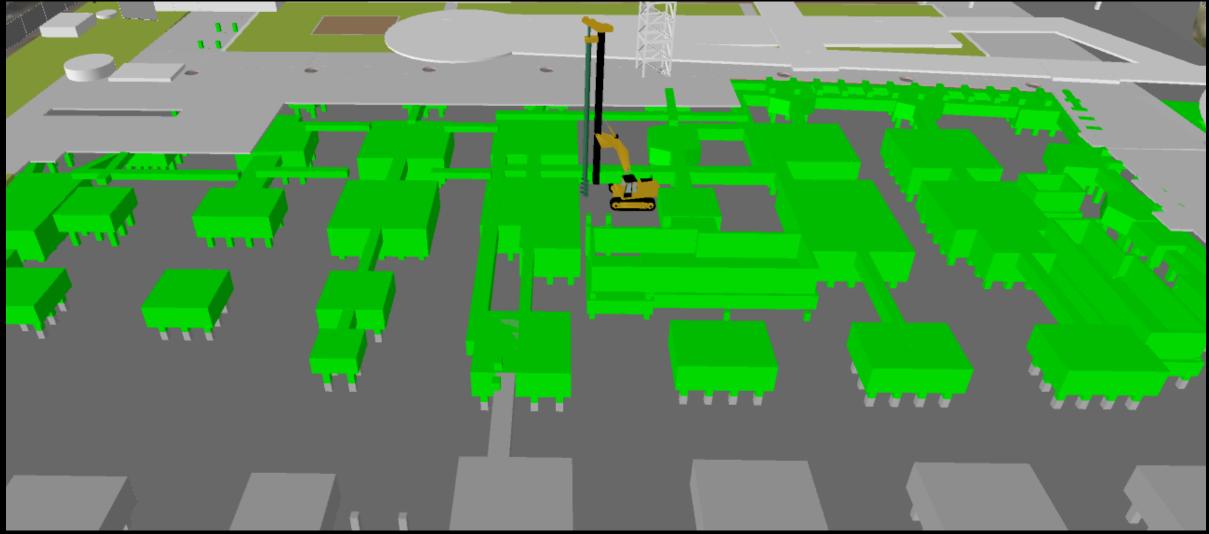
Collaboration



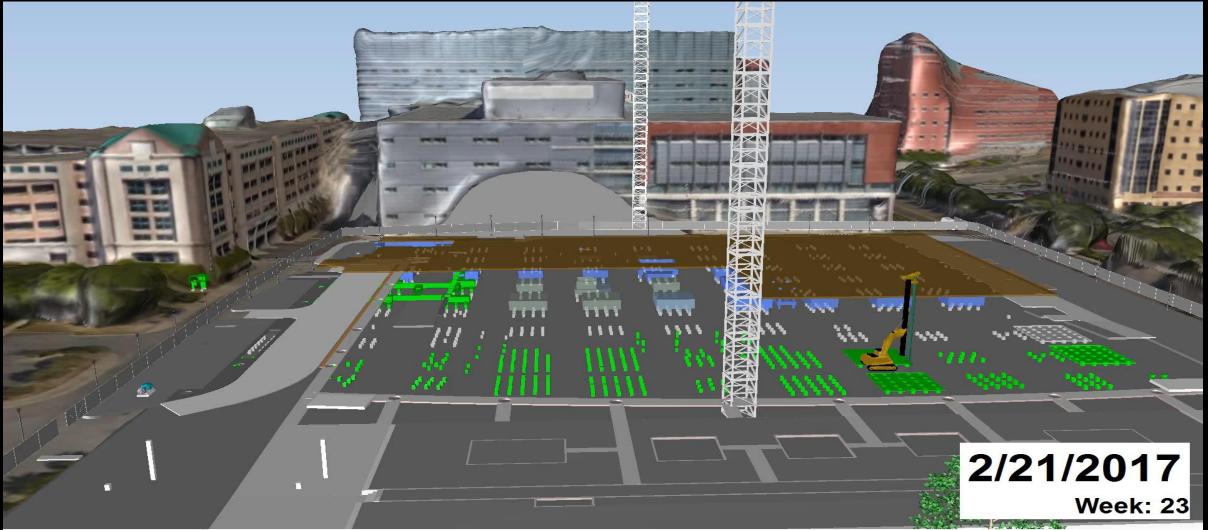
Schedule Validation



Schedule Validation



Schedule Validation

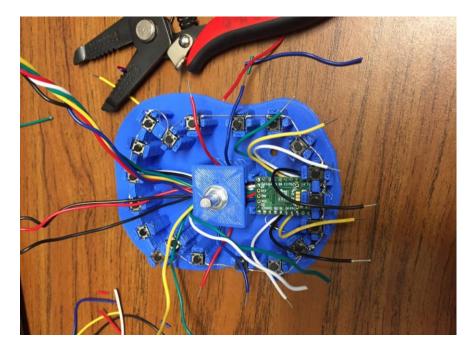


Schedule Validation – Steel Actual

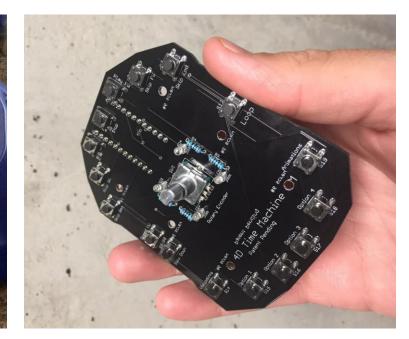


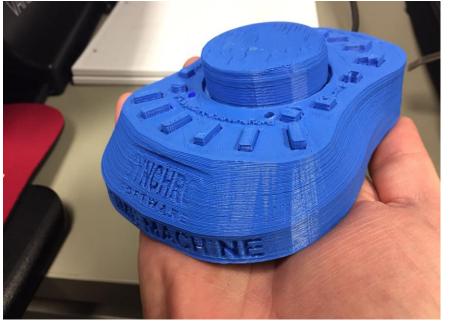




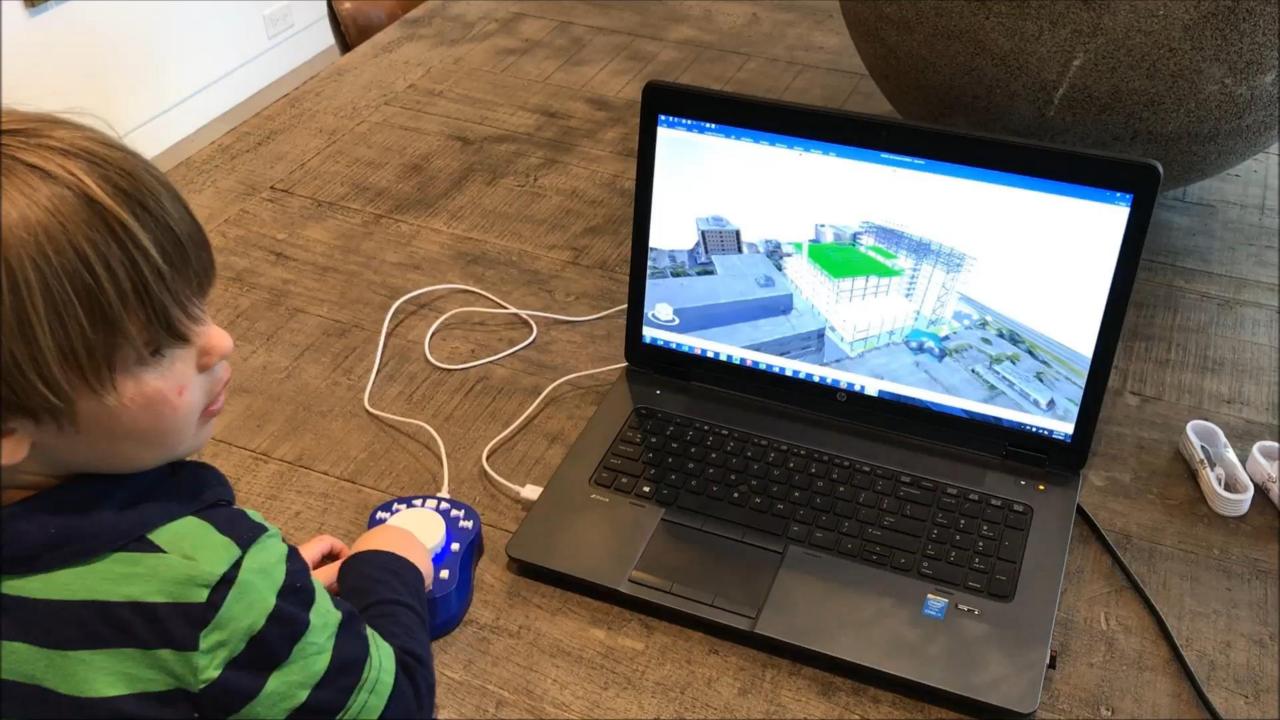








Time Machine Controller



Customer Feedback:

- Awesome Concept!
- Easy to use
- Clunky Design
- Large Form Factor
- Loud Buttons
- Driver Issues
- Corded
- Fragile USB Connection





TimeMachine 2.0

- Awesome Concept!
- Easy to use
- Sleek Design
- One-Handed Use
- Quiet Buttons
- Solid Drivers
- Cordless
- Tiny USB Dongle

Mouse wheel up Next viewpoint Mouse left click —

Skip to beginning Play backwards Stop

Step backwards



Next animation Middle Mouse Button Mouse wheel down Skip to end Speed up Play forwards Slow down Step forward

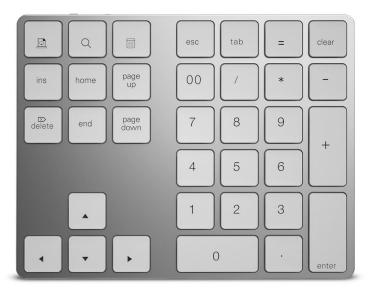




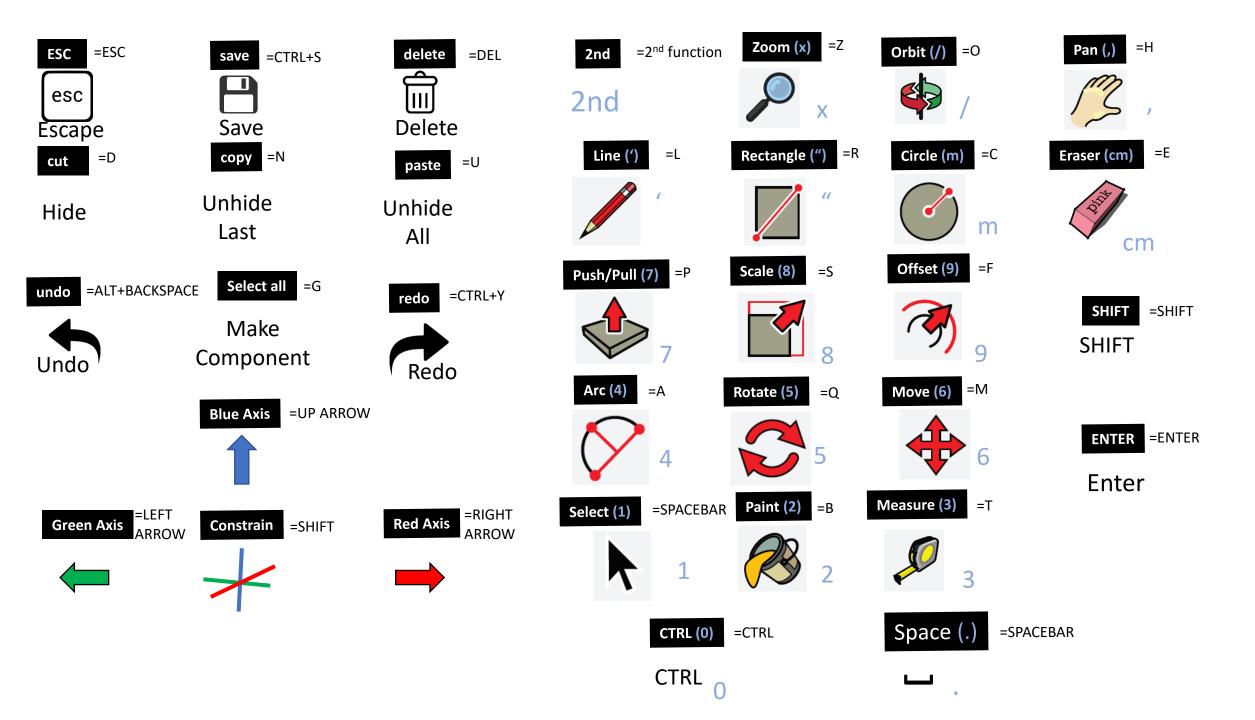


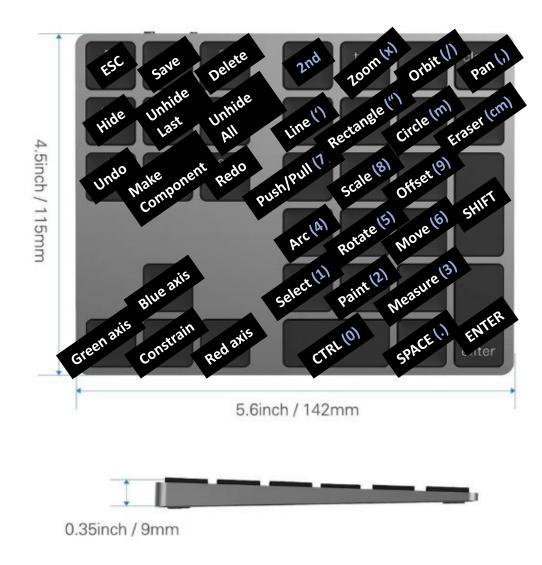


😵 Bluetooth"



Sketchup Controller

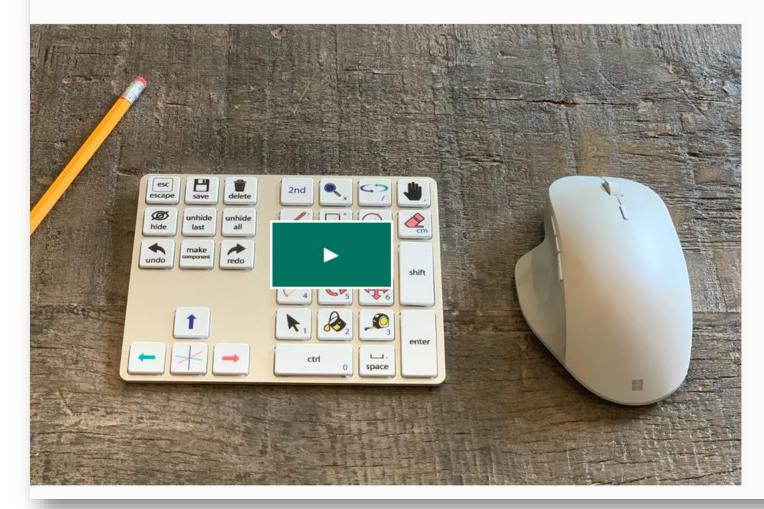






SketchPad for SketchUp

Take control of SketchUp and maximize your efficiency with this physical keypad.



\$3,991 pledged of \$8,500 goal

50 backers

Funding Unsuccessful

The project's funding goal was not reached on Fri, November 29 2019 2:29 PM CST

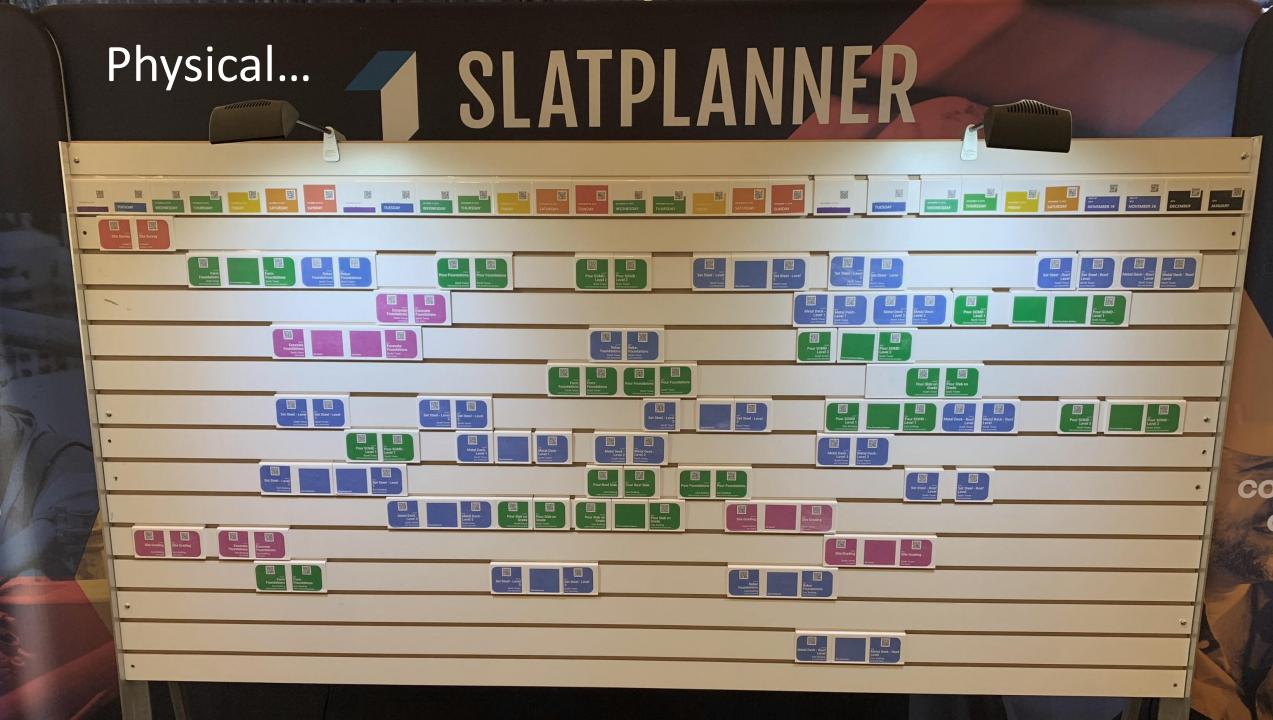
Last updated November 29, 2019



Next Steps

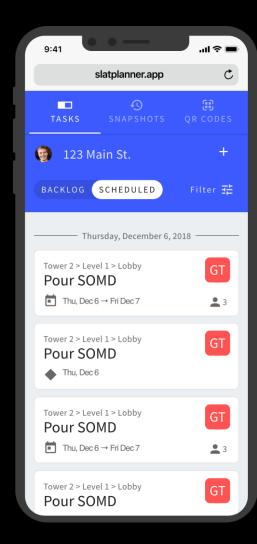
- Mac and PC Variants, Revised Layout
- Shortcut Controllers for Additional Software Products
- Virtual Shortcut Controller App

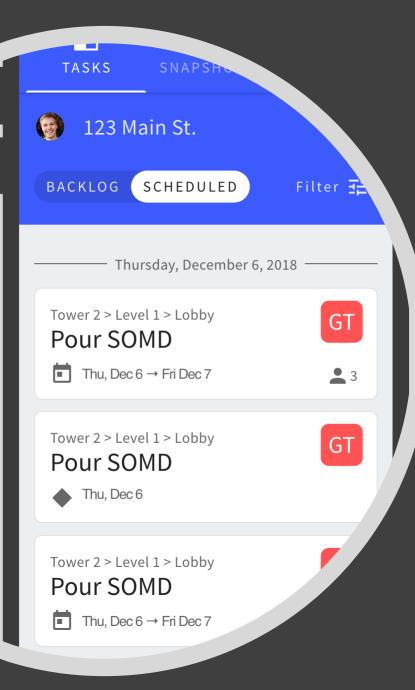


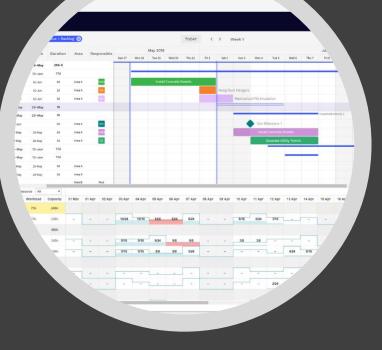


Digital...

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✓ Imported Task	28-May	13-Jun	17d				_	_	-	-									-	_	_	_	-
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Slat Task 2	01-Jun	01-Jun	1d	Area A	SS							Hang Du	uct Hanger	s									
Slat Task 3	01-Jun	02-Jun	3d	Area A	NA NA								Mechani	ical Pile Insi	alation								
Imported Task 2	27-May	29-May	18																				
✓ Imported Task 3	27-May	29-May	18		_								-					Imported /	Activity 2				
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Slat Task 4	27-May	29-May	3d	Area A										_	ll Concrete I								
Slat Task 5	27-May	29-May	3d	Area A	SS										Excavate U	tility Trenc	h		_				-
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Slat Task 5	27-May	29-May	3d	Area A																			
Unscheduled Task				Area B	Paul									_									
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🗋 Mike	48%	63h	240h	-	-	- 9/1	6 9/1	5 9/2	4 9/8	9/8	-	-	3/8	3/8	-	-	-	-	-	-	<u> </u>	-	L
🗋 Anna	21%	70h	240h	-	-	- 9/1	6 9/1	5 8/4	8/8	5/24	-	-	-	-	-	4/24	4/16	-	-	4/24	4/24	-	L
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G Other	80%	Oh	240h									-							_	_	-		









SlatPlanner

The Best of Both Worlds.



















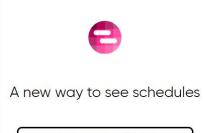


Plan. Build. Measure.

We make construction technology products for your team, large or small. Our products help executives to laymen collaboratively plan, understand, communicate, and measure their projects and performance.

Sticky Notes without the stick

PLAN TO GET PHYSICAL



THIS IS SO CRITICAL



GIVE FEEDBACK



THIS IS NOT A GAME

Proposed R&M Employee Innovation Structure



Idea Incubator Website set up to share and discuss problems and solutions. Ideas are initially registered here.



Profit/Savings Sharing The idea owner then receives either a portion of future profits/savings or a bonus, if the product is successful.

Project Funding

Funding is provided to bring the prototype to a viable product state.

Petition/nominations

As testing concludes, a predetermined number of nominations from R&M users is necessary to

obtain full funding.



This structure provides an avenue and incentive for anyone to propose ideas, take ownership, and lead their ideas from inception to implementation. Enabling and supporting our people's ideas will increase engagement and spawn industry-leading innovation.

Testing Period

The prototype is tested on volunteer pilot projects, which were listed in the proposal stage. lesting



Proposal Generation

guidance and support from the

innovation team.

Idea owners produce formal A3's with



Prototyping Grant The committee allocates funds and an initial prototype is built.

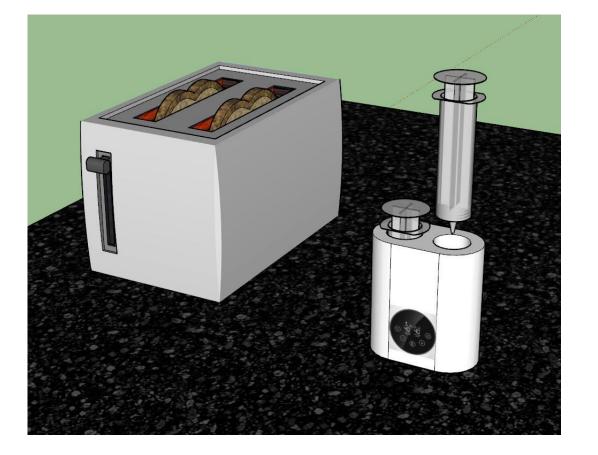
Innovation Lab

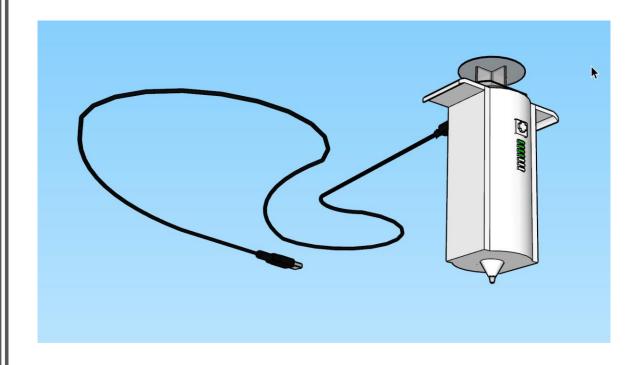
A center of innovation for R&M





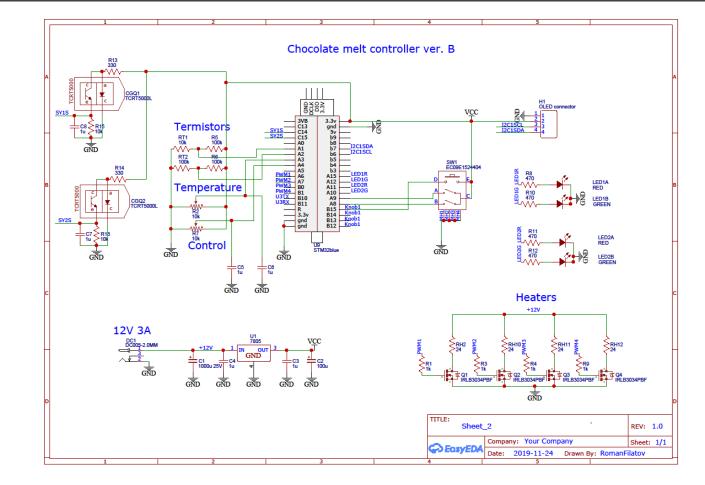




















Sneak Peak

Scheduling Tool

Revolutionary Simplicity

4

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Primavera P6 Professional 17 : EC00515 (City Center Office Building Addition) × Activities a Qtr 1, 2012 ~ Qtr 4, 2011 **Projects** Activities Qtr 3, 2011 Feb Ma 2 Qtr 2, 2011 Jan Dec Nov Qtr 1, 2011 Oct Filter: All Activities Aug Sep , 2010 Jun Jul V Layout: Classic Schedule Layout Total Float Finish May Schedule % Start Apr 5 Feb Mar Original Duration Remaining Jan Dec Activity Name Complete Activity ID Duration 6.67% 01-Nov-10 03-Jul-13 06-Apr-1 A, EC00515.D&E Design and Engineering = EC00515 City Center Office Bu 100% 01-Nov-10 / 06-Apr-11 A Design Building Addition 107 2 EC00515.D&E Design and Engi 100% 01-Nov-10 / 19-Jan-11 / rt Office Building Addition Project, 01-Nov-10 A 55 0 Design Building Addition 9 EC1000 Review and Approve Designs 100% 01-Nov-10 A 0 Assemble Technical Data for Heat Pump Start Office Building Addition 100% 17-Jan-11 A 17-Feb-11 / 😑 EC1010 22 Review and Approve Design Review echnical Data on Heat Pumps EC1030 100% 16-Feb-11 A 25-Feb-11 / 19-Sep-11, EC00515.Found Foundation 4 0 Assemble Technical Data for EC1050 100% 24-Feb-11 A 06-Apr-11 A 0 27 Review Technical Data on H Begin Building Construction, 28-Feb-11 A EC1160 22.02% 23-Feb-11 A 19-Sep-11 98 146 EC00515.Found Foundation Site Preparation 100% 28-Feb-11 A 0 0 Begin Building Construction Excavation 😑 EC1090 100% 23-Feb-11 A 18-Apr-11 A 2 Install Underground Water Lines 43 Site Preparation 127 + EC1100 41.67% 02-May-11 06-Jun-11 24 24 Install Underground Electric Conduit 127 Excavation 0% 03Jun-11 21Jun-11 EC1230 Form/Pour Concrete Footings 12 12 Install Underground Water Li 127 11 EC1320 0% 03Jun-11 21Jun-11 Concrete Foundation Walls 12 12 Install Underground Electric (127 😑 EC1330 0% 21-Jun-11 26-Jul-11 Form and Pour Slab 8 24 24 Form/Pour Concrete Footing: 127 😑 EC1340 0% 25-Jul-11 26-Aug-11 Backfill and Compact Walls 24 Concrete Foundation Walls 24 127 😑 EC1350 0% 26-Aug-11 14-Sep-11 + Foundation Phase Complete, 12 Form and Pour Slab 12 😑 EC1360 178 19-Sep-11 0% Erect Structural Frame 0 0 Foundation Phase Complete 306 0% 19-Sep-11 20-Apr-12 Hegin Structural Phase, 25-Nov-11 😑 EC1380 151 151 EC00515.Structure Structure Theor Decking 127 0% 19-Sep-11 25-Nov-11 48 48 Erect Structural Frame 418 Conci 😑 EC1390 0% 25-Nov-11 Π Begin Structural Phase 127 😑 EC1410 0% 25-Nov-11 13-Jan-12 34 34 127 EC1420 Floor Decking 0% 11-Jan-12 01-Mar-12 36 36 Concrete First Floor 139 EC1430 0% 01-Mar-12 04-Apr-12 24 24 139 Erect Stairwell and Elevator EC1460 0% 01-Mar-12 04-Apr-12 24 24 Concrete Basement Slab 127 EC1470 0% 01-Mar-12 20-Apr-12 36 36 Concrete Second Floor 127 ₩. EC1480 20-Apr-12 0% 0 0 Structure Complete 2.63% 14 Apr-11 A 26 Jun-13 EC1540 549 > 562 EC00515.Mechanicals Mechani 234 0% 12-Mar-12 0 0 Rough-In Phase Begins EC1490 05-Feb-13 0 0% v < 0 Rough In Complete EC1690 Project EC00515 General Status Resources Predecessors Successors Feedback Backfill and Compact Walls Activity Calendar Activity EC1370 . Trades - 5 Day Workweek % Complete Type • Duration Type Physical Activity Type Fixed Duration and Units/Time Primary Resource Task Dependent Responsible Manager Exc Excavator ... E&C WBS EC00515.Found Foundation

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Microsoft Project

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Safran Scheduler

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SmartSheet

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	-		Wire-frame	10/04/18	40/05/18	Jerry	Complete	Wire frame Build subpages
Q		F	Build subpages	10/08/18	10/10/18	Jerry	In Progress	Reply forms
4			Reply forms	10/10/18	10/16/18	Jerry	In Progress	Finalize messaging
	-0	F	Finalize messaging	10/10/18	10/16/18	Julie	Not Started	Core team review
	2		Core team review	10/16/18	10/22/18	Jerry	Not Started	Leadership team review
	2	P	Leadership team review	10/22/18	10/26/18	Jerry	Not Started	Pre-launch QA
		×	- Pre-launch QA	10/26/18	11/02/18			Beta test
	-		Beta test	10/26/18	10/30/18	Sally	Not Started	Fix bugs
-	2	B	Fix bugs	10/30/18	10/31/18	Jerry	Not Started	2nd beta test
5	2		2nd beta test	10/30/18	10/31/18	Sally	Not Started	Review bugs
-			Review bugs	11/01/18	11/02/18	Sally	Not Started	Final sign-off
) 🗹		Final sign-off	11/01/18	11/02/18	Sally	Not Started	Launch
	0		- Launch site	11/05/18	11/13/18			Prep CS team
	â		Prep CS team	11/05/18	11/06/18	Kim	Not Started	Prep support tes
			Prep support team	11/07/18	11/08/18	Kim	Not Started	Go live
	â		Go live	11/09/18	11/09/18	Jerry	Not Started	

* 1	< \u =	Finish -> Start Project Calend Sa	•	• • •	130en	Jan 2013 Oth wk -80	13th wk -79	20th uk -78	27th wk +77	Feb 2013 3rd wk -76	10th wk -75	17th wk -74	24th ak -73	Mar 2013 3rd wk -72
	ID	Name	Duration	23rd wk -82	30th wk -51	wk -80	Jux 4/2	110000000	and the second second					2
4	524	SUPERSTRUCTURE	449d					_						
	530	- Steel Megalrame (L00 to L47)	283d											
66	526	+ Steelframe L00 to L05	55d	-										
12	526	+ Low Level Steelwork L00 to	60d											
16	526	+ Steelframe L05 to L12	40d	-										
71	527	+ Steelframe L12 to L19	44d. 7h. 1											
24	527	+ Steelframe L19 to L26	43d =	-						Ster	elframe L33 ti	0140		
78	528	+ Steelframe L26 to L33	48d											
32	529	- Steelframe L33 to L40	41d						104.00.00					
33	529	+ Splice 1	15d				meta	I decking	L34,35,36					
537	529	±Imetal decking L34,35,36	196	-		Sp	lice 2		tel deckin	1 27 38 30				
543	529	+ Splice 2	13d						metal deckin	lined columns	& nodes			
547	579	+Imetal decking L37,38,39	22d						me	Inted columns			and a state of the	
554	529	inclined columns & nodes	19d	D P	2No Inclined Col	umns L34 39			1 1 24 20					
555	5293	B : 2No Inclined Columns L		2 0 1	Ento monitor o os	2°	C.NE Core 1No	nclined C	olumn L34-39	0				
556	5293	C : NE Core 1No Inclined				D ²	D: NW Gore 1No	Inclined	Column L34-3	9				
557	5293	D : NW Core 1No Inclined					B 2No No	des (A-B/	3-5) @ L40	2140				
558	5293	B : 2No Nodes (A-B/3-5) .					~~ C	NE Core	e 3No Nodes (@ 140				
559	5293	C : NE Core 3No Nodes @						NW Co	re 3No Nodes	40				
560	5294	D : NW Core 3No Nodes					44	B	C : NE Core E	AU	s@140			
561	5293	B : Install Beams @ L40	2d			E.	******		D : NW Core	Boams & Sta	irs @ 1.40			
562	5317	C : NE Core Beams & Stair	28						D: NVV Core	Deams & Old				
563	5317	D : NW Core Beams & St	a 2d			5	G : Install 1No I	inclined C	olumn GL1 B-	D				
564	5294	G : Install 1No Inclined Co	I 2d			5	H : Install 1No I	nclined C	olumn GL1 B- +H : 4No @ L	AO Nodes alor	GL C.Usin	a 400te Cran	e on road ered	ct 8 mega c
565	5294	H : Install 1No Inclined Co	12d				<<		+H : 4NO @ L	+H : Install L4	0 Beams Ins	stall Level 5 no	odes on temp	trestle
566	5294	G+H : 4No @ L40 Nodes	8d						1.6	TT: motor La	etal decking t	0140		
567	5294	G+H : Install L40 Beams						-		12	6 Decking O	nly	************	
568	529	- metal deciding to L40	11d						Zone B			************		10.00
569	529	L26 Decking Only	11d						Zone B	Zone C. D		1000		
570	5293	Zone B	5d	-					< <u> </u>					
571	5303	Zone C.D.	54 ,					Long Long						
		in the second se		-						and the second se	1		Transactions	21 Admin

	€-♦₽₽	The second se								Carilio	Roanoke Memorial Schedule 190918 - Synchro			🦎 Resources Wizard	Ctrl+Shift+R
File	e Plan	Assign Res	ources	3	D 4D Review	Project Co	ontrols Re	ports W	/indows N	lavigator				Select Assigned Task(s)	
	±	1			stra 🕷	Subdivide		555	So 3D Paths			Solate Selected		Camera	•
		L	-			Enable Snap	ning 👼 📍	S 1	SI 3D Path P	operties		Hide Selected		Zoom	•
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	•				ransformation(s)	copy	ЗС	Path 3D Path	h - convert P	Plane >			Selected Selected		•
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all P	lain '	r FS			 Project Calend 	dar	* Resource		 Task 	•				Create Workspace	•
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Ob	ojects	▲ ἀ Χ		L.	Name	Durat	Start -	Finish		Oct	Apr Jul Oct Apr	3D Using Dates	[Best] Colo	Render Mode	
		^	_			ion				wk 4 wk 1	7 wk 30 wk 43 wk 56 wk 69 wk 82 w	N	Ulsing Dates (5)		
	Name		2	ST	GC Selection	Od		10/1/2019 ((*)	GC Select				Visibility	
			6	ST	Align / Validate	Od	12/2/2019				Validate	=		Effects	•
	Faces - Lav	yer0	4	ST	Enabling Packag			1/1/2020 (*))		abling Package	A STATE AND A STATE		Visual Indicators	•
	■ Group		7	ST	Select Critical Tr.		1/2/2020			Sel	ct Critical Trade Partners	- CARLON ROLLAN		🛅 Change Window Caption	
	- Group		3	ST	Site and Utility D			4/1/2020 (*)			Site and Utility Design	CONTRACTOR CARD AND		Cutting Planes	•
	Faces - Lav	yer0	5	ST	Foundation, Stru.			6/1/2020 (*)			Foundation, Structure, & Skin I				,
	■ Group		8	ST 4	Crystal Spring T			5/31/2024	(8			BARRIN STUDIE	State and	Senable Markup Mode	
	Group			ST	 Milestones 	1042d	6/3/2020	5/31/2024	(5			CHARLES STREET	Charles the Court	Enable Snapping	
	- ■ Group		10000	ST	Complete Pum.			6/3/2020			Complete Pump Station Relocat	IC	NORTH TRACK	Dates to Use	•
	Faces - Lay	yeru		ST	Complete Ena			9/4/2020			Complete Enabling			Color Mode	•
	Group			ST	Start Deep Fou.		11/5/2020				Start Deep Foundat	EK CALLER CONTRACTOR	S. S	 Isometric 	
	■ <dsv></dsv>		10.3	ST	Start Concrete .		3/5/2021				Start Con	C C C C C C C C C C C C C C C C C C C	Carlo and		
	■ <dsv></dsv>			ST	100% Coordin			6/30/2021				4 362 355 36	SALESSAL	Measure Distance	
	■ <dsv></dsv>			ST	Start Steel Pac.		2/3/2022					C TRUE REAL P	CARD COLOR	Select All	
	■ <dsv></dsv>			ST	Start Skin	Dd	10/5/2022					All Star And China I	and the second s	S Deselect All	
	Group			ST	Exposed / Sem.			10/5/2022				A ISAN MARSON		Invert Selection	
	Group			ST	Start Buildout	Od	10/6/2022								
	■ Group			ST	Semi-Exposed			5/24/2023						Selection Tool	
	Group Faces - Lave	-0		ST	Conditioned Air			6/6/2023						Selection Level	•
	Faces - Laye Group	10		ST	Controlled Air	Od		12/6/2023				ON REPORT		🖬 Сору	
	r ■ Group			ST	Finish by 5/202		0/40/0040	5/31/2024 (*	58			CARILION		Paste	
	✓ ■ Group			ST	- Construction	1185d		4/3/2024	(8	4	Releasts Duran House (hu atha				C1.1. C1.10.
	- ■ Group			ST	Relocate Pump			6/3/2020			Relocate Pump House (by other			Assign to Selected Task(s)	Ctrl+Shift+A
	Faces - L	av		ST	Align and Valid.	43d 130d		11/29/2019		Aigna	nd Validate Business Case Select Team			👱 Unassign from All Tasks	Ctrl+U
	- Group	uy		ST	Select Team Relocated ED		12/2/2019 1/1/2020	5/29/2020 5/29/2020			Relocated ED Access			Create Task(s)	•
	Faces - L	av		ST	Prefabricate Uti		1/1/2020	2/28/2020			Prefabricate Utility Banks			Groups	•
	- Group		1000	ST	Divert Spring		1/2/2020	2/28/2020						Convert 3D Text to User Fields	
	- ■ Group		123.7	ST	Sheet Shoring	42d 22d	3/10/2020	4/8/2020			Divert Spring Water	The second have	11/ 10		
	■ Faces - L	av		ST	Grade New Lo		4/9/2020	5/8/2020			Grade New Loop Road			Convert Polylines to 3D Path	
	- races - E	-,	1000	ST	Remove ED Lo.		5/6/2020	5/19/2020	864		Remove ED Logistics		and the second second	🙀 Find 3D Object	
	■ Faces - L	av		ST	Ambulance Ba.		5/6/2020	5/26/2020	151		Ambulance Back In	and an	Contraction of the local division of the loc	Save as image	
	- Group	-,		ST	Additional Amb.		5/27/2020	6/2/2020	70		Additional Ambulance Appear	all of all	COLUMN TO A		
	- Group			ST	Relocate Utiliti.		6/1/2020	7/31/2020	10		Relocate Utilities & Tie-Ins	1000	and the second second	Stream to HoloLens	
	■ Faces - L	av		ST	Demo & De-W.		8/3/2020	9/4/2020			Demo & De-Water / Dive		1	😻 Render in Iray	
	- ■ Group		3.7	ST	Grade & Under.		9/7/2020	11/4/2020	q		Grade & Undergrou		200	3D Properties	
	Faces - L	av	57		Deep Foundati.			3/4/2020	9	~ <	Grade & pridergrou	BACK	and the		unding Box of Selecti
		-, V	51	51	Deep Foundati.	000	1113/2020	31412021		v .	,				

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For Help, press F1

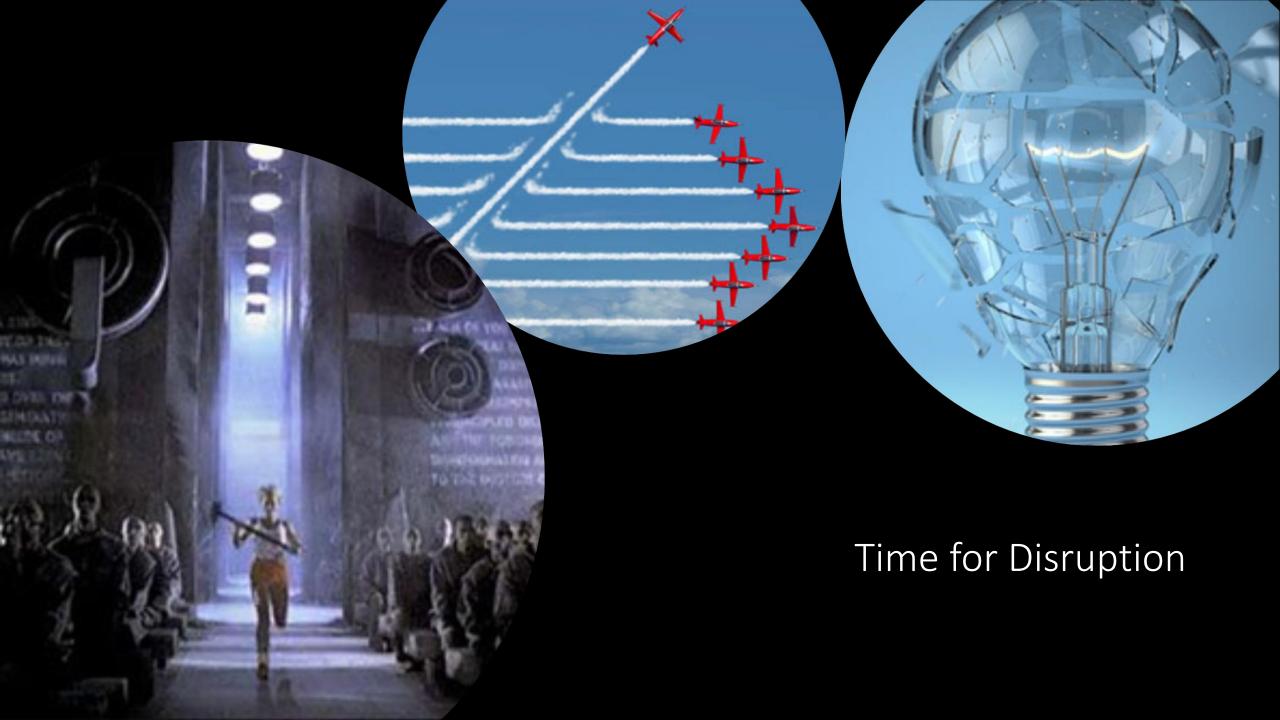
Expire 219 days Enough memory

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4/17/2024

Private Project

Transactions: 3214



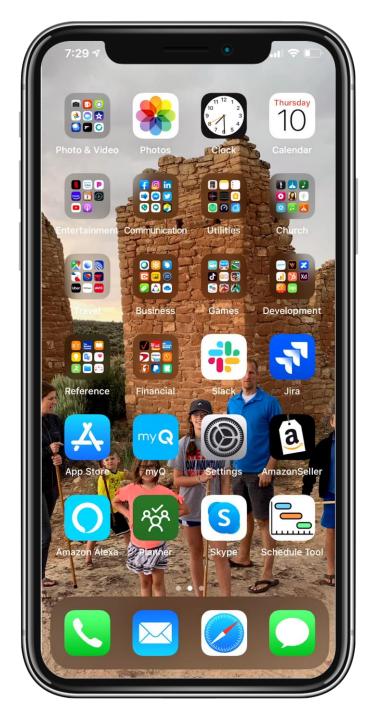
Scheduling Tool

- Simple
- Intuitive
- Web-Based



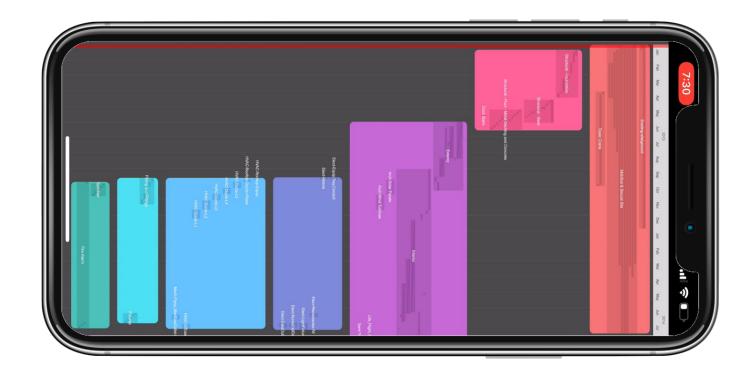
Scheduling Tool

- Simple
- Intuitive
- Web-Based
- Mobile Friendly



Scheduling Tool

- Simple
- Intuitive
- Web-Based
- Mobile Friendly
- Responsive





LAST SUMMER

NEXT YEAR



Steve Moore, PMP, PSP, PMI-SP, LEED AP Manager of Scheduling and Innovative Support

ROBINS & MORTON