

ScheduleXL User Guide

Introduction

ScheduleXL is PrimeThought's mine scheduling tool that works with our spatial products like SpatialXL and SpatialStudio.

ScheduleXL uses the constraints calculated in DesignXL or any third-party package plus the actual design and parameters to produce a schedule based on vehicle and machine capacities.

ScheduleXL links bidirectionally with graphics to display and animate the schedule.

ScheduleXL can export schedules to Microsoft Project as needed and has its own Gantt chart facility with hot graphics link.

Creating a Schedule Project

ScheduleXL loads as a window from the 'Window' section in the 'View' tab of our spatial products. Click the 'Schedules' button to toggle the window on.

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The window will show up in the pane on the right where your layers are.

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Click the 'Add new schedule project' button.

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Create new empty schedule		^			
? Are you sure?					
Yes No	Cance	el .			

Click 'Yes'

A new schedule is added in the list for you with a default name. You can rename it by double clicking on the name and typing in a new one.

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• 🗄		New Schedule

Once you have added your new schedule project click the 'Edit selected schedule project' button to begin setting up your schedule:



This brings up the ScheduleXL module:

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📳 · 🔚 Main 💿 View 🔽 Task	Schedules 🕂 Task Resourc	es 🕂 Export 💽 Graphics		
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Mappings

The first step is to go the 'Mappings' tab and set up the mappings from the graphics layer columns in SpatialXL or SpatialStudio to the task properties.

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Gantt Mappings Schedules 1. Resour	es Task Types	iscounts Task Schedules	Task Resources		 	
Plan P20 Pit05 OCTOBER 20-08-2022.DX						~
Task Layer:		Dependencies Layer:				
Text Column: ElementID		Predecessor Key Column:				*
Start Date Column:		Successor Key Column:				-
End Data Column		Dependency Type Column				_
	•	Dependency Type Column:				*
Duration Column:	•	Lag Column:				*
Key Column: ElementID						
Parent Column:	-]				
Predecessors Column: Dependencies						
Start: 2023/12/07 00:00:00 => 2024/03/07 00:00:00						

ScheduleXL allows you to build tasks from graphic elements that maybe represent a mine design or building construction. You can, but don't have to, have spatial set of elements that are the basis of the schedule.

Your source graphics layer must minimally have a key column that can be used as an ID for your different blocks you will schedule and mine.

Example:



đ	•			Layer	Data: Pit02			E		×
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1	, Refresh	🔓 Properties	👑 Pan	🛋 Highlight Selecte	d		Export to Ex	kcel		
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	1 Poly	FaceMesh		2697,07345890516	539,414691781032	21	57,65876712413	TIN Z(((594		
	2 Poly	FaceMesh		1497,13789173257	299,427578346514	11	97,71031338606	TIN Z (((594		
	3 Poly	FaceMesh		5380,20651281663	1076,04130256333	4	304, 1652102533	TIN Z(((594		
	4 Poly	FaceMesh		4903,00521750123	980,601043500245	39	22,40417400098	TIN Z(((594		
	5 Poly	FaceMesh		2433,74865591141	486,749731182282	19	46,99892472913	TIN Z(((594		
	6 Poly	FaceMesh		1897,9497219248	379,58994438496	15	18,35977753984	TIN Z(((594		
	7 Poly	FaceMesh		3160,48263191234	632,096526382468	25	28,38610552987	TIN Z(((594		
	8 Poly	FaceMesh		4345,08012552078	869,016025104157	34	76,06410041663	TIN Z (((594		
	9 Poly	FaceMesh		1477,06965951186	295,413931902373	11	81,65572760949	TIN Z(((594		
	10 Poly	FaceMesh		4377,34347743752	875,468695487504	35	01,87478195002	TIN Z(((594		
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	40 0.14			1000 0700 17701 11	044 475060556000			TTN 7///FOA		T

This ID column *must* be set as a key column. The way to ensure this is to right click on the column header, then select "Edit Column".



Then, make sure "Key" is checked on.

Column Properti	ies	x
Column Properties	Initial Values	
Column Name:	ID	
Type:	Integer	-
Width:	-1	
Format:	✓	
	🗌 Read Only 🕑 Visible 🕑 Required 🔽 Key 🕑 Unique	
	Lookup values from a layer or list	
Auto Increment		
Seed	0	
Increment	1 🖕	
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Then click OK.

Your source graphics layer can come from many different sources, for example, the source graphics layer used here originally came from a DXF file.

The other column that you should have is a dependencies or predecessors column; this is basically where the IDs of the blocks that must be mined before the current block will be populated.

If you don't already have such a column, you can add one by right clicking in the column header area and selecting "Add Stored Column".



In the Column Properties tab, give the new column a name:

Column Properti	es	x
Column Properties	Initial Values	
Column Name: Type:	Dependencies String	
Format:		
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Make sure the Type is String, then click OK.

A new blank column will be added where your generated dependencies will populate later using the tool in the "Graphics" tab of ScheduleXL.

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Dra	g a column h	neade	er here to gro	up by	r that column							ρ
	ID	Elem	ient Type	Dep	endencies	Volume	Strip Volume	Scrap	pe Volume		Geomet	ry
т	=	R B C		R B C		=	=	=			-	-
•	0	Poly	FaceMesh			1891,83813210893	378,367626421787	15	513,470505	68715	TIN Z (((
	1	Poly	FaceMesh			2697,07345890516	539,414691781032	21	157,658767	12413	TIN Z(((
	2	Poly	PolyFaceMesh			1497,13789173257	299,427578346514	11	197,710313	338606	TIN Z(((
	3	Poly	FaceMesh			5380,20651281663	1076,04130256333	4	1304, 16521	02533	TIN Z(((
	4	Poly	FaceMesh			4903,00521750123	980,601043500245		22,404174	100098	TIN Z(((
	5	Poly	FaceMesh			2433,74865591141	486,749731182282		46,998924	72913	TIN Z(((
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	8	Poly	FaceMesh			4345,08012552078	869,016025104157	34	176,064100	41663	TIN Z(((
	9	Poly	FaceMesh			1477,06965951186	295,413931902373	11	181,655727	760949	TIN Z(((
	10	Poly	FaceMesh			4377,34347743752	875,468695487504	35	501,874781	195002	TIN Z(((
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	12	Poly	FaceMesh			4345 13051782175	869.026103564351		8476 10441	42574	TTN 7(()	-
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You can have other columns in your source graphics layer such as Start Date and End Date. What's nice is that if you do bring in additional fields, you'll be able to then in your graphics, filter on the schedule that is created, because it will write back the numbers to the graphics.

Now, in the "Mappings" tab of ScheduleXL choose the "Task Layer" which will be your source graphics layer:



If you have a Start Date and End Date column etc. in your source graphics layer you can specify them here as well. In this example I do not have this.

Make sure you choose your "Key Column".

Your "Predecessors Column" will be the "Dependencies" column in the source graphics layer that we added earlier.

You can also specify a "Text Column" and "Tooltip Column", like I have here, which will display the name/ID of each block on your Gantt chart and also as a tooltip when the item in the Gantt is hovered over.

Text Column:	ID ~
Start Date Column:	·
End Date Column:	·
Duration Column:	· ·
Key Column:	ID 👻
Parent Column:	· · · · · · · · · · · · · · · · · · ·
Predecessors Column:	Dependencies +
Tooltip Column:	ID 👻
Progress % Column:	· · · · · · · · · · · · · · · · · · ·
Value Column:	· · · · · · · · · · · · · · · · · · ·

This is all the mappings that we will do in this example. There are other columns that you can pull through such as a "Value Column" which would be a column in your source graphics layer where some value such as a mineral value will be specified for each block in your mining layout that you want to track.

Schedules

The next place we will go to in here is the 'Schedules' tab to create a schedule. There can be multiple schedules specified in one schedule project.

Type an ID and then optionally Description, as well as Value and Discounts which we will go over in more detail later.

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Sav	ve Properties Visible Duild from Upda graphics Graph	→ Units → Cu Q Zoom in Q Reset Zoom Va cics Q Zoom out E	Internet:	 ★ Add in graphics ♦ Clear in graphics
	Project		Schedule	Dependencies ^
	Gantt Mappings	Resources	Discounts Task Schedules	Task Resources
Drag	g a column header here to group by that column	-		م
	ID	Description	Value	Discounts
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Start	:: 0001/01/01 00:00:00 =>			.::

Schedule Properties

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	Gantt 🚺 Mappings	s Lesources	Task Types	Ι
		••		L.
Dra	g a column header here to group by that column			
Dra	g a column header here to group by that column	Description		

Next, in the 'Main' tab above click on the 'Properties' button.

This will bring up the Project Properties dialogue. This sets up a project calendar for you; it's a date beyond which your project will never go.

You will set up the ID and Description of the schedule project, the Start and End Date, and also the Units of your schedule.

Project Properties	s 📕
ID:	New Project
Description:	Pit 02
Start Date:	2023/12/07 -
End Date;	2026/03/31 -
Units:	Day -
Current Schedule:	Main - Main 👻
Ok	Cancel

You can choose for your units to be in Hour, Day, Month or Year. In this example I have chosen Day.

Units:	Day	Ŧ
Current Schedule:	Hour	
	Day	
Ok	Month	
	Year	

Finally, by 'Current Schedule' choose from the dropdown list which schedule this project is for, this will pick up the schedules you have specified in the 'Schedules' tab earlier, in this case there is just one called 'Main'.



When done click 'OK'.

Resources

In the "Resources" tab you will define each of the resources that are available to use in your schedule project.

As an example here, these resources might be Scraper; Drill Rig; and Blaster. Simply type in the ID and Description of the resources in the blank grid below:

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Sa	ave Propertie	Selected Selected Selected Project	Build from Update Graphics	····· Units ∽ ⊕ Zoom in ⊖ Zoom out Tim	Q R	eset Zoom	Current: Main - I /alue: 0 - Auto 🗸	Main -	Clear Let	vel Clea	in graphics r in graphics ndencies	^
	Gantt	Mappings	Schedules	Resources		Task Types	Discount	ts Task	Schedules	Task Reso	urces	
Dra	ig a column he	ader here to gro	up by that column									ρ
	ID	Description	Default Application	Maximum Rate		2023-Dec-07	2023-Dec-08	2023-Dec-09	2023-Dec-10	2023-Dec-11	2023-Dec-12	2 2
	SC	Scraper	DrivesTime		1	1,00	1,00	0,00	0,00	1,00	1,0	00
	DR	Drill Rig	DrivesTime		1	1,00	1,00	0,00	0,00	1,00	1,0	00
	BL	Blaster	DrivesTime		1	1,00	1,00	0,00	0,00	1,00	1,0	00
*												
•												
Sta	t: 2023/12/07	00:00:00 => 20	024/07/25 00:00:00									:

A description of the remaining column headers in this grid follows.

• **Default Application**: Two options available: DrivesTime or Required. DrivesTime means the usage of the resource is dependent upon how much it can do in a certain time period.

Required mean that the resource has to be there everyday for example a truck that has to be there to monitor.

- Maximum Rate: How many times the resource can be used per unit of time, Day in this example. A value of 1 means it can only be used once per day.
- **Date Ranges**: The remaining column headers will be the different dates of your schedule; under each date you will need to specify the availability of the resource per Day (or whatever other unit of time you specified). A value of 1 will mean the resource is available the whole day. A value of 0.5 would mean the resource is available for only half the day.

Availability

You can specify the availability of each resource by right clicking on the resource and selecting "Availability".



This brings up the Resource Availabilities grid where you can easily specify the availability of each resource. This grid can be filtered and sorted.

Here is an example of usage of this grid to set the availabilities for my Scraper resource.

I filter on the Day column to only show weekdays, since my scraper is not available on weekends (filtering can be done with the little filter icon in the top right of a column header when you hover over it).

Then I type in a value of 1 under the "Amount" column for the availability of the resource (1 full day). Then I right click on that row where I have entered the value and then select "Set visible to current" which will set all the currently filtered weekdays to a value of 1 as well.

Resource SC Availabilities ×											
Dra	ig a column he										
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	2023	12	8	Friday	00:00	1	🚔 Set visik	ole to current			
	2023	12	11	Monday	00:00	4	Set sele	cted to curre	nt		
	2023	12	12	Tuesday	00:00	5	±		Currenti		
	2023	12	13	Wednesday	00:00	6	1	leset Zoom	Value: 0		
	2023	12	14	Thursday	00:00	7	1		🔄 Auto		
	2023	12	15	Friday	00:00	8	1				
	2023	12	18	Monday	00:00	11	1				
	2023	12	19	Tuesday	00:00	12	1	Task Type	s 🍾		
×	🗸 🗸 Day	In Friday	Monday Thur	sday Tuesd	ay Wednesd	lay 👻	Edit Filter				

You can then edit the filter to only show weekend days (by clicking on the little filter icon in the top right of the Day column header again), and then following the same procedure, this time enter in a 0 (if it is not already there) and then right click on the row and set visible to current again to specify that the resource is not available on weekends.

Re	source SC Av								
Dra	g a column hea								
	Year	Month	Day No.	Day 📍	Hour	Index	Amount	rbeduleXI - Pi	t 20
Þ	2023	12	9	Saturday	00:00	2	0		. 20
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	2023	12	30	Saturday	00:00	23	0		
	2023	12	31	Sunday	00:00	24	0		
	2024	1	6	Saturday	00:00	30	0	Task Types	Dis
×	✓ Day	In Saturday	Sunday	- ·			Edit Filter		

When done you can close the Resource Availabilities window and then you will see your availability amounts have now been set in your Resources grid:

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	Gantt	Mappings	Schedules	Resources		Task Types	Discour	its Task	Schedules	Task Reso	urces	
Dra	g a column head	der here to grou	up by that column									ρ
	ID	Description	Default Application	Maximum Rate		2023-Dec-07	7 2023-Dec-08	2023-Dec-09	2023-Dec-10	2023-Dec-11	2023-Dec-1	12 2
•	SC	Scraper	DrivesTime		1	1,0	0 1,00	0,00	0,00	1,00	1,	,00
	DR	Drill Rig	DrivesTime		1	1,0	0 1,00	0,00	0,00	1,00	1,	,00
	BL	Blaster	DrivesTime		1	1,0	0 1,00	0,00	0,00	1,00	1,	,00
*												
	_											_
	h. 2022/12/07 0	0.00.00 -> 20	24/07/25 00:00:00									•
Star	1: 2023/12/07 0	0:00:00 => 20	24/07/25 00:00:00									

Time Script

You can specify a Time Script for a resource. Time Script says what proportion of the time period unit (in this example Day) does the resource require. It can be based upon how strong this resource is.

Right click on the resource and select "Time Script".



This script uses JavaScript. In this example Time Script, we are referring to the Volume column from the graphics layer. This script is for the Scraper resource and basically says the following: if (thisTask. Type == 'SC'): If the task type is Scraping...

{(**thisTask.DataRow**['**Volume**'] * 0.8) / 1000;}: take 80%(0.8) of the Volume of the block being mined and divide it by 1000 cubic meters.

Basically, 80% of the block being mined would be taken up by Scraping and the Scraper can only scrape 1000 cubic meters per Day.

else if (thisTask. Type == 'ST'): If the task type is Stripping...

{(**thisTask.DataRow**['**Volume'**] * 0.2) / 1000;}: take 20% (0.2) of the Volume of the block being mined and divide it by 1000 cubic meters.

Basically, 20% of the block being mined would be taken up by Stripping and the Scraper can only strip 1000 cubic meters per Day.

else {0;}: If it is any other task type for the Scraper (which there is no other task type in this case) then the availability is zero.



You can test the script by clicking the "Test" button in the top right of the window. When done simply close the Resource Time Script window.

Task Types

Next, you will set up your task types. Per graphic entity, these are the tasks generated by the system for them.

For example, stripping, drilling, blasting, scraping rock away.

[Gantt	Mappings	Schedules	Resources	es Discounts	Task Schedules	Resources
D	rag a column	header here to gro	oup by that column				Q
	ID		Description	Predecessors	Link Predecessors	Default Resources	Colour
	B ST		Stripping			SC	255, 128, 0
	⊞ DR		Drilling	ST	SC	DR	192, 0, 0
	🕀 BL		Blasting	DR		BL	0, 255, 255
	⊞ SC	SC Scraping		BL		SC	0, 0, 0
3	*						

Type in an ID and Description of the tasks in the grid below.

An explanation of the remaining column headers in this grid follows:

- **Predecessors**: Within a mining block these task types have precedents, for example, before drilling you have to strip etc. This is the order of tasks implicit in a block.
- Link Predecessors: When one block must be processed before another block, there are other links that have to be specified between the task types. The only thing which prevents you from working on a particular task in a subsequent block is that that previous block must have been scraped for example. In this example the link predecessor is between drilling and scraping. The previous block must have been scraped before the subsequent block can be drilled.
- **Default Resources**: Here you specify which resources (as defined earlier in the Resources tab) are associated with which task.
- **Colour**: You can set a unique colour for each task type that will then be displayed in the blocks on your Gantt chart later.

Discounts

In the Discounts tab you can specify the discount for each period.

This is the time value of money or the "Net Present Value". Money you get in a years' time is worth less than having it now.

Typically for first period will be 1, no discount. Then the next period might go to 0.95. That's the value at that time ahead that your money in present day terms has. Flat one in this example so all are 1. Once you have your discounts in, you can go back to the Schedules tab and choose the discount you set up.

Type in an ID and Description for the discount set on the left:

In this example we call it "Flat" because the value will be just 1, no discount, same value all the time.

[Gantt Mappings		Tas	sk Types	5	Discounts	Task Sche	dules	Task Resources					
D	rag a column header here to group	by that column							Discoun	t Values				
	ID	Description Drag a column header here to group by that column												
1	Flat	Flat Rate				Year		Month	Week Day	Day	Hour	Amount		
1	•			_	Þ		2023	12	Thursday	7	00:00		1	-
							2023	12	Friday	8	00:00		1	
							2023	12	Saturday	9	00:00		1	
							2023	12	Sunday	10	00:00		1	
							2023	12	Monday	11	00:00		1	
							2023	12	Tuesday	12	00:00		1	
							2023	12	Wednesday	13	00:00		1	
							2023	12	Thursday	14	00:00		1	
							2023	12	Friday	15	00:00		1	
							2023	12	Saturday	16	00:00		1	
L							2023	12	Sunday	17	00:00		1	•

Then in the Discount Values grid on the right, you can set up the discount amounts, you can manually type in the amounts for each period under the Amount column. You can also use filtering on the grid to filter out certain days and then for example, type in a value in a specific row and then right click on that row and "Set visible to current", which will set all the currently visible rows to the value of the current row.

	Discount Values											
Drag a column header here to group by that column												
	Year	Month	Week Day	Hour	Amount	7.22						
•	2023	12	Thursday	7	00:00	1 🔺	2.78					
	2023	12	Friday	8	00:00	🦻 Set visible to	current					
	2023	12	Saturday	9	00:00	0	A STATE					

Filtering can be done by hovering over a column header in the grid and clicking the little filter icon that comes up in the top right:



Building Tasks from Graphics

The next step is to actually build the tasks you have now set up from your graphics layer.

This is done with the "Build from graphics" button in the "Main" tab of the ScheduleXL ribbon.



Your tasks will be built and will display on your Gantt chart now in the "Gantt" tab:

ı	Main	•	View	Task	Schedules	Task Res	sources	Export	٩	iraphics																
ш	E Sel	lected	. 🥊		units ~		0	urrent: Main - Mai	n -		+≣ Add in	graphics														
Save	Properties _{Viei}	ible 🗌	Build	from Update	🔍 Zoom in	🔍 Reset Zo	om Va	alue: 0		Clear Level	🤙 Clear i	n graphice														
	. 15		grap	hics Graphics	Q Zoom out			Auto 🗸			Cical I	rigraphics														
	_	Project			Time	line			Schedule		Depend	encies														
G 🔁	antt 🚺 M	Mappings	l 💼	Schedules]	Resources		Types	Siscounts	Task	Schedules	Task Resour	ces														
		_								••						_		entembe	r 2024				Octobe	r 2024		
ID	Start F	inish	Durati	Duration Units	Predecessors	Effort	Туре	Resources	A_Elemen	A_Dependencies	A_Volume	A_Strip	A_Scrap	A_ID	DiscountedValue	31 3	6 9	12 15	18 21	24 27	30 3	6 9	12 1	5 18 2	21 24	27 30
0/ST	2024/ 2	2024/	13:55	0,579861111		0	ST	SC	PolyFace	40	1891,83	378,367	1513,47	0	0,00			0								
0/DR	2024/ 2	2024/	13:55	0,579861111	0/ST 40/SC	0	DR	DR	PolyFace	40	1891,83	378,367	1513,47	c	0,00			0								
0/BL	2024/ 2	2024/	13:55	0,579861111	. 0/DR	0	BL	BL	PolyFace	40	1891,83	378,367	1513,47		0,00		×	0								
0/SC	2024/ 2	2024/	13:55	0,579861111	. 0/BL	0	SC	SC	PolyFace	40	1891,83	378,367	1513,47	C	0,00		÷	0								
1/ST	2024/ 2	2024/	13:55	0,579861111		0	ST	SC	PolyFace		2697,07	539,414	2157,65	. 1	L 0,00			1								
1/DR	2024/ 2	2024/	13:55	0,579861111	. 1/ST	0	DR	DR	PolyFace		2697,07	539,414	2157,65	1	0,00		1	1								
1/DL 1/SC	2024/ 2	2024/	13:55	0,579861111	1/R	0	SC	SC	PolyFace		2697,07	539,414	2157,05		0,00		1									
2/ST	2024/ 2	2024/	13:55	0,579861111		0	ST	SC	PolyFace		1497.13	299,427	1197.71	2	2 0,00		1	2								
2/DR	2024/ 2	2024/	13:55	0,579861111.	2/ST	0	DR	DR	PolyFace		1497,13	299,427	1197,71	2	2 0,00		-	2								
2/BL	2024/ 2	2024/	13:55	0,579861111	2/DR	0	BL	BL	PolyFace		1497,13	299,427	1197,71	2	2 0,00			2								
2/SC	2024/ 2	2024/	13:55	0,579861111	. 2/BL	0	SC	SC	PolyFace		1497,13	299,427	1197,71	2	2 0,00		÷	2								
3/ST	2024/ 2	2024/	13:55	0,579861111		0	ST	SC	PolyFace		5380,20	1076,04	4304,16	3	3 0,00		l	3								
3/DR	2024/ 2	2024/	13:55	0,579861111	. 3/ST	0	DR	DR	PolyFace		5380,20	1076,04	4304,16	3	3 0,00		→	3								
3/BL	2024/ 2	2024/	13:55	0,579861111	. 3/DR	0	BL	BL	PolyFace		5380,20	1076,04	4304,16	. 3	3 0,00		*	3								
3/SC	2024/ 2	2024/	13:55	0,579861111	. 3/BL	0	SC	SC	PolyFace		5380,20	1076,04	4304,16	. 3	3 0,00		케	3								
4/00	2024/ 2	024/	13:55	0,579861111	4/ST	0	DP	DP	PolyFace		4903,00	980,601	3922,40		+ 0,00		1	4								
4/BI	2024/ 2	024/	13:55	0.579861111	4/DR	0	BI	BI	PolyFace		4903.00	980.601	3922,40	4	1 0,00		-	4								
4/SC	2024/ 2	2024/	13:55	0,579861111	4/BL	0	SC	SC	PolyFace		4903,00	980,601	3922,40	4	1 0,00		-	4								
5/ST	2024/ 2	2024/	13:55	0,579861111		0	ST	SC	PolyFace	6	2433,74	486,749	1946,99	5	5 0,00		1	5								
5/DR	2024/ 2	2024/	13:55	0,579861111	5/ST 6/SC	0	DR	DR	PolyFace	6	2433,74	486,749	1946,99	. 5	5 0,00			5								
5/BL	2024/ 2	2024/	13:55	0,579861111.	. 5/DR	0	BL	BL	PolyFace	6	2433,74	486,749	1946,99	5	5 0,00		×	5								
5/SC	2024/ 2	2024/	13:55	0,579861111	. 5/BL	0	SC	SC	PolyFace	6	2433,74	486,749	1946,99	5	5 0,00		÷	5								
6/ST	2024/ 2	2024/	13:55	0,579861111		0	ST	SC	PolyFace		1897,94	379,589	1518,35	6	0,00		l	6								
6/DR	2024/ 2	024/	13:55	0,579861111.	. 6/ST	0	UR.	DR	PolyFace		1897,94	379,589	1518,35	6	0,00			6								
6/SC	2024/ 2	024/	13:55	0.579861111	6/BI	0	SC	SC	PolyFace		1897,94	379,589	1518,35		5 0,00		- * 	6								
7/ST	2024/ 2	2024/	13:55	0.579861111		0	ST	sc	PolyFace		3160,48	632.096	2528.38		7 0.00		1	7								
7/DR	2024/ 2	2024/	13:55	0,579861111	7/ST	0	DR	DR	PolyFace		3160,48	632,096	2528,38	7	7 0,00			7								
7/BL	2024/ 2	2024/	13:55	0,579861111	. 7/DR	0	BL	BL	PolyFace		3160,48	632,096	2528,38	7	7 0,00			7								
7/SC	2024/ 2	0124/	13:55	0.579861111	7/Ri	0	SC	SC	PolvFace		3160.48	632.096	2528.38	7	7 0.00		۰ſ	7								
						SUM=																				
4															•	4										
Qtr 4, 202	Qtr 1, 2024			Qtr	2, 2024		Q	2tr 3, 2024	6	Qtr 4, 202	4		d t 1	, 2025			, 2025				Qtr (
									Ī				آه													
Starts 20	23/12/07 00:00	D-00 ->	2023/12	/07.00.00.00																						
5 tor to 20.			-323/12	,01.00.00.00																						

Setting up Graphic Dependencies

If you do not already have your own dependencies set up, in a column in your source graphics layer, between your graphic entities (which blocks are mined before another block), then you can set them up using the tools in the "Graphics" tab in the ScheduleXL ribbon.

E •		
📳 - 🔚 Main 💿 View 💆 Task Schedules	Task Resources Export	
Buffer Distance 0 Mining direction 0 1 0 Maximum angle 55 Maximum angle 55 Maximu	Arrow Colour Arrow thickness 3 + 5 Show Arrow Size 20 +	
Dependencies		
Gantt Mappings Schedules 1 Resources	Task Types Discounts Task Schedules	Task Resources

First, make sure you have a blank column in your source graphics layer where the generated dependencies will be populated. How to add such a column is covered in the <u>Mappings</u> section of this guide.

Explanation of the fields and buttons in the Graphics tab follow:

Buffer Distance: Value specified to test the closeness of an object that will be made a dependency, to allow for some gaps that might exist between your mining blocks.

Mining Direction: Direction of mining. Used to order the mining sequence, by making blocks ahead in the direction "depend" on blocks behind to enforce the mining direction.

Note: The direction is taken from the bottom of the screen going upwards, therefore make sure to rotate the scene as necessary so that your desired direction is now in line with the bottom to the top of the screen.

The appropriate values will be populated here after clicking the "Set Mining Direction" button.

Maximum Angle: The maximum angle in degrees from the mining direction vector of a predecessor entity to consider it a valid predecessor. 0 degrees is directly "behind", 45 is behind but off by 45 degrees and 90 is to the left or right.

When you have your scene oriented correctly in SpatialStudio so that you have your desired mining direction and you have set your desired Buffer Distance and Maximum Angle, you can then click the "Set Mining Direction" button, and your mining direction will be set.



Next, you will select the exact graphic entities you want to create dependencies for by using one of the selection tools in SpatialStudio:



Then, you would click the "Generate" button to generate your dependencies. Your generated dependencies will then be populated in your blank column of your source graphics layer.

		ScheduleXL - Pit 02	2		Ē	-
📳 - 🔚 Main 💿 View	Task Schedules	Task Resources	Expor	rt Graphics		
Buffer Distance 0 \$ Mining direction 0 1 0 Maximum angle 55 \$	t Mining rection	Arrow Colour Arrow thickness 3 Arrow Size 20	, 🦐 Show			
	Dependencies					
Gantt Mappings	et mining direction et the mining direction to the	"upwards" direction of the	e current	Task Schedules	Task Re	sources
Drag a column header here to group by th	ctive view. Upwards is the di creen.	irection of the "Y" axis of t	he	Discount Va	lues	

1	-					Layer [Data: Pit02	I –			×				
IE	- Main	£) Search												
~	Filter Grap	hics	💵 Inplace	e v	Q Zoom		🧱 Highlight All								
	Columns		😮 Delete		Q Zoom	and Highlight	📘 Un Highlight All	🚦 Un Highlight Sele	ected						
	Refresh		🔒 Proper	ties	W Pan	👑 Pan 💽 Highlight Selected									
Ŭ	Filter		Edit		-		Selection				~				
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-			encrype	. Dep	endendes		-		50 4	ape volume					
Ľ	- 0	Polvi	FaceMesh	0.41			1477 06965951186	1181.65572760							
	10 PolyFaceMesh 0 1				•		4377 34347743752	875 468695487504	39	01 874781	195(
	11	Polvi	FaceMesh	01	2 41		3017.02416991686	603,404833983372	24	13.619335	593				
	12	11 PolyFaceMesh 0 1 12 PolyFaceMesh 0 1					4345,13051782175	869.026103564351	3	476.10441	142!				
	13	Polyf	FaceMesh	34			, 1222,37684778141	244,475369556282	97	, 7,9014782	225:				
	14	Polyf	FaceMesh	3 4 42			2293,15863649322	458,631727298643	18	34,526909	9194				
	15	Poly	FaceMesh	34	5 6 42 43		907,540613351479	6 726,032490681		581:					
	16	Polyf	FaceMesh	45	5 7 42 43		881,579738483701	176,31594769674	74 705,263790786						
	17	Polyf	FaceMesh	56	7 8 19 43		5932,2475130327	1186,44950260654	47	45,798010)42(
	18	Polyf	FaceMesh	78	9 19 44		4885,50792055514	977,101584111028	39	08,406336	544				
	19	Poly	FaceMesh	8			0,100207002554417	0,0200414005108833	0,08	016560204	435:				
	20	Poly	FaceMesh	21			19,559173175389	3,9118346350778	15	64733854	1 03:				
	21	Poly	FaceMesh	89	10 11 44		3843,43394544378	768,686789088757	30	74,747156	635!				
	22	Polyf	FaceMesh	9 10	11 12 44 45	5	3773,94375164522	754,788750329044	30	19,155001	1316 👻				
ĽL											-				

To see how your generated dependencies look visually, check on the "Show" box in the Graphics tab of ScheduleXL. This will show arrows connecting the blocks to their predecessors. The styling of these arrows can be customized by Arrow Colour, Arrow Thickness and Arrow Size.





Scheduling Your Tasks

Now that you have built your tasks into your schedule project from graphics, you are now ready to schedule them.

To do this click the "Level" button in the "Main" tab of the ScheduleXL ribbon.



Within resource usage amount and tasks that use those resources it will try fit those tasks in, in time, with dependencies per task. If you want to clear schedule first, click "Clear". "Level" makes sure tasks go correctly in order and use only the amount of resources available to them to complete the task. Your Gantt will update accordingly.

Gantt	Mappings	Schedules	1 <mark></mark> Re	esources		ypes Discoun	ts Task	Schedu	iles 📃	Task Resources									
ID		Start Date		Finish D	ate	Duration	Duration Units	Pres	decessors	Effort	Туре	Resources	A_Element T	A_Dependencies	A_Volume	A_Strip Volume	A_Scrape Volume	A_ID	DiscountedValue
0/SC		2024/02/26		2024/02	2/28	2.00:00:00		2 0/B	L	1,5134705056	SC	SC	PolyFaceMesh	40	1891,8381	378,3676264	1513,47050568	0	0,00
1/ST		2023/12/07		2023/12	2/09	2.00:00:00		2		0,5394146917	ST	SC	PolyFaceMesh		2697,0734	539,4146917	2157,65876712	1	0,00
1/DR		2023/12/11		2023/12	2/12	1.00:00:00		1 1/S	г	1	DR	DR	PolyFaceMesh		2697,0734	539,4146917	2157,65876712	1	0,00
1/BL		2023/12/12		2023/12	2/13	1.00:00:00		1 1/D	R	0,5	BL	BL	PolyFaceMesh		2697,0734	539,4146917	2157,65876712	1	0,00
1/SC		2023/12/13		2023/12	2/16	3.00:00:00		3 1/B	L	2,1576587671	SC	SC	PolyFaceMesh		2697,0734	539,4146917	2157,65876712	1	0,00
2/ST		2023/12/08		2023/12	2/09	1.00:00:00		1		0,2994275783	ST	SC	PolyFaceMesh		1497,1378	299,4275783	1197,71031338	2	0,00
2/DR		2023/12/12		2023/12	2/13	1.00:00:00		1 2/S	г	1	DR	DR	PolyFaceMesh		1497,1378	299,4275783	1197,71031338	2	0,00
2/BL		2023/12/13		2023/12	2/14	1.00:00:00		1 2/D	R	0,5	BL.	BL.	PolyFaceMesh		1497,1378	299,4275783	1197,71031338	2	0,00
2/SC		2023/12/15		2023/12	2/19	4.00:00:00		4 2/B	L	1,1977103133	SC	SC	PolyFaceMesh		1497,1378	299,4275783	1197,71031338	2	0,00
3/ST		2023/12/11		2023/12	2/13	2.00:00:00		2		1,0760413025	ST	SC	PolyFaceMesh		5380,2065	1076,041302	4304, 1652 102533	3	0,00
3/DR		2023/12/13		2023/12	2/14	1.00:00:00		1 3/S	г	1	DR	DR	PolyFaceMesh		5380,2065	1076,041302	4304, 1652102533	3	0,00
3/BL		2023/12/14		2023/12	2/15	1.00:00:00		1 3/D	R	0,5	BL.	BL.	PolyFaceMesh		5380,2065	1076,041302	4304, 1652 102533	3	0,00
3/SC		2023/12/18		2023/12	2/23	5.00:00:00		5 3/B	L	4,3041652102	SC	SC	PolyFaceMesh		5380,2065	1076,041302	4304, 1652 102533	3	0,00
4/ST		2023/12/12		2023/12	2/23	11.00:00:00		11		0,9806010435	ST	SC	PolyFaceMesh		4903,0052	980,6010435	3922,40417400	4	0,00
4/DR		2023/12/25		2023/12	2/26	1.00:00:00		1 4/S	г	1	DR	DR	PolyFaceMesh		4903,0052	980,6010435	3922,40417400	4	0,00
4/BL		2023/12/26		2023/12	2/27	1.00:00:00		1 4/D	R	0,5	BL	BL	PolyFaceMesh		4903,0052	980,6010435	3922,40417400	4	0,00
4/SC		2023/12/27		2024/01	1/02	6.00:00:00		6 4/B	L	3,9224041740	SC	SC	PolyFaceMesh		4903,0052	980,6010435	3922,40417400	4	0,00
5/ST		2023/12/22		2023/12	2/26	4.00:00:00		4		0,4867497311	ST	SC	PolyFaceMesh	6	2433,7486	486,7497311	1946,99892472	5	0,00
5/DR		2024/01/04		2024/01	1/05	1.00:00:00		1 5/S	T 6/SC	1	DR	DR	PolyFaceMesh	6	2433,7486	486,7497311	1946,99892472	5	0,00
5/BL		2024/01/05		2024/01	1/06	1.00:00:00		1 5/D	R	0,5	BL	BL	PolyFaceMesh	6	2433,7486	486,7497311	1946,99892472	5	0,00
5/SC		2024/01/08		2024/01	1/10	2.00:00:00		2 5/B	L	1,9469989247	SC	SC	PolyFaceMesh	6	2433,7486	486,7497311	1946,99892472	5	0,00
6/ST		2023/12/25		2023/12	2/27	2.00:00:00		2		0,3795899443	ST	SC	PolyFaceMesh		1897,9497	379,5899443	1518,35977753	6	0,00
6/DR		2023/12/27		2023/12	2/28	1.00:00:00		1 6/S	г	1	DR	DR	PolyFaceMesh		1897,9497	379,5899443	1518,35977753	6	0,00
6/BL		2023/12/28		2023/12	2/29	1.00:00:00		1 6/D	R	0,5	BL.	BL	PolyFaceMesh		1897,9497	379,5899443	1518,35977753	6	0,00
6/SC		2024/01/01		2024/01	1/04	3.00:00:00		3 6/B	L	1,5183597775	SC	SC	PolyFaceMesh		1897,9497	379,5899443	1518,35977753	6	0,00
7/ST		2023/12/26		2024/01	1/04	9.00:00:00		9		0,6320965263	ST	SC	PolyFaceMesh		3160,4826	632,0965263	2528,38610552	7	0,00
7/DR		2024/01/05		2024/01	1/06	1.00:00:00		1 7/S	г	1	DR	DR	PolyFaceMesh		3160,4826	632,0965263	2528,38610552	7	0,00
7/BL		2024/01/08		2024/01	1/09	1.00:00:00		1 7/D	R	0,5	BL.	BL	PolyFaceMesh		3160,4826	632,0965263	2528,38610552	7	0,00
7/SC		2024/01/09		2024/01	1/13	4.00:00:00		4 7/B	L	2,5283861055	SC	SC	PolyFaceMesh		3160,4826	632,0965263	2528,38610552	7	0,00
8/ST		2024/01/03		2024/01	1/05	2.00:00:00		2		0,8690160251	ST	SC	PolyFaceMesh		4345,0801	869,0160251	3476,06410041	8	0,00
8/DR		2024/01/08		2024/01	1/09	1.00:00:00		1 8/S	г	1	DR	DR	PolyFaceMesh		4345,0801	869,0160251	3476,06410041	8	0,00
8/BI		2024/01/09		2024/01	1/10	1.00:00:00		1 8/D	R	0.5	BI	BI	PolyEaceMesh		4345.0801	869.0160251	3476.06410041	8	0.00
										SUM=228.69									



Gantt

Grid

An explanation of each column header in the Gantt data grid on the left follows here.

ID: Unique ID of graphic entity being mined, plus the task ID.

Start Date: Start date of task.

End Date: End date of task.

Duration: This is the full duration of the task in Days, Hours, Minutes etc. **Duration Units:** This is the amount of time units you chose for your project, such as Days, for the task. This will round to the unit in question so even if the task took less than a Day, and your project units are Days, then it will still read as 1 Day.

Predecessors: These are the tasks and graphic entities that must be done before beginning another task/graphic entity; composed of the graphic entity ID as well as the task ID.

Effort: This is the actual amount of time units that are needed for that task to complete, precisely stated. For example, if your project units are Days, then a value of 0.5 will indicate half a Day.

Type: This is the task type, such as ST (for Stripping); uses the ID of the task type that you specified.

Resources: This is the resource assigned to the task; uses the ID of the resource you defined.

All column headers preceded by "A_" are columns that are pulled through as attributes from the columns in your source graphics layer.

DiscountedValue: This discount value amount based on the discount set you specified in the "Discounts" tab.

For example, I have a "Volume" column in my source graphics layer and so a column appears in the grid called "A_Volume" that gives the total volume of each mining block.

Sorting

You can sort on the different columns in the grid. Click once on a column header to sort ascending and click twice to sort descending.

Alternatively you can right click on a cloumn header and choose "Sort Ascending" or "Sort Descending".

Gantt		s Schedules Re	source
ID	Start Dal	Sort Ascending	Pre
SW4L1/ST SW5L1/ST	2024/01/ A+ 2024/01/	Clear Sorting	1
SW6L1/ST SW2L1/ST	2024/01/ 2024/01/	Column Chooser Best Fit	1 1 SW
SE6L1/ST SE4L1/ST	2024/01/ 2024/01/	Best Fit (all columns)	1
SW3L1/ST SE5L1/ST	2024/01/ Y 2024/01/	Filter Editor Show Find Panel	1 SW
SE2L1/ST SW1L1/ST	2024/01/ 2024/01/	Show Auto Filter Row	1 SE ⁴
NW5L1/ST NW4L1/ST	2024/01/ •	Hide Footer	1 SW 1 SW
NW 1L 1/ST SE 1L 1/ST	2024/01/17 2024/01/18	2024 1 SE1L1	1 NW 1 SW

In this example I have sorted ascending on my Start Date column, as indicated by the upwards pointing arrow on the column header, so that my schedule goes from the earliest date onwards in order:

Gantt	Ņ	Mappings		Sche
ID		Start Date	- E	^
SW4L1/ST		2024/01/01	L	
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Context Menu

In the Gantt data grid, you can right click on a task to bring up a context menu where you can do different things as regards that task.



Move to: Jump to the associated task bar on the Gantt chart.

Zoom to: Zoom in close to the associated task bar on the Gantt chart.

Highlight Selected: Highlight the actual associated mining block in graphics.

Highlight Selected dependencies: Highlight the mining block dependencies in graphics of the selected mining block.

Un Highlight Selected: Unhighlight the actual associated mining block in graphics.

Add Resource: Clicking on this will bring up a dialogue where you can add a resource to the task.

Select Resource		
Resource:	DR -	•
Rate:	1	
Application Type:	DrivesTime -	•
Ok	Cancel	

Update Resource: Clicking on this will bring up a dialogue where you can edit the current resource associated with the task.

Select Resource		x
Resource:	SC +	
Rate:	1	~
Application Type:	DrivesTime +	~
Ok	Cancel	

Remove Resource: Will allow you to choose a resource to remove form the current task.

Edit Resources: Here you can edit the resources associated with a task.

Chart

The Gantt chart on the right will display your tasks per graphic entity, coloured by the colours you chose in the "Task Types" tab for each task.



These task bars are displayed along a timeline.

You can click and drag any of the task bars to move them around in time and the grid on the left will automatically update.

You can also reposition the connecting arrows between task bars to create new predecessors.

At the bottom of the Gantt tab is a timeline pane. There are two lines with handles that can be dragged in and out to home in on a particular period of time in the chart, as well as a scroll bar to move the timeline left and right.

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You can add a new timeline bar by right clicking and selecting "Add Timeline Bar".



Once a new timeline bar is added you can set a custom date range for that bar and in this way you can navigate your Gannt chart using custom timelines to move around easy.

Add Timeline Bar Remove Timeline Bar Date Range Set Timeline Bar Date Range Use the project's Start and Finish dates Start 2024/02/01
Qtr 2, 20 Date Range Set Timeline Bar Date Range Use the project's Start and Finish dates Image Start 2024/02/01
Set Timeline Bar Date Range Use the project's Start and Finish dates Start 2024/02/01
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Set Timeline Bar Date Range X Use the project's Start and Finish dates Set custom dates Start 2024/02/01 *
 Use the project's Start and Finish dates Set custom dates Start 2024/02/01
 Use the project's Start and Finish dates Set custom dates Start 2024/02/01
Set custom dates Start 2024/02/01
Start 2024/02/01
Start 2024/02/01
Finish 2024/02/29 -
OK Cancel

You can add a task to the timeline by right clicking on the task in the Gantt chart and then selecting "Add to timeline".



It will then be added with its date to the timeline below:



Task Schedules

You can look in the Task Schedules tab and see that the totals add up correctly for your tasks. Here you can get an idea of the usage of the task time per time unit.

In the Task Schedules ribbon above, you can specify task and period properties and attributes to display in your grid. You can then filter and sort on these.

Properties are the built-in properties of the tasks and period whereas Attributes are columns pulled in from your source graphics layer.

By specifying a property or attribute for a period, these are proportioned per period, for example the Volume attribute I have chosen to show per period and per task.

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	Task	Variables	P	Period Variables									
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	NW3L1/ST	ST	1 875.00	0.00	0.00	1 875.00	0.38	0.00	0.00	0.00	0.00		
	NE1L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	1 875.00	0.38	0.00	0.00		
	NE2L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	1 250.00	0.25	625.00	0.13		
	NE3L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	1 875.00	0.38		
	NW4L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	NW5L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
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	SW3L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
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	SE2L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	SE3L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	SW4L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	SW5L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	SW6L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	SE4L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	SE5L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	SE6L1/ST	ST	1 875.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
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Task Resources

In the Task Resources tab you can get summaries of your resource usage.

In the Task Resources ribbon above you can specify Task, Resource and Period variables to show in the grid.

In this example, I added the resource ID as a Resource Variable, then I filtered on the Scraper (SC) resource so I can see the total usage in terms of time of my Scraper per day:

Ξ	-						ScheduleXL - Ne	w Schedule					⊞ –		×
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	NW 1L 1/SC	SC	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
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	NW2L1/SC	SC	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NW3L1/ST	ST	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NW3L1/SC	SC	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NE1L1/ST	ST	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NE 1L 1/SC	SC	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NE2L1/ST	ST	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NE2L1/SC	SC	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NE3L1/ST	ST	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NE3L1/SC	SC	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NW4L1/ST	ST	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NW4L1/SC	SC	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NW5L1/ST	ST	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NW5L1/SC	SC	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	·
	NW6L1/ST	ST	SC	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
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Exporting Data

When you are in any of the ScheduleXL views, you can go to the "Export" tab in the ribbon above and then choose to export your view, whethger it be the Gantt, Task Schedules view etc. to Excel, CSV,PDF, or Word:



Writing Back Schedule Data To Graphics

You can update your graphics with your schedule data by using the "Update Graphics" button in the Main tab of the ScehduleXL window.

First, you will choose the task type that you want to use to update the graphics with by selcting the task in the "Task Type" field.

In this example I am choosing the Stripping (ST) task type:



In the Mappings tab, I orignally chose Start Date and End Date columns that exist in my solurce graphics layer. These columns in the source graphics data are blank.

Project									
Gantt Maj	ppings	Resources							
Task Layer:	Blocks to sche	dule							
Text Column:	ID								
Start Date Column:	Start Date								
End Date Column:	End Date								
Duration Column:									
Key Column:	ID								
Parent Column:									
Predecessors Column:	Dependencies								
Tooltip Column:	ID								
Progress % Column:									
Value Column:									

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	NE5L1	SE1L1 SE2L1 SE3L1	1550	1875	L1			TIN Z (((5 93		
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	SW2L1	SW4L1 SW5L1 SW	1550	1875	L1			TIN Z (((593		
	SW3L1	SW5L1 SW6L1 SE4	1550	1875	L1			TIN Z (((593		_
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When I click the "Update Graphics" button the Start Date and End Dtae columns in my source graphics layer will update with the corresponding data from the Schedule. I can then use the GIS and Business Intelligence etc. capability capability of SpatialStudio to do a colour theme, for example, on this schedule data.



1	-			Layer Da	ita: Blod	ks to schedule		⊡ –	· _	ı x
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	NE4L1	SW3L1 SE1L1 SE2L1	1550	1875	L1	2024/01/19	2024/01/20	TN Z(((593		
	NE5L1	SE1L1 SE2L1 SE3L1	1550	1875	L1	2024/01/26	2024/01/27	TN Z(((593		
	NE6L1	SE2L1 SE3L1	1550	1875	L1	2024/01/29	2024/01/30	TN Z(((593		
	SW1L1	SW4L1 SW5L1	1550	1875	L1	2024/01/12	2024/01/13	TN Z(((593		
	SW2L1	SW4L1 SW5L1 SW	1550	1875	L1	2024/01/04	2024/01/05	TN Z(((593		
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Support



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