SYNCHRO 4D Pro

Physical Quantity Dependent Tasks and Durations

Physical Quantity and Physical quantity units are two useful task properties to show construction quantities for tasks. Physical quantity and physical quantity units can be entered manually or created by script. For Physical Quantity Dependent Tasks, we can compute the task durations based on:

- Task Physical Quantity (and Units)
- Rule (production rate) that was applied to the task

Set up Physical Quantity and Physical Quantity Unit

1. Create a TXT file > Save your script in it;

Script can be saved as a TXT file and then opened to be run later.

TASK (SELECTED) SET_PROPERTY (PHYSICALVOL_SH, "Cubic metre", SUM 3D.UFV("Volume"))

This script assigns the UFV "Total Volume" to physical quantities with the unit "Cubic metre" for selected tasks.

Here are some explanations:

The basic format of one line of script is <Object> (Condition) <Command>.
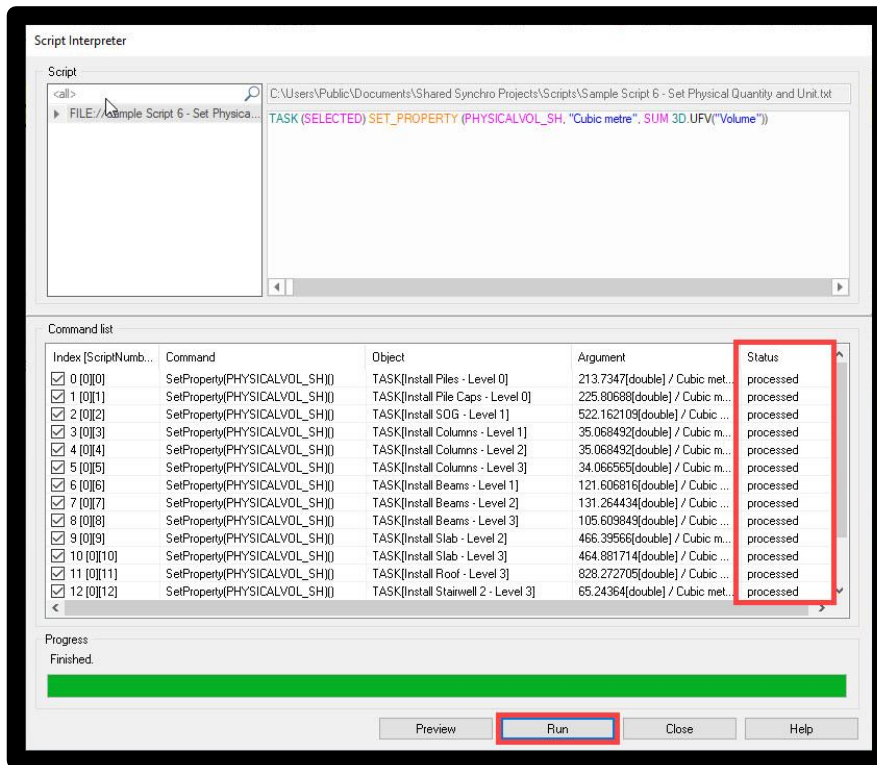
In this script:

- Object (condition): TASK(SELECTED) - all selected tasks in the project;
- Command:

SET_PROPERTY(PHYSICALVOL_SH, UNIT_STRING, VALUE) - Sets Planned Physical Quantity for all selected tasks to the count all of the resources assigned to the task. Set Physical Quantity Unit for those tasks to "unit_string".

2. Select All Tasks > "Project Control" Ribbon > Synchro Script > Script > Right-Click > Add External Script to open the script file;

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Our usual practice is to select a saved script. You can edit it in the script window and click "Save" to save your changes.

3. Preview to **Check** > Run;
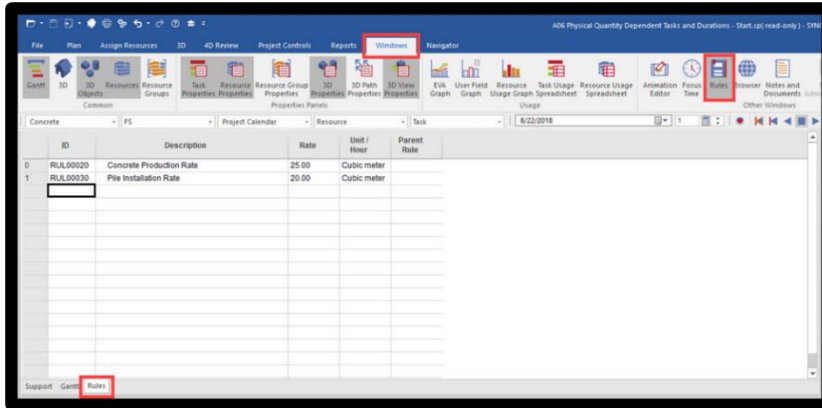
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When we go back to the Gantt Chart we can see all the Physical Quantities and Physical Quantity Unit have been populated.
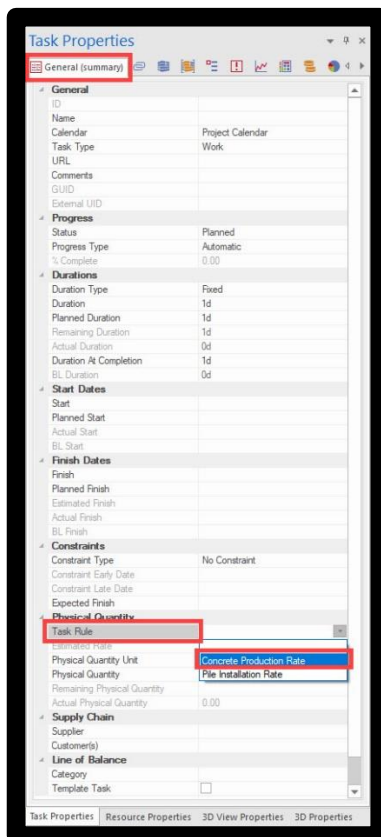
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Rules

1. Windows > Rules > Description, Input Rate and Unit/Hour in Rule Panel;

2. Select all tasks except piles tasks > Select Concrete rules from the drop-down of rules in the Task Rule column;

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3. Select all piles tasks > Select pile rule from the drop-down of rules in the Task Rule column;

Now you have applied right rules to related tasks. It is possible to assign any rules (root/parent and leaf/child). You can also confirm which rule is assigned to the selected task, in Task Properties > Resources by expanding the Rules node.

Set Duration Types

1. Select all Tasks > Select "Physical Quantity Dependent" from the drop-down of duration types in the Durations column;

When the Duration Type is set to Physical Quantity Dependent, the task duration is calculated based on Physical Quantity (eg. square feet of wall to paint, cubic meters of concrete to pour) and assigned Production Rate Rule.

	ID	Name	Duration	Start ▲	Finish	3D Reso...	Category	Level	Total Volum
1	ST00020	Install Piles - Level 0	1d, 32m	9:00 AM ...	9:32 AM 8/...	216	Piles	0	2
2	ST00030	Install Pile Caps - Level 0	1d, 1h, 1m	9:00 AM ...	10:01 AM ...	78	Pile Caps	0	2
3	ST00040	Install SOG - Level 1	2d, 4h, 53m	9:00 AM ...	1:53 PM 8...	1	SOG	1	5
4	ST00050	Install Columns - Level 1	1h, 24m	9:00 AM ...	10:24 AM ...	63	Columns	1	
7	ST00080	Install Beams - Level 1	4h, 51m	9:00 AM ...	1:51 PM 8...	119	Beams	1	1.
10	ST00110	Install Slab - Level 2	2d, 2h, 39m	9:00 AM ...	11:39 AM ...	1	Slab	2	4
5	ST00060	Install Columns - Level 2	1h, 24m	9:00 AM ...	10:24 AM ...	63	Columns	2	
8	ST00090	Install Beams - Level 2	5h, 15m	9:00 AM ...	2:15 PM 8...	119	Beams	2	1
11	ST00120	Install Slab - Level 3	2d, 2h, 35m	9:00 AM ...	11:35 AM ...	1	Slab	3	4
6	ST00070	Install Columns - Level 3	1h, 21m	9:00 AM ...	10:21 AM ...	63	Columns	3	
9	ST00100	Install Beams - Level 3	4h, 13m	9:00 AM ...	1:13 PM 9...	119	Beams	3	1
12	ST00130	Install Roof - Level 3	4d, 1h, 7m	9:00 AM ...	10:07 AM ...	1	Roof	3	8
14	ST00150	Install Stairwell 1 - Level 3	2h, 28m	9:00 AM ...	11:28 AM ...	3	Stairwell 1	3	
13	ST00140	Install Stairwell 2 - Level 3	2h, 36m	9:00 AM ...	11:36 AM ...	3	Stairwell 2	3	
15	ST00160	Install Canopy - Level 1	54m	9:00 AM ...	9:54 AM 9/...	57	Canopy	1	

Support Gantt Rules

2. To adjust the duration: Change Duration Type back to Fixed> Input Integer Days manually;

Note: Here if you forget to change the duration type back to Fixed, the quantities will change when you customize duration.

3. Reschedule all the tasks: Select all Tasks > Plan > Reschedule Selected.

Physical Quantity Dependent Tasks and Durations (Video)

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