

یکپارچه سازی
مدیریت زمان و
هزینه با استفاده از
نرم افزارهای
Navisworks &
Synchro

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SYNCHRO™

۳. مدلسازی اطلاعات ساخت با استفاده
از نرم افزار Synchro

۳. مدلسازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.1 Overview

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3.1 Overview



➤ Why Synchro PRO?

- At Synchro Software, we are passionate about improving construction project performance because we understand the impact construction has on global resources and we recognize the importance of the industry to quality of life and economic prosperity.
- We have also experienced how significantly digital technology improves results over the tried and true methods that have been standard in the industry for generations. Imagine crystal clear communications and engaged team collaboration.
- Imagine the ability to easily create a shared vision of the project among your stakeholders, the ability to identify spatial and resource clashes in the planning phase rather than the costly construction phase, imagine a project schedule that gives you confidence to deliver according to plan!

3.1 Overview



➤ Why 4D?

- Scheduling and planning is critical to safe, efficient, high quality construction. While using 4D, the computer becomes a practice field where sequences, safety, special relationships and more can be viewed and discussed continuously before and throughout the project lifetime.
- Because Synchro links 3D Resources (human, material, equipment, and space) to the associated Schedule tasks, making changes and comparing baselines to alternatives is quick and easy.
- Testing sequencing and running “what if” scenarios is highly efficient and engaging. Communications are crystal clear, because you can see each step in the process. Cooperative knowledge sharing creates innovation and unique approaches that build competitive advantage. The result is an efficient, reliable and safe project delivery process that saves time and money.

3.1 Overview



➤ Who uses Synchro PRO?

- Contractors, Subcontractors, Specialty Supplies, Consultants and Owners use Synchro for the construction of buildings, infrastructure, roads and bridges, healthcare facilities, Industrial, Oil and Gas, Power, Alternative Energy, Marine, as well as Mining Projects.

3.1 Overview



- How does Synchro PRO apply to you?
 - Synchro PRO integrates with Oracle Primavera and other scheduling software but it can also be used as a stand-alone scheduling tool. In this tutorial, you will learn how to integrate your schedule with 3D models from most CAD systems to produce a 4D schedule and visualization in virtual reality. Whether you like to see the schedule through the model or see the model through the schedule, the ability to visualize your plan while maintaining its integrity allows project delivery performance to consistently and reliably exceed today's performance standards in an immediate and dramatic way.

۳. مدلسازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.2 Workspace Layout

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3.2 Workspace Layout Overview

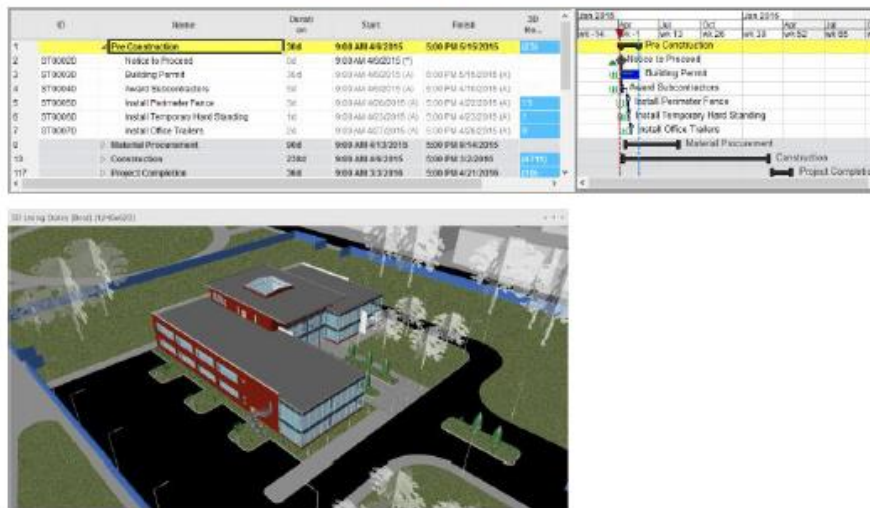
➤ Windows in Synchro



Resources, & 3D Objects



Task List & Gantt Chart Window



Properties



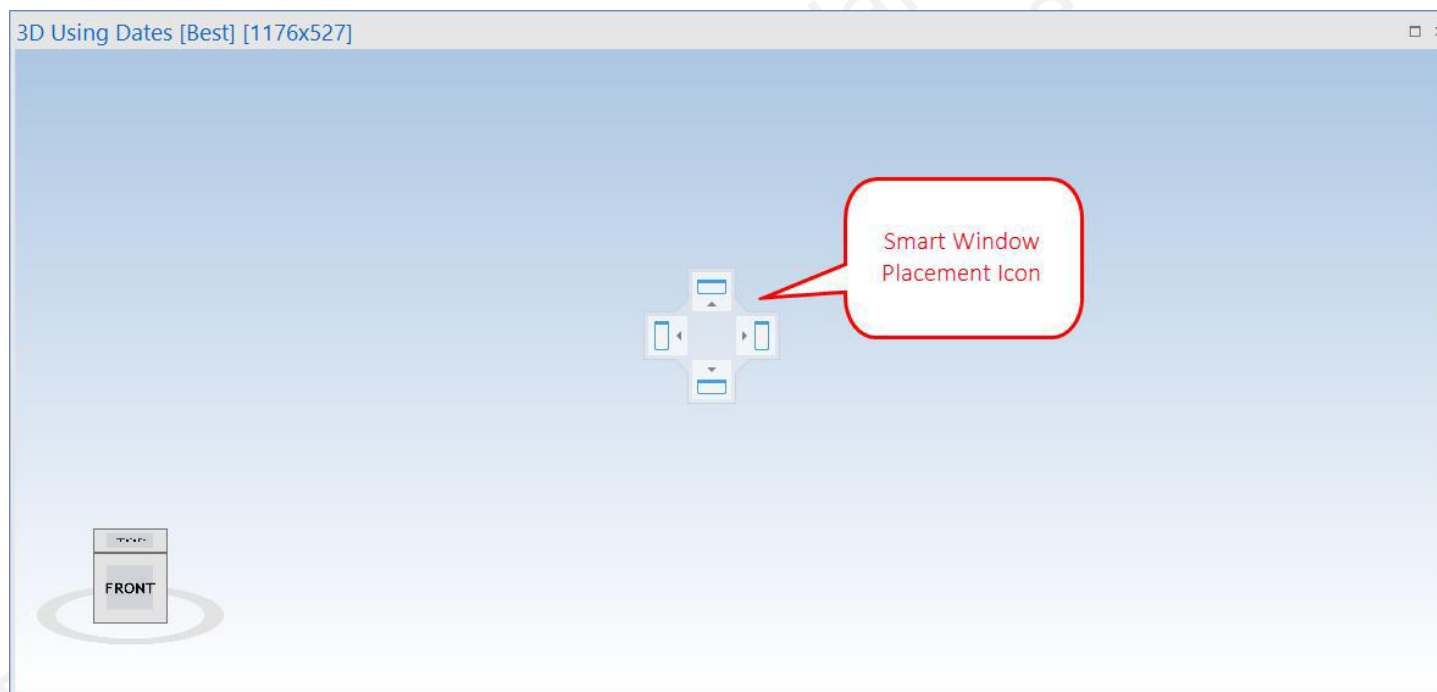
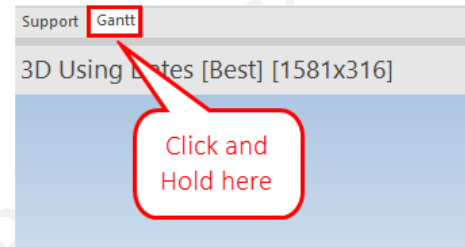
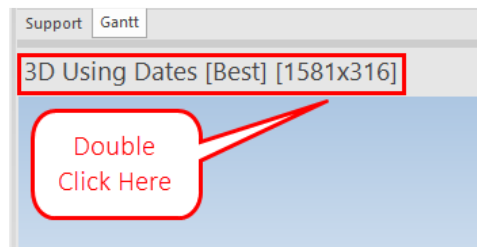
3D Window



3D Objects Tab
Resources Tab

Task Properties
Resource Properties
3D View Properties
3D Properties

3.2 Workspace Layout Overview



۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.3 Importing Schedules/Plans

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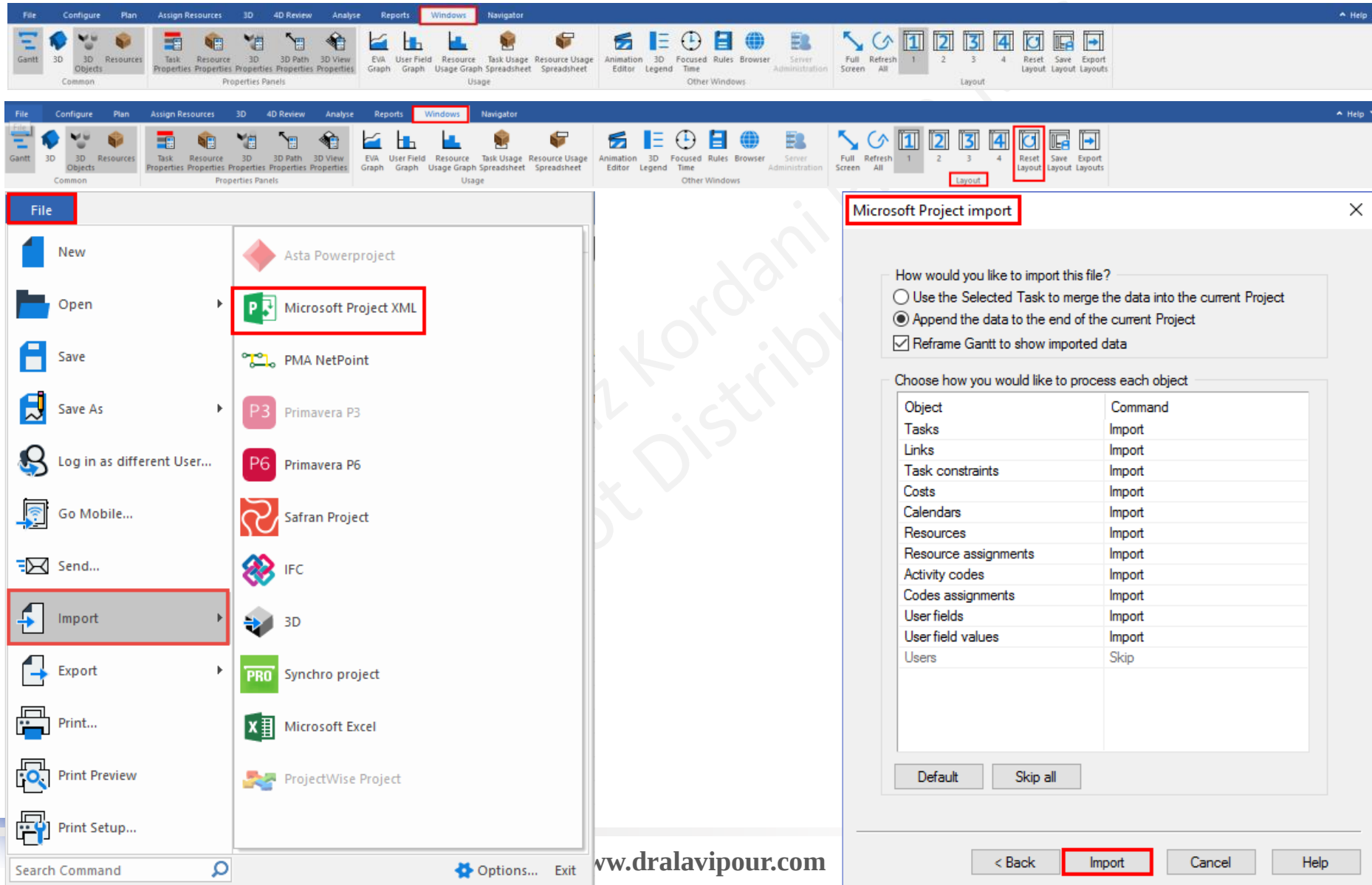
Instagram: [@acemi_social](#)

3.3 Importing Schedules/Plans



- You can import a range of different schedule/plan files into Synchro PRO. The types of plan/schedule files that can be imported:
 - Synchro PRO and Synchro Scheduler (.SP file extension)
 - Asta Powerproject
 - Microsoft Project XML
 - PMA NetPoint
 - Primavera P3
 - Primavera P6
 - IFC

3.3 Importing Schedules/Plans



The screenshot displays the software's main interface with the 'File' menu open. The 'Import' option is highlighted. The 'Microsoft Project import' dialog box is open, showing options for how to import the file and a table for processing each object.

File Menu Options:

- New
- Open
- Save
- Save As
- Log in as different User...
- Go Mobile...
- Send...
- Import**
- Export
- Print...
- Print Preview
- Print Setup...

Microsoft Project import Dialog:

How would you like to import this file?

- ☐ Use the Selected Task to merge the data into the current Project
- ☒ Append the data to the end of the current Project
- ☒ Reframe Gantt to show imported data

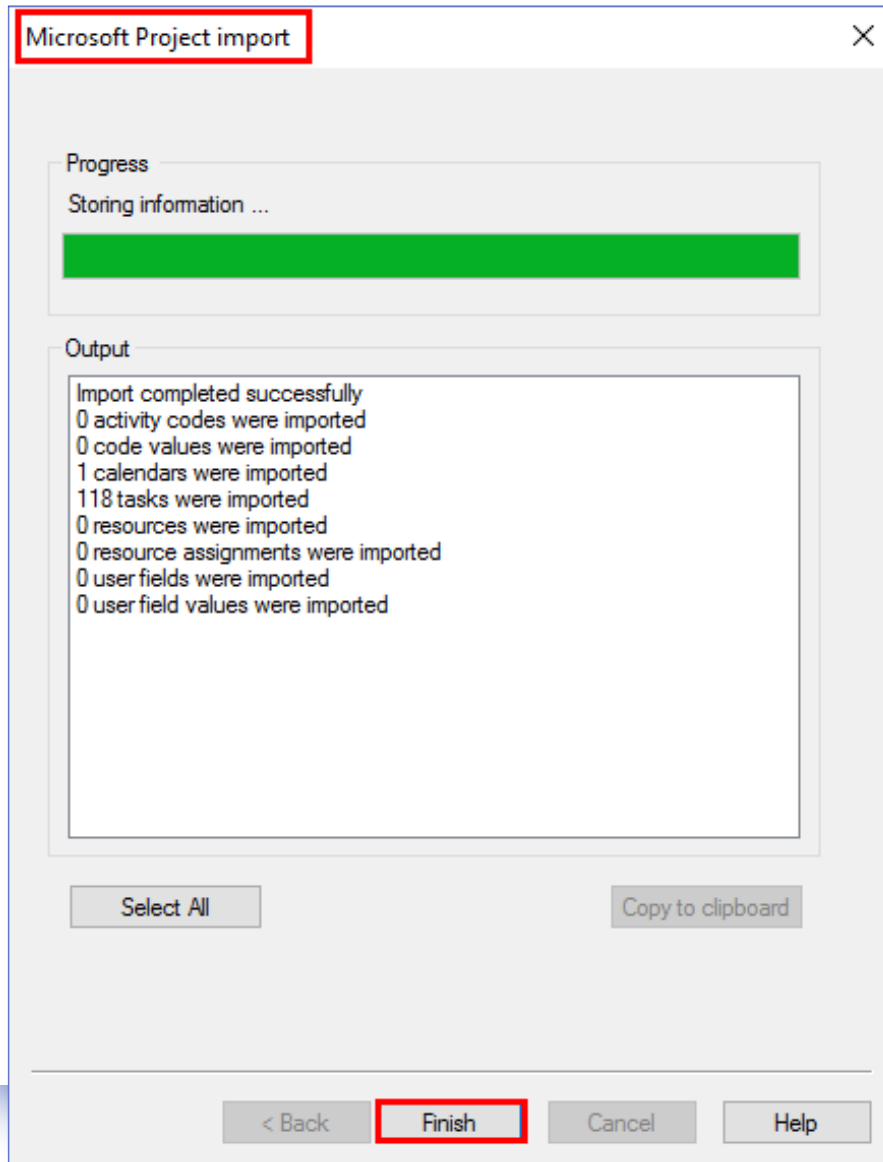
Choose how you would like to process each object

Object	Command
Tasks	Import
Links	Import
Task constraints	Import
Costs	Import
Calendars	Import
Resources	Import
Resource assignments	Import
Activity codes	Import
Codes assignments	Import
User fields	Import
User field values	Import
Users	Skip

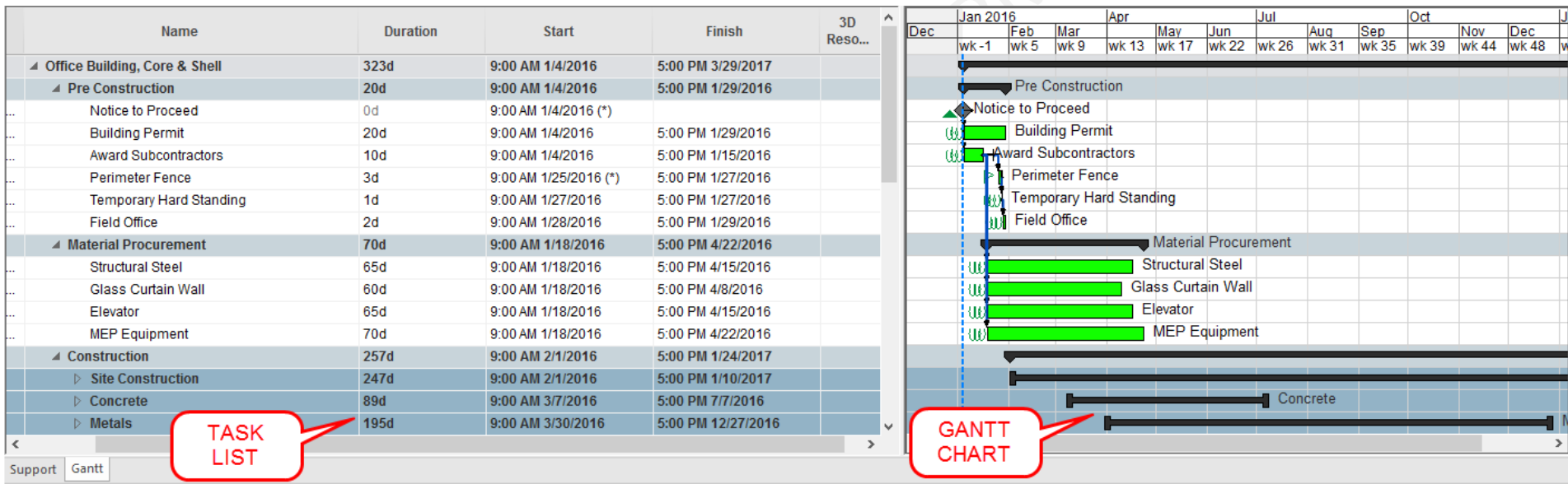
Buttons: Default, Skip all

Bottom Buttons: < Back, **Import**, Cancel, Help

3.3 Importing Schedules/Plans

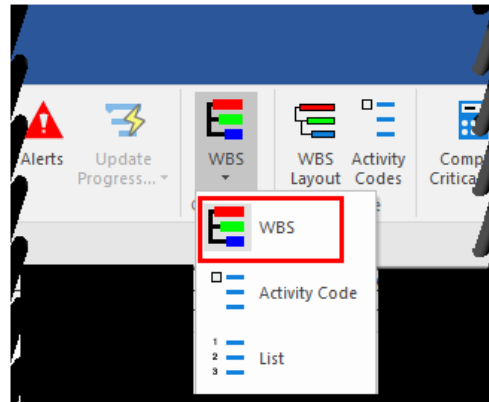


3.3 Importing Schedules/Plans



3.3 Importing Schedules/Plans

➤ Gantt Chart Navigation



ID	Name	Duration	Start	Finish
	▷ Office Building, Core & Shell	323d	9:00 AM 1/4/2016	5:00 PM 3/29/2017

Dec	Jan 2016	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
wk -1	wk 5	wk 9	wk 13	wk 17	wk 22	wk 26	wk 31	wk 35	wk 39	wk 44	wk 48	

Name	Duration	Start
▷ Office Building, Core & Shell	323d	

Customise Columns...

Sort...

Ascending Critical Path

✓ Sort via WBS Level

Custom Filter...

Clear Filter

Clear All Filters

Justification

Customise Columns

Available Columns

<all>

Task Parameters

Analysis

Assignments

Baseline

Constraints

Costs

Durations

EVA

Finish Dates

General

Activity Count

Calendar

Comments

External UID

GUID

Task Type

URL

Selected Columns

ID

Name

Duration

Start

Finish

3D Resources

Up

Down

Rename

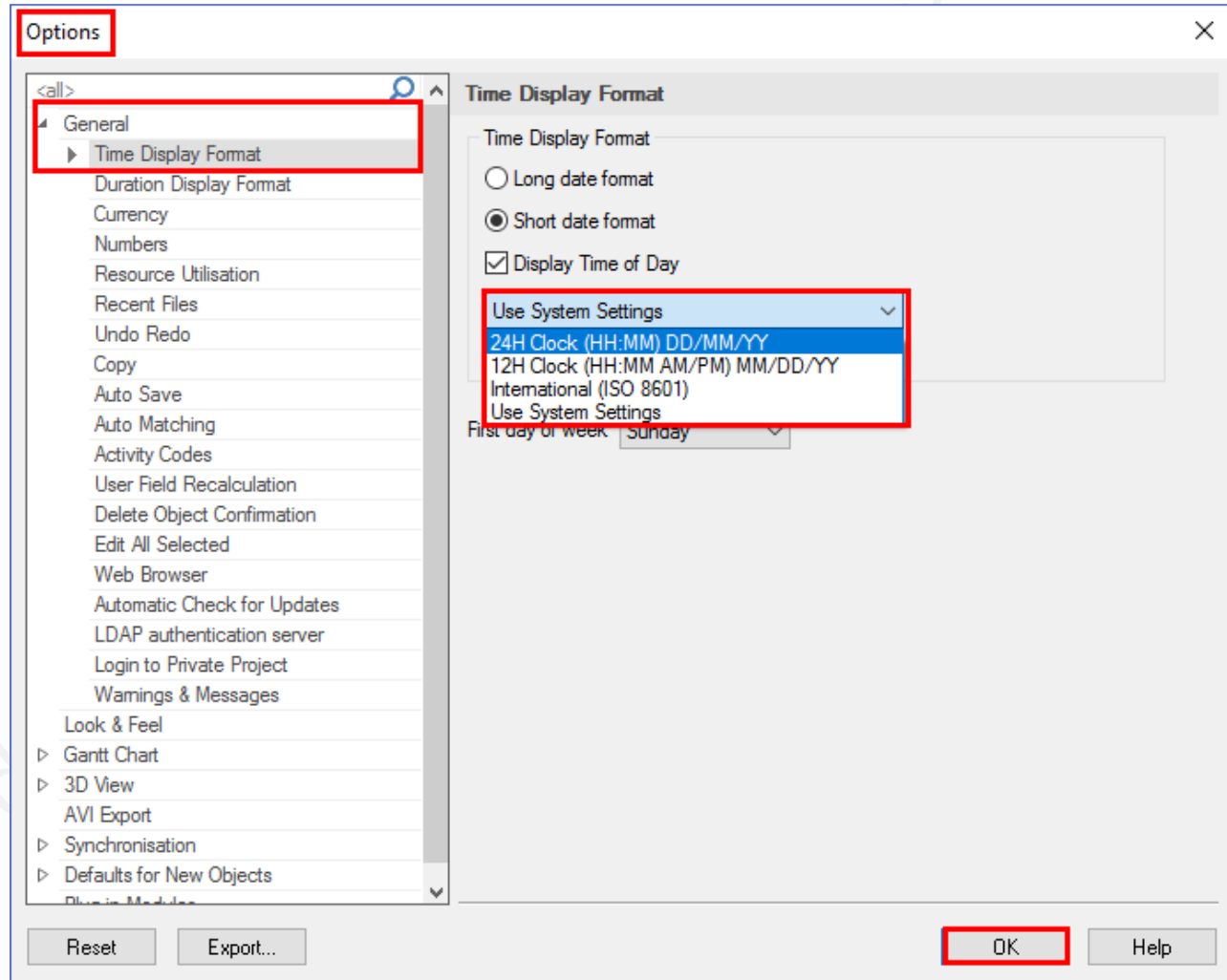
OK

Cancel

Help

3.3 Importing Schedules/Plans

➤ Date Display



۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.4 AutoSave & Importing models

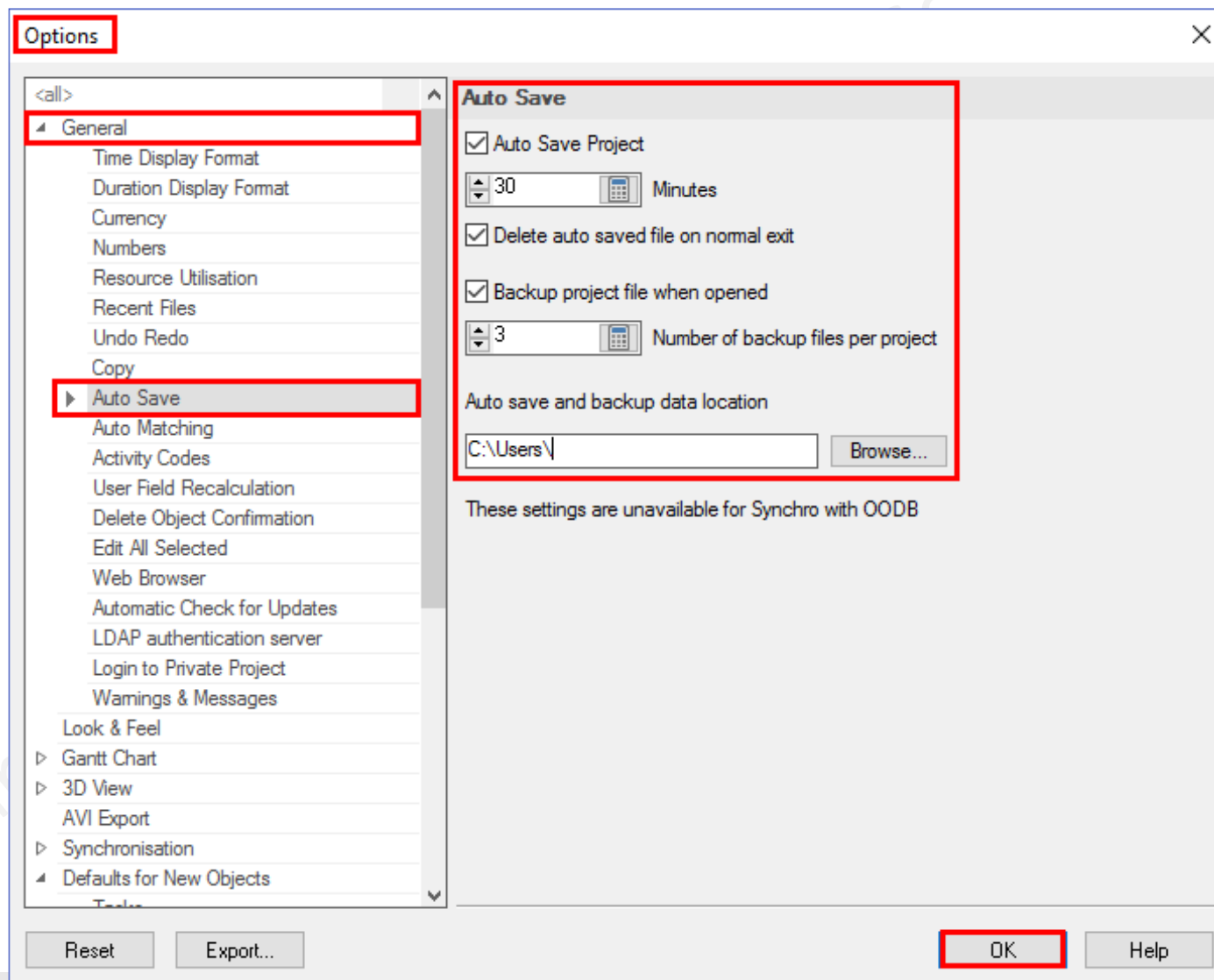
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Instagram: [@acemi_social](https://www.instagram.com/acemi_social)

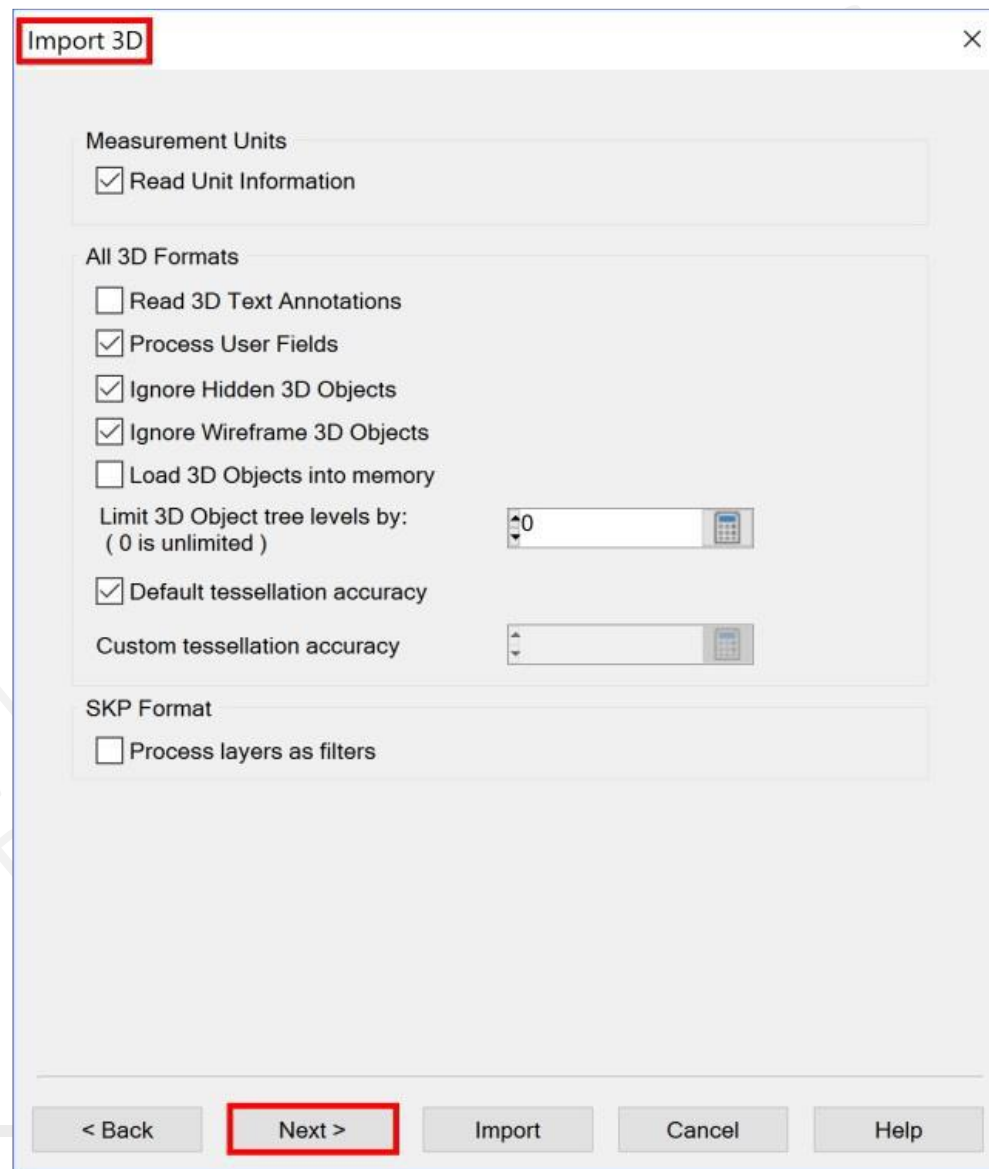
3.4 AutoSave & Importing models

➤ Auto Save



3.4 AutoSave & Importing models

➤ Importing Models



The image shows a software dialog box titled "Import 3D". The dialog is organized into several sections with checkboxes and input fields. The "Import" button at the bottom is highlighted with a red rectangle.

Import 3D

Measurement Units

- ☒ Read Unit Information

All 3D Formats

- ☐ Read 3D Text Annotations
- ☒ Process User Fields
- ☒ Ignore Hidden 3D Objects
- ☒ Ignore Wireframe 3D Objects
- ☐ Load 3D Objects into memory

Limit 3D Object tree levels by:
(0 is unlimited)

0

☒ Default tessellation accuracy

Custom tessellation accuracy

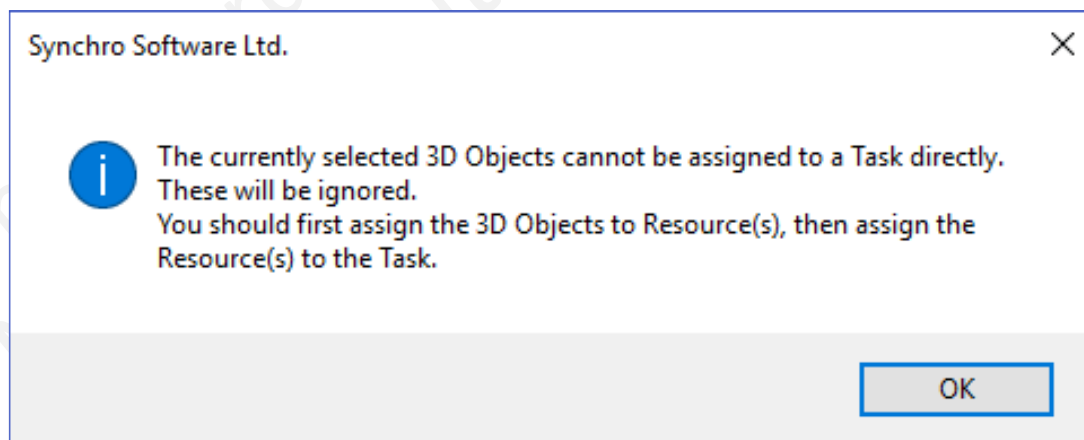
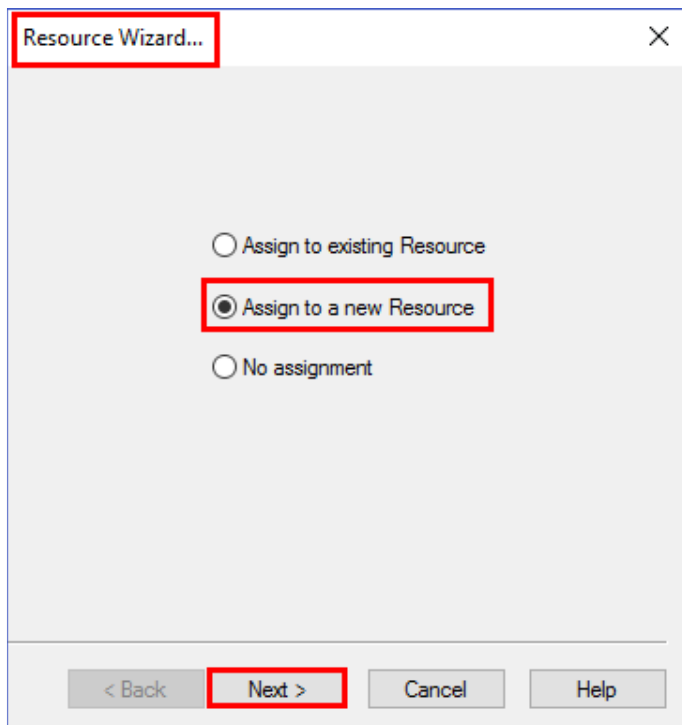
SKP Format

- ☐ Process layers as filters

< Back **Next >** Import Cancel Help

3.4 AutoSave & Importing models

➤ Resource Wizard



3.4 AutoSave & Importing models

➤ Resource Wizard

Enter Resource details...

Company: New Company

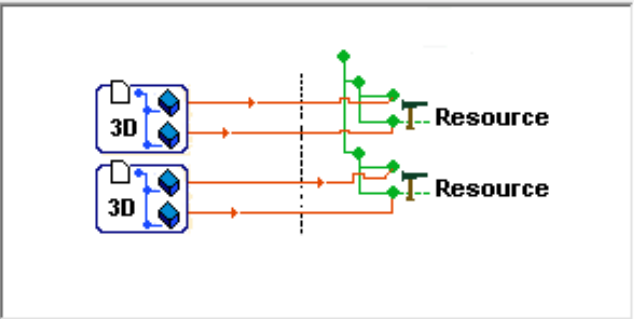
Name: Site

Type: Material

Resource status: System statuses

< Back **Next >** Cancel Help

Resource Creation...



☐ Assign to this Resource, don't build tree

☐ Add Resources underneath, don't build tree

☐ Assign to this Resource, build tree

☒ **Add Resources underneath, build tree**

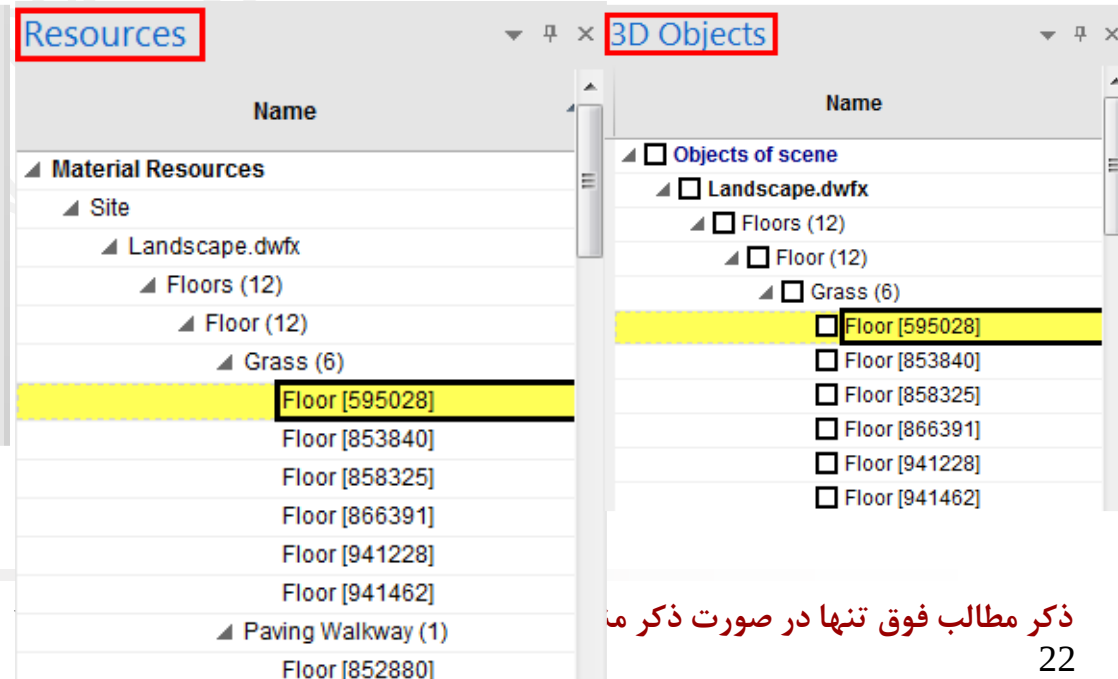
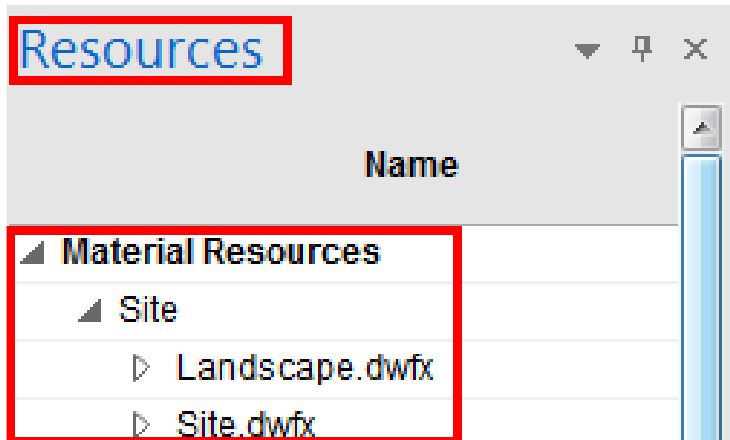
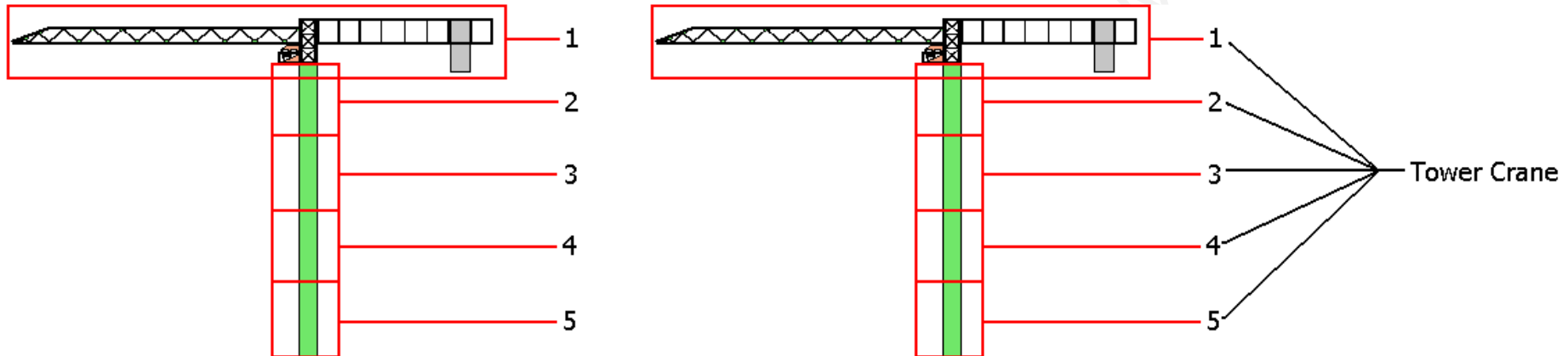
Resource tree maximum depth (0 means unlimited)

The current 3D Object tree is 5 levels deep

< Back **Finish** Cancel Help

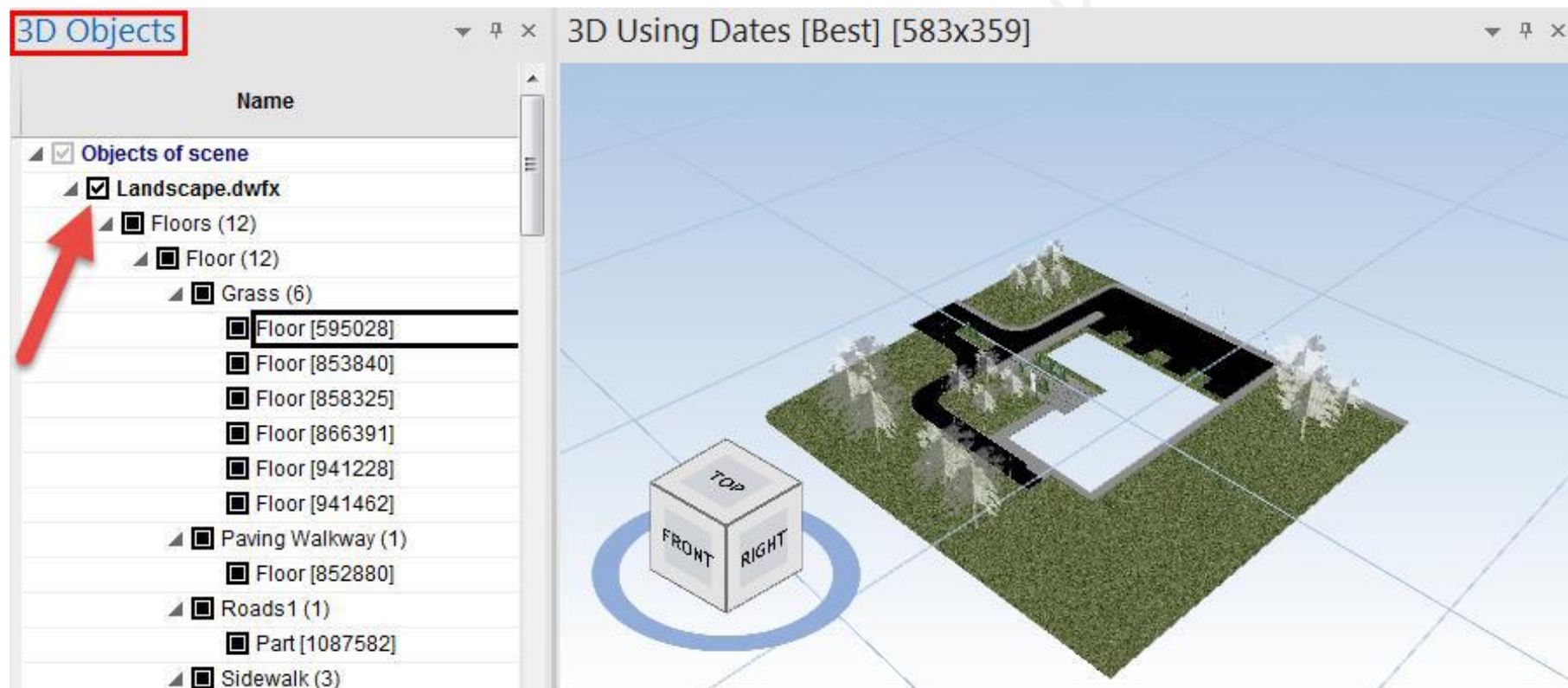
3.4 AutoSave & Importing models

➤ Resource Creation Options



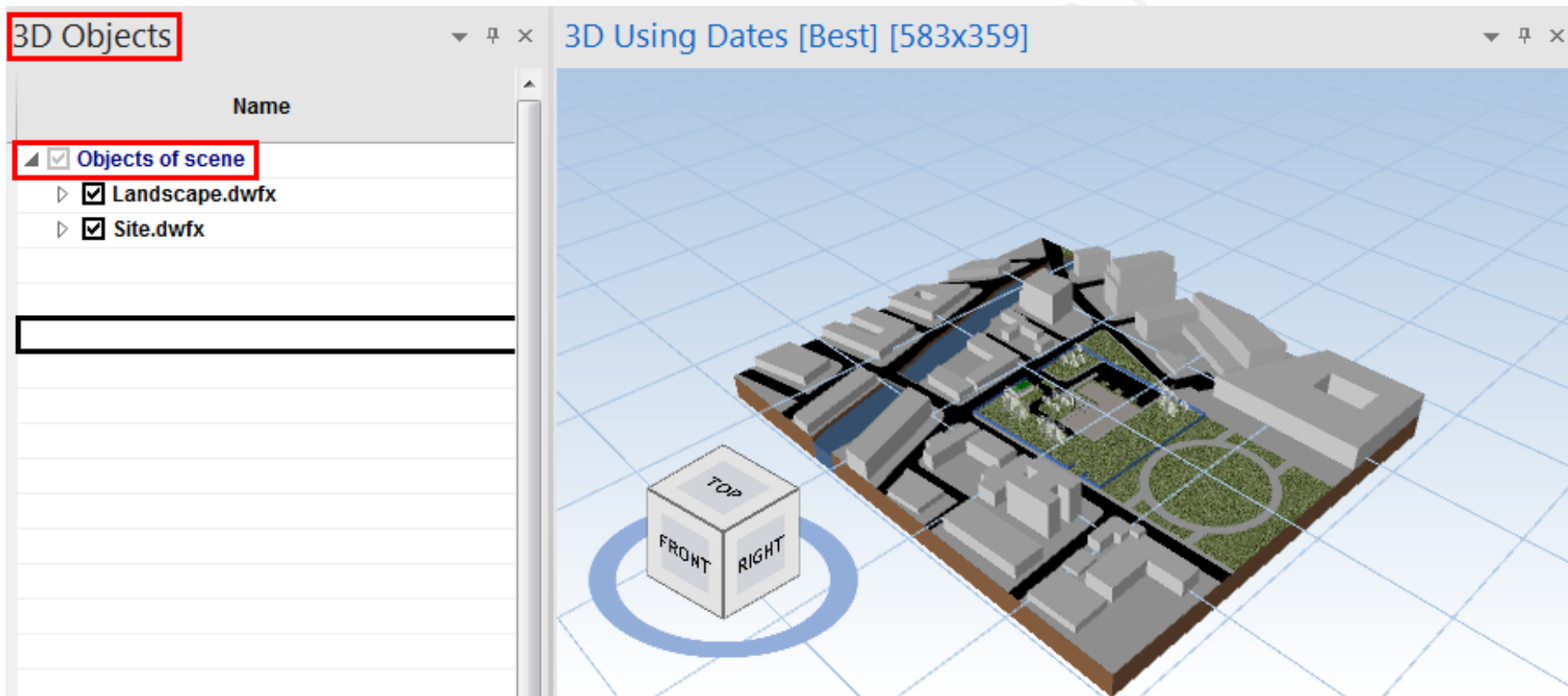
3.4 AutoSave & Importing models

➤ Load 3D Objects



3.4 AutoSave & Importing models

➤ Load 3D Objects



3.4 AutoSave & Importing models

➤ Duplicate Names Warning

Duplicate Names in 3D file!



Warning!

This operation will cause 3D objects with duplicate names to be assigned to Resources. This means that some Resource assignments will be lost if you synchronise with an updated 3D file. If you intend to synchronise with updated 3D files, you need to ensure all names for 3D objects are unique!

These are the duplicated names:

"SubPart 1" (10)
"SubPart 2" (10)
"SubPart 1" (99)

Copy to clipboard

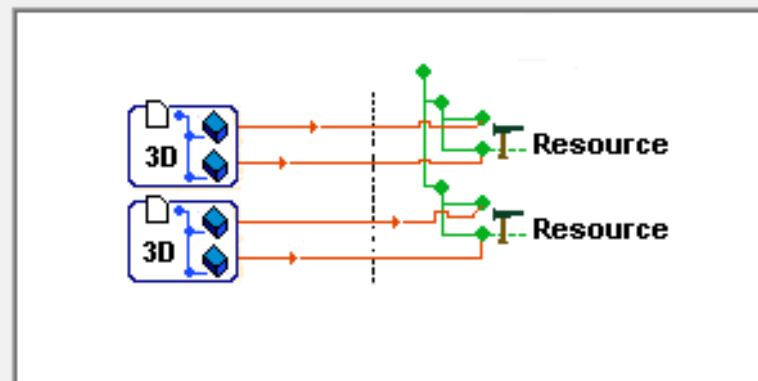
< Back

Finish

Cancel

Help

Resource Creation...



- ☐ Assign to this Resource, don't build tree
- ☐ Add Resources underneath, don't build tree
- ☐ Assign to this Resource, build tree
- ☒ Add Resources underneath, build tree

Resource tree maximum depth (0 means unlimited)
The current 3D Object tree is 6 levels deep

0

< Back

Next >

Cancel

Help

3.4 AutoSave & Importing models

➤ Duplicate Names Warning

Find 3D Objects...

Find what: SubPart

Find Next

☐ Match whole word

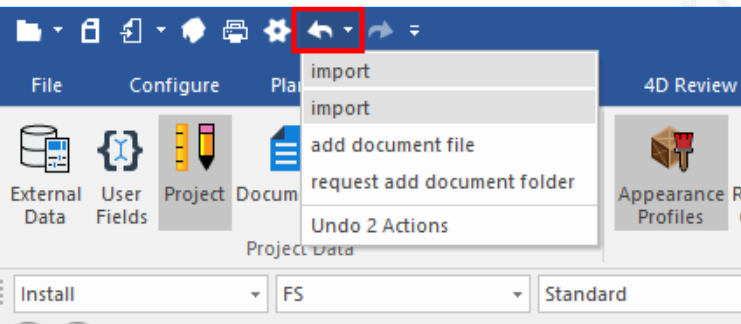
☐ Match case

Find All

☐ Search in all columns

☐ Use wildcards

Cancel



3D Objects

Name

<all>

Objects of scene

Architecture.dwg

Curtain Panels (408)

Curtain Wall Mullions (1087)

Doors (30)

Railings (14)

Roofs (2)

Specialty Equipment (3)

Stairs (4)

Wall Sweeps (2)

Walls (88)

Basic Wall (88)

Exterior Wall - Metal Siding (21)

Interior - Blockwork 200 (11)

Interior Partition Wall - 190mm (40)

Parapet Wall (6)

Basic Wall [822061]

SubPart 1

SubPart 2

Basic Wall [822486]

SubPart 1

SubPart 2

Basic Wall [822672]

SubPart 1

SubPart 2

Basic Wall [822749]

SubPart 1

SubPart 2

Basic Wall [823710]

SubPart 1

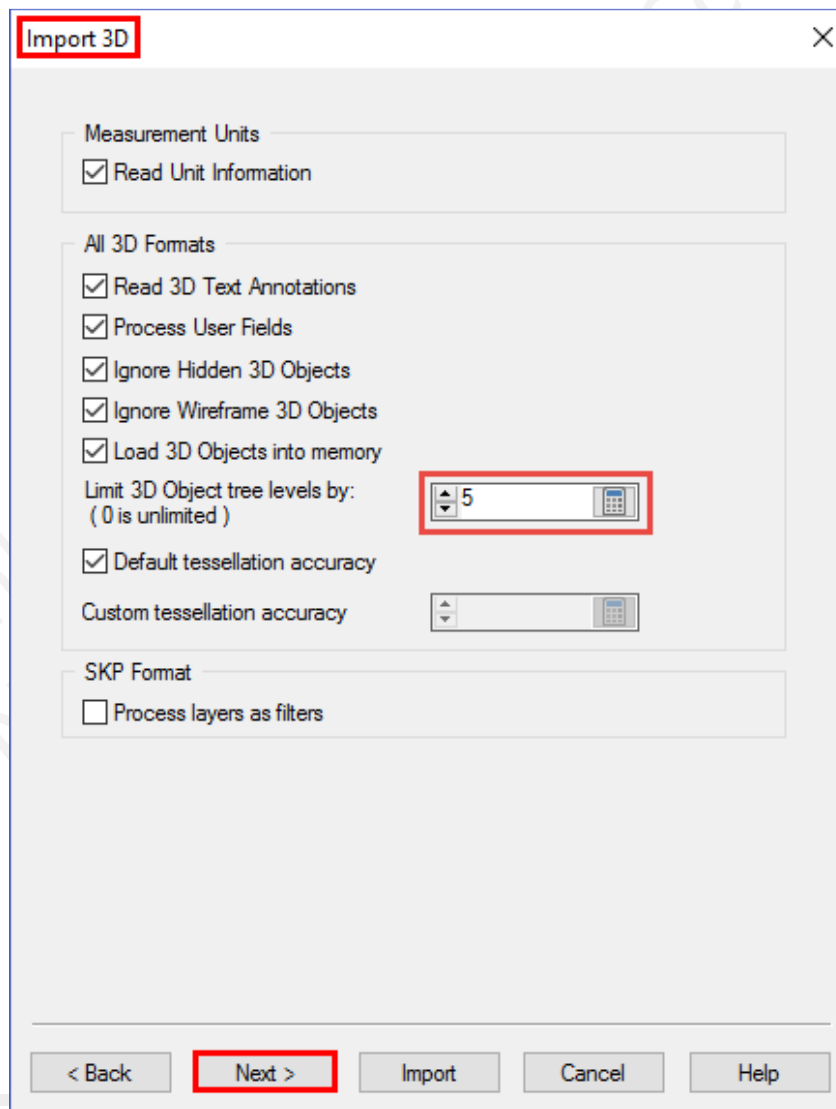
SubPart 2

Resources

3D Objects

3.4 AutoSave & Importing models

➤ Duplicate Names Warning



The image shows a software dialog box titled "Import 3D". The dialog is organized into several sections with checkboxes and input fields. The "Import 3D" title bar is highlighted with a red rectangle. The "Measurement Units" section contains a checked checkbox for "Read Unit Information". The "All 3D Formats" section contains several checked checkboxes: "Read 3D Text Annotations", "Process User Fields", "Ignore Hidden 3D Objects", "Ignore Wireframe 3D Objects", and "Load 3D Objects into memory". Below these is a label "Limit 3D Object tree levels by: (0 is unlimited)" followed by a spinner box containing the number "5", which is also highlighted with a red rectangle. Below that is a checked checkbox for "Default tessellation accuracy" and an input field for "Custom tessellation accuracy". The "SKP Format" section contains an unchecked checkbox for "Process layers as filters". At the bottom, there are five buttons: "< Back", "Next >" (highlighted with a red rectangle), "Import", "Cancel", and "Help".

Import 3D

Measurement Units

☒ Read Unit Information

All 3D Formats

☒ Read 3D Text Annotations

☒ Process User Fields

☒ Ignore Hidden 3D Objects

☒ Ignore Wireframe 3D Objects

☒ Load 3D Objects into memory

Limit 3D Object tree levels by:
(0 is unlimited)

5

☒ Default tessellation accuracy

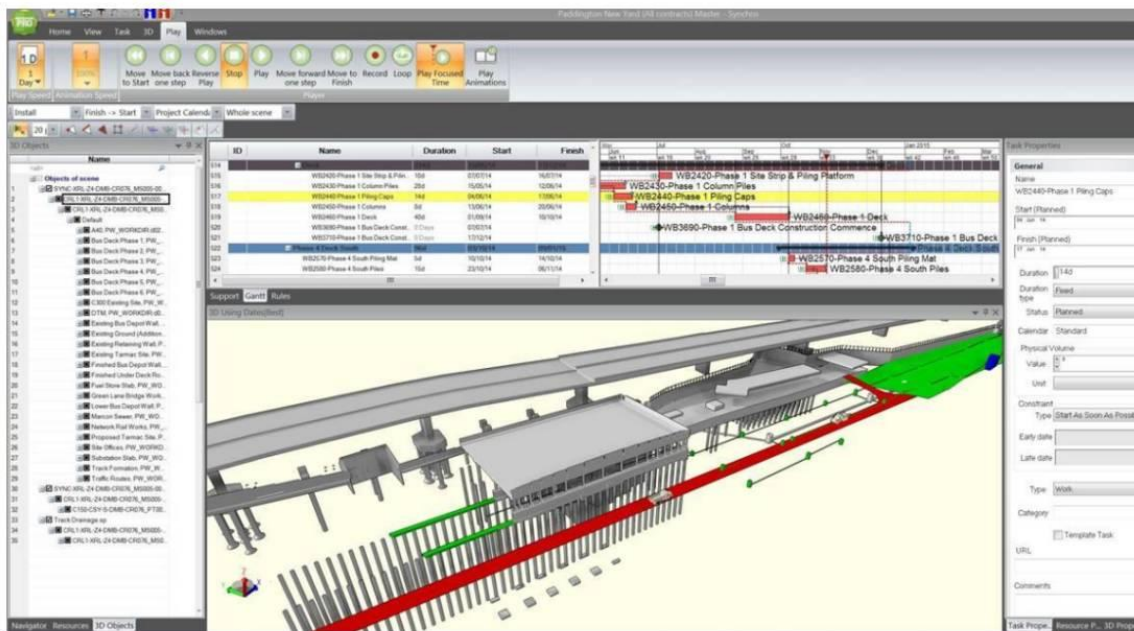
Custom tessellation accuracy

SKP Format

☐ Process layers as filters

< Back Next > Import Cancel Help

۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.5 3D view & 4D Linking Process

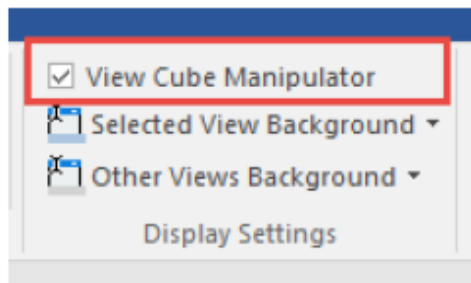
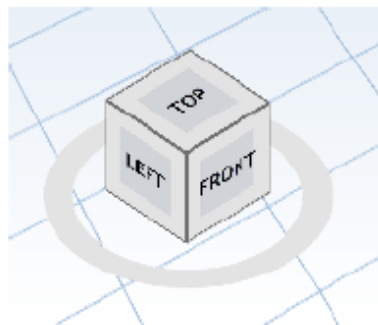
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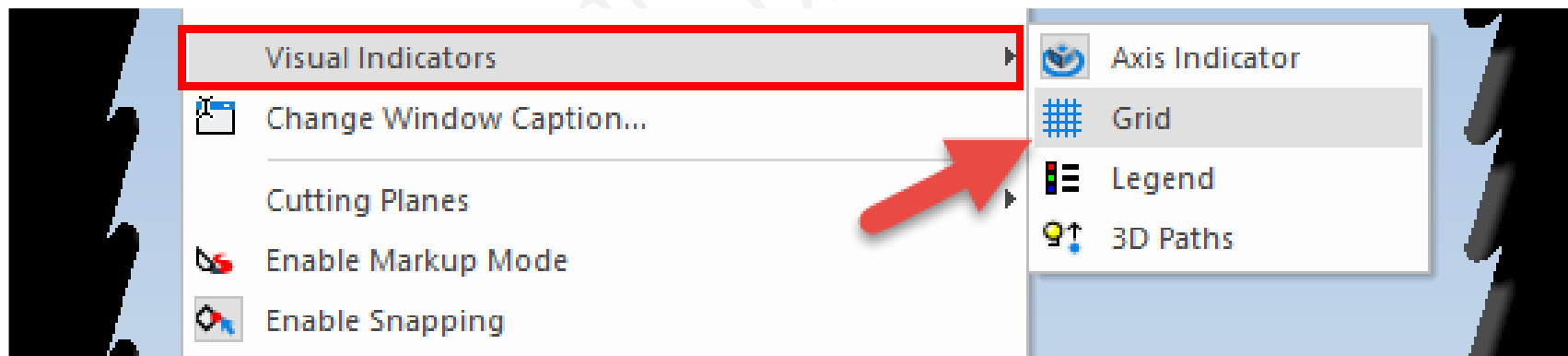
Instagram: [@acemi_social](#)

3.5 3D view & 4D Linking Process

➤ 3D View

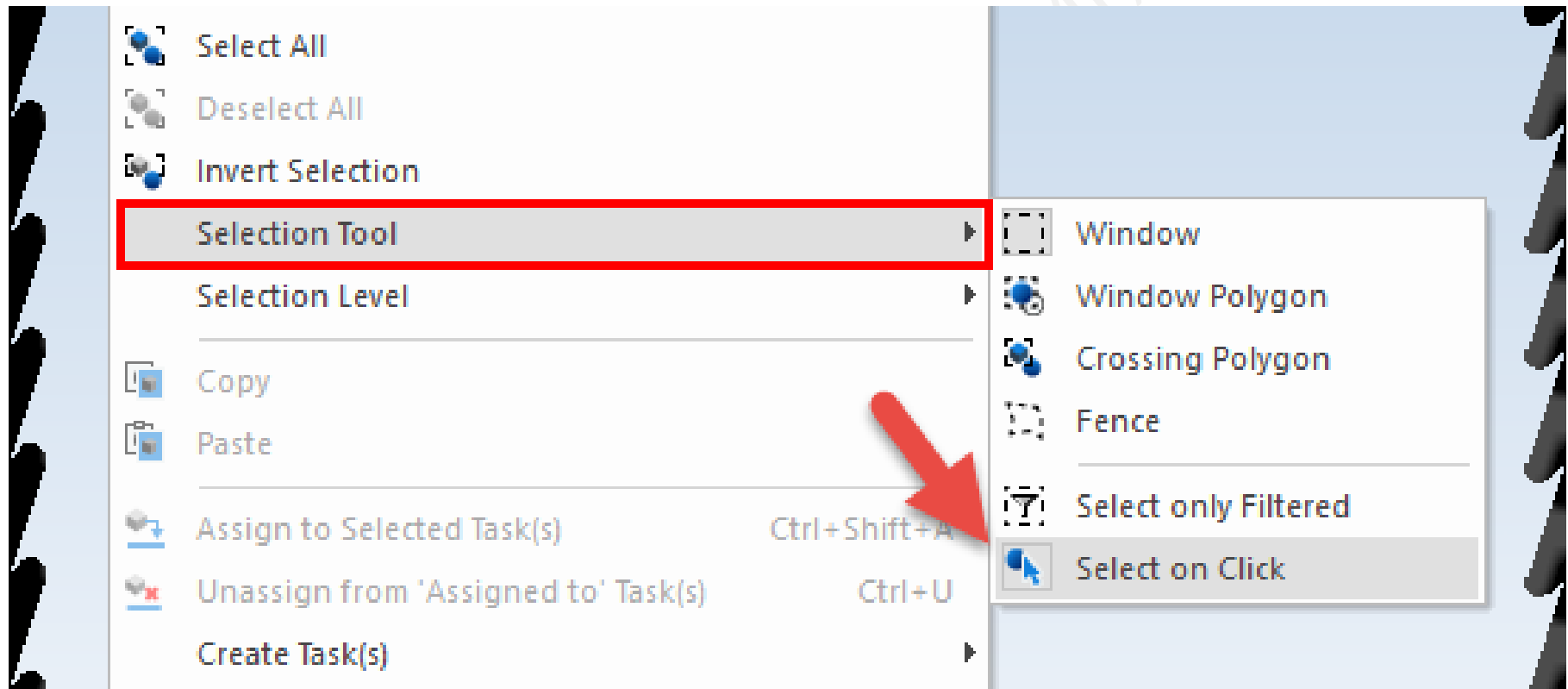


NOTE: To enable the View Cube, in the 3D tab → Display Settings panel. Check the box next to “View Cube Manipulator”



3.5 3D view & 4D Linking Process

➤ 4D Linking Process – Assigning Resources to Tasks

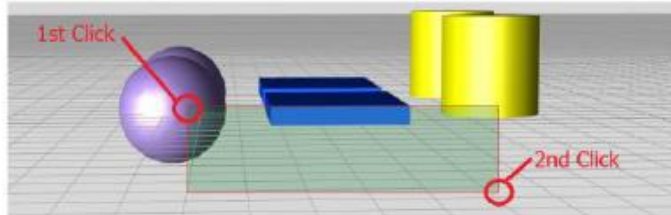


3.5 3D view & 4D Linking Process

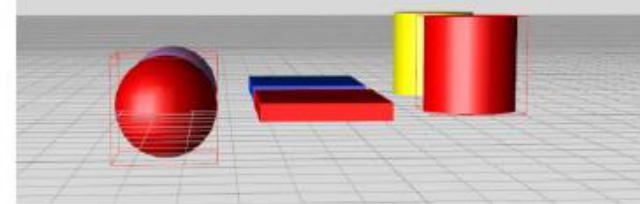
➤ 4D Linking Process – Assigning Resources to Tasks

- a. Top Left to Bottom Right- All objects within the window box and all that it touches that are visible.

Selection:

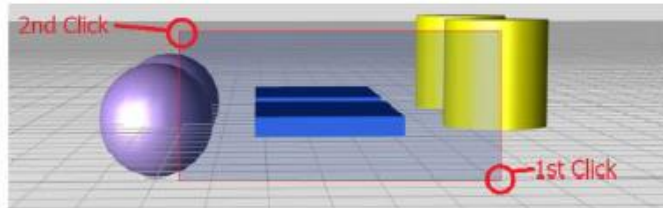


Result:

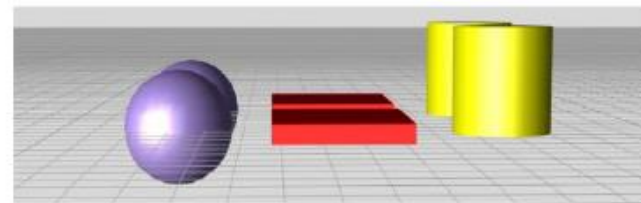


- b. Bottom Right to Top Left- All objects completely within the box that are visible.

Selection:

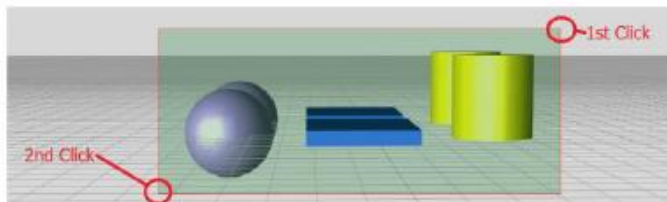


Result:

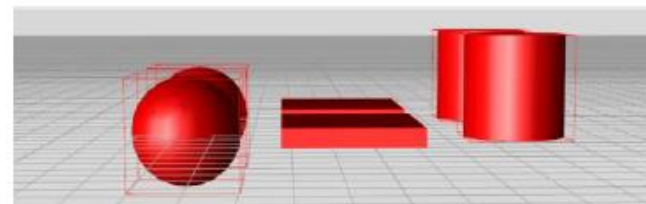


- c. Top Right to Bottom Left- All objects within the window box and all that it touches that are visible and non-visible.

Selection:

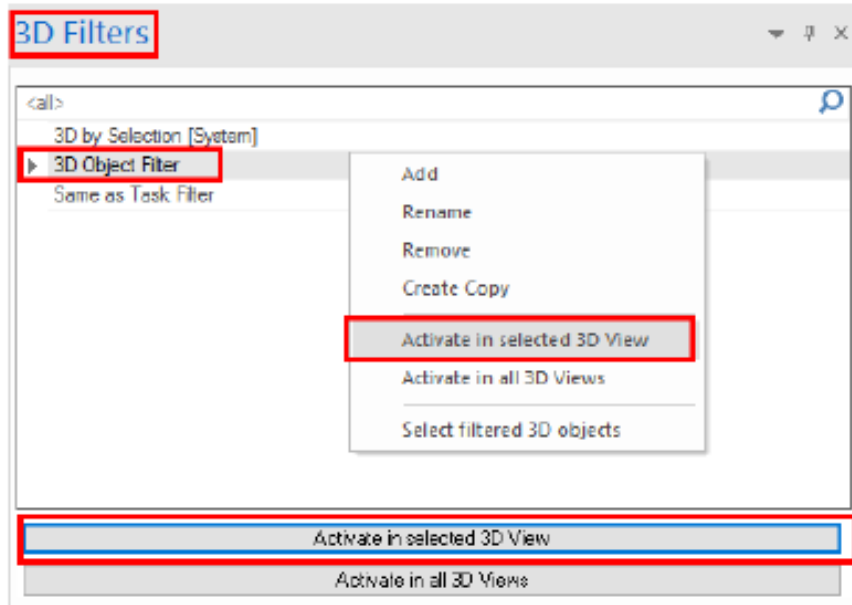


Result:



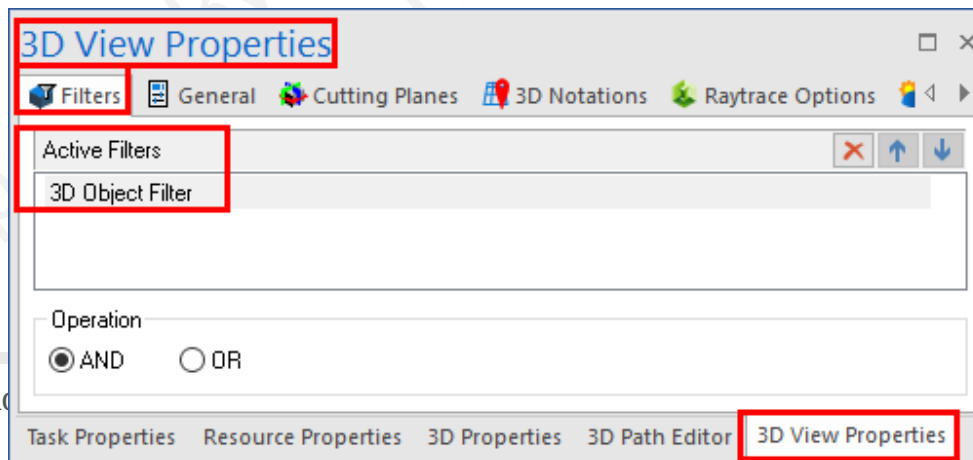
3.5 3D view & 4D Linking Process

➤ 3D Filters



NOTE: The 3D by Selection [System] filter is automatically enabled when using the 3D → Filters → Show Selected or Hide Selected commands

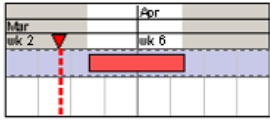
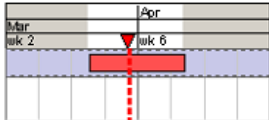
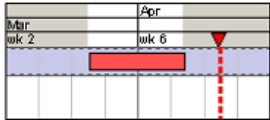
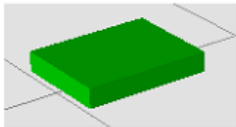
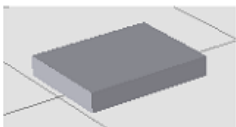
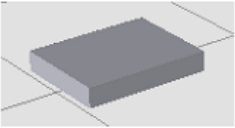
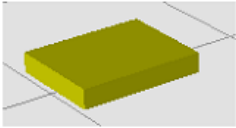
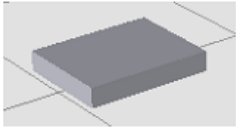
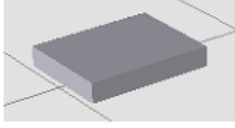
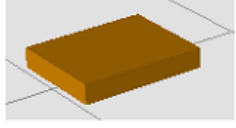
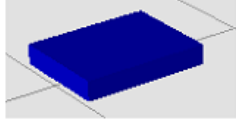
The Same as Task Filter, this filters the 3D view to show only the objects assigned to Tasks included in the current Task Filter.



ذکر مطالب فوق تنها در صورت ذکر منبع

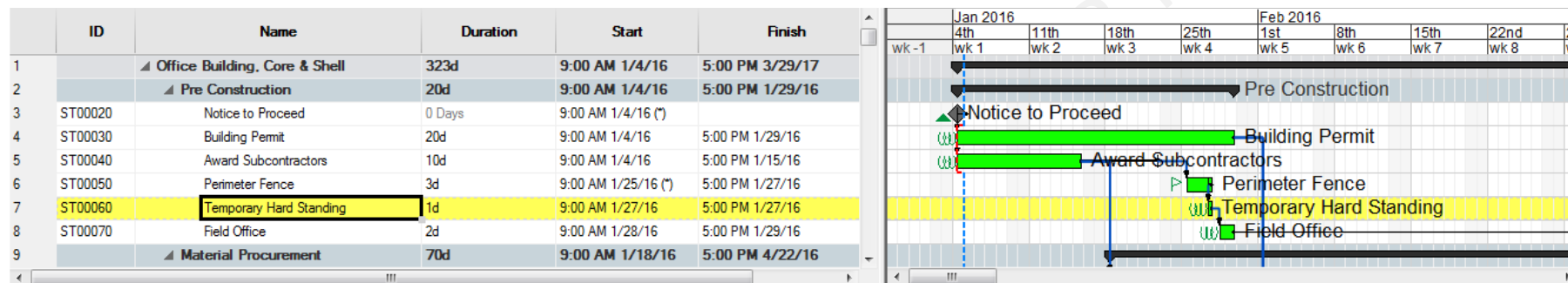
3.5 3D view & 4D Linking Process

➤ Appearance Profiles

PROFILE	FOCUS TIME		
	Before Task	During Task	After Task
			
INSTALL	 Start Appearance	 Active Appearance	 End Appearance
MAINTAIN	 Start Appearance	 Active Appearance	 End Appearance
REMOVE	 Start Appearance	 Active Appearance	 End Appearance
TEMPORARY	 Start Appearance	 Active Appearance	 End Appearance

3.5 3D view & 4D Linking Process

➤ Basic Linking Process



3D

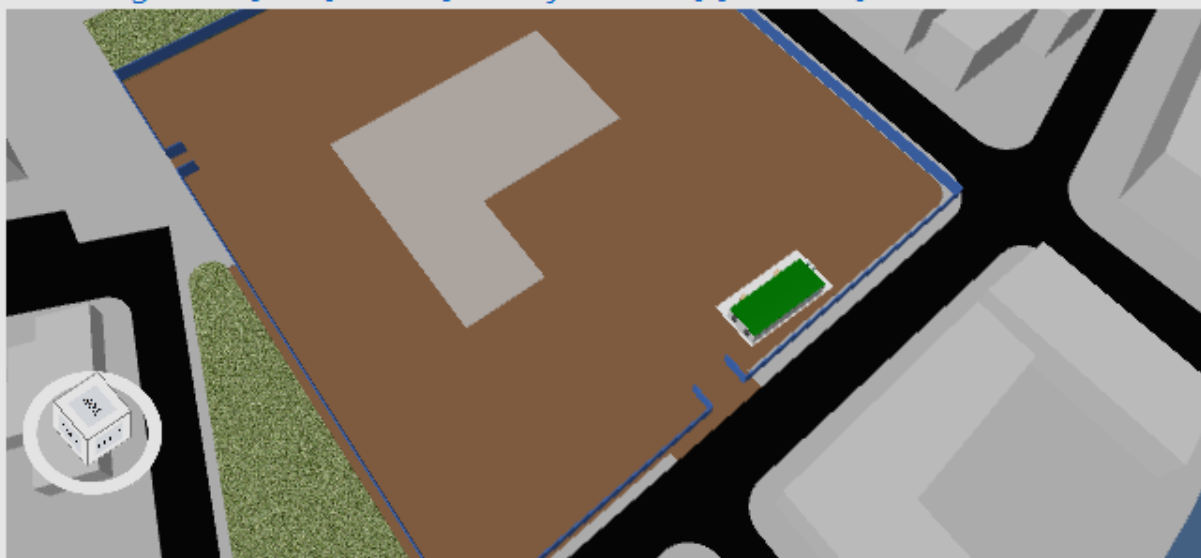
- ☒ Include matches
- ☐ Exclude matches

- Objects of scene**
- ☐ Architecture.dwg
 - ☐ Landscape.dwg
 - ☒ Site.dwg
 - ☐ Structure.dwg

Mark All

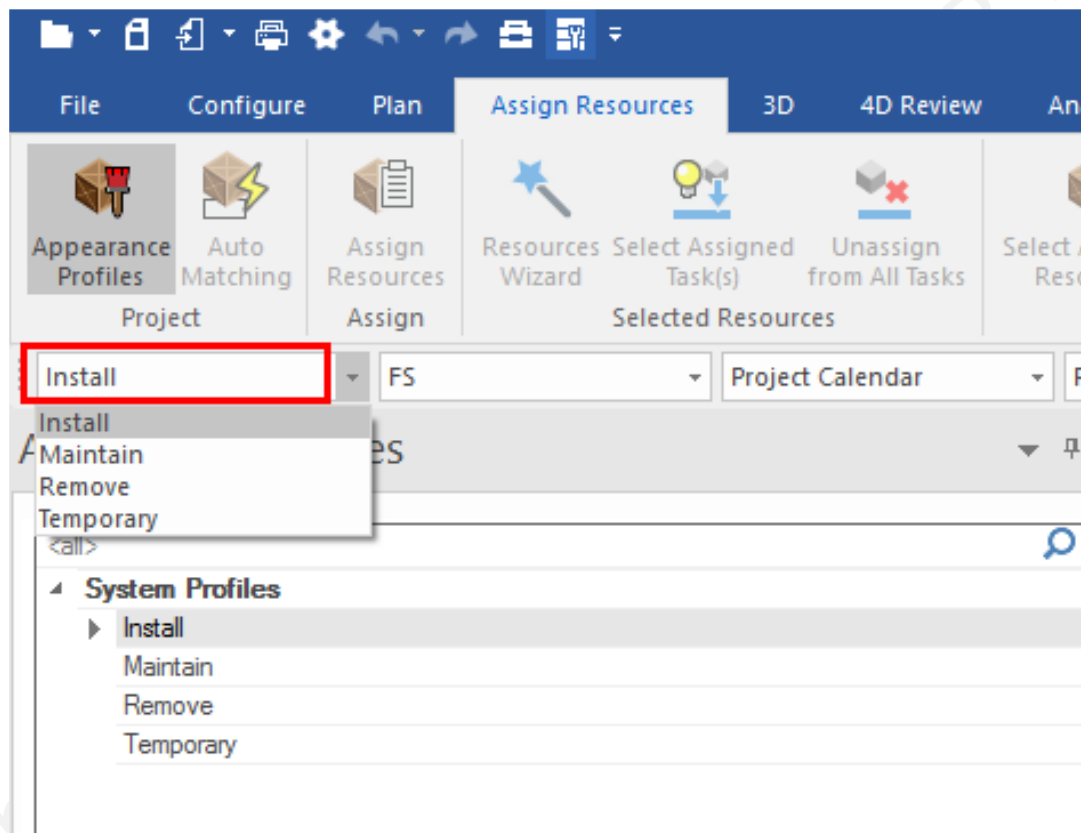
Clear

3D Using Dates[Best] Filters[3D Object Filter] [643x293]



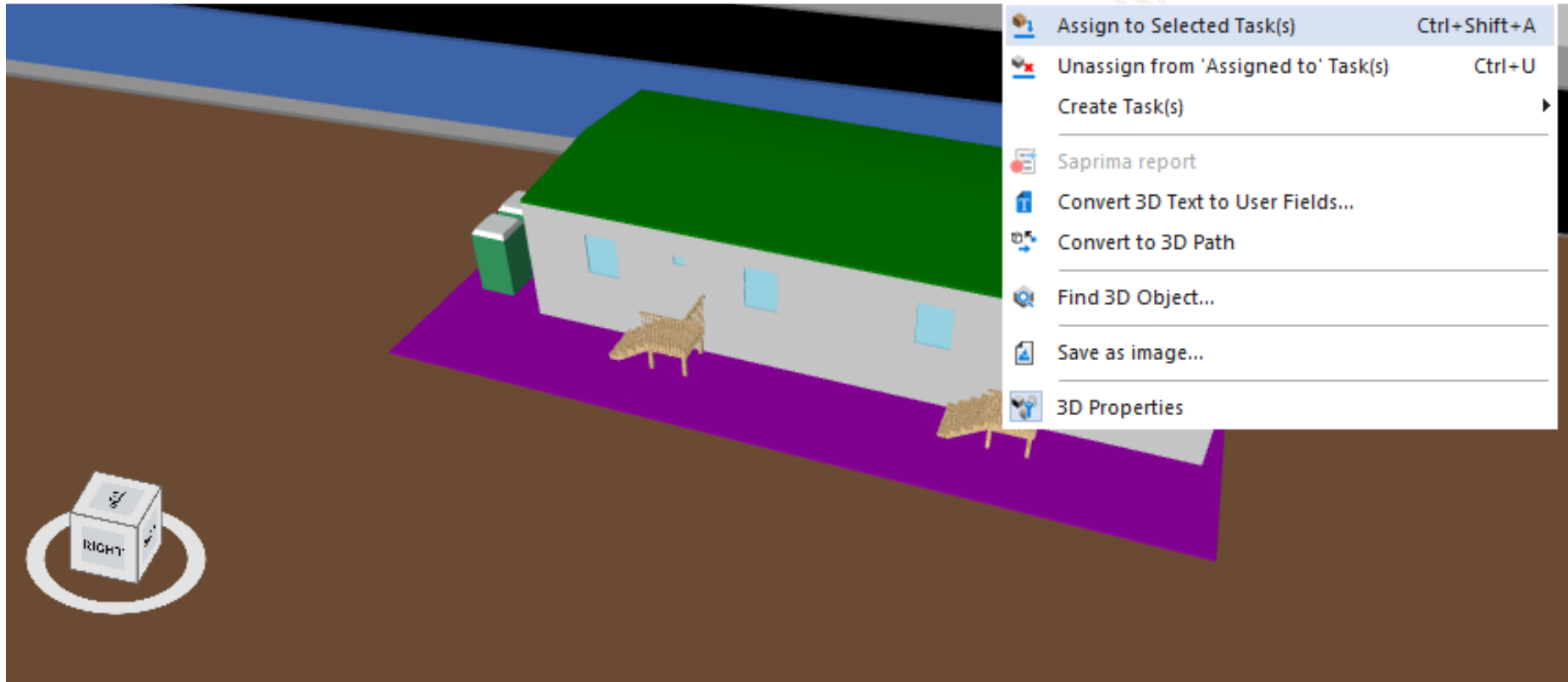
3.5 3D view & 4D Linking Process

➤ Basic Linking Process



3.5 3D view & 4D Linking Process

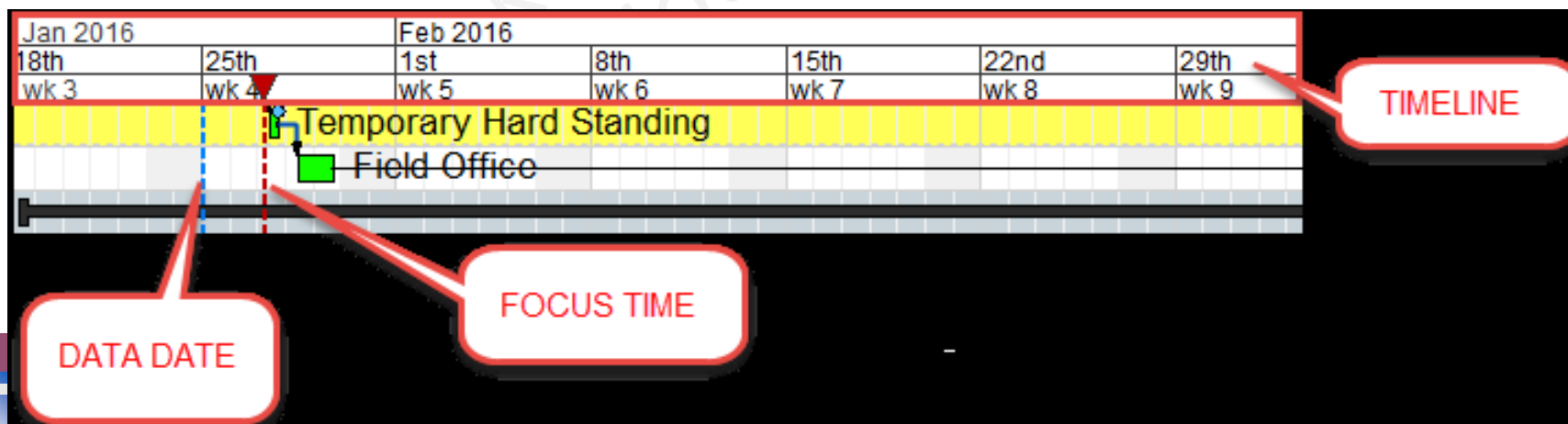
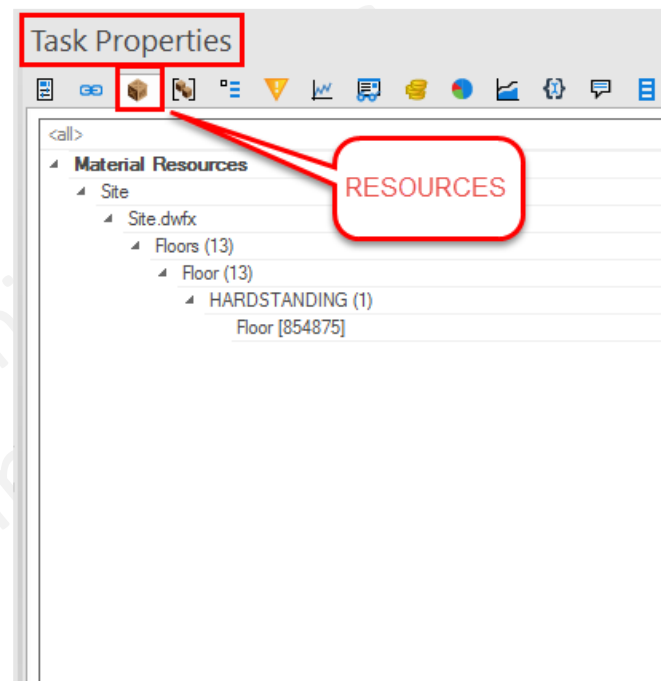
➤ Basic Linking Process



	ID	Name	Duration	Start	Finish	3D Resources
7	ST00060	Temporary Hard Standing	1d	9:00 AM 1/27/16	5:00 PM 1/27/16	1
8	ST00070	Field Office	2d	9:00 AM 1/28/16	5:00 PM 1/29/16	
9		Material Procurement	70d	9:00 AM 1/18/16	5:00 PM 4/22/16	

3.5 3D view & 4D Linking Process

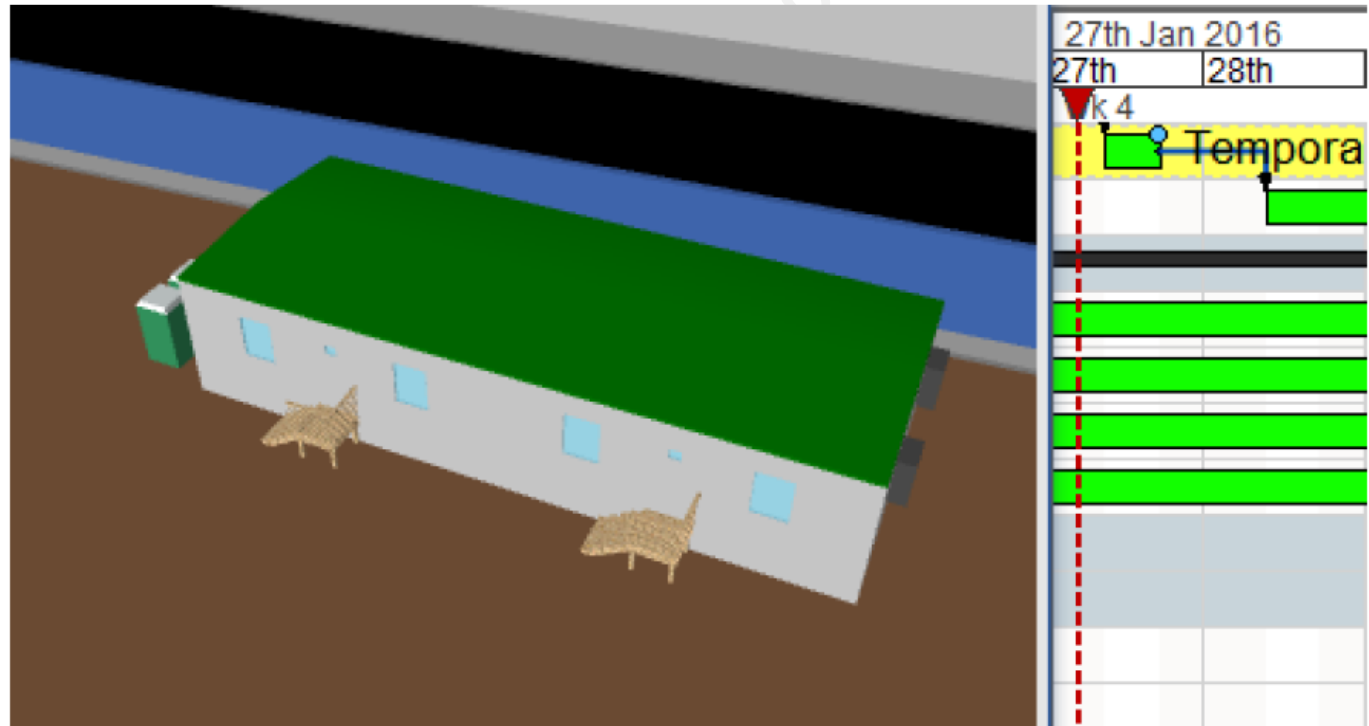
➤ Basic Linking Process



3.5 3D view & 4D Linking Process

➤ Basic Linking Process

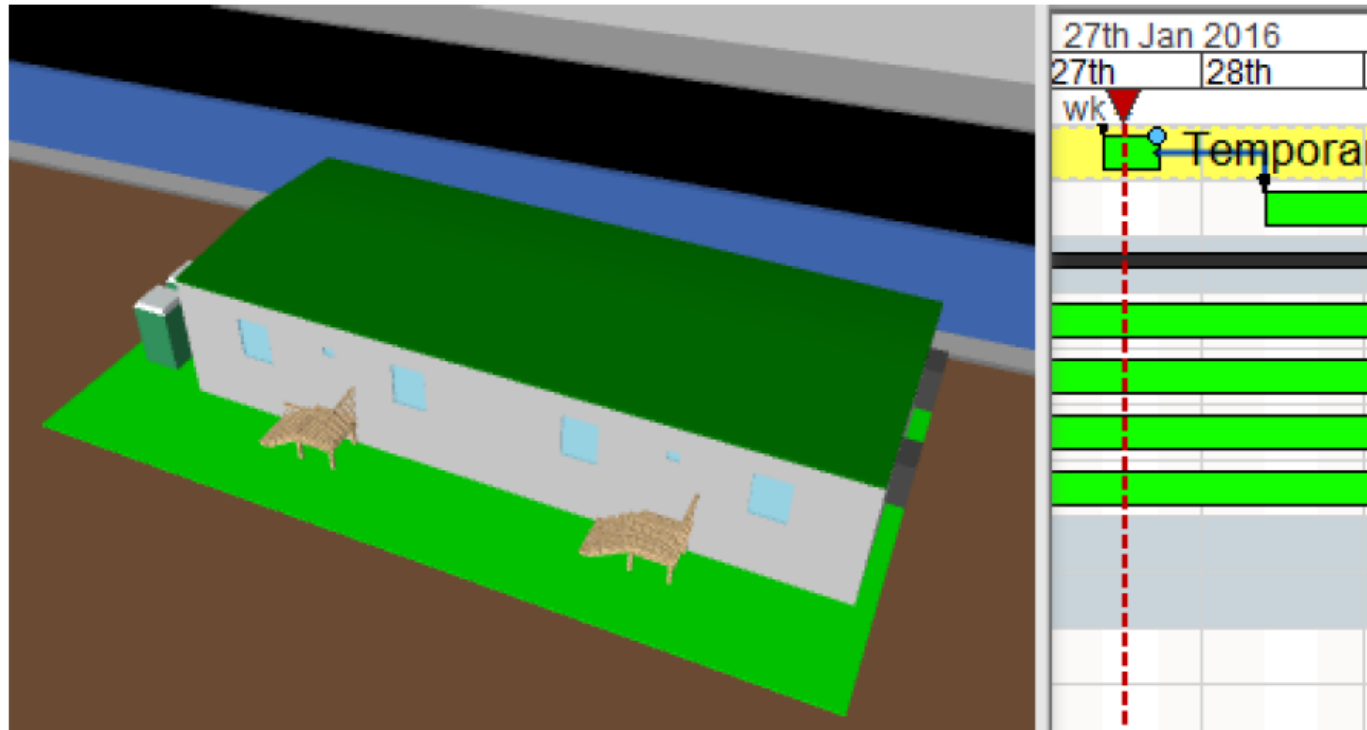
Move the **Focus Time** before the start of the **Install Temporary Hard Standing** task. When the **Focus Time** is before the start of the Task, the hard standing object is not visible in the 3D window because it has not yet been installed.



3.5 3D view & 4D Linking Process

➤ Basic Linking Process

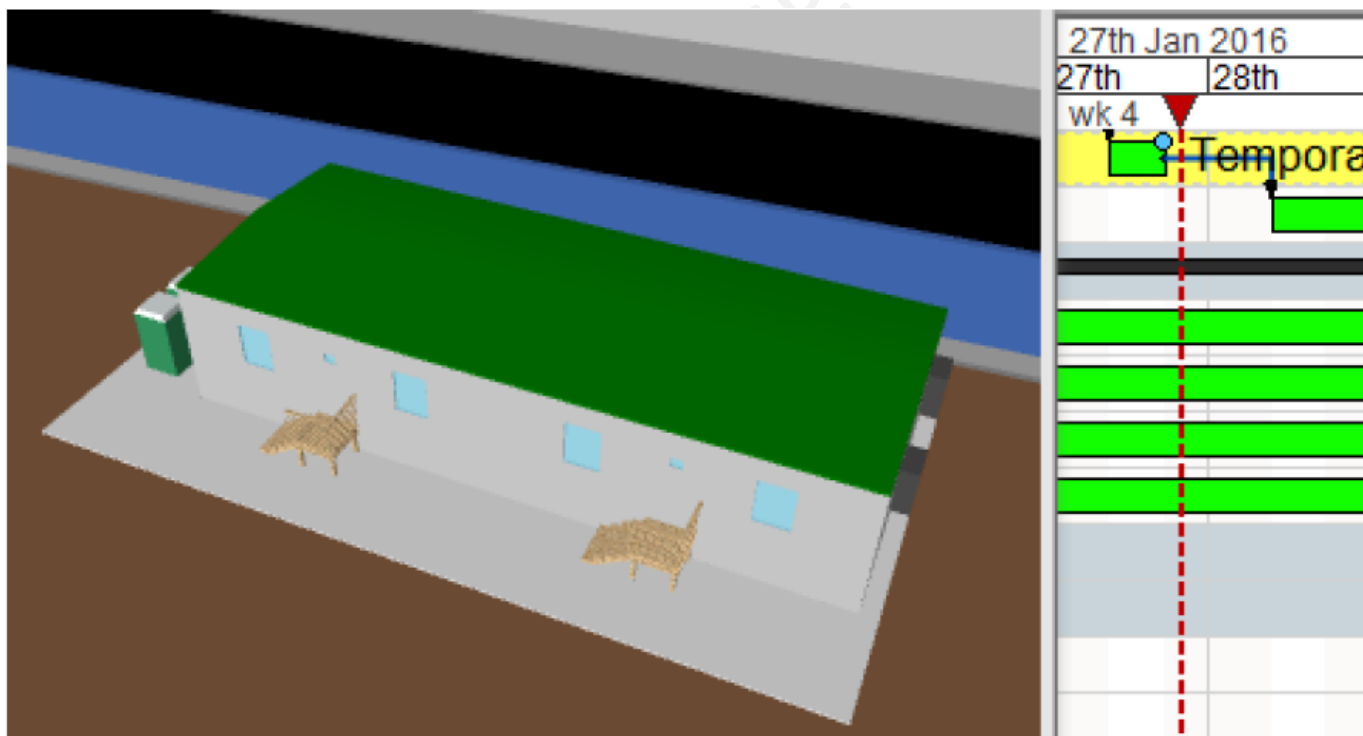
Move the **Focus Time** during the **Install Temporary Hard Standing** task. The hard standing object is visible and highlighted green according to the **Appearance Profile** to indicate that it is currently being installed.



3.5 3D view & 4D Linking Process

➤ Basic Linking Process

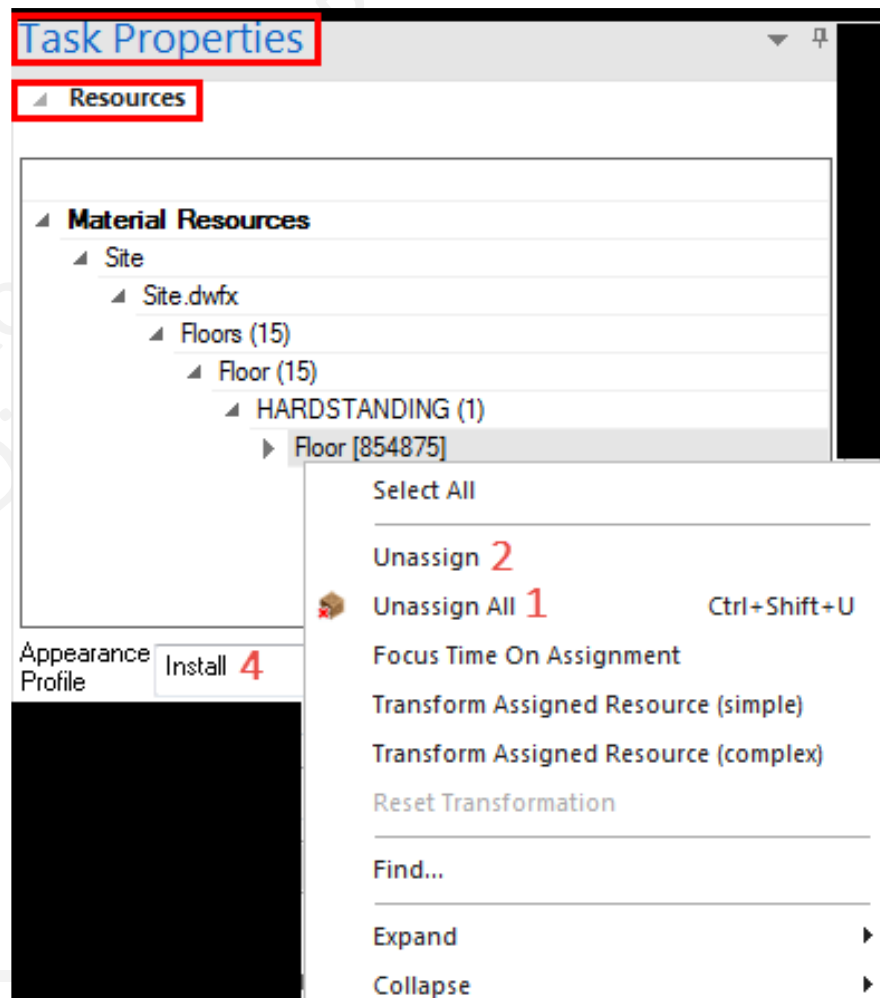
Move the **Focus Time** after the **Install Temporary Hard Standing** task. The hard standing object is visible and shown in its original colour because it has already been installed.



3.5 3D view & 4D Linking Process

➤ Correcting Resource Assignment Mistakes

	Assign to Selected Task(s)	Ctrl+Shift+A
	Unassign from 'Assigned to' Task(s)	Ctrl+U
Create Task(s)		



Task Properties

Resources

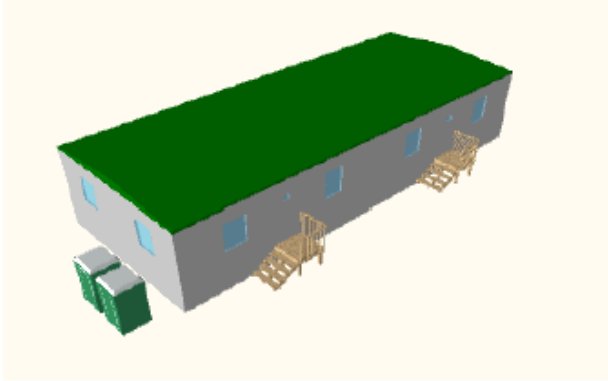
- Material Resources
 - Site
 - Site.dwfx
 - Floors (15)
 - Floor (15)
 - HARDSTANDING (1)
 - Floor [854875]

Context Menu:

- Select All
- Unassign 2
- Unassign All 1 Ctrl+Shift+U
- Focus Time On Assignment
- Transform Assigned Resource (simple)
- Transform Assigned Resource (complex)
- Reset Transformation
- Find...
- Expand
- Collapse

3.5 3D view & 4D Linking Process

➤ Correcting Resource Assignment Mistakes

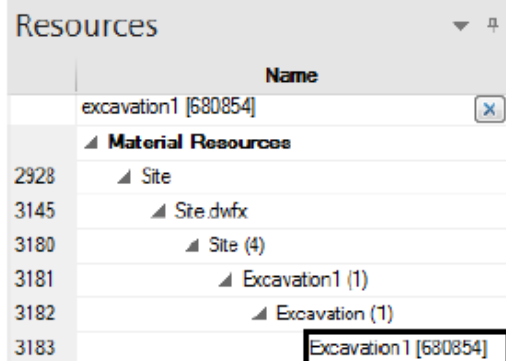
Resource(s)	Task	Appearance Profile	
Double Wide Construction Trailer & Portable Restrooms. TIP: Select these items visually in the 3D Window, making sure to hold Ctrl or Shift on the keyboard to select all the separate resources before assigning.	Field Office	Install	

3.5 3D view & 4D Linking Process

➤ Correcting Resource Assignment Mistakes

Excavation1 [680854]

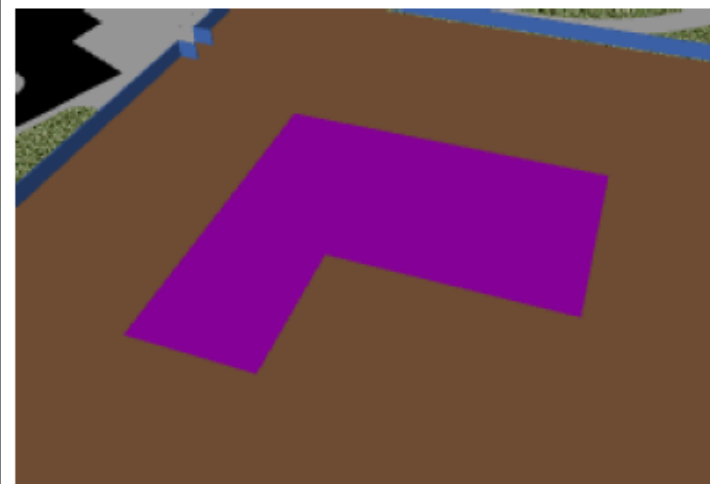
TIP: You can search for Resources by name by right clicking in the Resources window and selecting Find... or by typing in the search field at the top of the Name column in the Resources window.



Using the search field will expand all in the tree. You may wish to right click in the Resources window and select Collapse → All afterwards.

Foundation
Excavation

Remove



3.5 3D view & 4D Linking Process

➤ Correcting Resource Assignment Mistakes

All 13 “Basic Wall” Resources that make up the node “Site Perimeter Fence”.

TIP: From the Resources window, you can select the parent node “Site Perimeter Fence” and drag and drop onto the task – this will assign all the Basic Wall Resources that make up the node.

Perimeter
Fence

Install

▲ Site ▷ Landscape.dwg ▲ Site.dwg ▷ Floors (15) ▷ Generic Models (3) ▷ Site (4) ▲ Walls (13) ▲ Basic Wall (13) ▲ Site Perimeter Fence (13) - Basic Wall [317646] - Basic Wall [328000] - Basic Wall [613789] - Basic Wall [628115] - Basic Wall [628162] - Basic Wall [628189] - Basic Wall [635607] - Basic Wall [635653] - Basic Wall [854096] - Basic Wall [854448] - Basic Wall [854565] - Basic Wall [854605] - Basic Wall [854631]

۳. مدلسازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.6 Review and Investigate Assignments & Creating New Tasks

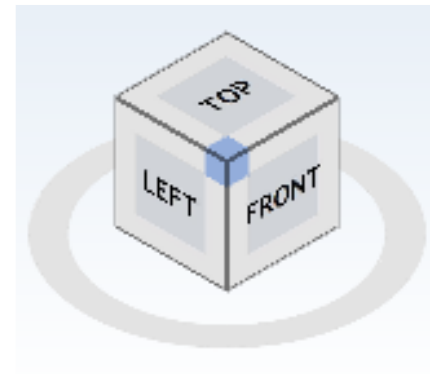
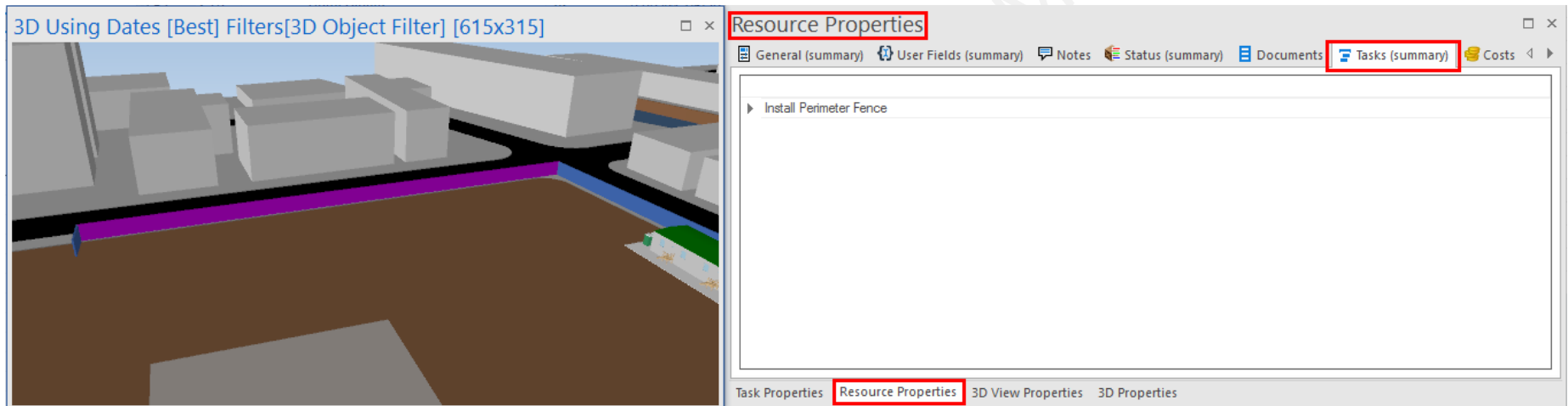
Kambiz Kordani PMP,MSc

Linkedin: [@kordani-kambiz](https://www.linkedin.com/in/@kordani-kambiz)

Instagram: [@acemi_social](https://www.instagram.com/@acemi_social)

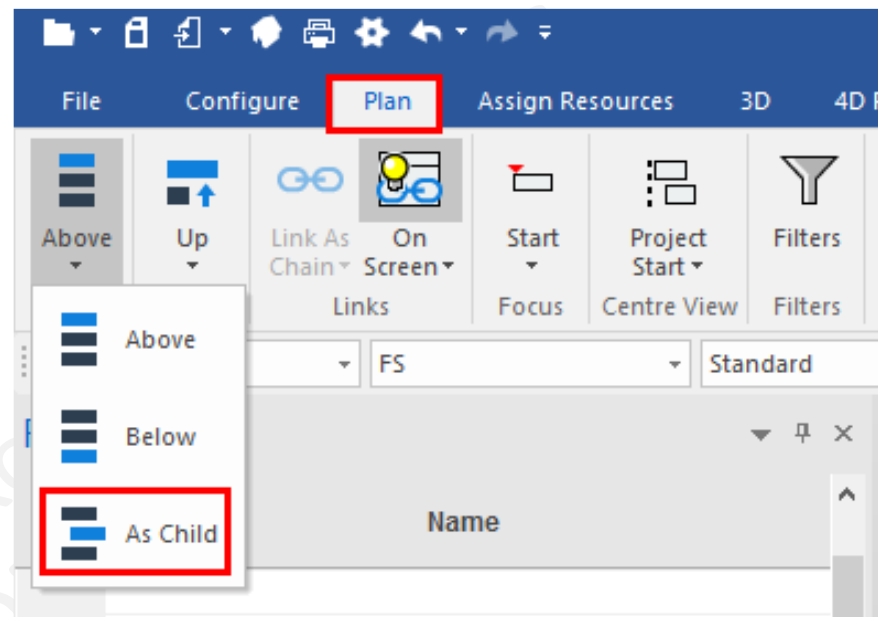
3.6 Review and Investigate Assignments & Creating New Tasks

- Select “Assigned To” Tasks from an Object

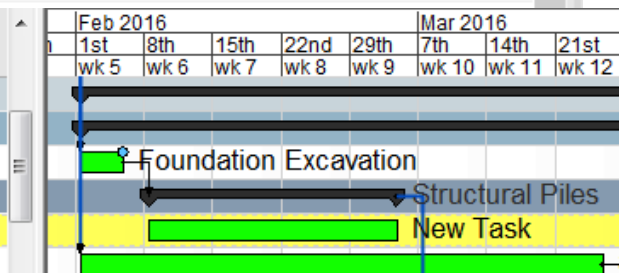


3.6 Review and Investigate Assignments & Creating New Tasks

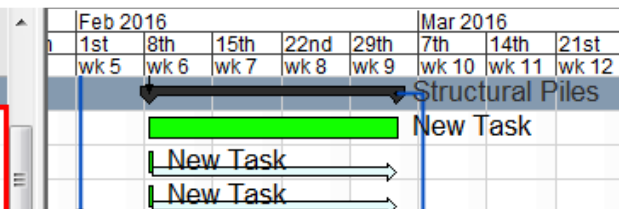
➤ Inserting New Tasks Manually



	ID	Name	Duration	Start	Finish
14		Construction	257d	9:00 AM 2/1/16	5:00 PM 1/24/17
15		Site Construction	247d	9:00 AM 2/1/16	5:00 PM 1/10/17
16	ST00120	Foundation Excavation	5d	9:00 AM 2/1/16	5:00 PM 2/5/16
17	ST00130	Structural Piles	20d	9:00 AM 2/8/16	5:00 PM 3/4/16
18	ST00970	New Task	20d	9:00 AM 2/8/16	5:00 PM 3/4/16
19	ST00140	Site Utilities	40d	9:00 AM 2/1/16	5:00 PM 3/25/16

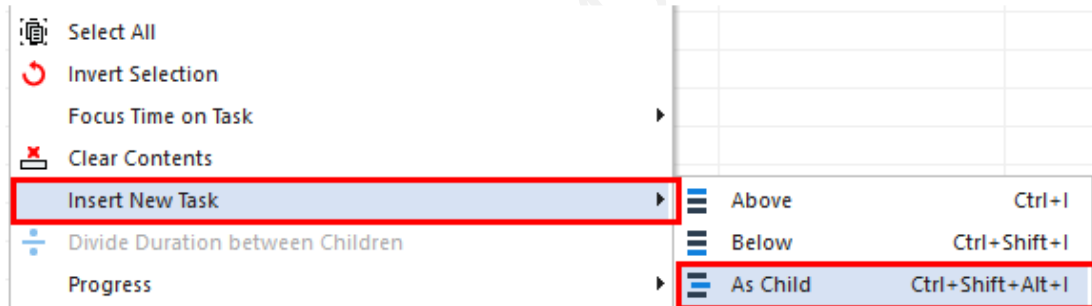


	ID	Name	Duration	Start	Finish
17	ST00130	Structural Piles	20d	9:00 AM 2/8/16	5:00 PM 3/4/16
18	ST00970	New Task	20d	9:00 AM 2/8/16	5:00 PM 3/4/16
19	ST00980	New Task	1d	9:00 AM 2/8/16	5:00 PM 2/8/16
20	ST00990	New Task	1d	9:00 AM 2/8/16	5:00 PM 2/8/16

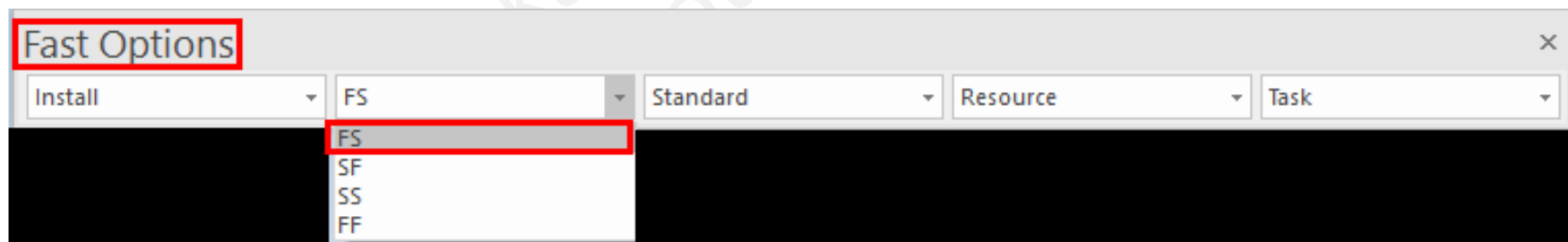


3.6 Review and Investigate Assignments & Creating New Tasks

➤ Inserting New Tasks Manually

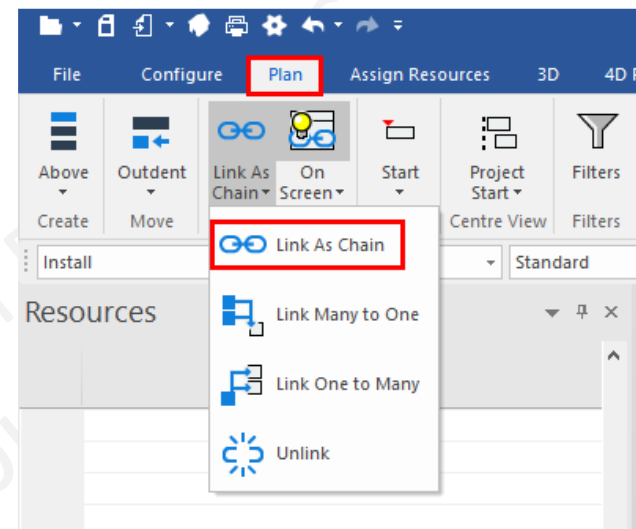


➤ Adding Logic Links

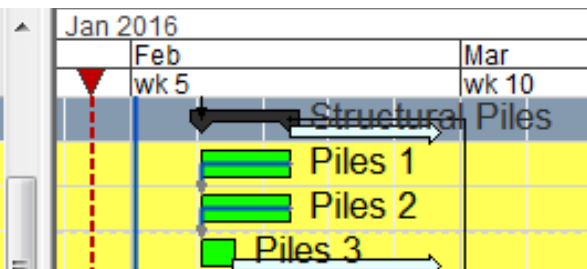


3.6 Review and Investigate Assignments & Creating New Tasks

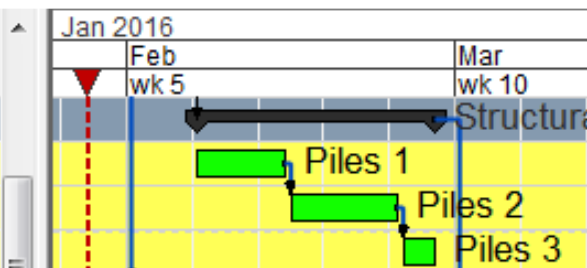
➤ Adding Logic Links



Name	Duration	Start	Finish
▲ Structural Piles	8d	9:00 AM 2/8/16	5:00 PM 2/17/16
Piles 1	8d	9:00 AM 2/8/16	5:00 PM 2/17/16
Piles 2	8d	9:00 AM 2/8/16	5:00 PM 2/17/16
Piles 3	4d	9:00 AM 2/8/16	5:00 PM 2/11/16

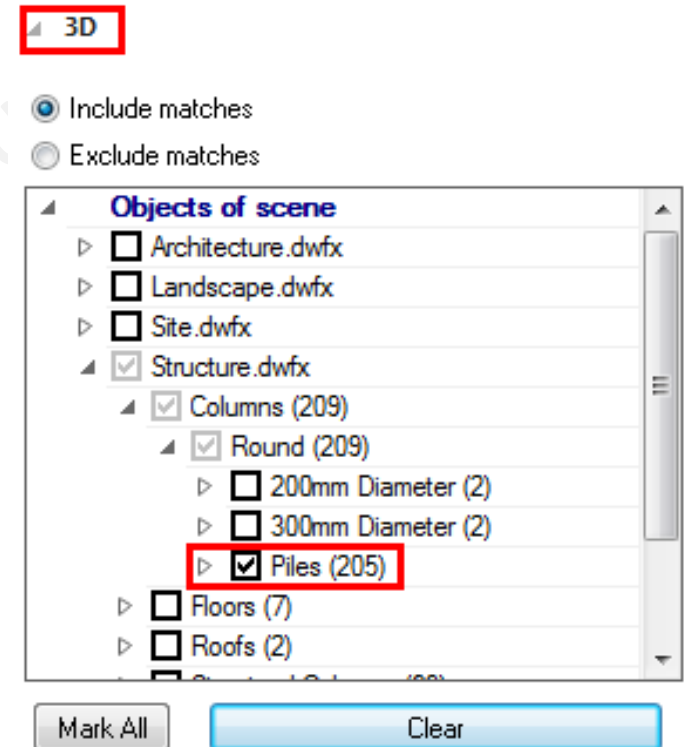
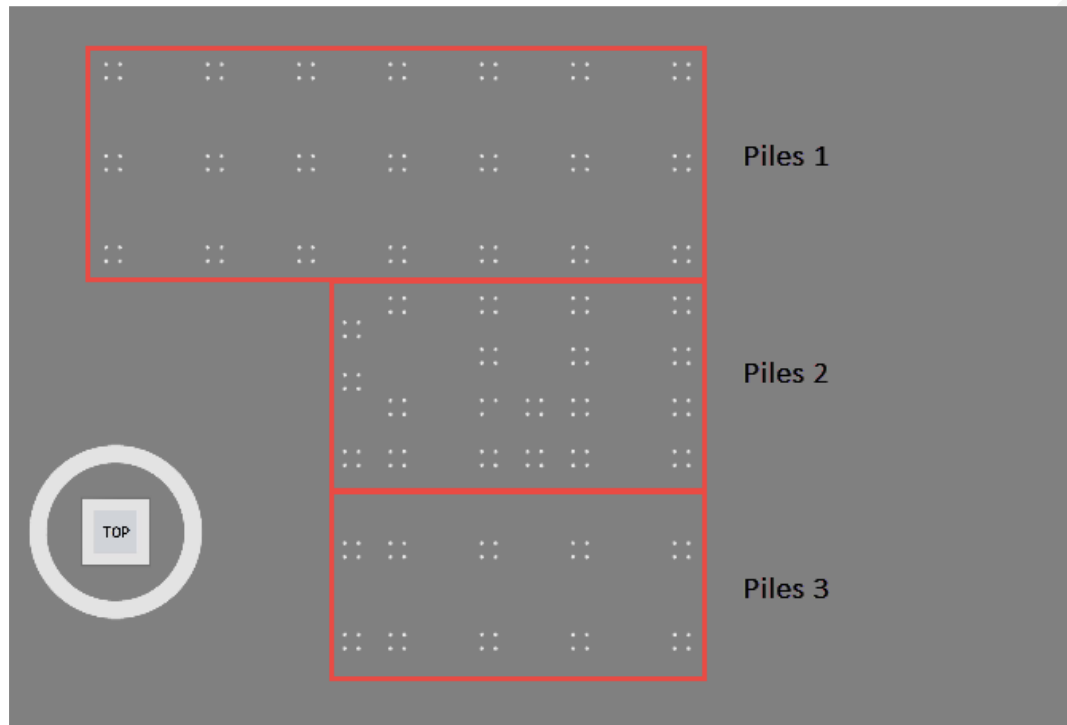


Name	Duration	Start	Finish
▲ Structural Piles	20d	9:00 AM 2/8/16	5:00 PM 3/4/16
Piles 1	8d	9:00 AM 2/8/16	5:00 PM 2/17/16
Piles 2	8d	9:00 AM 2/18/16	5:00 PM 2/29/16
Piles 3	4d	9:00 AM 3/1/16	5:00 PM 3/4/16



3.6 Review and Investigate Assignments & Creating New Tasks

➤ Adding Logic Links

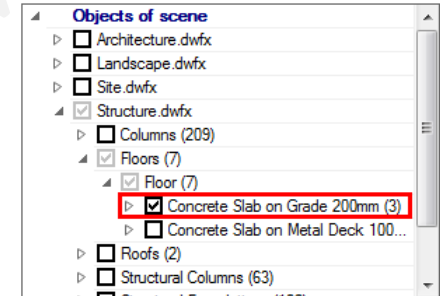


3.6 Review and Investigate Assignments & Creating New Tasks

➤ Model-Based Scheduling

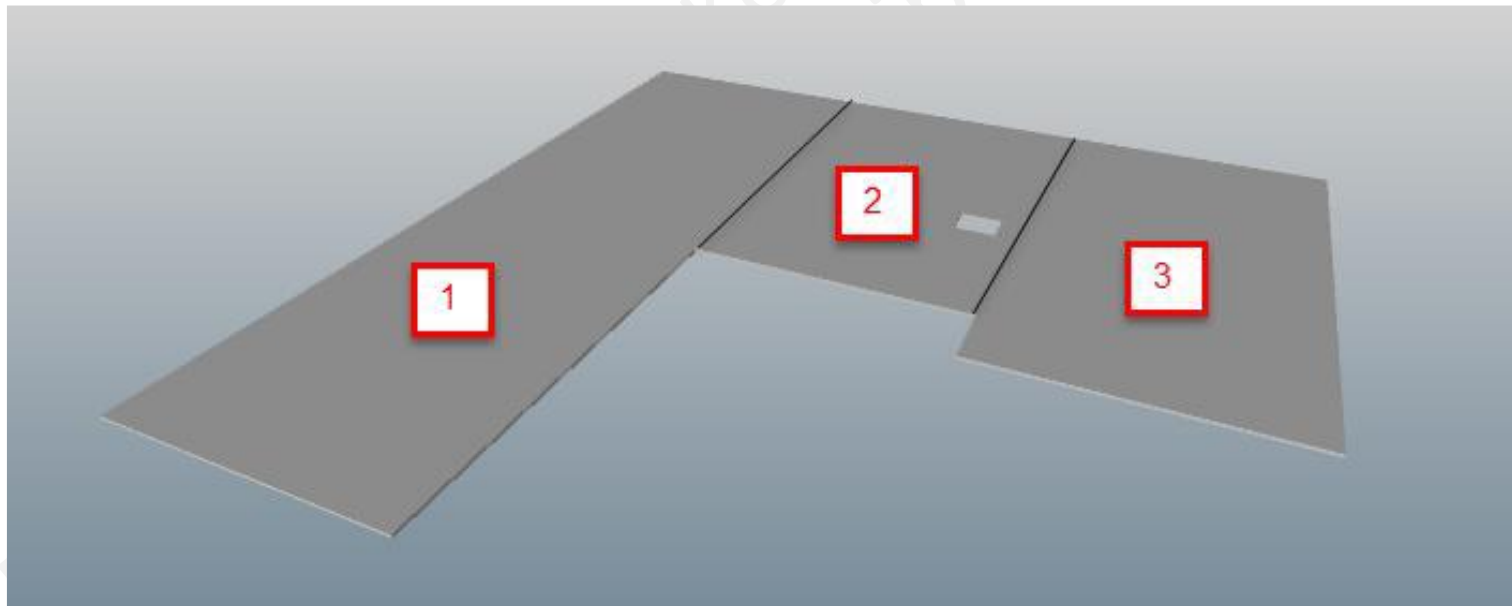
3D

- ☒ Include matches
☐ Exclude matches



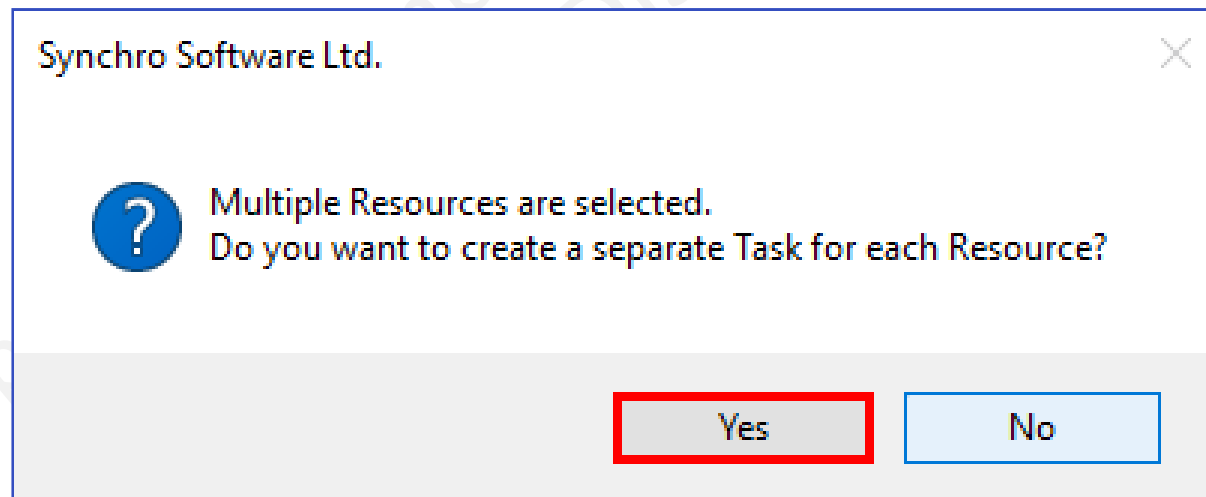
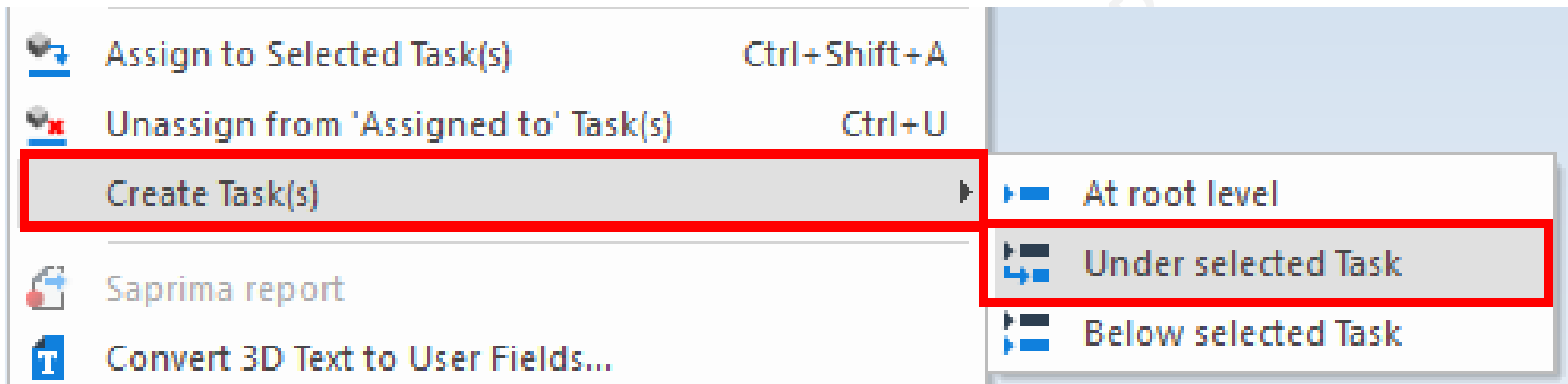
Mark All

Clear



3.6 Review and Investigate Assignments & Creating New Tasks

➤ Model-Based Scheduling



3.6 Review and Investigate Assignments & Creating New Tasks

➤ Model-Based Scheduling

	ID	Name	Duration	Start	Finish	3D Resources
31	ST00230	▲ Slab on Grade	3d	9:00 AM 6/20/16	5:00 PM 6/22/16	(3)
32	ST01000	Slab on Grade, Area 1	1d	9:00 AM 6/20/16	5:00 PM 6/20/16	1
33	ST01010	Slab on Grade, Area 2	1d	9:00 AM 6/21/16	5:00 PM 6/21/16	1
34	ST01020	Slab on Grade, Area 3	1d	9:00 AM 6/22/16	5:00 PM 6/22/16	1

۳. مدلسازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.7 Custom Appearance Profiles

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3.7 Custom Appearance Profiles

➤ Transparency Interpolation

Active Appearance

Original Colour ☒

Colour

Original Transparency ☐

Start Transparency

Transparency Interpolation ☒

Finish Transparency

Growth Simulation

None

Direction

➤ Growth Simulation

Active Appearance

Original Colour ☒

Colour

Original Transparency ☐

Start Transparency

Transparency Interpolation ☐

Finish Transparency

Growth Simulation

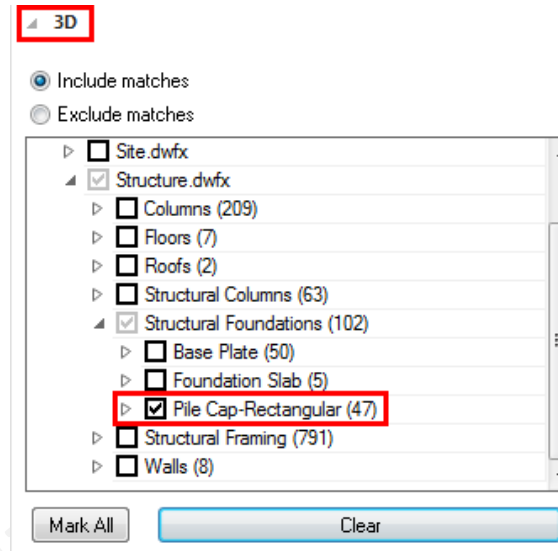
Right - Left

Direction

{ -1, 0, 0 }

3.7 Custom Appearance Profiles

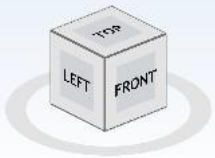
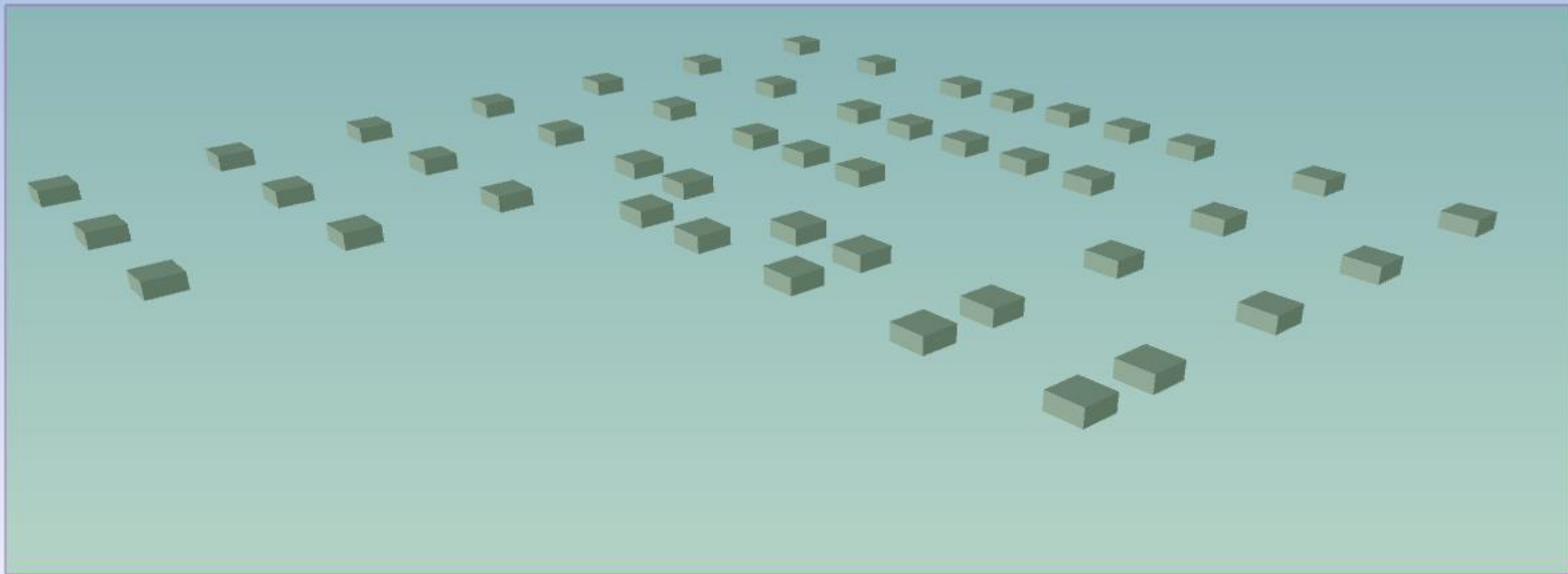
➤ Grouping Objects for Growth



3.7 Custom Appearance Profiles

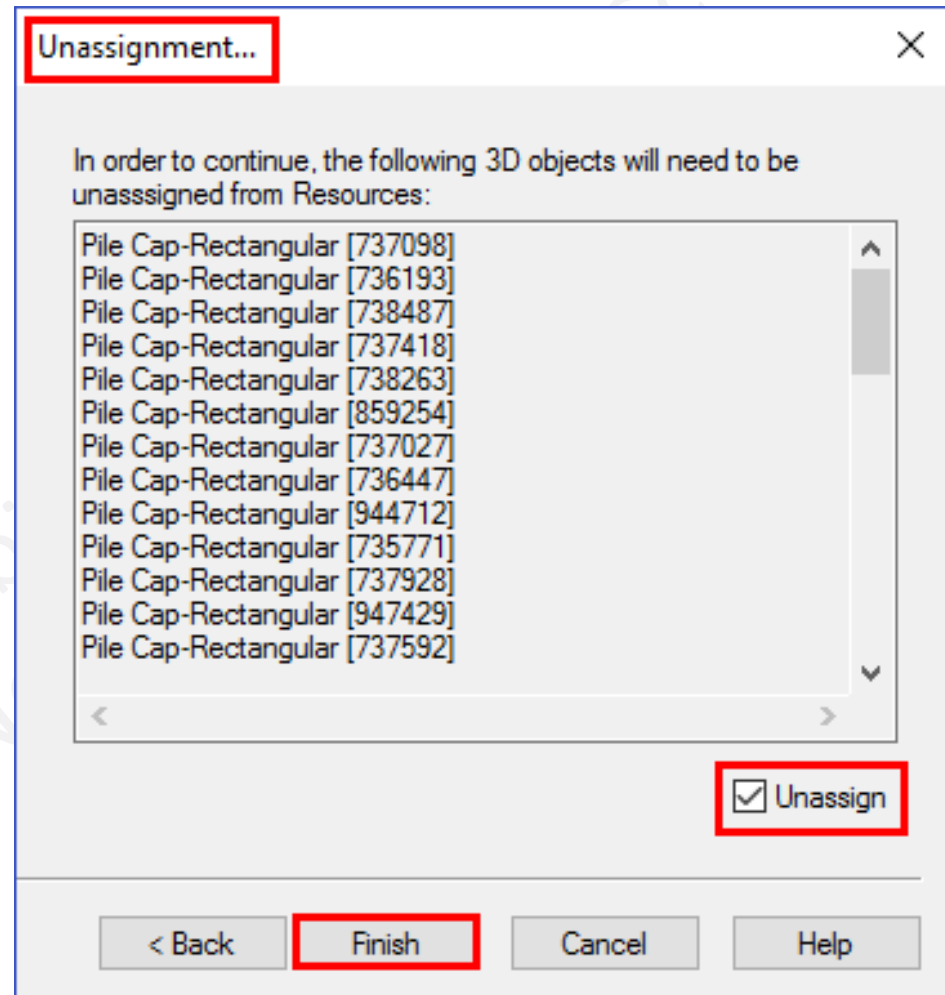
➤ Grouping Objects for Growth

3D Using Dates [Best] Filters[3D by Selection [System]] [1406x652]



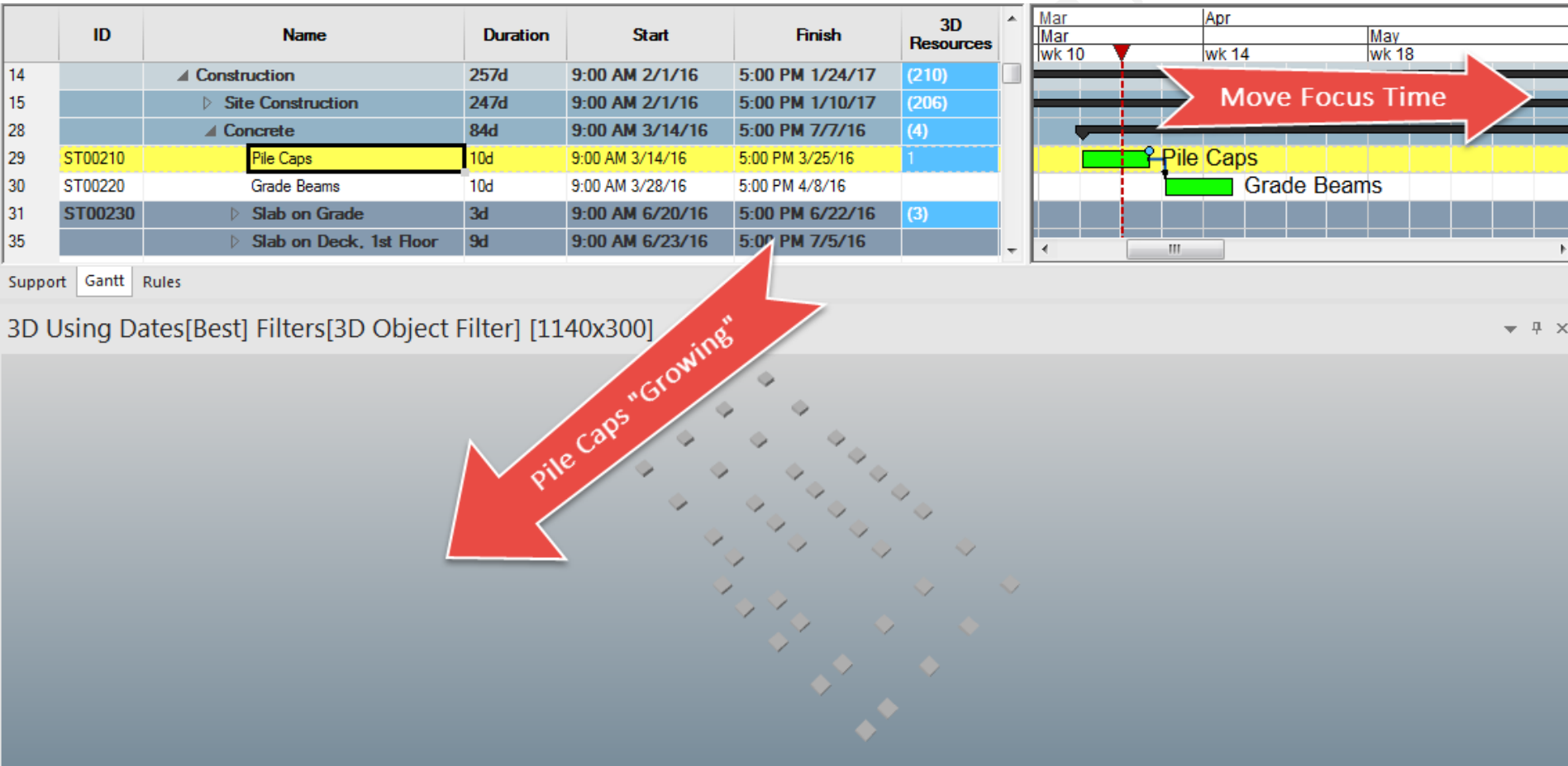
3.7 Custom Appearance Profiles

➤ Grouping Objects for Growth



3.7 Custom Appearance Profiles

➤ Grouping Objects for Growth



۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.8 3D Subdivision

Kambiz Kordani PMP,MSc

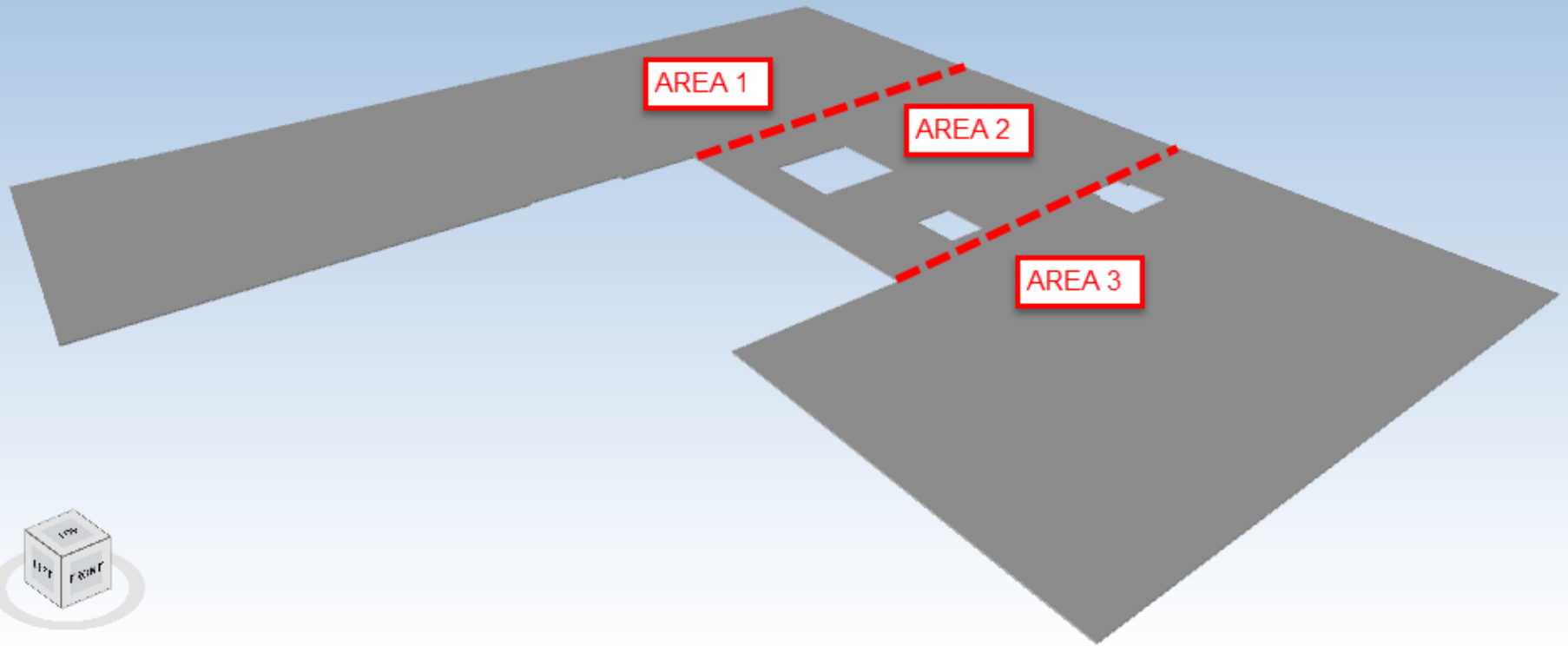
Linkedin: [@kordani-kambiz](#)

Instagram: [@acemi_social](#)

3.8 3D Subdivision

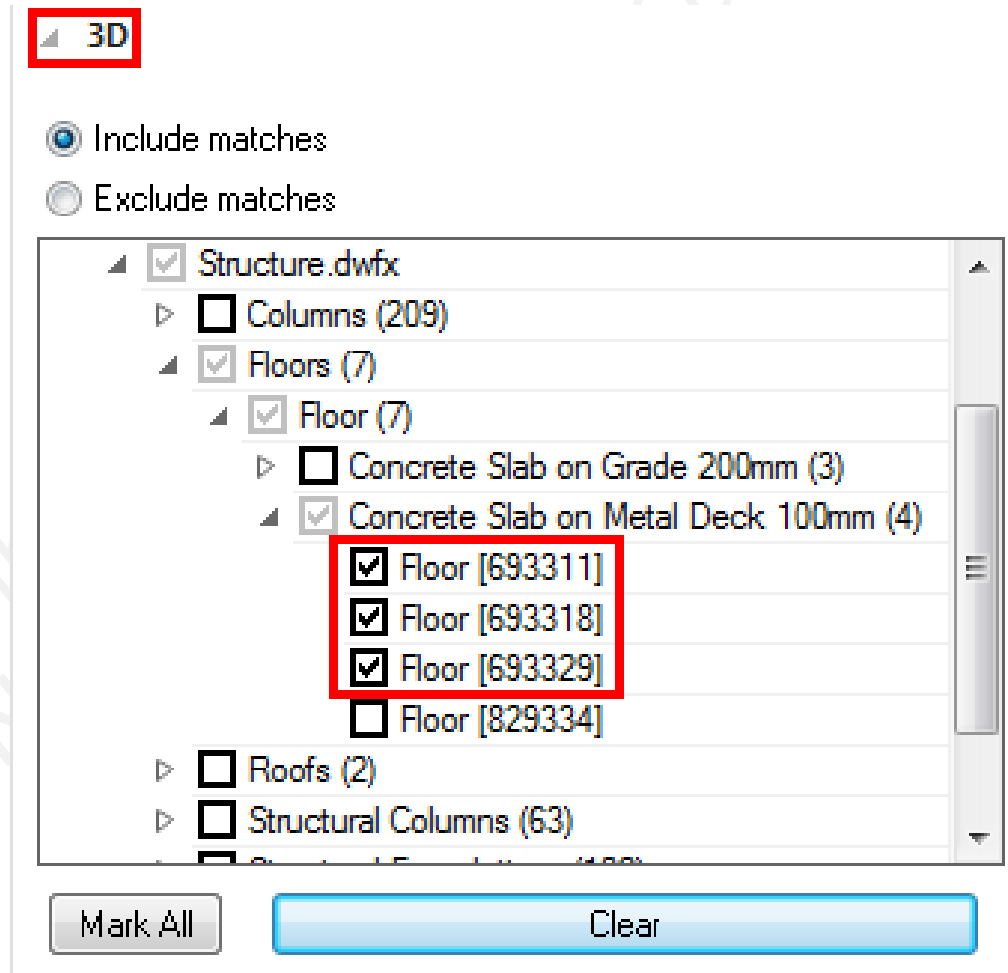
MSC

3D Using Dates [Best] Filters[3D by Selection [System]] [985x396]



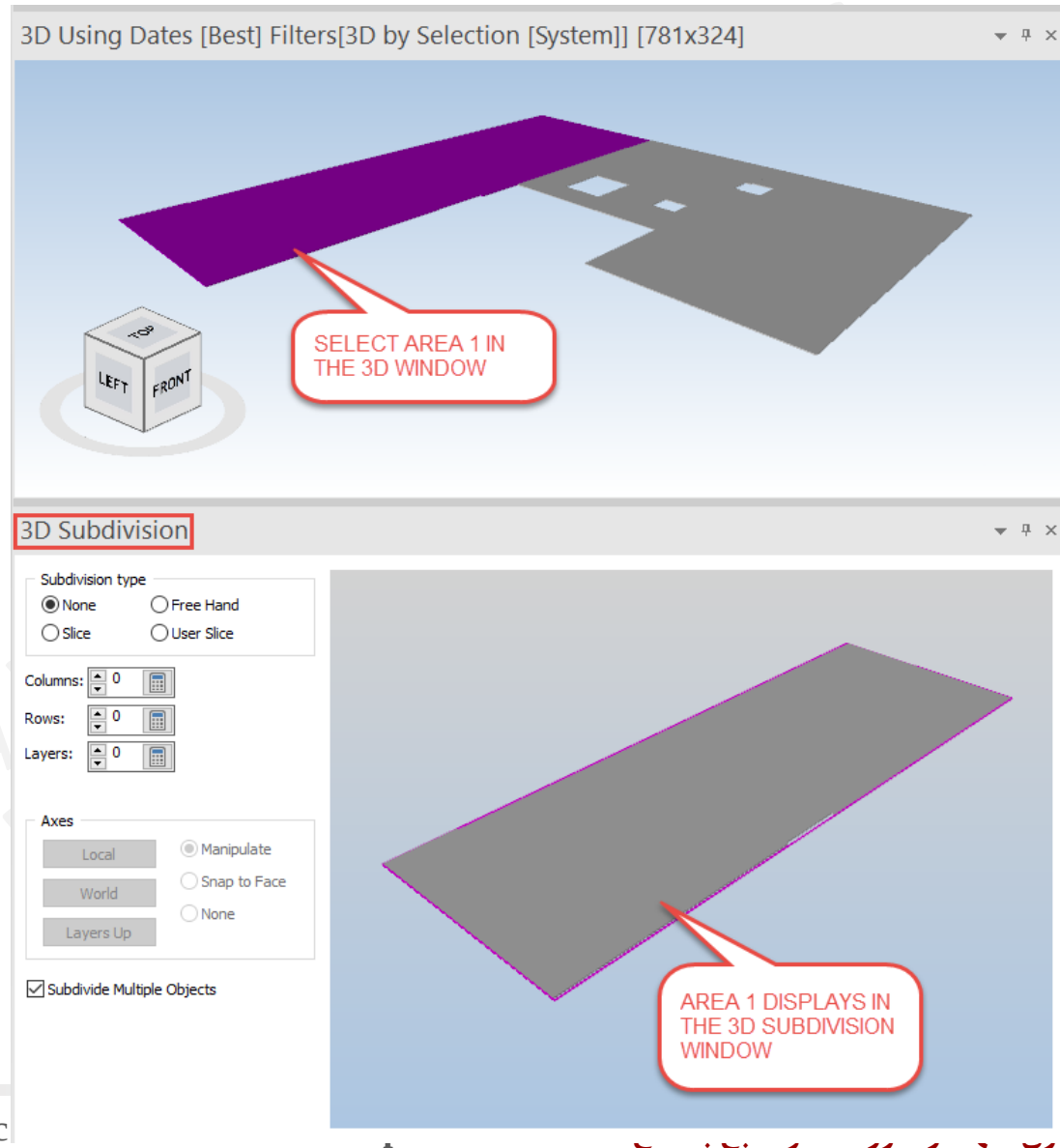
3.8 3D Subdivision

➤ Subdivide by Slice



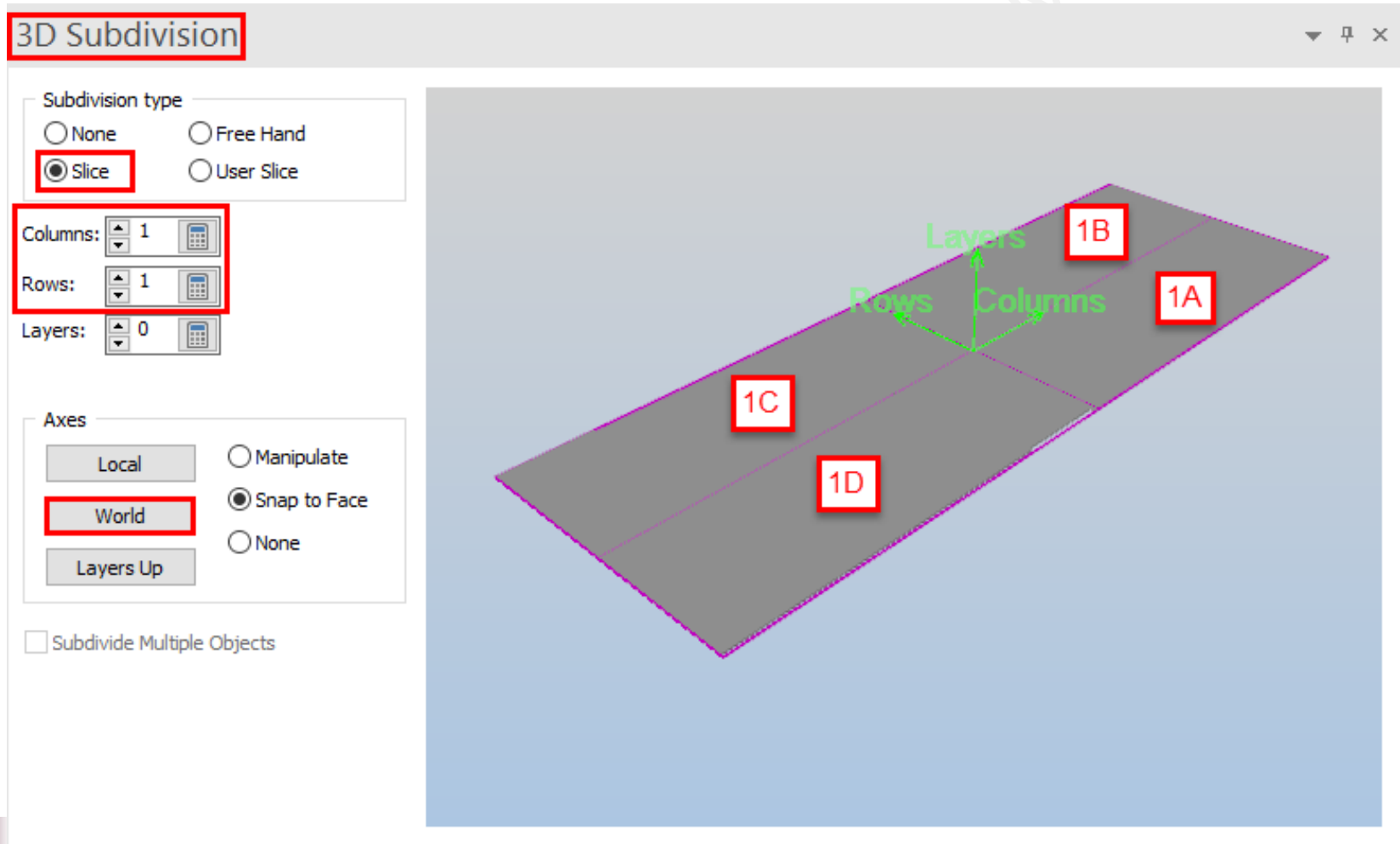
3.8 3D Subdivision

➤ Subdivide by Slice



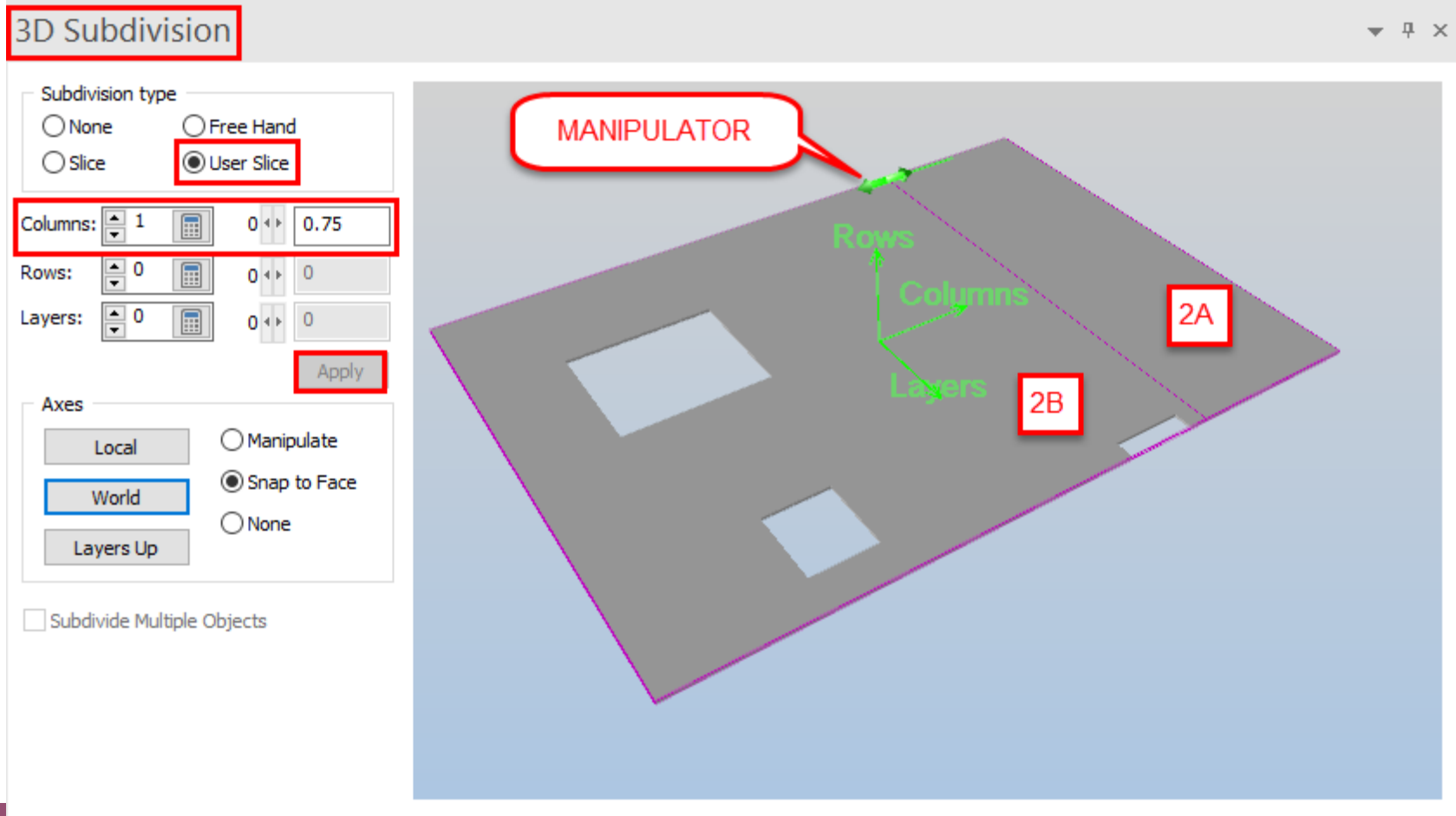
3.8 3D Subdivision

➤ Subdivide by Slice



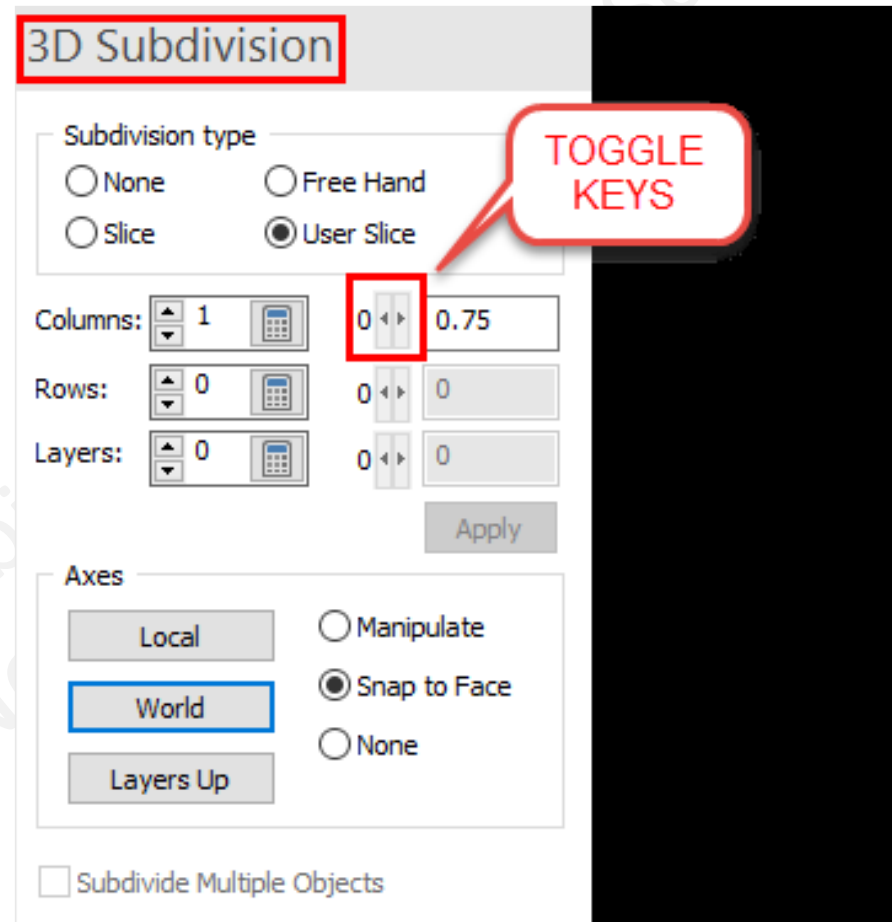
3.8 3D Subdivision

➤ Subdivide by User Slice



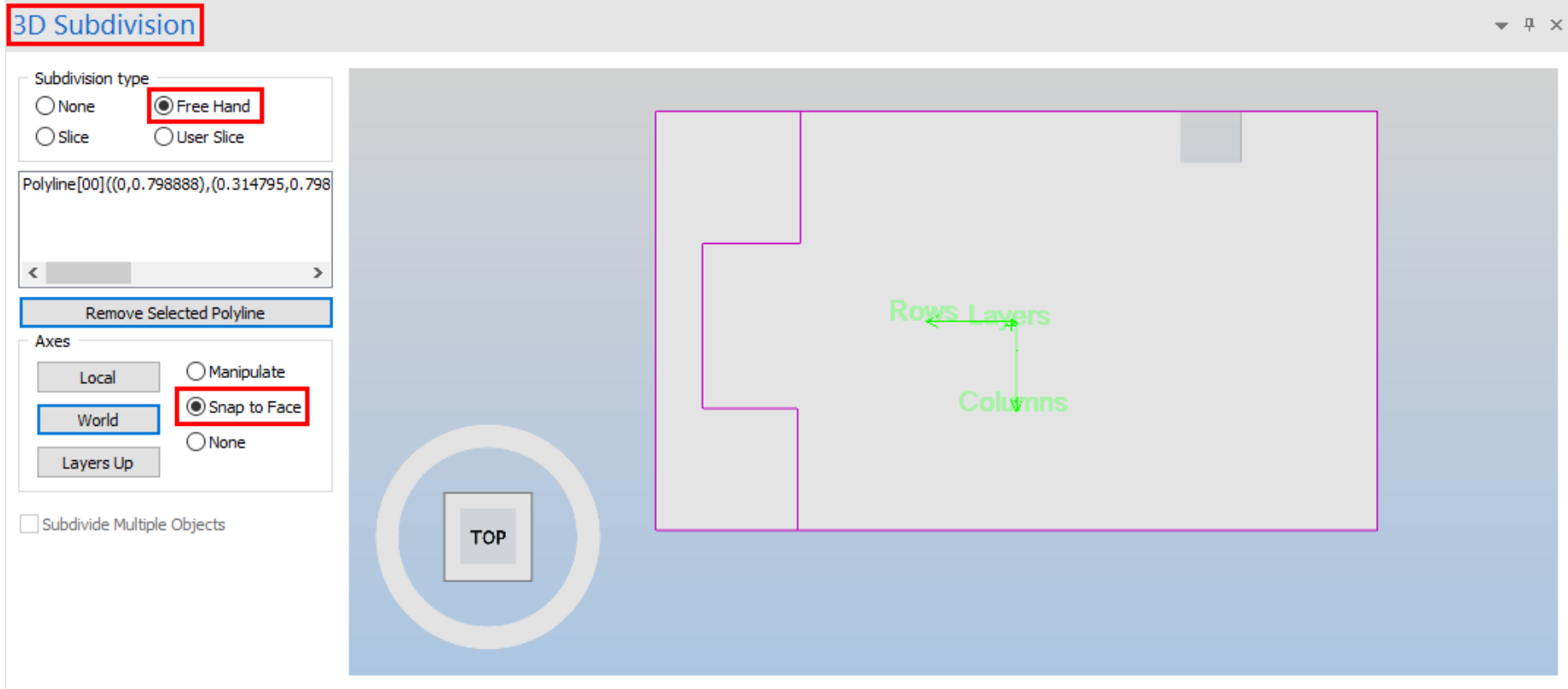
3.8 3D Subdivision

➤ Subdivide by User Slice



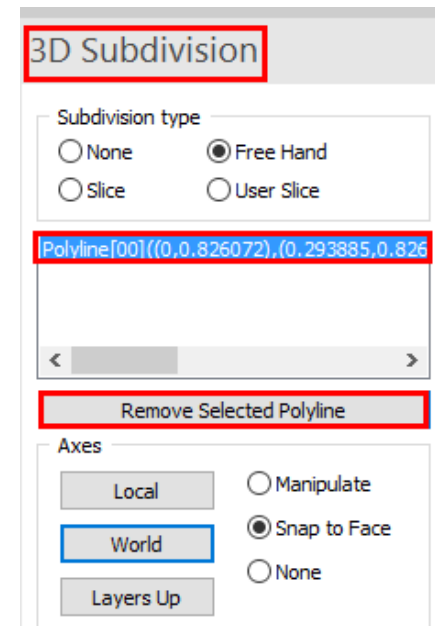
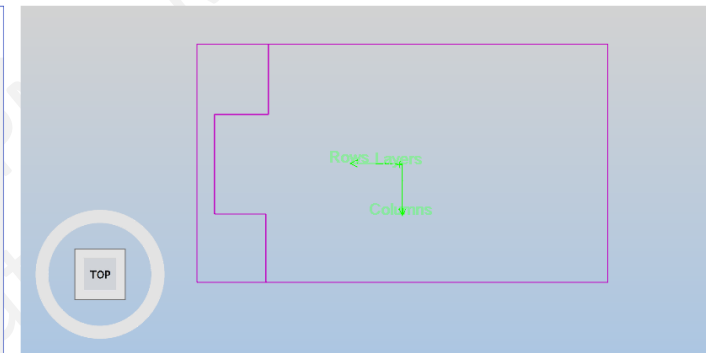
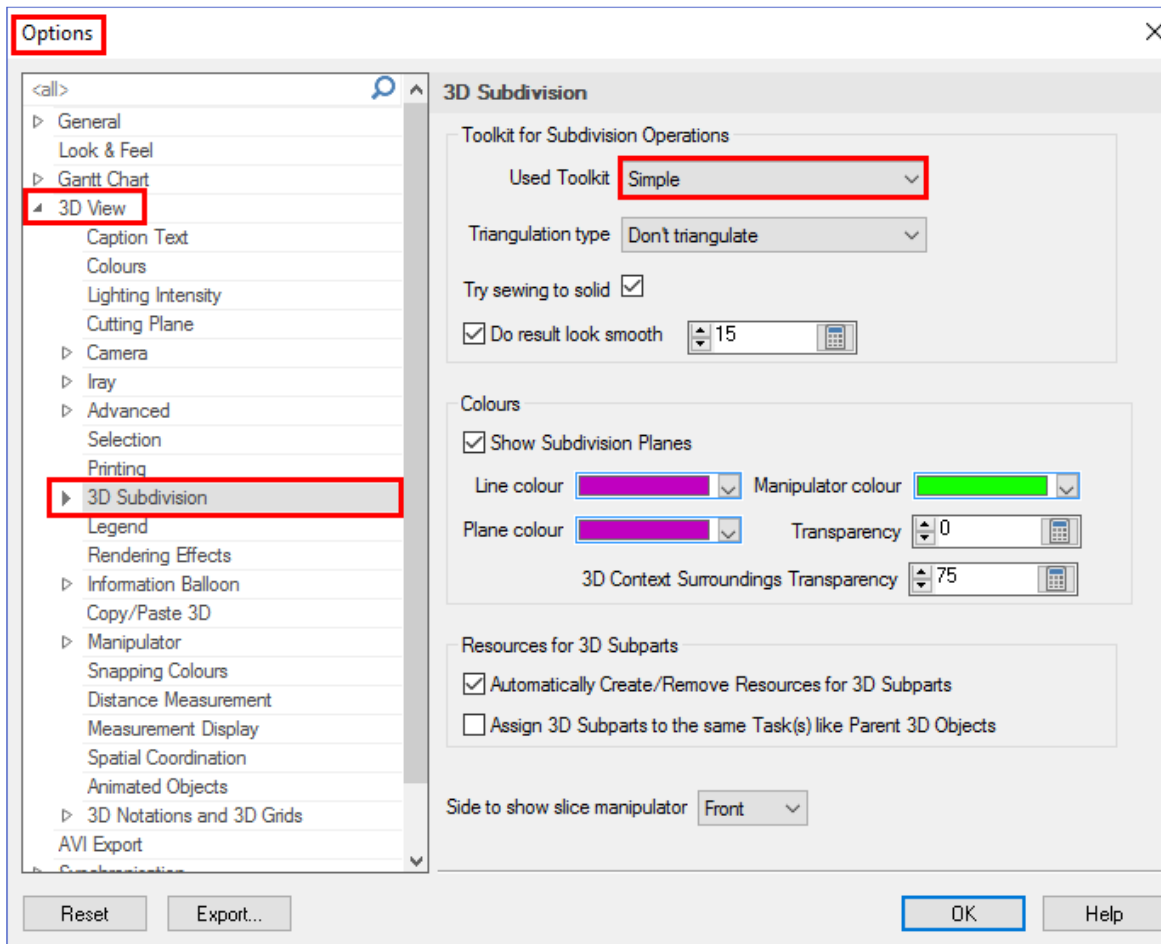
3.8 3D Subdivision

➤ Subdivide by Freehand



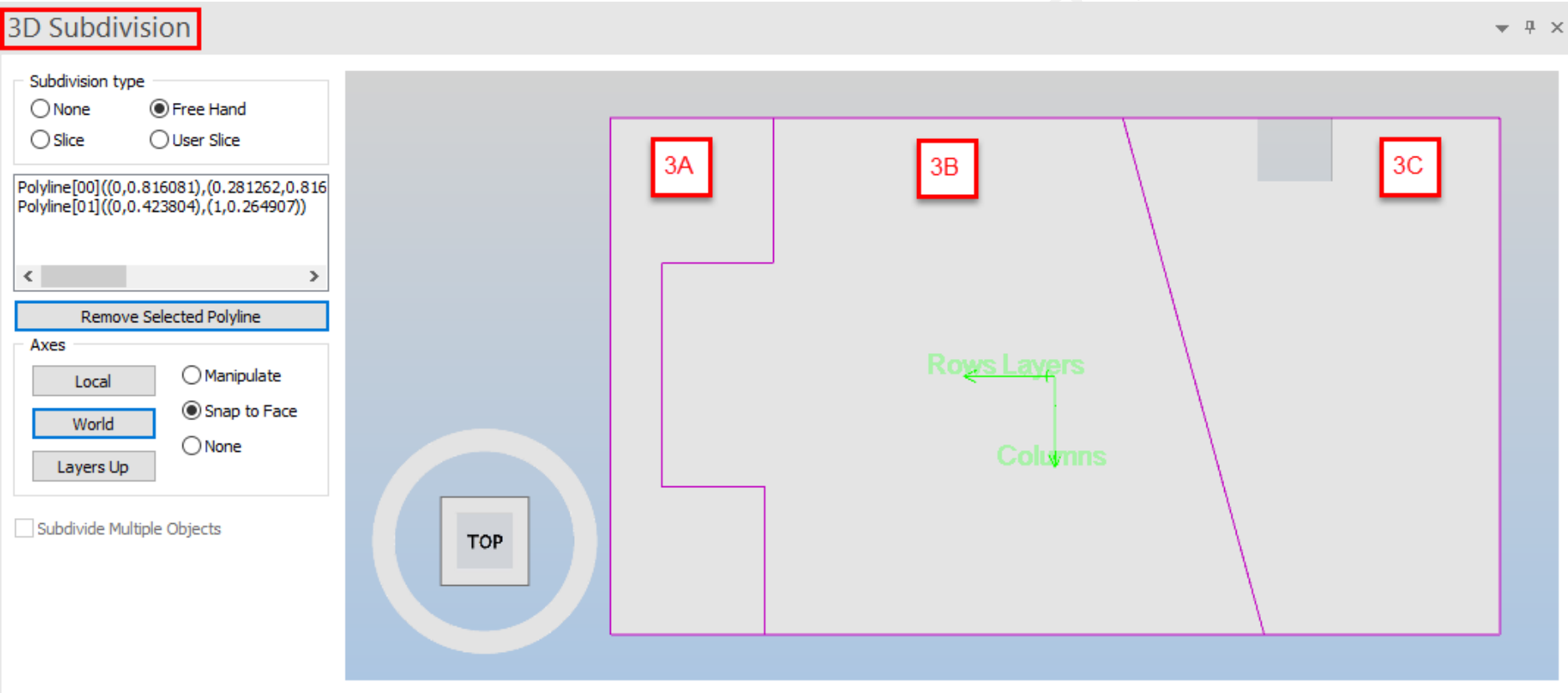
3.8 3D Subdivision

➤ Troubleshooting



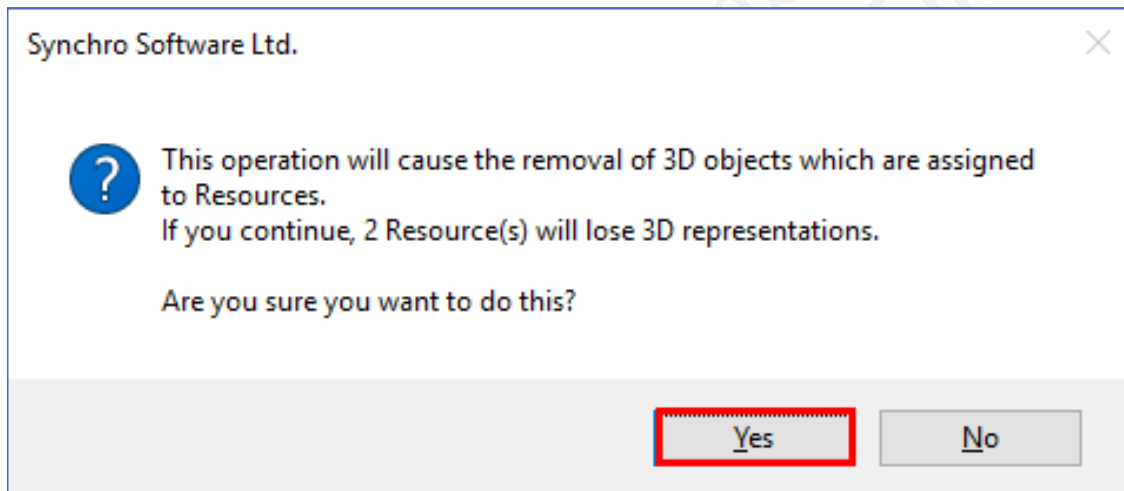
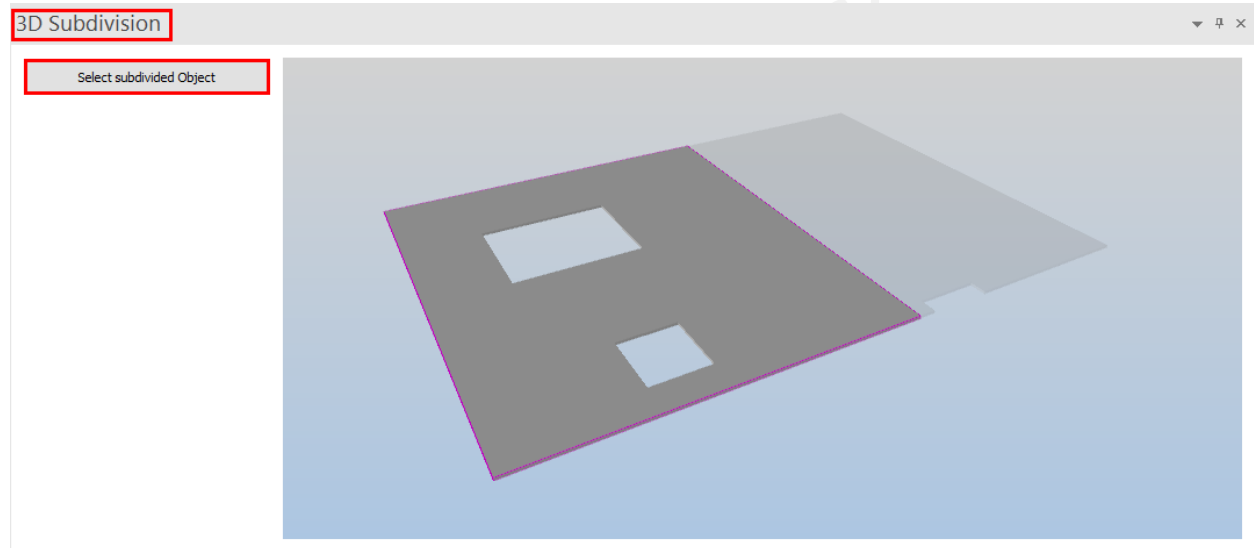
3.8 3D Subdivision

➤ Troubleshooting



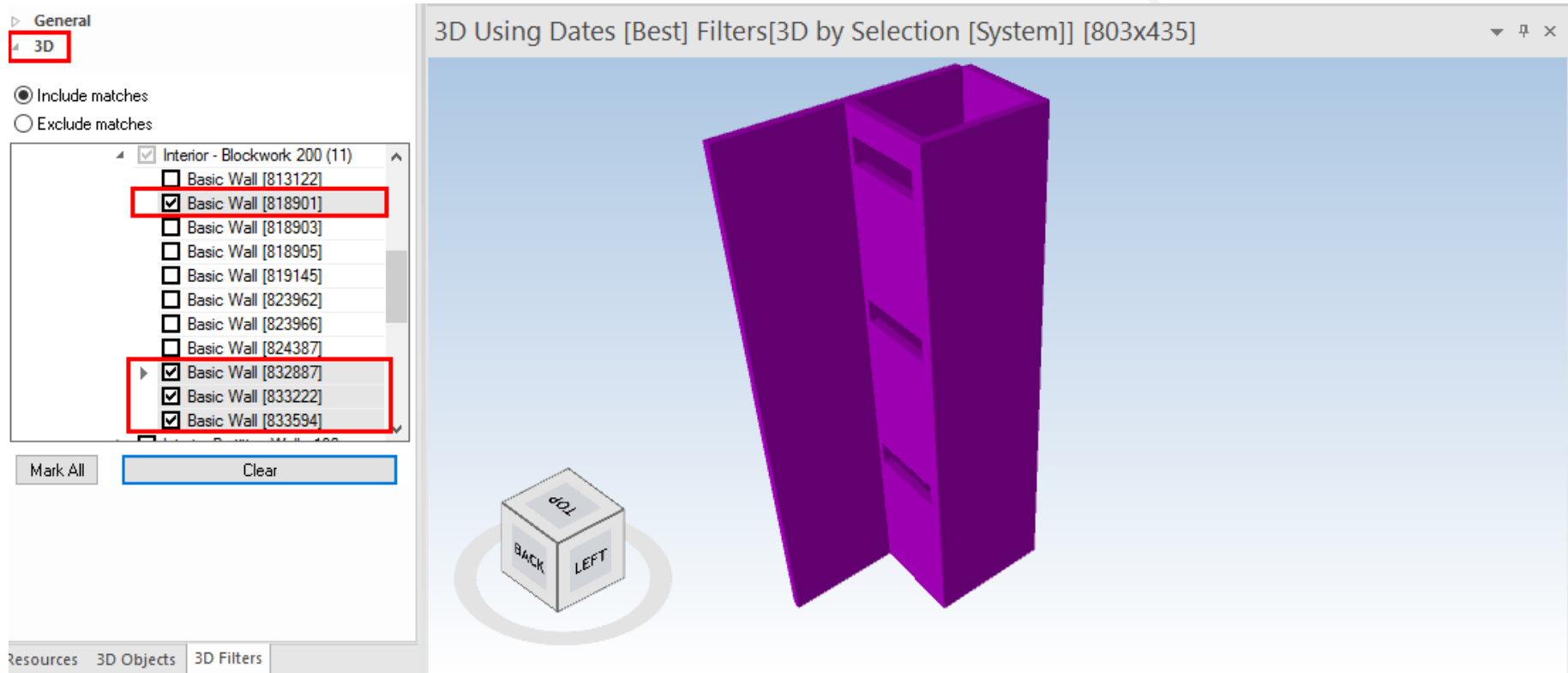
3.8 3D Subdivision

➤ Editing Subdivisions



3.8 3D Subdivision

➤ Subdivide Multiple Objects



General

3D

☒ Include matches
☐ Exclude matches

- ☒ Interior - Blockwork 200 (11)
 - ☐ Basic Wall [813122]
 - ☒ Basic Wall [818901]
 - ☐ Basic Wall [818903]
 - ☐ Basic Wall [818905]
 - ☐ Basic Wall [819145]
 - ☐ Basic Wall [823962]
 - ☐ Basic Wall [823966]
 - ☐ Basic Wall [824387]
 - ☒ Basic Wall [832887]
 - ☒ Basic Wall [833222]
 - ☒ Basic Wall [833594]

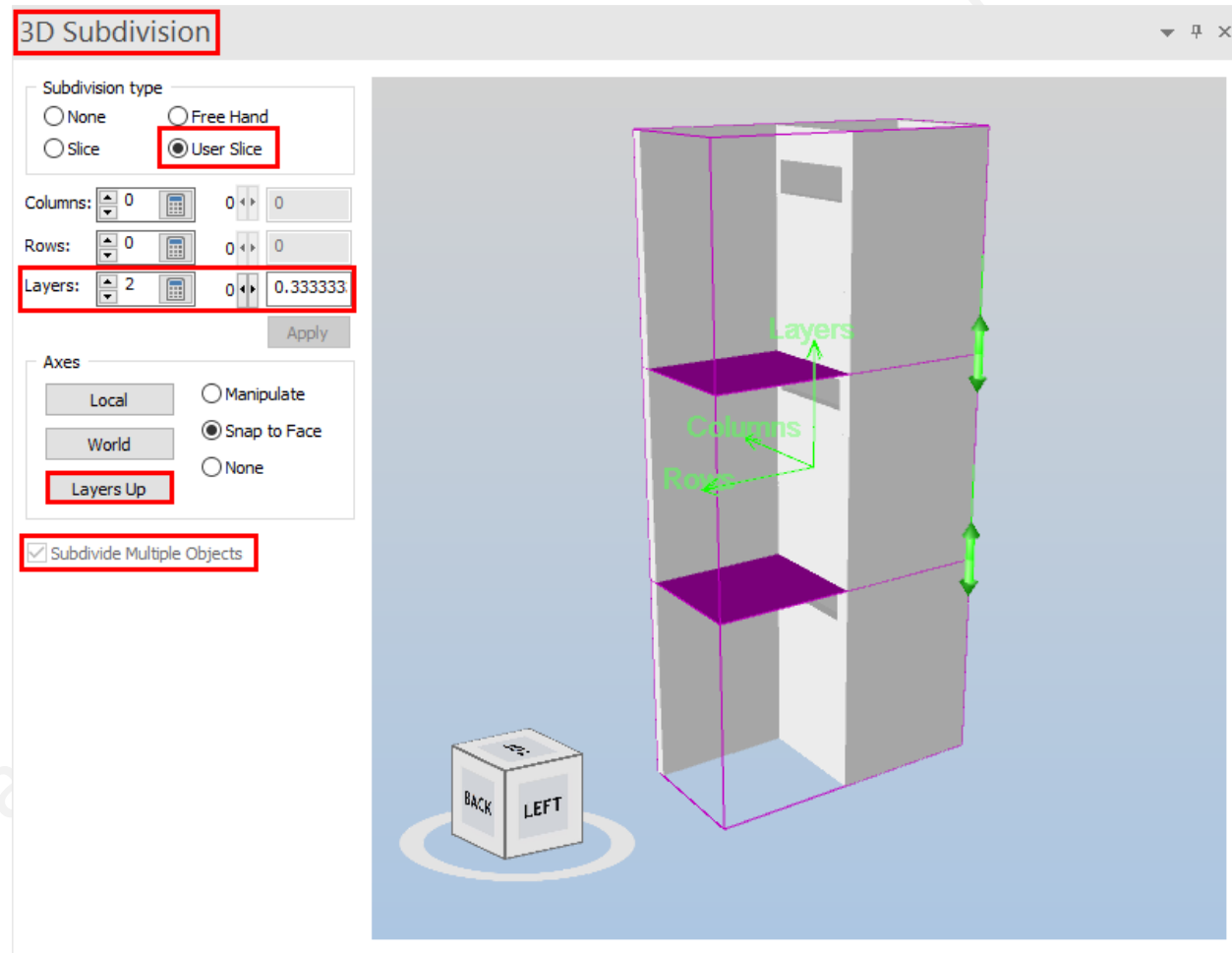
Mark All Clear

Resources 3D Objects 3D Filters

3D Using Dates [Best] Filters[3D by Selection [System]] [803x435]

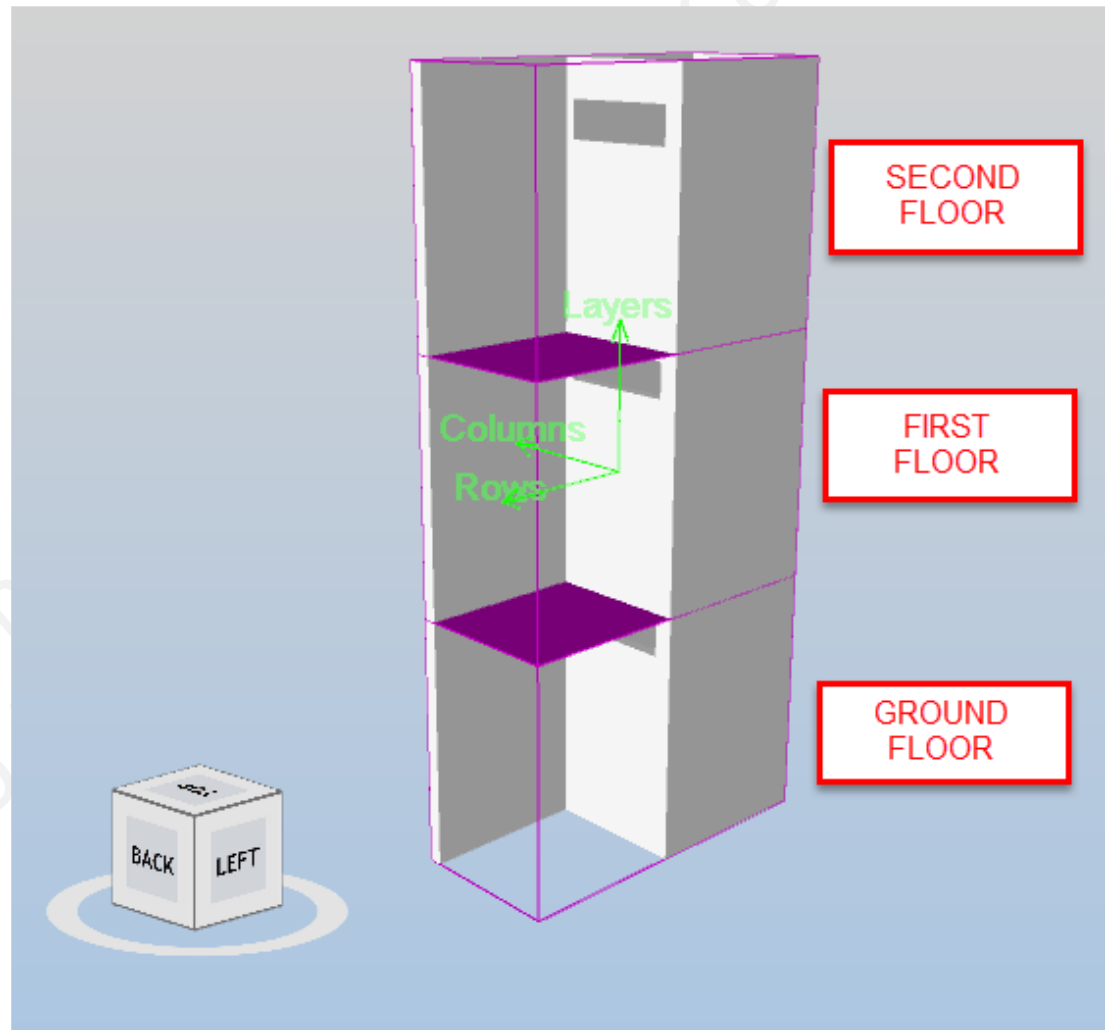
3.8 3D Subdivision

➤ Subdivide Multiple Objects



3.8 3D Subdivision

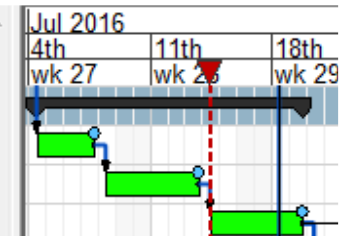
➤ Subdivide Multiple Objects



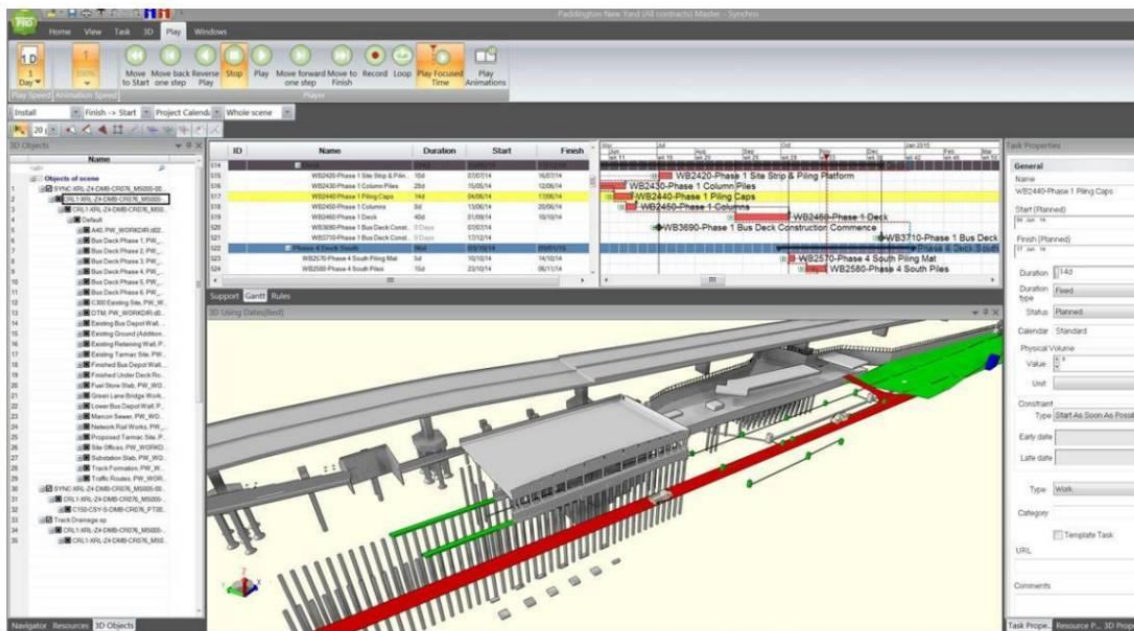
3.8 3D Subdivision

➤ Subdivide Multiple Objects

	ID	Name	Duration	Start	Finish	3D Resources	
70		▲ Masonry	12d	9:00 AM 7/4/16	5:00 PM 7/19/16	(12)	
71	ST00530	Blockwork / Elevator Shaft, Ground Floor	4d	9:00 AM 7/4/16	5:00 PM 7/7/16	4	
72	ST00540	Blockwork / Elevator Shaft, 1st Floor	4d	9:00 AM 7/8/16	5:00 PM 7/13/16	4	
73	ST00550	Blockwork / Elevator Shaft, 2nd Floor	4d	9:00 AM 7/14/16	5:00 PM 7/19/16	4	



۳. مدلسازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.9 Auto-Matching with User Fields

Kambiz Kordani PMP,MSc

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Instagram: [@acemi_social](#)

3.9 Auto-Matching with User Fields

➤ User Fields

3D

☒ Include matches
☐ Exclude matches

Objects of scene

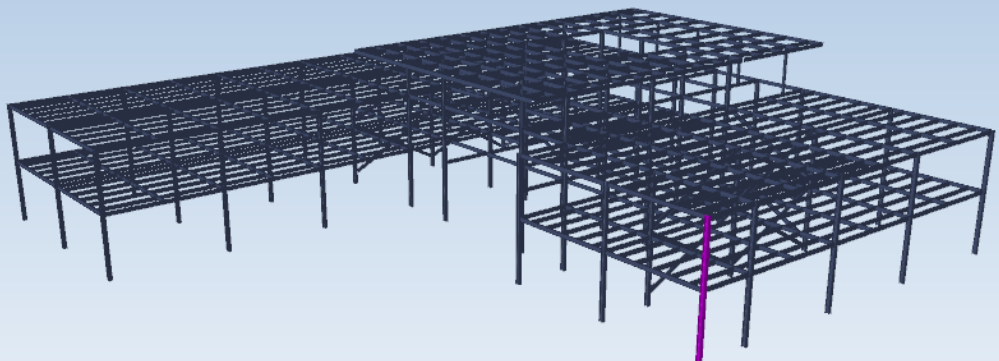
- ▷ ☐ Architecture.dwfx
- ▷ ☐ Landscape.dwfx
- ▷ ☐ Site.dwfx
- ▶ ☒ Structure.dwfx
 - ▷ ☐ Columns (209)
 - ▷ ☐ Floors (7)
 - ▷ ☐ Roofs (2)
 - ▷ ☒ Structural Columns (63)
 - ▷ ☐ Structural Foundations (102)
 - ▷ ☒ Structural Framing (791)
 - ▷ ☐ Walls (8)

Mark All Clear

3.9 Auto-Matching with User Fields

➤ User Fields

3D Using Dates [Best] Filters[3D Object Filter] [877x616]

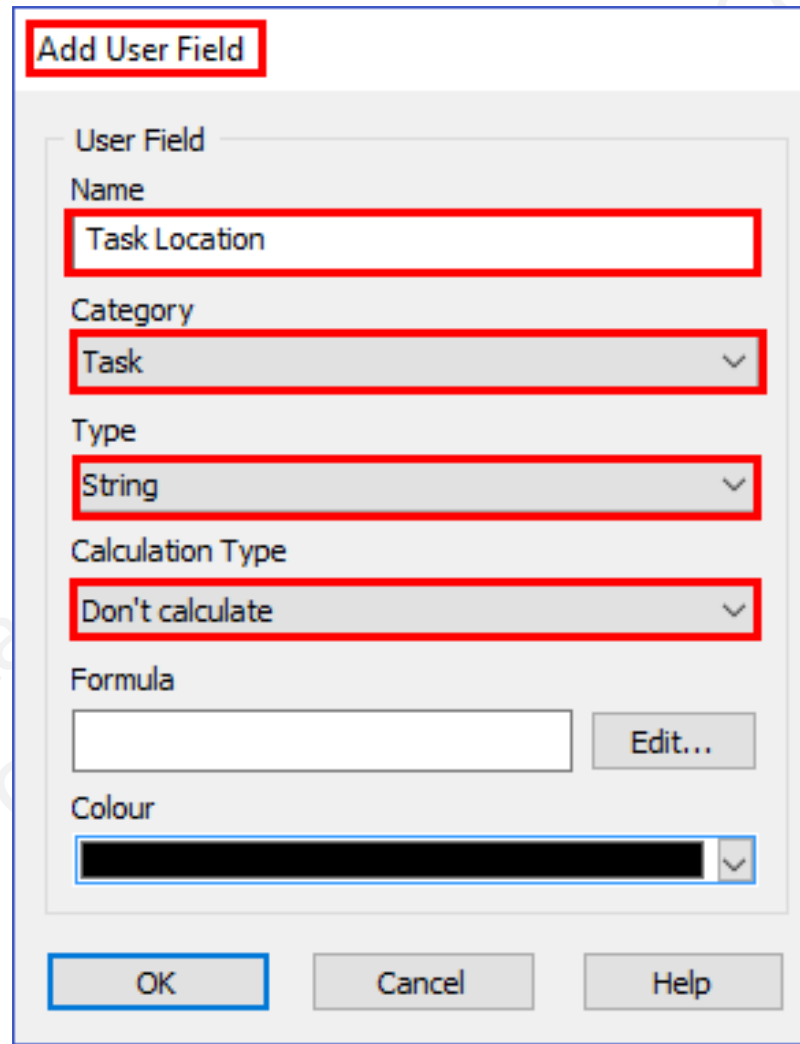


Resource Properties

User Field	Value	Type
Base Level	TOP OF PILE CA...	String
Base Offset	0	String
Guid	c0755707-7ce3-4...	String
Id	725451	String
key	mRJHR+5kzUeyJ...	String
label	UC-Universal Col...	String
Length	9644	String
object id	mRJHR+5kzUeyJ...	String
Phase Created	New Construction	String
Structural Material	Metal - Steel - 34...	String
Task Location	Area 4	String
Top Level	T.O. STEEL - ME...	String
Top Offset	0	String
Volume	0.12 m³	String

3.9 Auto-Matching with User Fields

➤ User Fields



Add User Field

User Field

Name
Task Location

Category
Task

Type
String

Calculation Type
Don't calculate

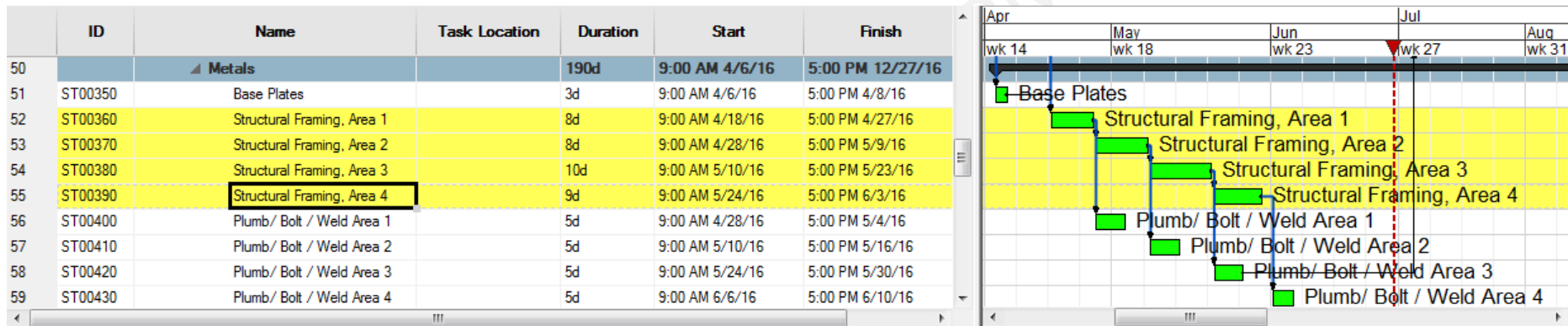
Formula
 Edit...

Colour

OK Cancel Help

3.9 Auto-Matching with User Fields

➤ User Fields



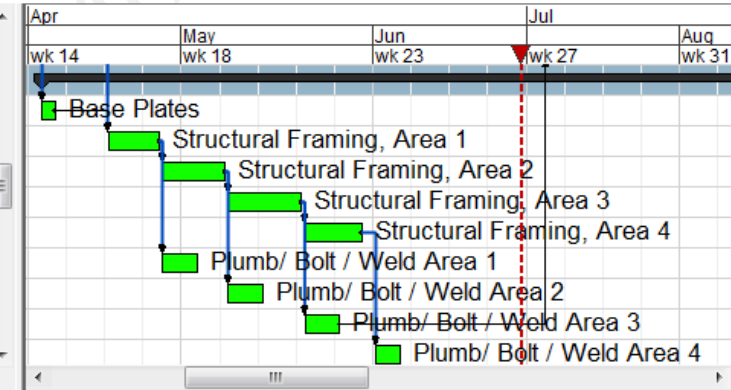
User Fields

User Field	Value	Type
Task Location		

3.9 Auto-Matching with User Fields

➤ User Fields

	ID	Name	Task Location	Duration	Start	Finish
50		Metals		190d	9:00 AM 4/6/16	5:00 PM 12/27/16
51	ST00350	Base Plates		3d	9:00 AM 4/6/16	5:00 PM 4/8/16
52	ST00360	Structural Framing, Area 1	Area 1	8d	9:00 AM 4/18/16	5:00 PM 4/27/16
53	ST00370	Structural Framing, Area 2	Area 2	8d	9:00 AM 4/28/16	5:00 PM 5/9/16
54	ST00380	Structural Framing, Area 3	Area 3	10d	9:00 AM 5/10/16	5:00 PM 5/23/16
55	ST00390	Structural Framing, Area 4	Area 4	9d	9:00 AM 5/24/16	5:00 PM 6/3/16
56	ST00400	Plumb/ Bolt / Weld Area 1	Area 1	5d	9:00 AM 4/28/16	5:00 PM 5/4/16
57	ST00410	Plumb/ Bolt / Weld Area 2	Area 2	5d	9:00 AM 5/10/16	5:00 PM 5/16/16
58	ST00420	Plumb/ Bolt / Weld Area 3	Area 3	5d	9:00 AM 5/24/16	5:00 PM 5/30/16
59	ST00430	Plumb/ Bolt / Weld Area 4	Area 4	5d	9:00 AM 6/6/16	5:00 PM 6/10/16



3.9 Auto-Matching with User Fields

➤ Creating an Auto-Matching Rule

Auto Matching (Resources to Tasks)

Rules
seq test

Import Export New Edit Remove Remove All

Operations
Appearance Profile: Install V Search Clear Assign All Close

#	Resource	Task	Appearanc...
---	----------	------	--------------

Resource Tree

Task Tree

Resource Attributes

Task Attributes

3.9 Auto-Matching with User Fields

➤ Creating an Auto-Matching Rule

Add New Rule...

Name: Structural Framing & Columns

Summary options

☒ Use only Selected Resources ☒ Use only Selected Tasks

☐ Ignore Assigned Resources ☐ Ignore Tasks with Assignments

☐ Merge Resource Groups ☐ Ignore Summary Tasks

Relations

☐ None ☐ One-to-One ☒ Many-to-Many

Expression

AND (User field: Task Location = User field: Task Location)

Add Remove Remove All

Operator

☒ AND ☐ OR ☐ AND NOT ☐ OR NOT ☐ True if Undef

Term

Resource attribute

☐ Use Parent

User field: User Field Task Location

Type: ☒ E ☒ H ☒ L ☒ M

Task attribute

☐ Use Parent

User field: User Field Task Location

Algorithm

☒ Exact ☐ Substring ☐ Longest Common Substring

Options

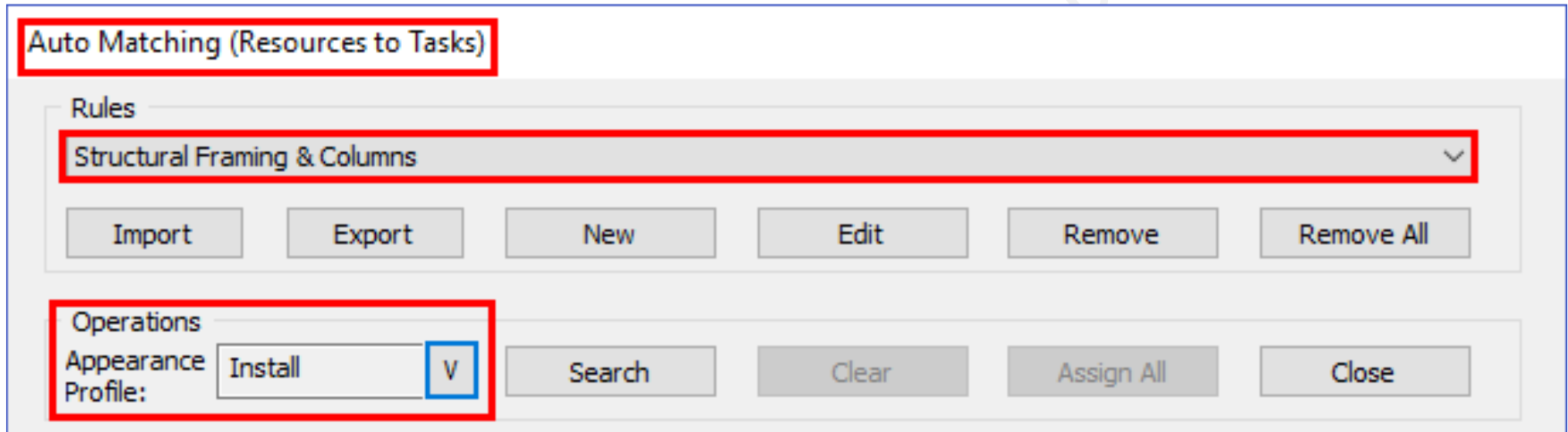
Min Length: 1 Min Digits: 0

☐ Separators: ☐ Case Sensitive

OK Cancel Help

3.9 Auto-Matching with User Fields

➤ Auto-Match 3D Resources to Tasks



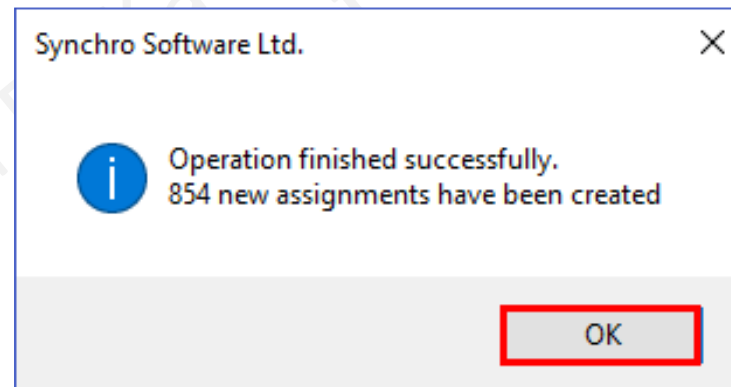
Auto Matching (Resources to Tasks)

Rules

Structural Framing & Columns

Import Export New Edit Remove Remove All

Operations Appearance Profile: Install V Search Clear Assign All Close



3.9 Auto-Matching with User Fields

➤ Auto-Match 3D Resources to Tasks

Auto Matching (Resources to Tasks)

Rules
Structural Framing & Columns

Import Export New Edit Remove Remove All

Operations
Appearance Profile: Install V Search Clear **Assign All** Close

#	Resource	Task	Appearanc...
1	UC-Universal Column-Column [725375]	Structural Framing, Area 1	Install
	UC-Universal Column-Column [725389]		
	UC-Universal Column-Column [729972]		
	UC-Universal Column-Column [725377]		
	UC-Universal Column-Column [725373]		
	UC-Universal Column-Column [725359]		
	UC-Universal Column-Column [725391]		
	UC-Universal Column-Column [725393]		
	UC-Universal Column-Column [725361]		
	UB-Universal Beam [971505]		
	UB-Universal Beam [971629]		

Resource Tree
<all>
Material Resources
Office Building
Structure.dwg

Task Tree
<all>
Construction
Metals
Structural Framing, Area 1

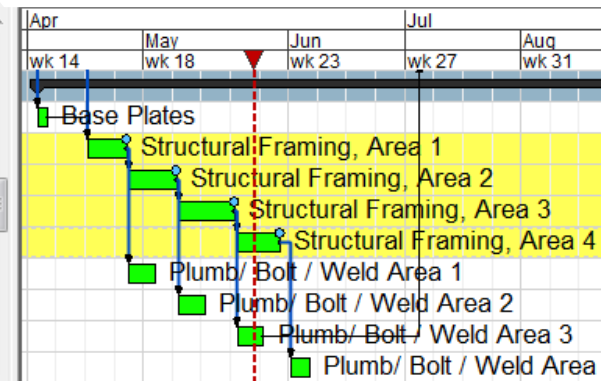
Resource Attributes
<all>
General [2]
company: New Company
name: UC-Universal Column-Column [725375]
User fields [14]
Matched tasks [1]
Assigned tasks [0]

Task Attributes
<all>
General [2]
name: Structural Framing, Area 1
code: ST00370
Activity codes [0]
User fields [1]
Matched resources [121]
Assigned resources [0]

3.9 Auto-Matching with User Fields

➤ Auto-Match 3D Resources to Tasks

	ID	Name	Task Location	Duration	Start	Finish	3D Resource
50		Metals		190d	9:00 AM 4/6/16	5:00 PM 12/27/16	(854)
51	ST00350	Base Plates		3d	9:00 AM 4/6/16	5:00 PM 4/8/16	
52	ST00360	Structural Framing, Area 1	Area 1	8d	9:00 AM 4/18/16	5:00 PM 4/27/16	121
53	ST00370	Structural Framing, Area 2	Area 2	8d	9:00 AM 4/28/16	5:00 PM 5/9/16	242
54	ST00380	Structural Framing, Area 3	Area 3	10d	9:00 AM 5/10/16	5:00 PM 5/23/16	281
55	ST00390	Structural Framing, Area 4	Area 4	9d	9:00 AM 5/24/16	5:00 PM 6/3/16	210
56	ST00400	Plumb/ Bolt / Weld Area 1	Area 1	5d	9:00 AM 4/28/16	5:00 PM 5/4/16	
57	ST00410	Plumb/ Bolt / Weld Area 2	Area 2	5d	9:00 AM 5/10/16	5:00 PM 5/16/16	
58	ST00420	Plumb/ Bolt / Weld Area 3	Area 3	5d	9:00 AM 5/24/16	5:00 PM 5/30/16	
59	ST00430	Plumb/ Bolt / Weld Area 4	Area 4	5d	9:00 AM 6/6/16	5:00 PM 6/10/16	



۳. مدلسازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.10 Adding Equipment & Editing 3D Objects

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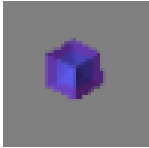
3.10 Adding Equipment & Editing 3D Objects



- Importing Equipment Models
- Appearance Profiles for Equipment

3.10 Adding Equipment & Editing 3D Objects

➤ Move, Rotate, and Scale (Advanced Manipulator)

-  use plane axis movement.
- or
-  scale the selected object in a particular axis or overall.

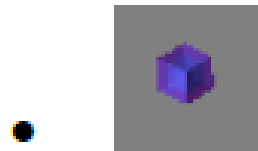
3.10 Adding Equipment & Editing 3D Objects

➤ Move, Rotate, and Scale (Advanced Manipulator)

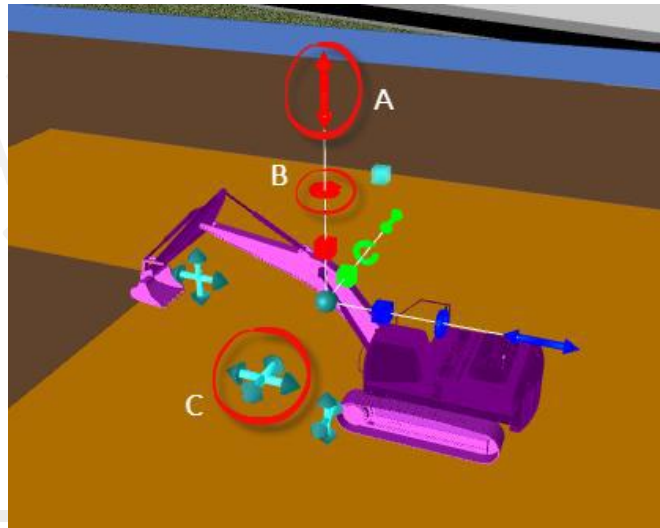


use plane axis movement.

or

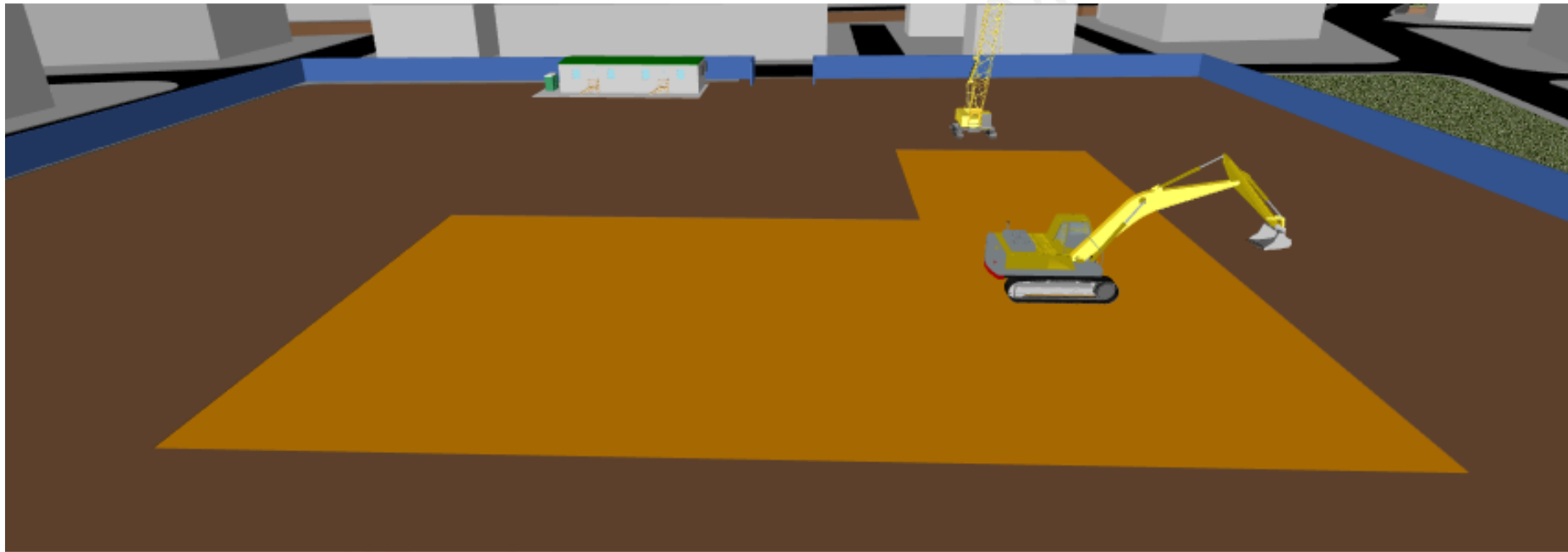


scale the selected object in a particular axis or overall.



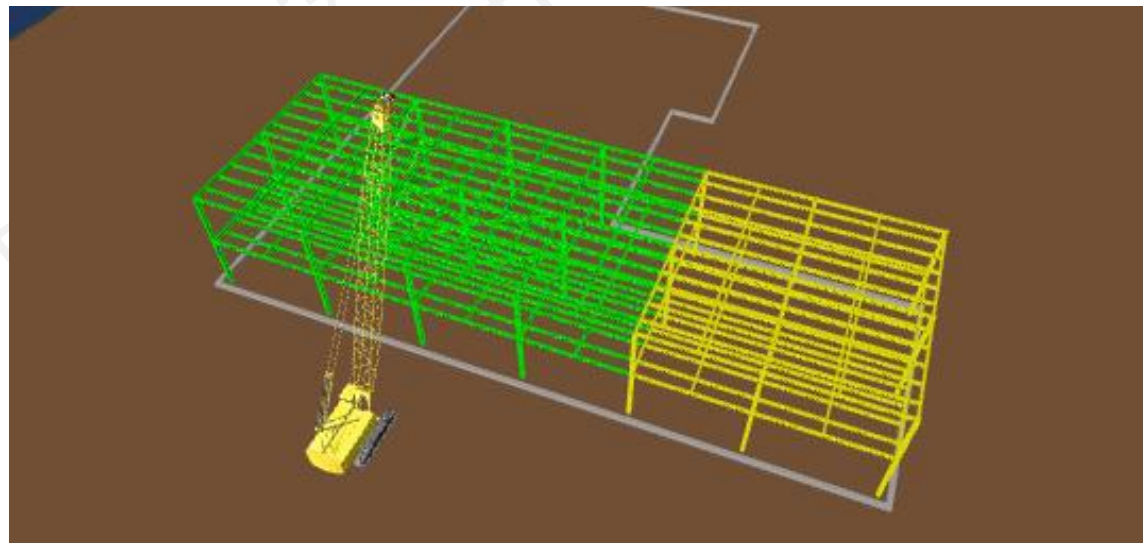
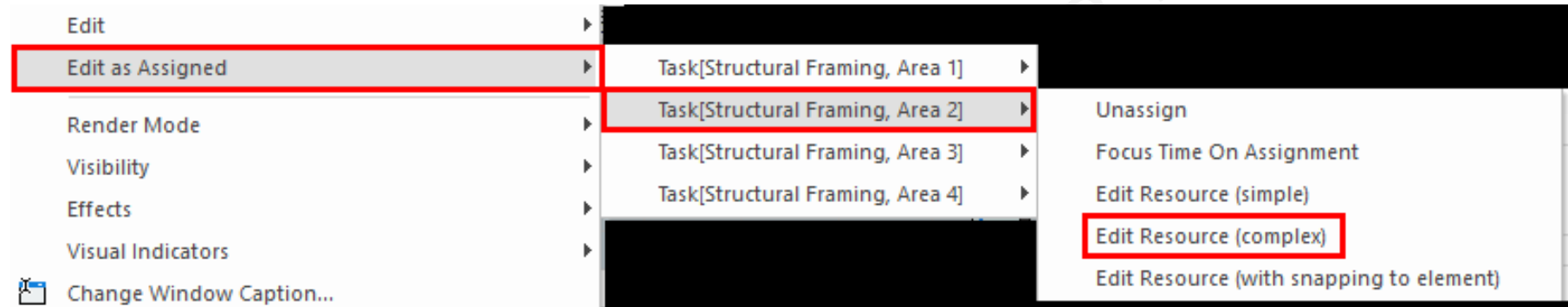
3.10 Adding Equipment & Editing 3D Objects

- Move, Rotate, and Scale (Advanced Manipulator)



3.10 Adding Equipment & Editing 3D Objects

➤ Edit as Assigned



۳. مدلسازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.11 3D Paths

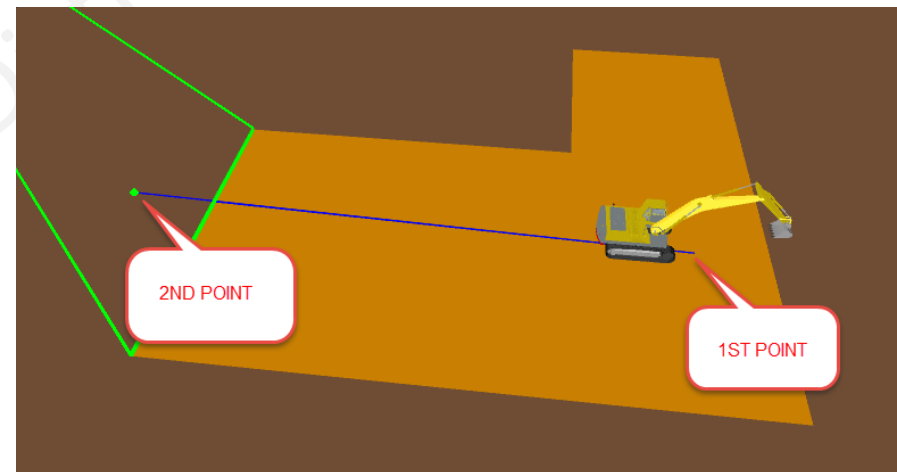
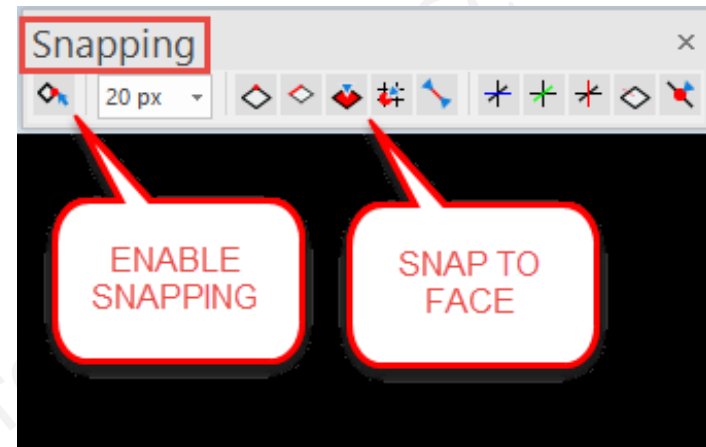
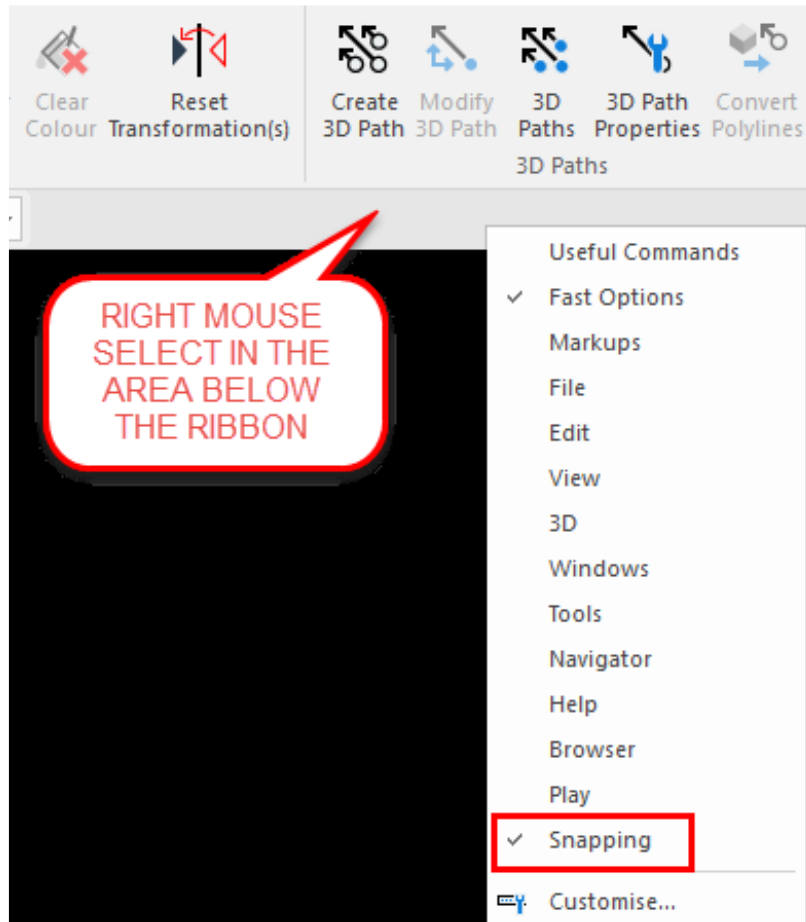
Kambiz Kordani PMP,MSc

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3.11 3D Paths

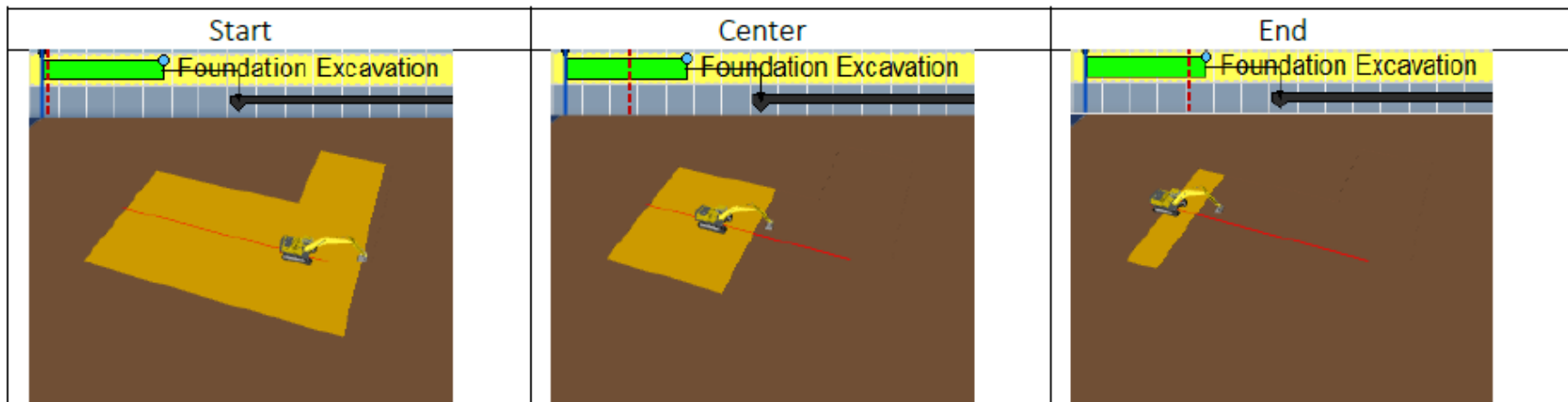
➤ Create 3D Path



3.11 3D Paths

➤ Assign 3D Path to a Resource

3D Path	
3D Path	Foundation Excavation
Alignment	Z Max
Reverse Direction	☐
Adjust for Task Percent Complete	☐
Pause During Non-working Time	☐
Motion Start	0.00

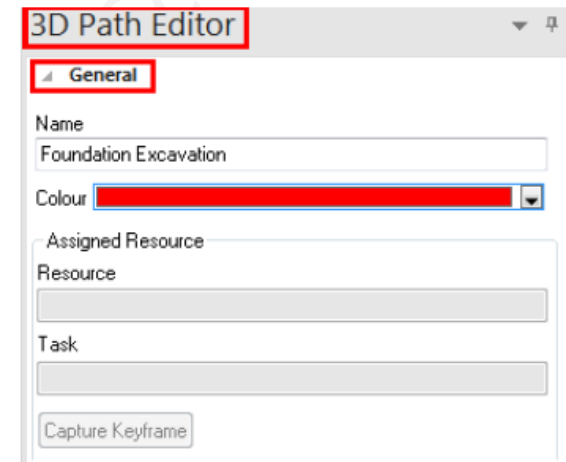
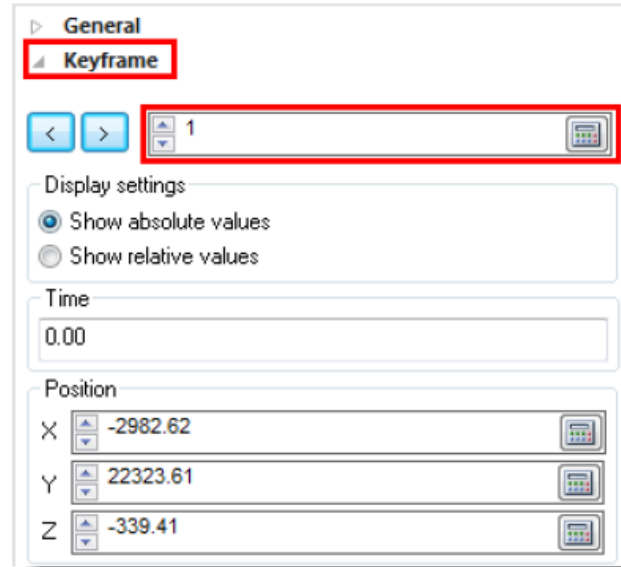
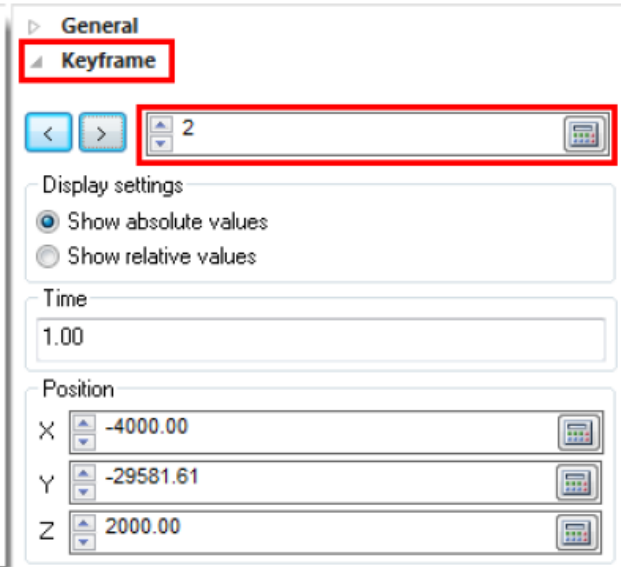


3.11 3D Paths

➤ Edit 3D Path

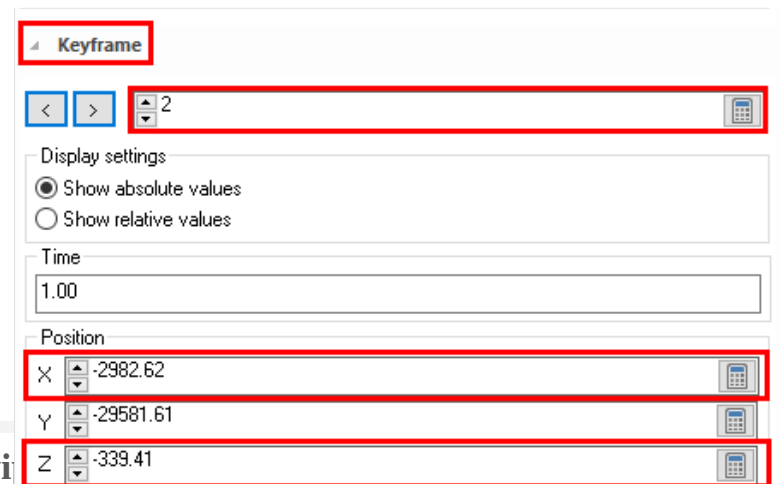
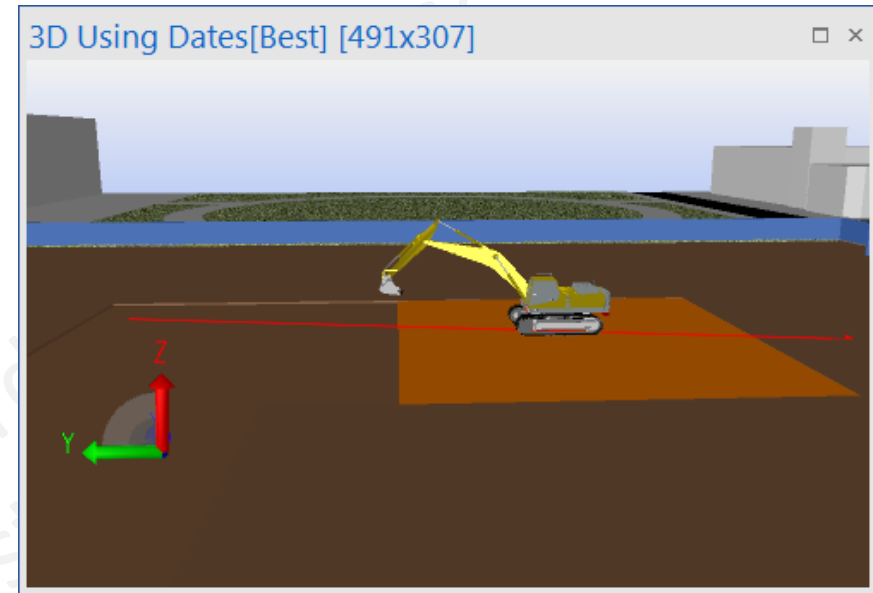
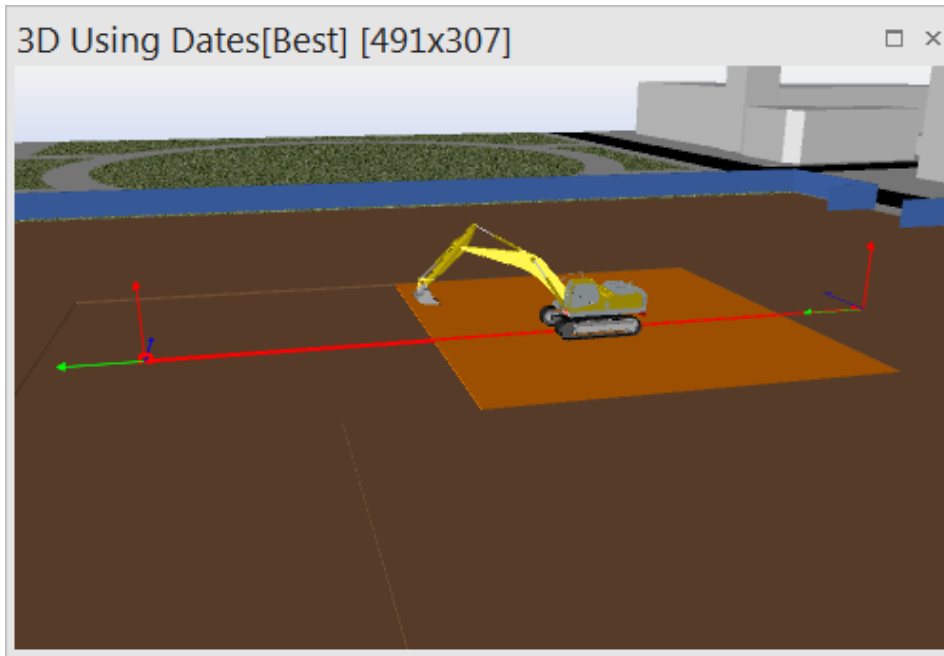
Open the 3D Path Editor tab.

1. In the 3D tab → 3D Paths panel → 3D Path Properties.
2. In the 3D Path Editor tab → General tab, make sure the name is "Foundation Excavation".
3. Under 3D Path Editor tab → Keyframe tab, Keyframe 1 displays the starting point of the 3D Path and Keyframe 2 displays the ending point.

3.11 3D Paths

➤ Edit 3D Path



۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



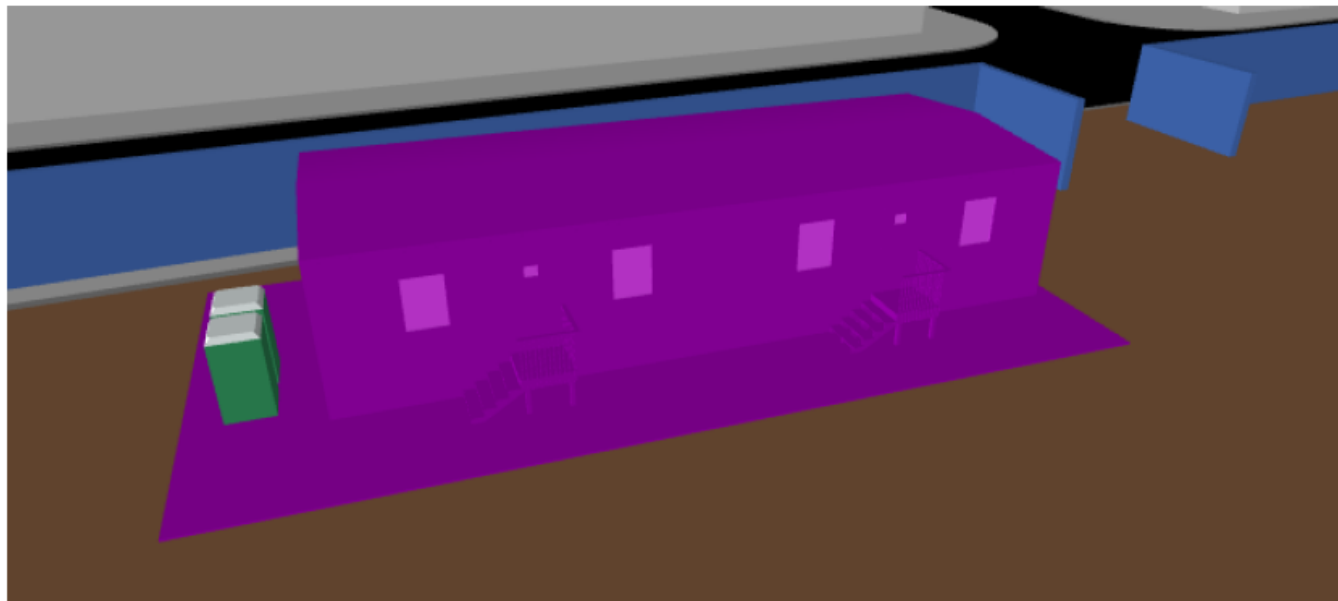
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3.12 Copy and Create 3D Objects

3.12 Copy and Create 3D Objects

➤ Copy & Paste

1. In the Navigator tab → 3D Filters tab → 3D tab, select Clear to hide all objects, then show the Site file.
2. Select the Field Office & Temporary Hard Standing objects as shown:

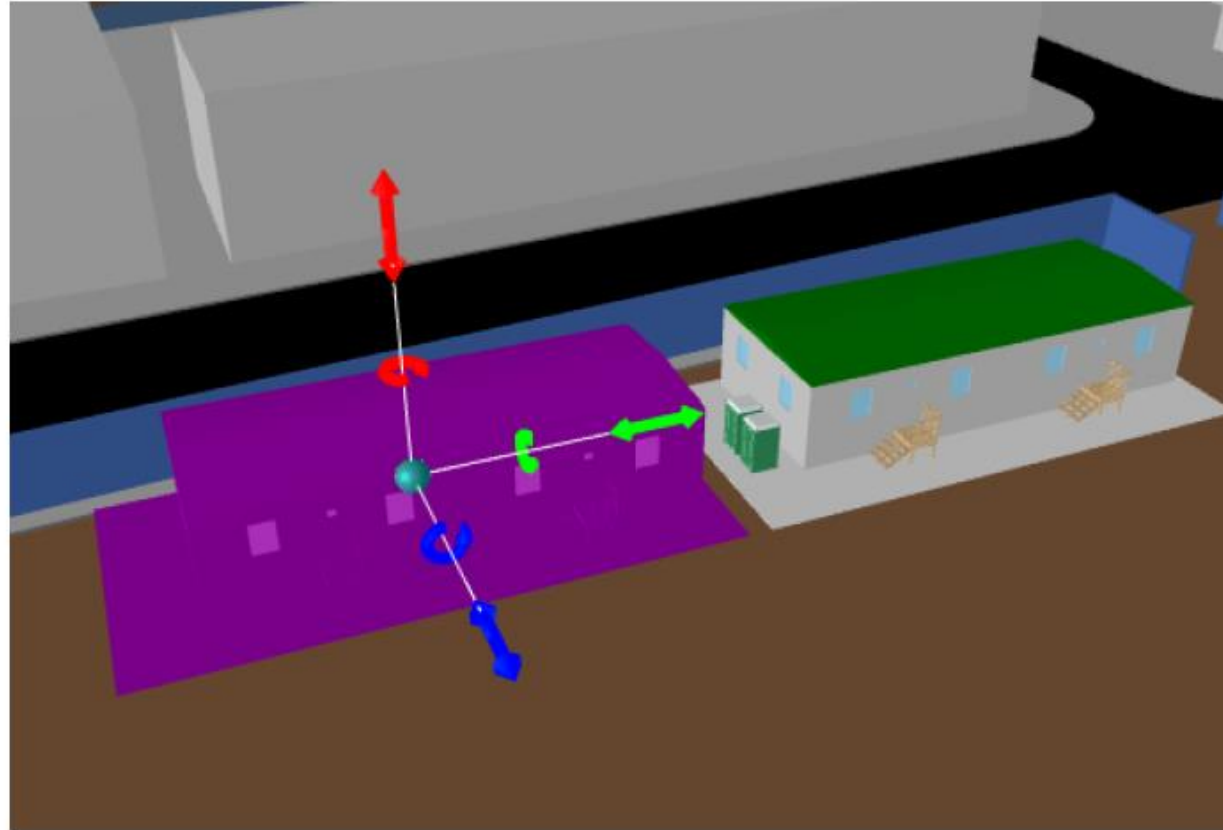


3. Right click in the 3D view and select **Copy** from the context menu.
4. Right click again and select **Paste**.
The copied site office & temporary hard standing will be created in the same location as the original site office and we will need to assign it a resource.
5. The **Resource Wizard** is displayed. Select **Assign to a new Resource**, then select **Next**
6. Rename **BIM Office**, change the **Type** to **Material**, and then select **Next**.
7. Select **Assign to this Resource**, don't build tree, and then select **Finish**.
The copied site office will appear in the same position as the original one and we will need to move it to a new location.
8. With the **BIM Office** still selected, right click in the 3D view and choose **Edit** → **Simple Manipulator**.

3.12 Copy and Create 3D Objects

➤ Copy & Paste

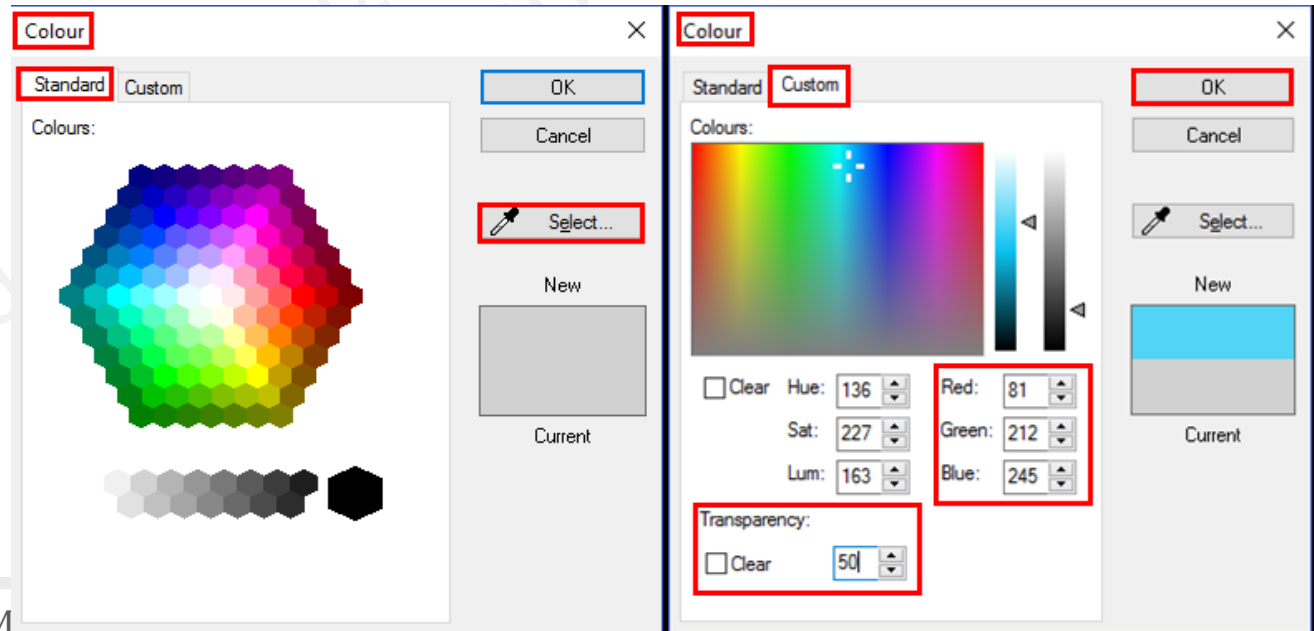
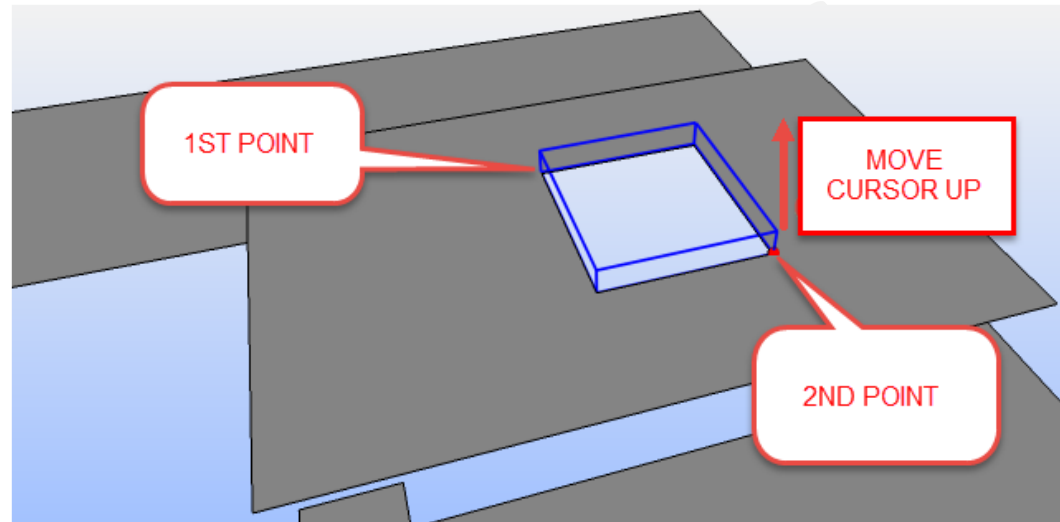
9. Move the new office to a new location as shown:



10. Press Esc on the keyboard to exit the manipulator and deselect the object.
11. Use the **Install Appearance Profile** to assign the **BIM Office** to the **Field Office** task.

3.12 Copy and Create 3D Objects

➤ Creating Objects



۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro

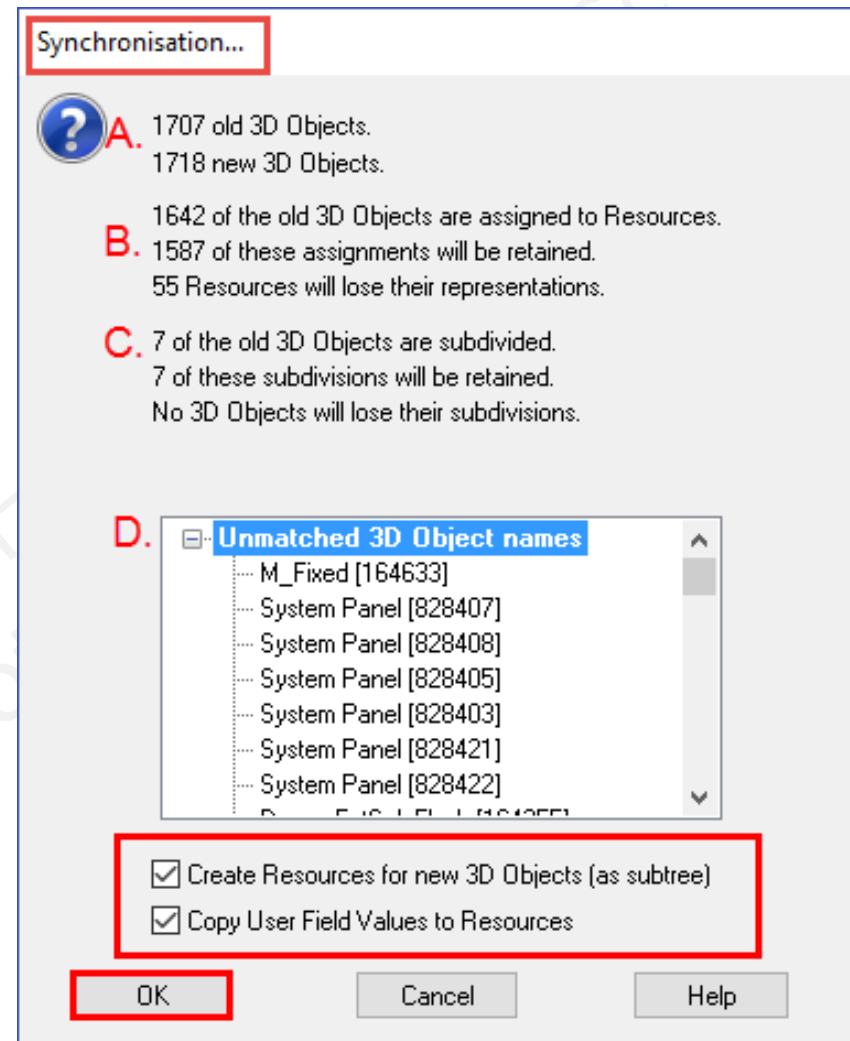
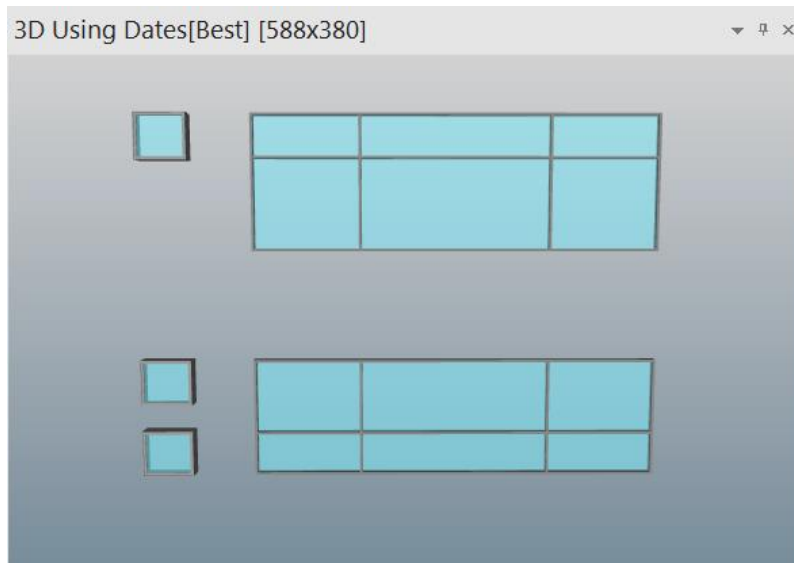
Kambiz Kordani PMP,MSc
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 Instagram: [@acemi_social](#)



3.13 Synchronising 3D Models

3.13 Synchronising 3D Models

➤ Identifying 3D Object Changes



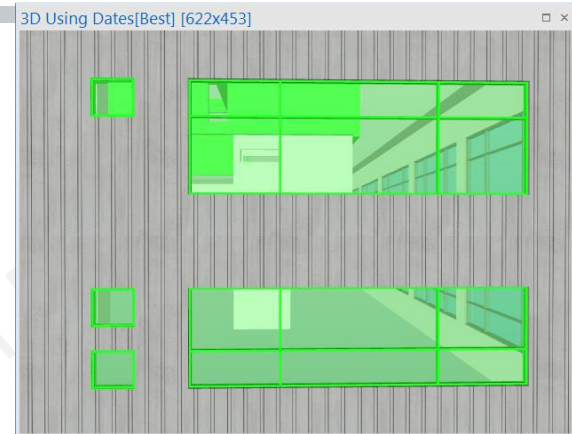
3.13 Synchronising 3D Models

➤ Identifying 3D Object Changes

	ID	Name	Duration	Start	Finish	3D Resources
74		▲ Doors and Windows	98d	9:00 AM 8/19/16	5:00 PM 1/3/17	(1304)
75	ST00560	Exterior Doors, Frames, Hardware	4d	9:00 AM 10/3/16	5:00 PM 10/6/16	3
76	ST00570	Interior Doors, Frames, Hardware	6d	9:00 AM 12/27/16	5:00 PM 1/3/17	18
77	ST00580	Glass Entry Doors	7d	9:00 AM 9/7/16	5:00 PM 9/15/16	1
78	ST00590	Glass Curtain Wall (Front)	20d	9:00 AM 8/19/16	5:00 PM 9/15/16	812
79	ST00600	Punched Windows (Left)	4d	9:00 AM 9/16/16	5:00 PM 9/21/16	187
80	ST00610	Punched Windows (Back)	6d	9:00 AM 9/22/16	5:00 PM 9/29/16	276
81	ST00620	Punched Windows (Right)	1d	9:00 AM 9/30/16	5:00 PM 9/30/16	
82	ST00630	Punched Windows (Mechanical Room)	1d	9:00 AM 10/17/16	5:00 PM 10/17/16	6
83	ST00640	Glass Railings	4d	9:00 AM 12/27/16	5:00 PM 12/30/16	1

3.13 Synchronising 3D Models

➤ Identifying 3D Object Changes



۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.14 Baselines & Synchronising Schedules

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3.14 Baselines & Synchronising Schedules

➤ Creating a Baseline

Select All

☒ Select all Tasks

☐ Select only visible Tasks (in table)

☒ Ask next time

OK Cancel Help

Baseline name

Name:

Original Schedule

☒ Ask for the next time

OK Cancel Help

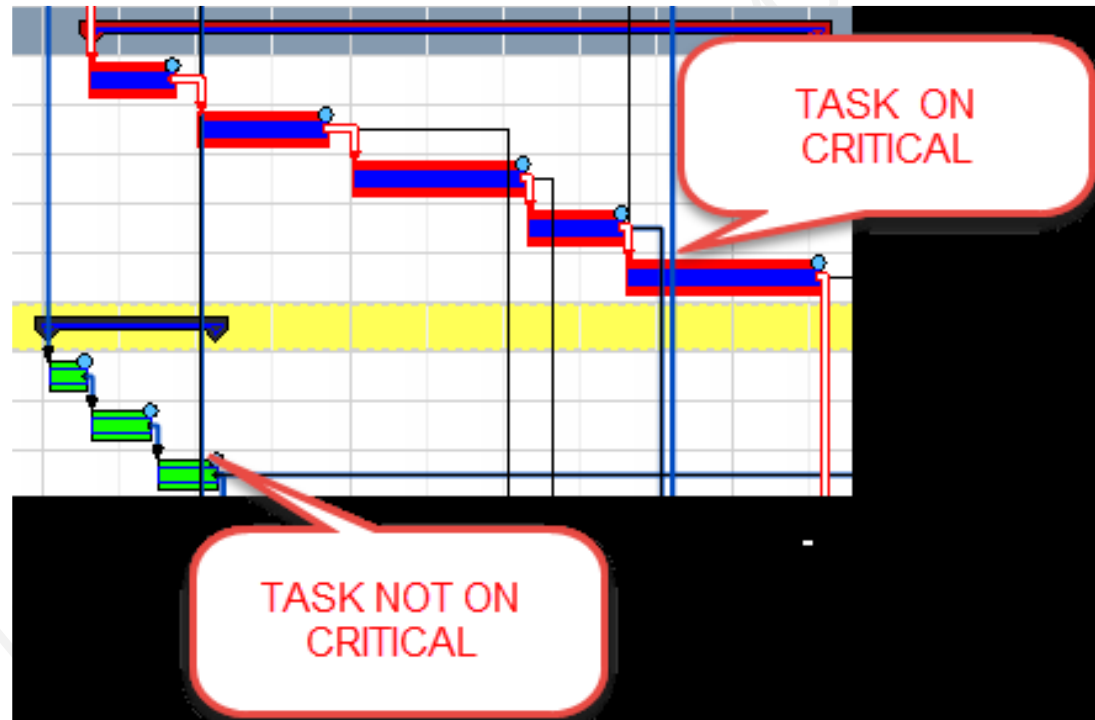
Synchro Software Ltd.

? The Critical Path is currently not up to date.
Refresh before Baselining Tasks?

Yes No Cancel

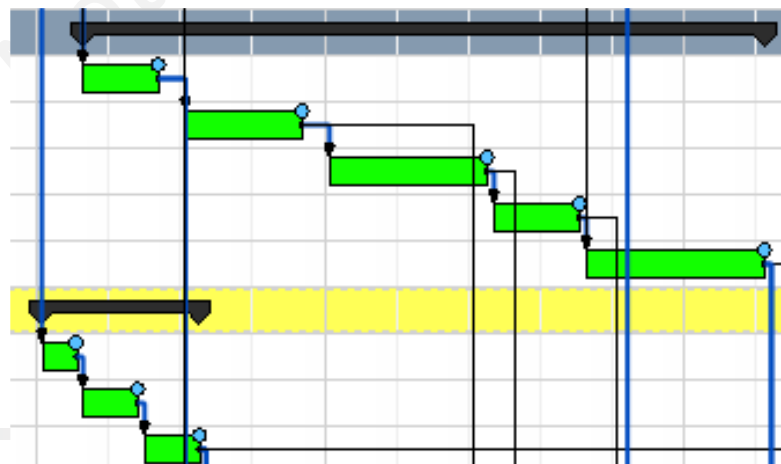
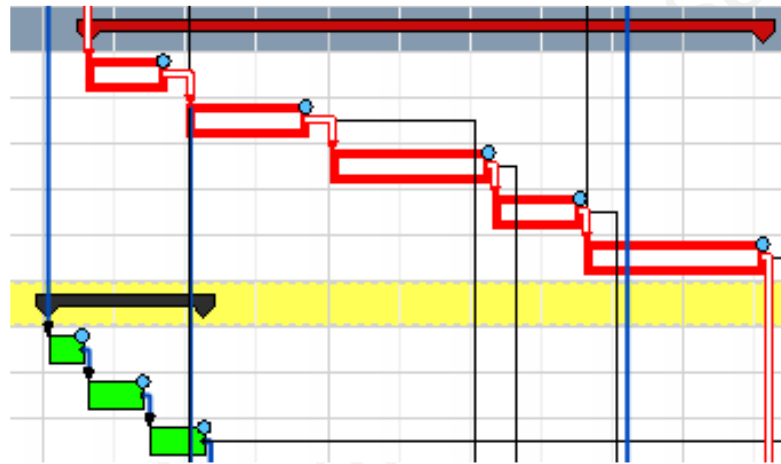
3.14 Baselines & Synchronising Schedules

➤ Creating a Baseline



3.14 Baselines & Synchronising Schedules

➤ Creating a Baseline



3.14 Baselines & Synchronising Schedules

➤ Synchronising Schedules (Programmes)

Microsoft Project synchronise from

How would you like to import this file?

☐ Use the Selected Task to merge the data into the current Project

☐ Append the data to the end of the current Project

Choose how you would like to process each object

Object	Command
Tasks	Consolidate
Links	Consolidate
Task constraints	Synchronise
Costs	Synchronise
Calendars	Consolidate
Resources	Consolidate
Resource assignments	Consolidate
Activity codes	Synchronise
Codes assignments	Synchronise
User fields	Synchronise
User field values	Synchronise
Users	Skip

Default Skip all

< Back Synchronise Cancel Help

3.14 Baselines & Synchronising Schedules



➤ Synchronising Schedules (Programmes)

SYNCHRONISE

If you choose to Synchronise, the existing schedule in Synchro will be completely replaced with the updated external schedule.

Outcome: External schedule takes precedence over Synchro schedule when Synchronising according to the following rules:

- Attributes **ADDED** externally → **ADDED** in Synchro
- Attributes **DELETED** externally → **DELETED** in Synchro
- Attributes **MODIFIED** externally → **MODIFIED** in Synchro
- Attributes **ADDED** or **MODIFIED** in Synchro → **OVERRIDDEN**

NOTE: In the current version of Synchro Pro 5.1, the option to **Synchronise** is not available for P6 global objects (such as Calendars, Resources, Risks and Activity Codes) since these cannot be deleted. **Synchronise** is the default choice for Primavera P3.

CONSOLIDATE

If you choose to Consolidate, any schedule changes made externally or in Synchro will still exist, **NOTHING IS DELETED**.

Outcome: Merges the External and Synchro Schedules when Synchronising

- Attributes **ADDED** externally → **ADDED** in Synchro
- Attributes **MODIFIED** externally → **MODIFIED** in Synchro
- Attributes **ADDED** or **MODIFIED** in Synchro → **MAINTAINED**

3.14 Baselines & Synchronising Schedules

➤ Synchronising Schedules (Programmes)

INTEGRATE

If you choose to Integrate, any modifications made to the selected external schedule in Synchro will be overridden. However, any additions to the schedule in Synchro will be maintained.

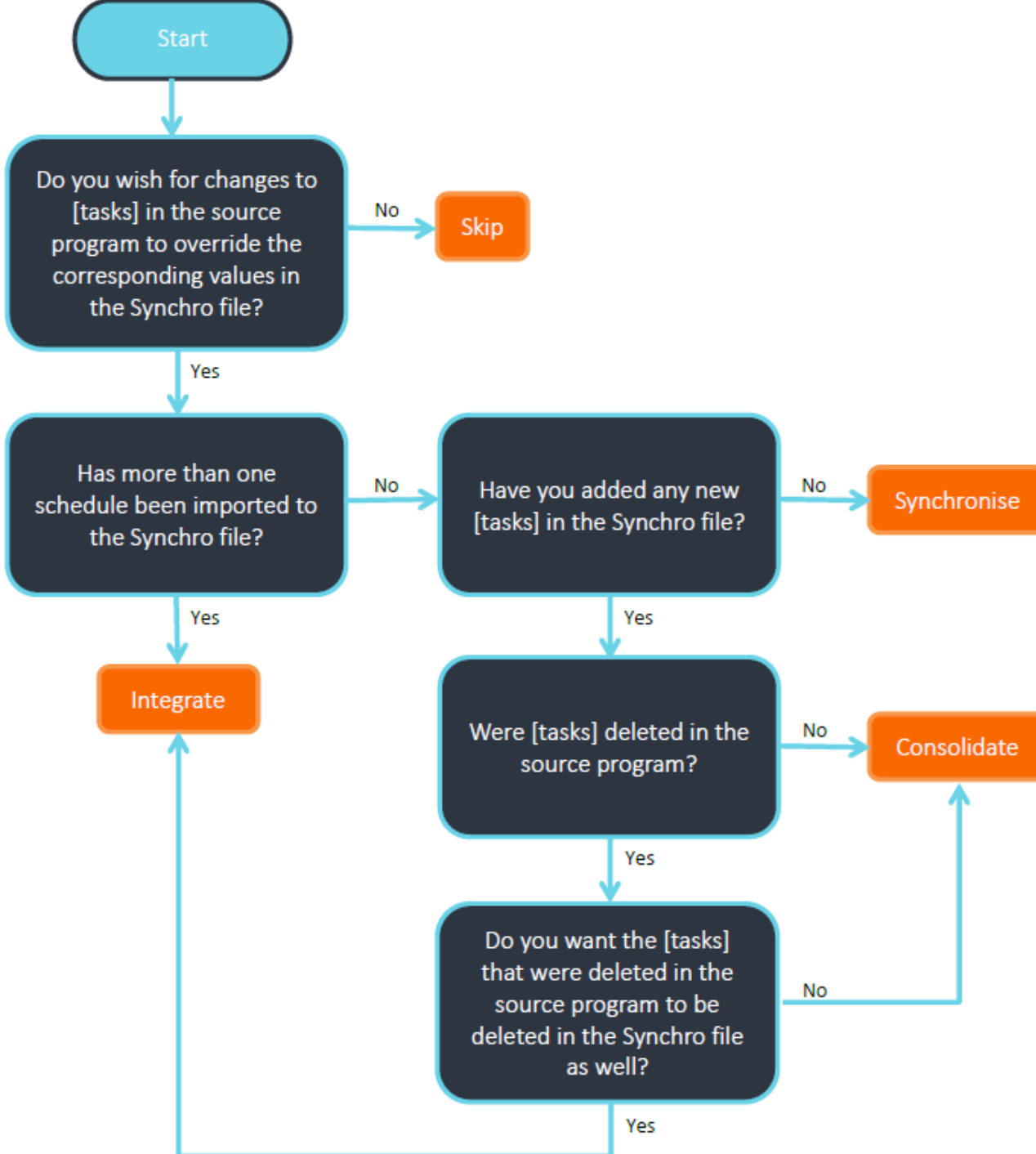
Outcome: External schedule takes precedence over Synchro schedule for all Attributes not originally created in the external schedule.

- Attributes **ADDED** externally → **ADDED** in Synchro
- Attributes **DELETED** externally → **DELETED** in Synchro
- Attributes **MODIFIED** externally → **MODIFIED** in Synchro
- Attributes **ADDED** in Synchro → **MAINTAINED**
- Attributes **MODIFIED** in Synchro → **OVERRIDDEN**

NOTE: Integrate only affects schedule attributes associated with the selected schedule being Synchronised. Thus the option to Integrate is most commonly used when multiple schedules have been imported into Synchro so no project data is lost upon Synchronisation. Integrate is the default choice for Resources and Resource Assignments. The option to Integrate is unavailable for Microsoft Project XML.

SKIP

If you choose to Skip, the associated attribute will not be modified or updated.



3.14 Baselines & Synchronising Schedules

3.14 Baselines & Synchronising Schedules

➤ Synchronising Schedules (Programmes)

Microsoft Project synchronise from

How would you like to import this file?

☐ Use the Selected Task to merge the data into the current Project

☐ Append the data to the end of the current Project

Choose how you would like to process each object

Object	Command
Tasks	Consolidate
Links	Consolidate
Task constraints	Synchronise
Costs	Skip
Calendars	Consolidate
Resources	Skip
Resource assignments	Skip
Activity codes	Skip
Codes assignments	Skip
User fields	Skip
User field values	Skip
Users	Skip

Default Skip all

< Back Synchronise Cancel Help

3.14 Baselines & Synchronising Schedules

➤ Synchronising Schedules (Programmes)

Project

Details

Project Start
4/6/2015

Project Finish
4/21/2016

Project Duration
381d

Number of Tasks
120

Project Date Zero
06 Apr 15

Data Date
☐ Automatic
☒ Manual
17 :00 15 May 15

Schedule
☒ ASAP
☐ ALAP

Schedule From
☒ Data Date
☐ Project Start
☐ Selected Date

Schedule To
☒ Early Project Finish
☐ Project Finish
☐ Selected Date

Costs

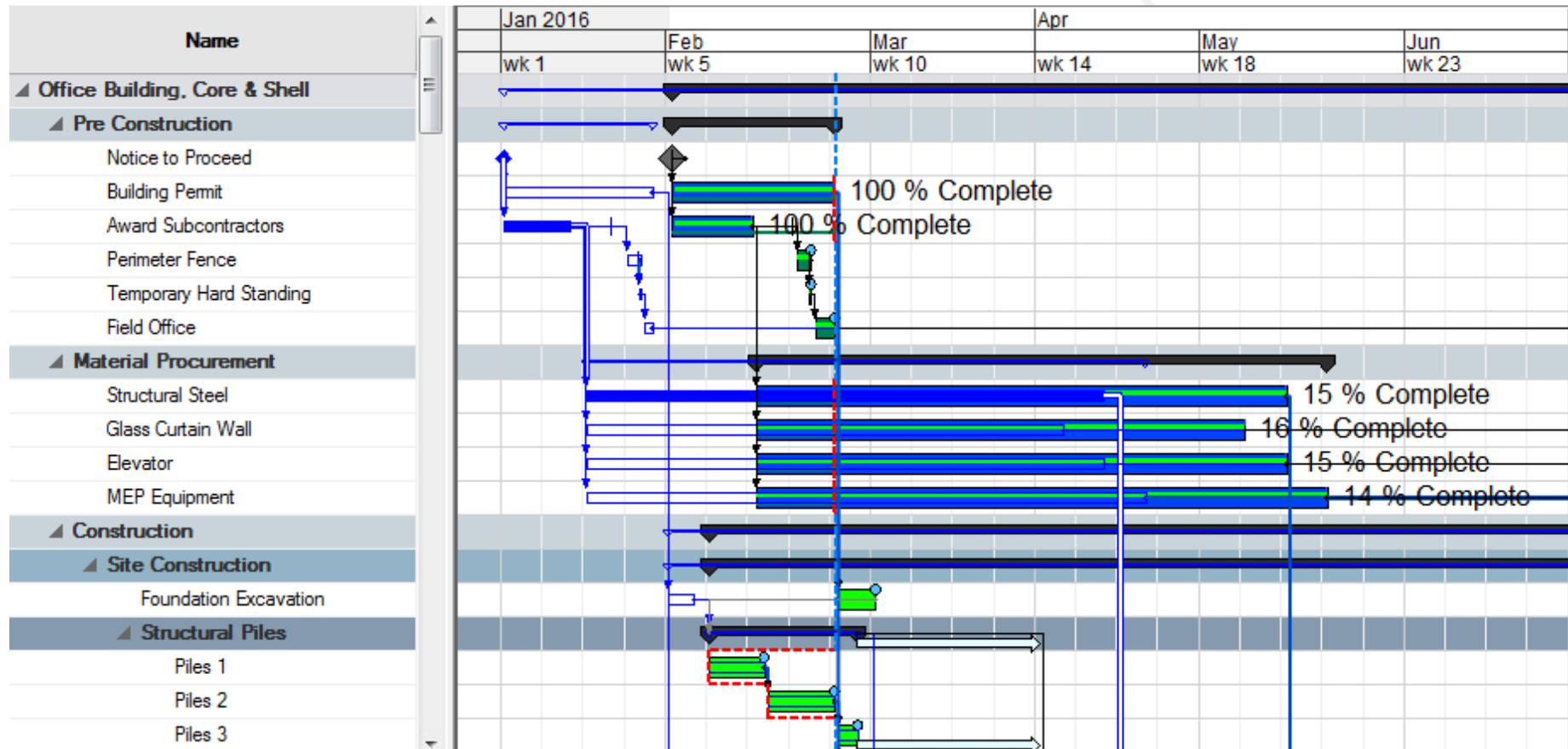
Units

Latest Measurements

Resources 3D Objects **Project** 3D Filters Baselines and Scenarios External Data

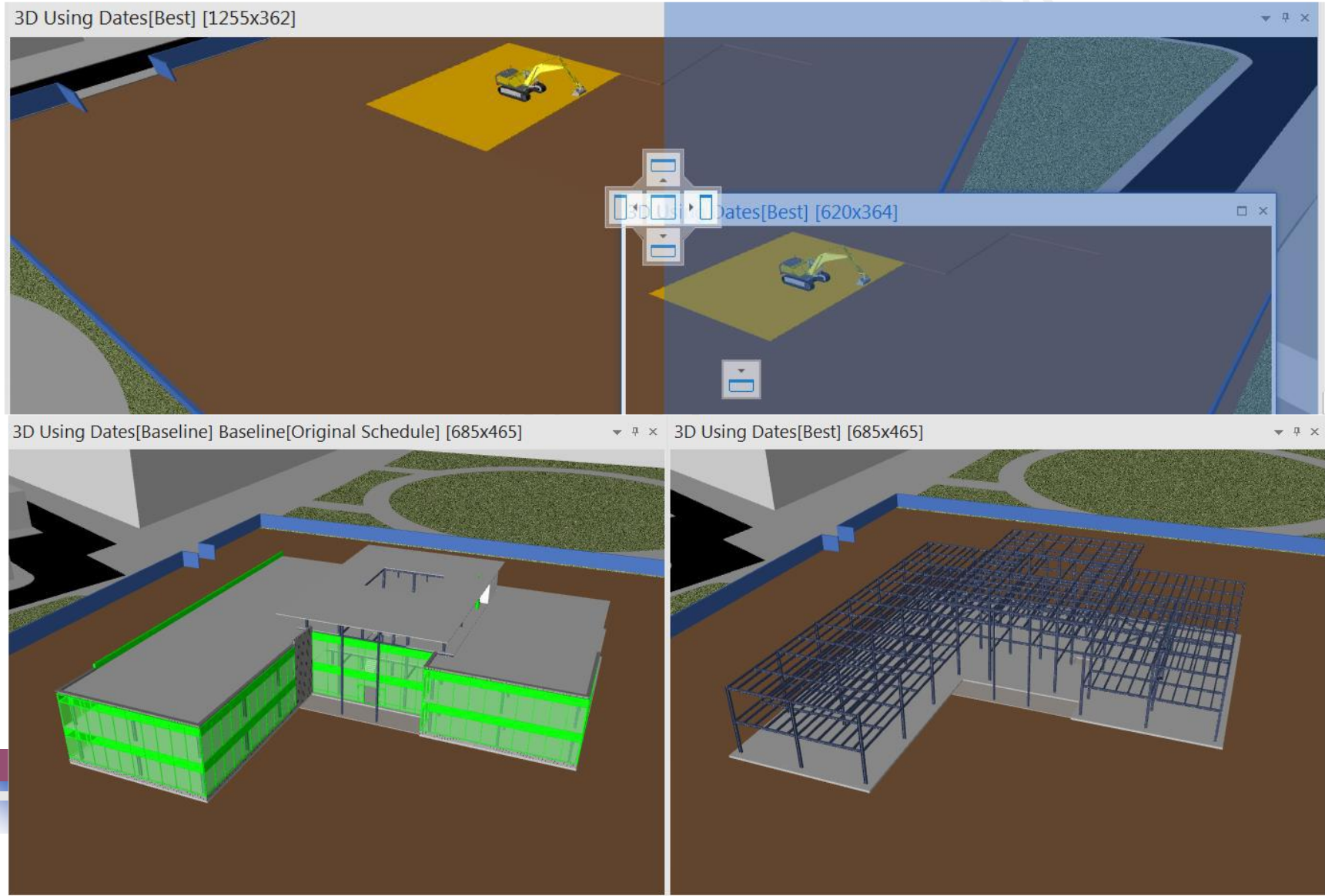
3.14 Baselines & Synchronising Schedules (Programmes)

➤ Synchronising Schedules (Programmes)



3.14 Baselines & Synchronising Schedules

➤ Compare Baselines using 3D Views



۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.15 Cutting Planes

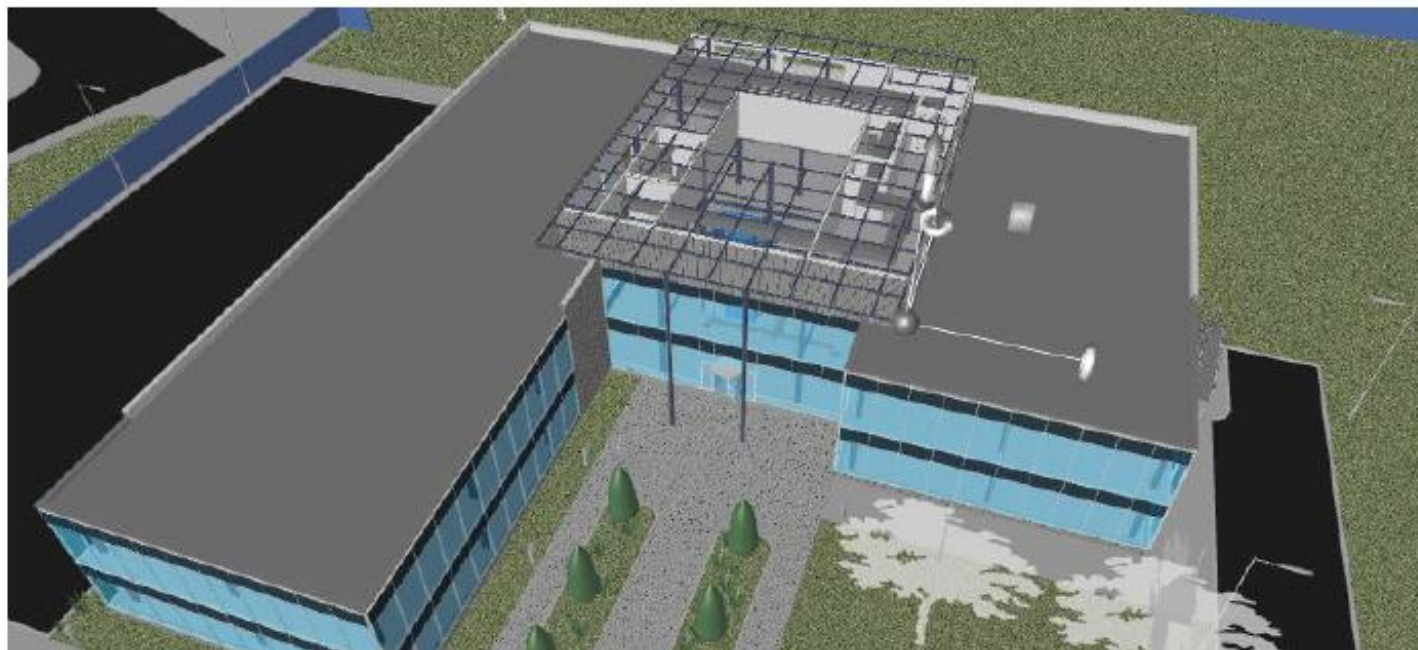
Kambiz Kordani PMP,MSc

Linkedin: [@kordani-kambiz](#)

Instagram: [@acemi_social](#)

3.15 Cutting Planes

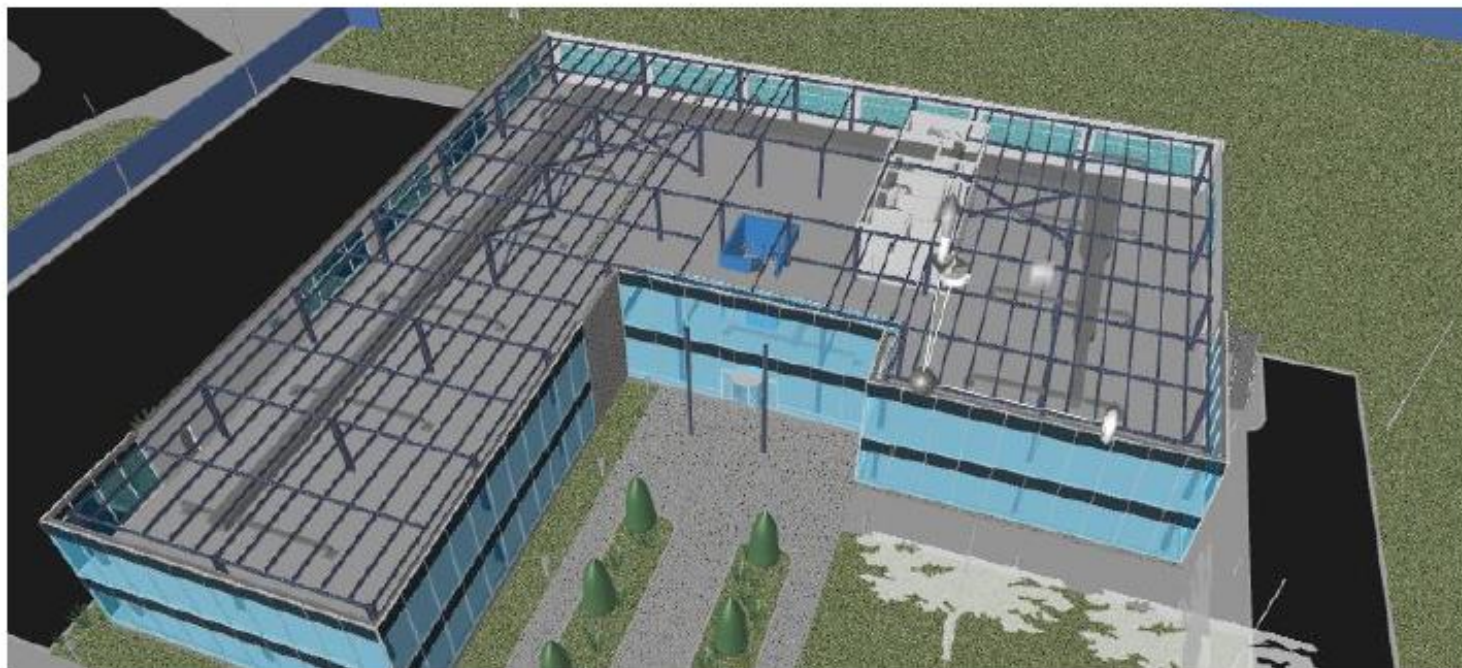
1. Ensure that the **Focus Time** is at the end of the project and all objects are shown.
2. Right click in the 3D window and select **Cutting Planes** → **Cutting Plane Z**.
3. Left click to place the cutting plane on the roof which will appear as shown below.



NOTE: To set a Cutting Plane, you must click on an object, not in empty space.

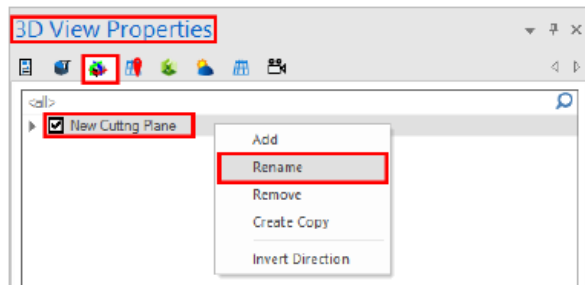
3.15 Cutting Planes

4. A simple manipulator appears. Move the cursor over the manipulator until the vertical icon 'grows' then hold down the left button and drag the cutting plane up and down in the Z direction, so that you can see into the Level 1 space.

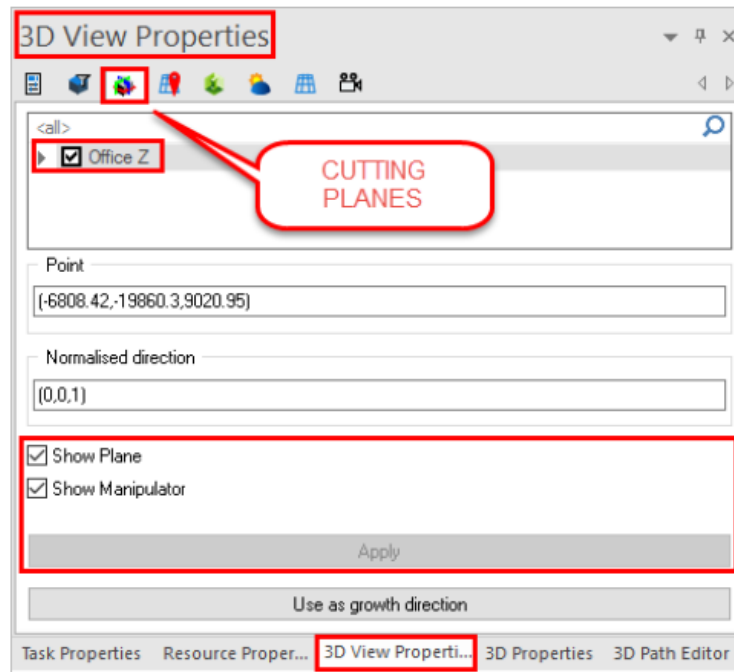
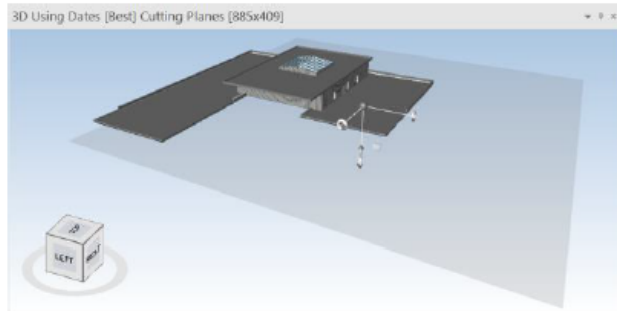


3.15 Cutting Planes

5. In the Windows tab → Properties Panels panel → 3D View Properties tab → Cutting Planes tab, notice the *New Cutting Plane* listed.
6. Right click on *New Cutting Plane* and rename it to *Office Z*.
7. The plane can be turned on/off by enabling/disabling the check box.
8. The **Show Plane** and **Show Manipulator** check boxes allow you to hide these visual indicators in the 3D view, while still applying the cutting plane. This may be useful when exporting an animation, for example. After changing the preferences, press **Apply**.
9. Right click on *Office Z1* and you will see the following options.



10. Select **Invert Direction** to change the direction of the cutting plane.



11. **Invert Direction** once again to revert back.

NOTE: X and Y cutting planes can also be created, cutting planes can be rotated off-axis, and multiple cutting planes can be applied simultaneously.

۳. مدل سازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro

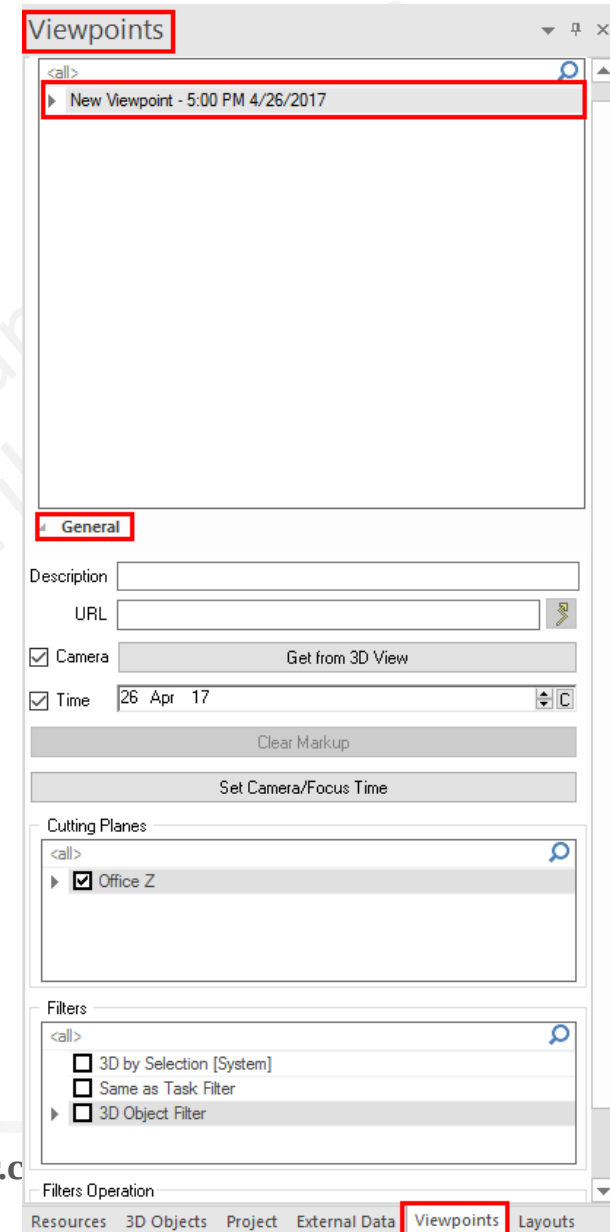


3.16 Viewpoints & Animations

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3.16 Viewpoints & Animations

- Viewpoints can store Focus Time, Camera Angle, applied 3D Filters, and Cutting Planes. A saved Viewpoint can be reactivated at any point in one or all 3D windows. This can be useful for returning to a particular time or view after updating a schedule or model to see what has changed, or to quickly jump to points of interest when presenting to stakeholders.



Viewpoints

<all>

▶ New Viewpoint - 5:00 PM 4/26/2017

General

Description

URL

☒ Camera Get from 3D View

☒ Time 26 Apr 17

Clear Markup

Set Camera/Focus Time

Cutting Planes

<all>

▶ ☒ Office Z

Filters

<all>

☐ 3D by Selection [System]

☐ Same as Task Filter

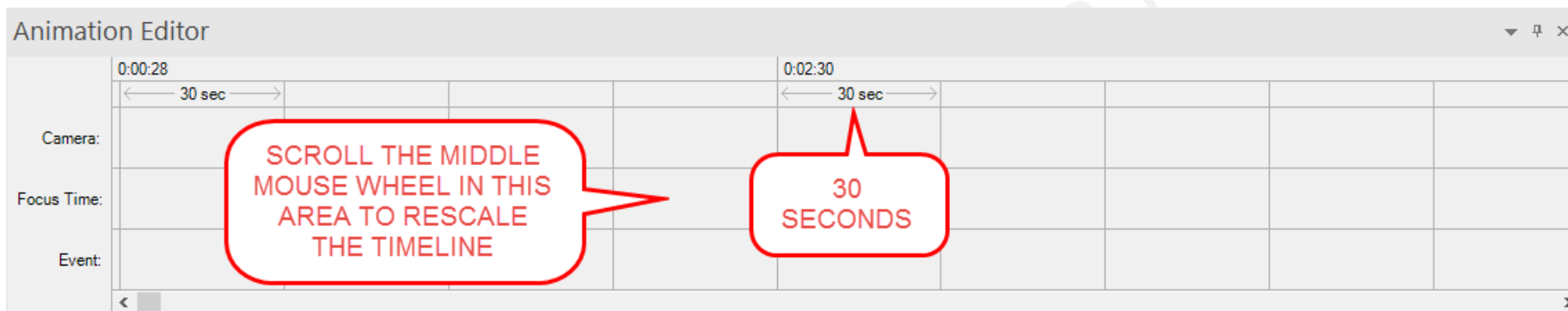
▶ ☒ 3D Object Filter

Filters Operation

Resources 3D Objects Project External Data Viewpoints Layouts

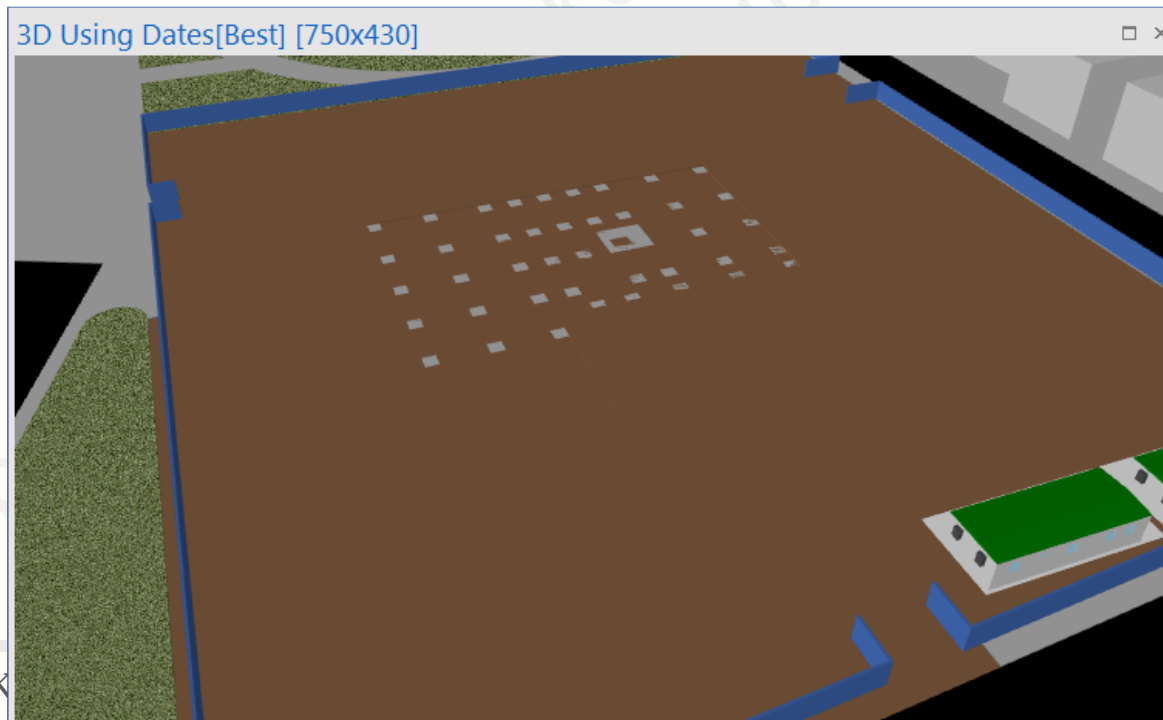
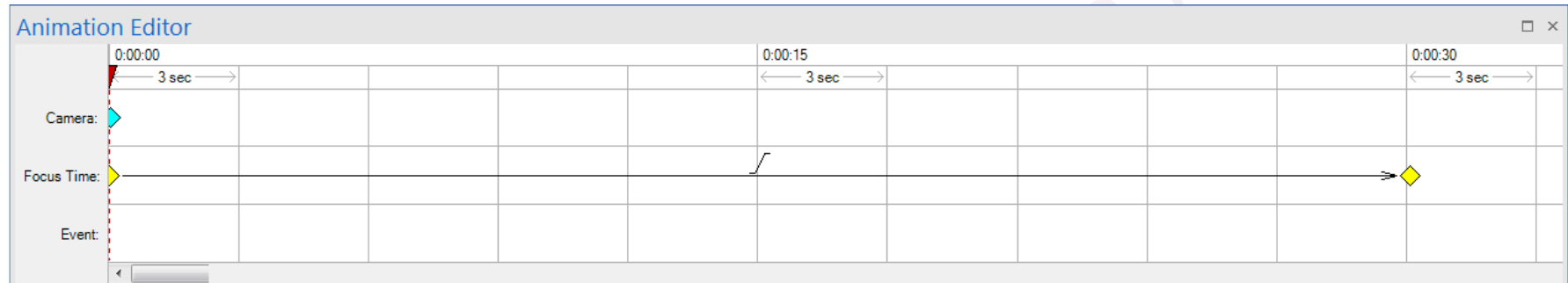
3.16 Viewpoints & Animations

➤ Creating an Animation



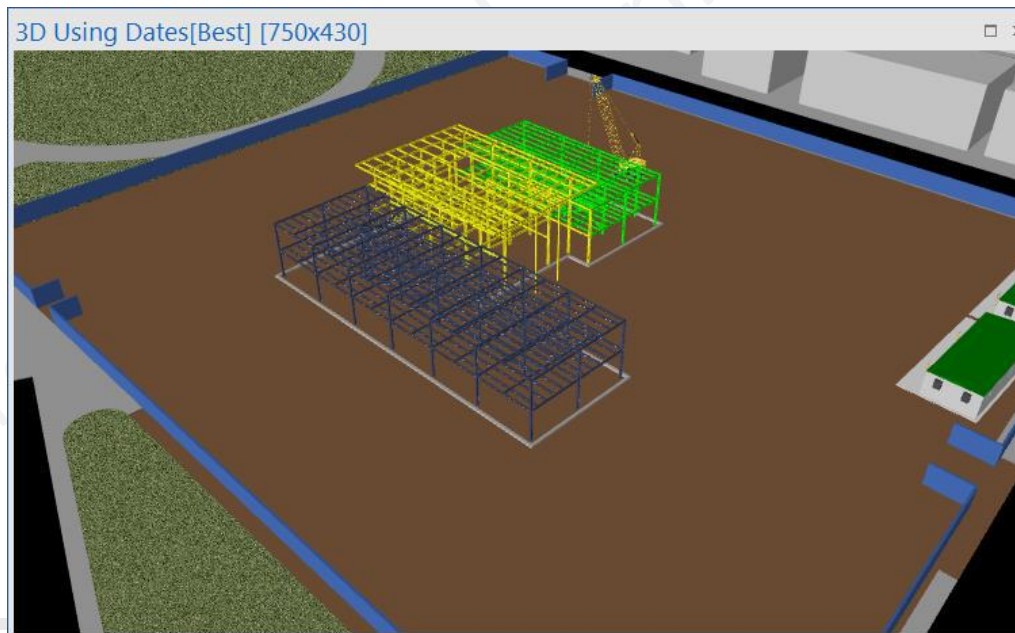
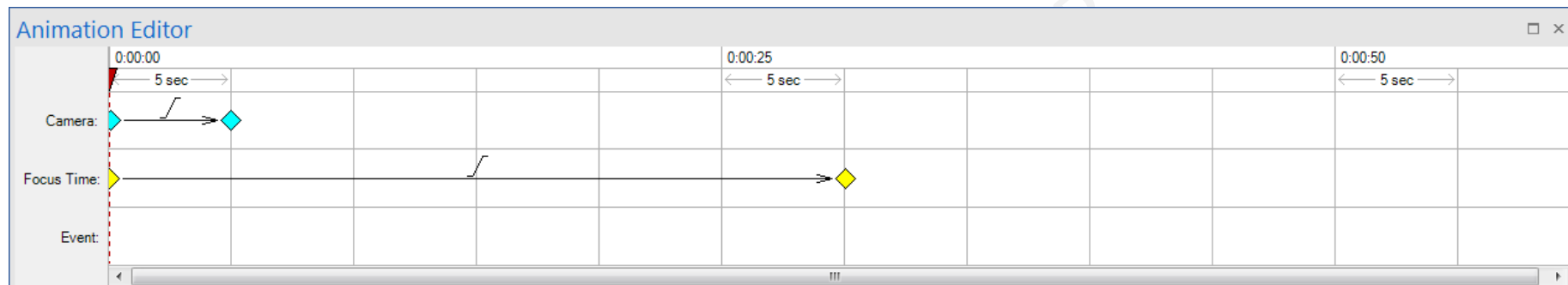
3.16 Viewpoints & Animations

➤ Creating an Animation



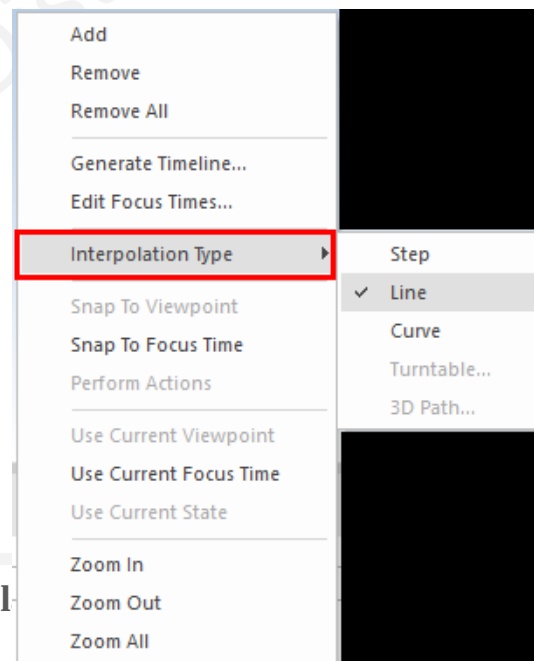
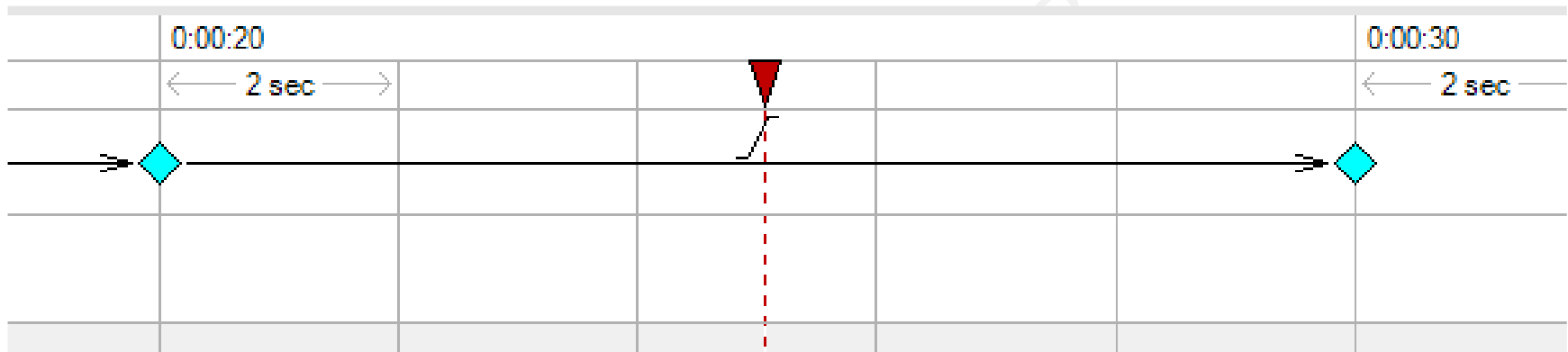
3.16 Viewpoints & Animations

➤ Creating an Animation



3.16 Viewpoints & Animations

➤ Editing the Animation



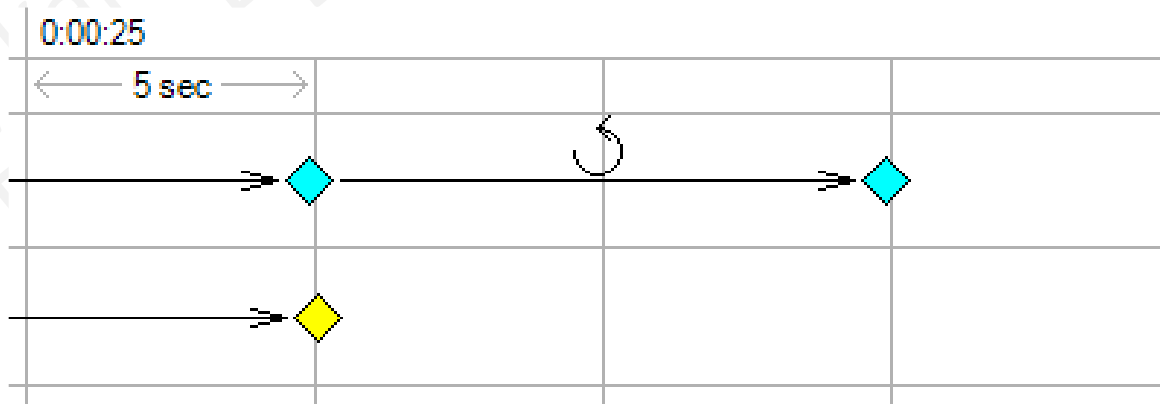
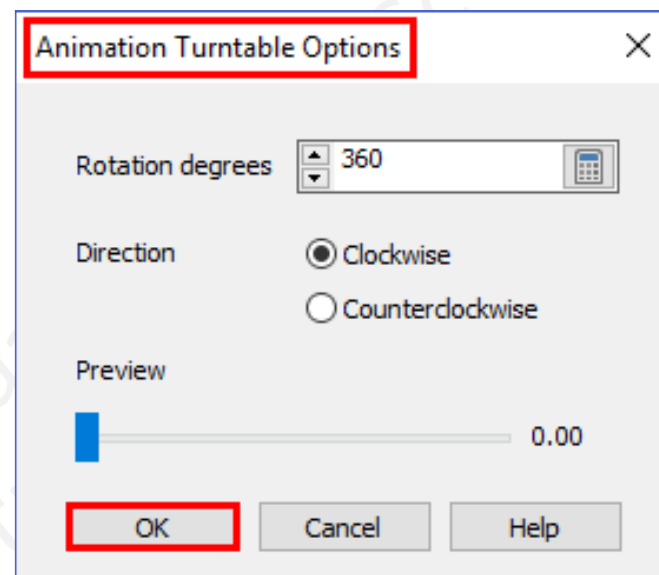
3.16 Viewpoints & Animations

➤ Editing the Animation

Interpolation Type:	Camera Behaviour:	Focus Time Behaviour:
Curve	Linear interpolation along a calculated curve between the 2 points.	N/A
Line	Linear interpolation along a calculated straight line between the 2 points.	Linear interpolation between 2 focus time positions
Step	No interpolation; Jump from 1 st to 2 nd position.	No interpolation; Jump from 1 st to 2 nd focus time position
Turntable	Camera rotation around the currently selected 3D object. When chosen, the Turntable Options dialog is displayed to configure the rotation.	N/A
3D Path	Camera follows the selected 3D Path using the camera angle of the first Keyframe relative to the path. When this Interpolation type is chosen a dialog is displayed to choose the path to follow.	N/A

3.16 Viewpoints & Animations

➤ Editing the Animation



3.16 Viewpoints & Animations

➤ Exporting an AVI

Export AVI...

Resolution | Content | Images | Soundtrack | Gantt Chart | Focus Time | Timeline | Textual Frames

Resolution

Width: 1280

Height: 800

Frame Rate: 15

Duration

Start (sec): 0

Finish (sec): 30.011999

Speed: 100%

Split every (sec): 10

Compression

Codec: Microsoft Video 1 **Change**

File for Export

C:\Synchro AVI Test\Sample.avi **Browse...**

☐ Export the animation as a sequence of images with given quality **Good**

☐ Skip existing frames

☐ Open animation location when complete

3.16 Viewpoints & Animations

➤ Exporting an AVI

Video Compression

Compressor:
Microsoft Video 1

Compression Quality: 100

OK
Cancel
Configure...
About...

Export AVI...

Resolution Content Images Soundtrack Gantt Chart Focus Time Timeline Textual Frames

0.00 sec
9:00 AM 4/6/2015

Preview...

- ☒ Focused Time
- ☒ 3D Legend
- ☒ 3D Using Dates [Best] (Select)
- ☐ Timeline
- ☐ Gantt
- ☐ Tasks
- ☐ Resources
- ☐ 3D List

☐ lock update of the window content

☐ keep aspect ratio of 3D views

Shaded Options

Render with
Software

Anti-alias
2x

☐ Enable Software

☐ Shadows

☐ Ambient Occlusion

☐ Fast Silhouette Edges

Iray Options

☐ Raytrace with Iray

Max iterations per frame:
300

Max seconds per frame:
300

Send to Render Farm

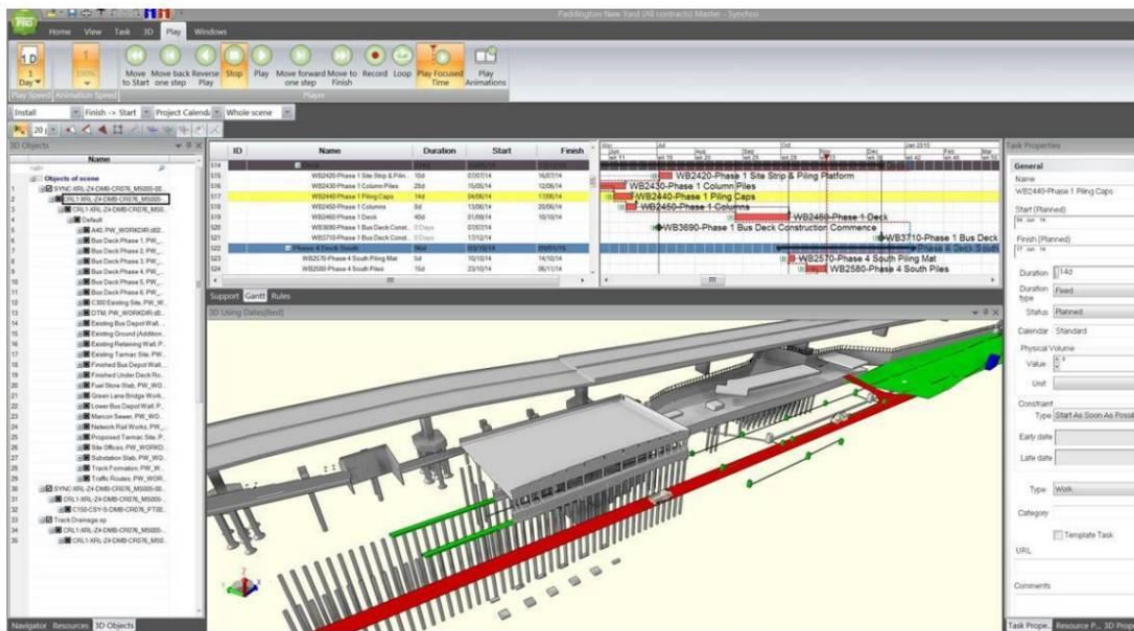
Appearance Profiles

- ☐ Equipment Install
- ☐ Equipment Remove
- ☐ Equipment Temporary
- ☐ Excavation
- ☐ Install
- ☐ Maintain
- ☐ R-L Growth
- ☐ Remove
- ☐ Temporary
- ☐ Transparency Interpolation

4/6/2015
Week: 1

OK Cancel Save... Help

۳. مدلسازی اطلاعات ساخت با استفاده از نرم افزار Synchro Pro



3.17 Output

Kambiz Kordani PMP,MSc

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3.17 Output

➤ Save as Image

Save the selected 3D view as image...

Image Size [pixels]

☒ Like selected 3D View

☐ Custom Update height by width

Width: 1279 Height: 520

JPEG Image Quality

Super

Rendering Parameters

Type: OpenGL

Antialiasing: No

Effects: ☐ Enable Software ☐ Shadows
☐ Ambient Occlusion ☐ Fast Silhouette Edges

Image Filename

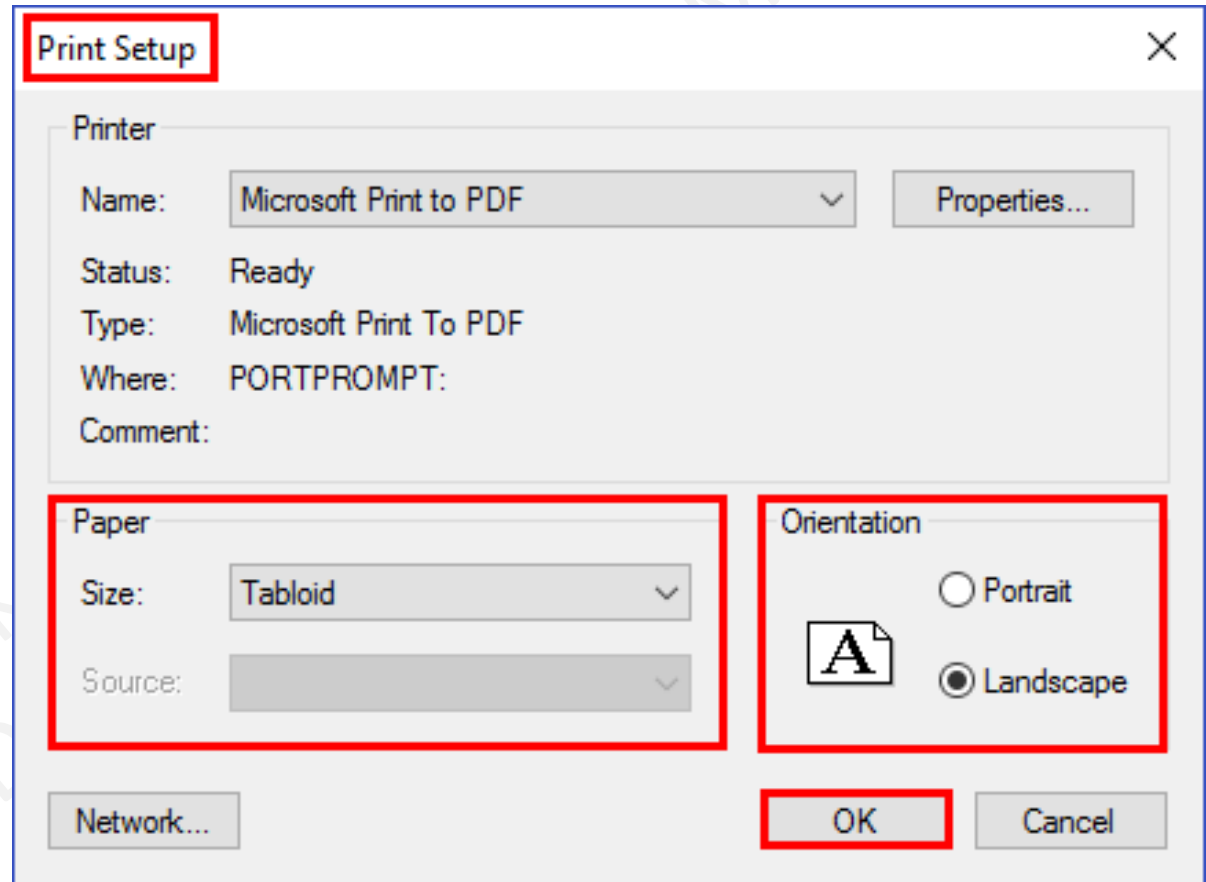
C:\User\ Browse...

☐ Ask the image name before raising this dialog

OK Cancel Help

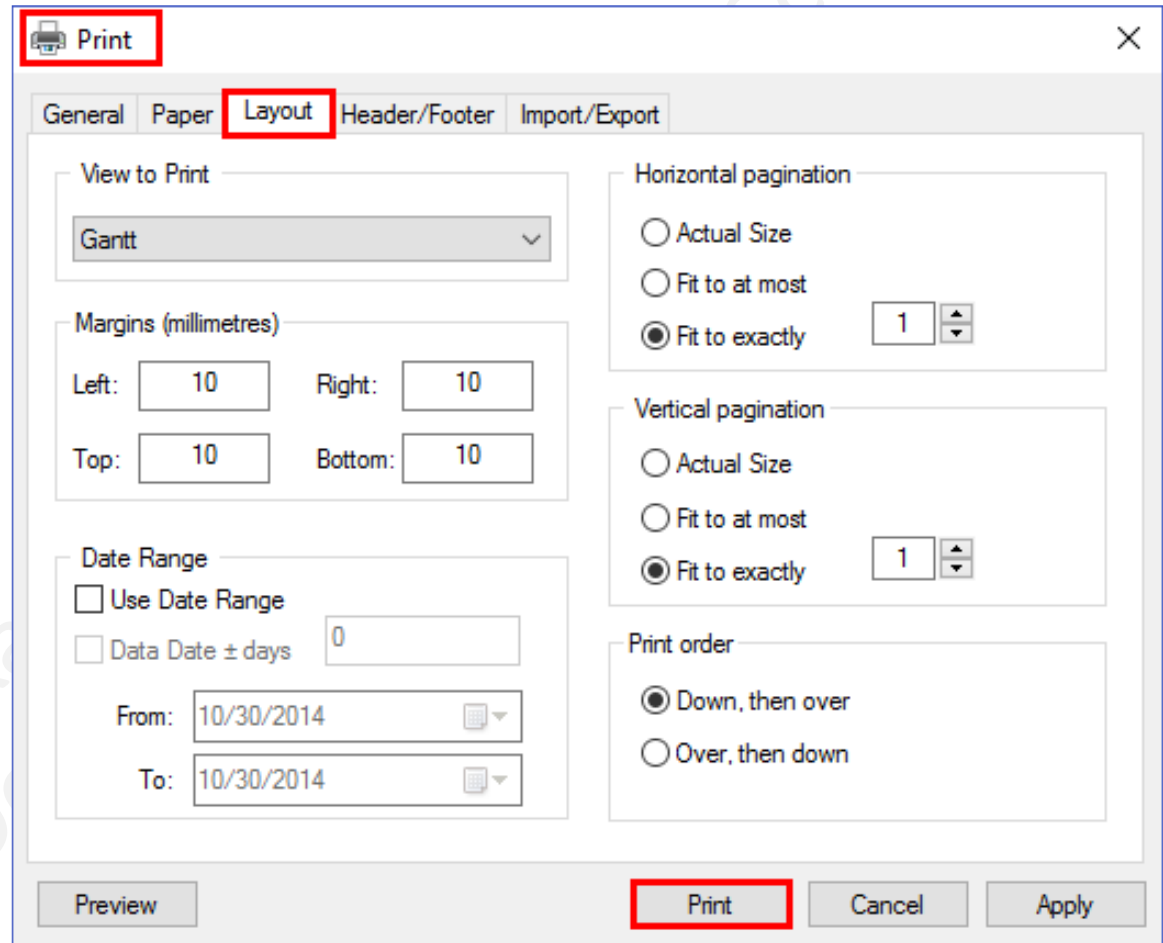
3.17 Output

➤ Printing the Gantt Chart



3.17 Output

➤ Printing the Gantt Chart



Print

General Paper **Layout** Header/Footer Import/Export

View to Print
Gantt

Margins (millimetres)
Left: 10 Right: 10
Top: 10 Bottom: 10

Date Range
☐ Use Date Range
☐ Data Date ± days 0
From: 10/30/2014
To: 10/30/2014

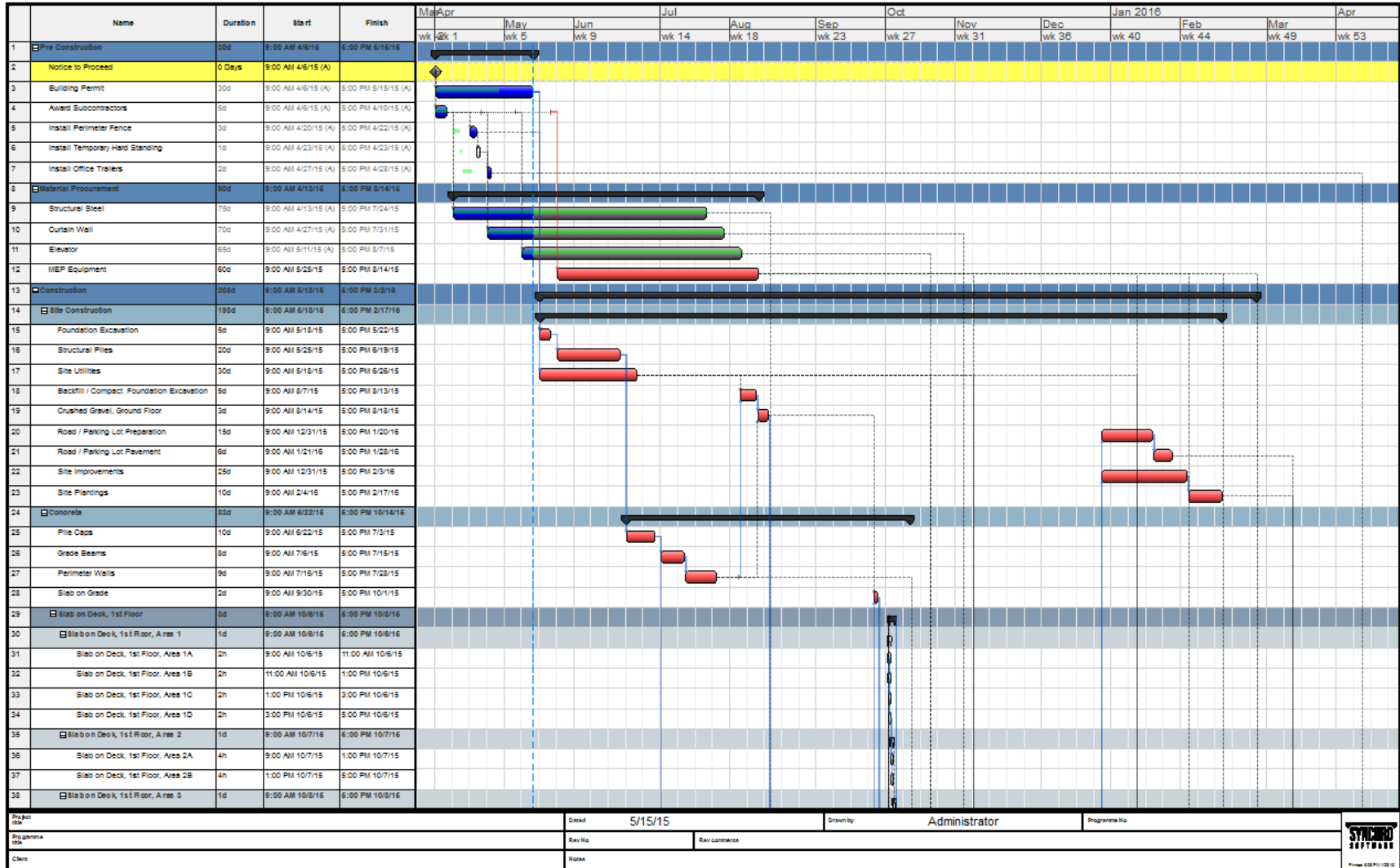
Horizontal pagination
☐ Actual Size
☐ Fit to at most
☒ Fit to exactly 1

Vertical pagination
☐ Actual Size
☐ Fit to at most
☒ Fit to exactly 1

Print order
☒ Down, then over
☐ Over, then down

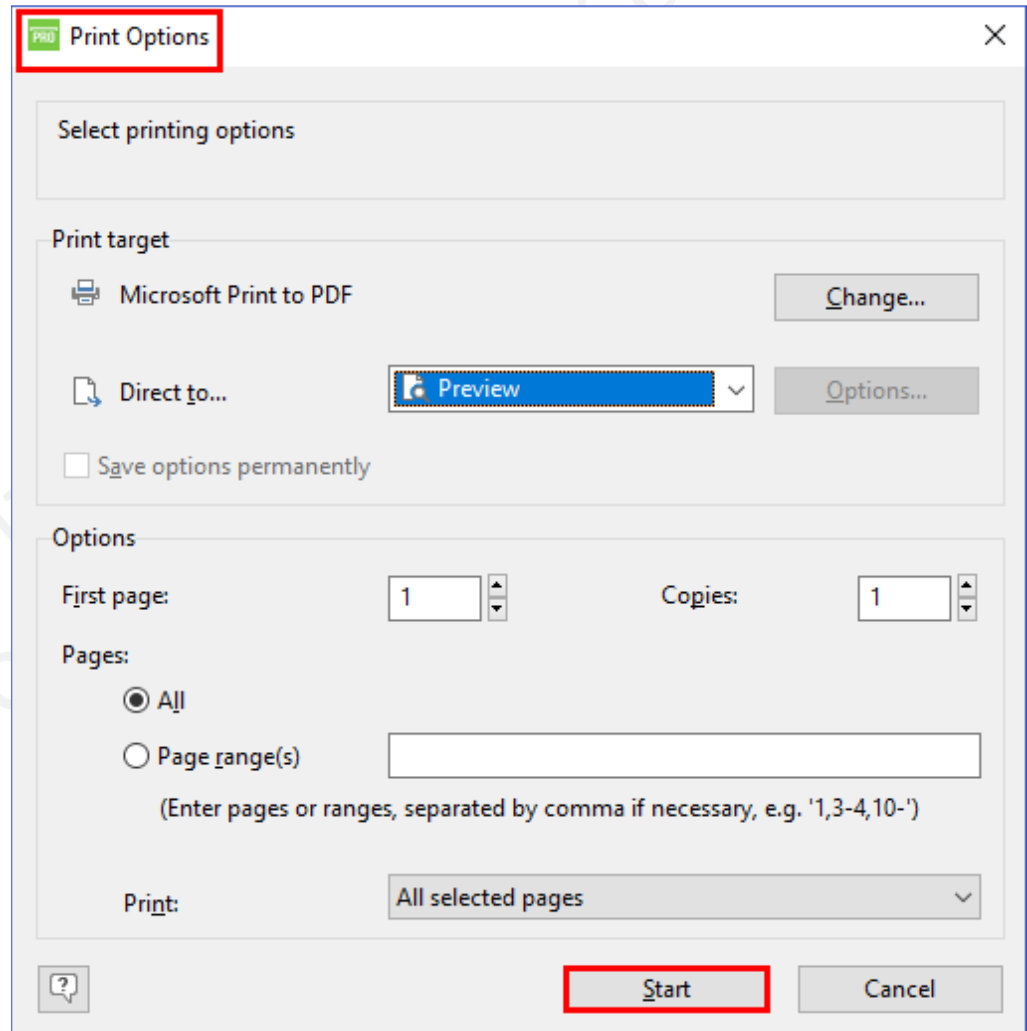
Preview **Print** Cancel Apply

3.17 Output



3.17 Output

➤ Schedule Health Check Report



The image shows a 'Print Options' dialog box with a red border around the title bar and the 'Start' button. The dialog is titled 'Print Options' and has a close button (X) in the top right corner. It contains the following sections:

- Select printing options:** A section with a light gray background.
- Print target:** A section containing:
 - A printer icon and the text 'Microsoft Print to PDF' with a 'Change...' button to its right.
 - A document icon and the text 'Direct to...' with a dropdown menu showing 'Preview' and an 'Options...' button to its right.
 - A checkbox labeled 'Save options permanently' which is currently unchecked.
- Options:** A section containing:
 - 'First page:' with a spinner box set to '1'.
 - 'Copies:' with a spinner box set to '1'.
 - 'Pages:' with two radio buttons: 'All' (selected) and 'Page range(s)' (unselected). Below the radio buttons is a text input field with the placeholder text '(Enter pages or ranges, separated by comma if necessary, e.g. '1,3-4,10-')'.
 - 'Print:' with a dropdown menu showing 'All selected pages'.

At the bottom of the dialog, there is a help icon (question mark in a square), a 'Start' button with a red border, and a 'Cancel' button.

3.17 Output

➤ Schedule Health Check Report

Synchro Schedule Health Check

Project: C:\Users\Joe Kendersky\Documents\Joe K\Synchro\Synchro Tutorial

Test	Description	Goal	Result
1	Missing Logic	Tasks without predecessors or successors	< 5% 3.96%
2	Leads	Relationships with negative lag	0% 0.00%
3	Lags	Relationships with positive lag	< 5% 2.19%
4	Relationship Types	Relationships other than FS type	< 10% 1.64%
5	Hard Constraints	Incomplete tasks with hard constraints	< 5% 1.04%
6	High Float	Incomplete tasks with at least 44 days float	< 5% 3.13%
7	Negative Float	Incomplete tasks with negative downstream float	0% 0.00%
8	High Duration	Incomplete tasks with at least 44 days duration	< 5% 5.21%
9	Invalid Dates	Tasks with forecasted dates before the Data Date and/or actual dates past the Data Date	< 1 7
10	Missing Resources	Incomplete tasks without scheduling resource assignments	N/A 97.92%
11	Missed Tasks	Tasks with actual finish dates later than baseline plan finish dates	< 5% N/A

ID	Name	Value
1: Missing Logic		
ST00020	Notice to Proceed	
ST00790	Glass Skylight	
ST00780	Temporary Hoist	
ST00980	Project Turnover	
5: Hard Constraints		
ST00020	Notice to Proceed	Mandatory Start
6: High Float		
ST00890	Piles 1	232d
ST00995	Piles 2	232d
ST01000	Piles 3	232d
8: High Duration		
ST00080	Structural Steel	75d
ST00090	Curtain Wall	70d
ST00100	Elevator	65d
ST00110	MEP Equipment	60d
ST00780	Temporary Hoist	90d
9: Invalid Dates		
ST00020	Notice to Proceed	
ST00120	Foundation Excavation	

Data date: 5:00 PM 5/16/2016

Report Date: 10:00 AM

Page 1 of 4