



# Welkom

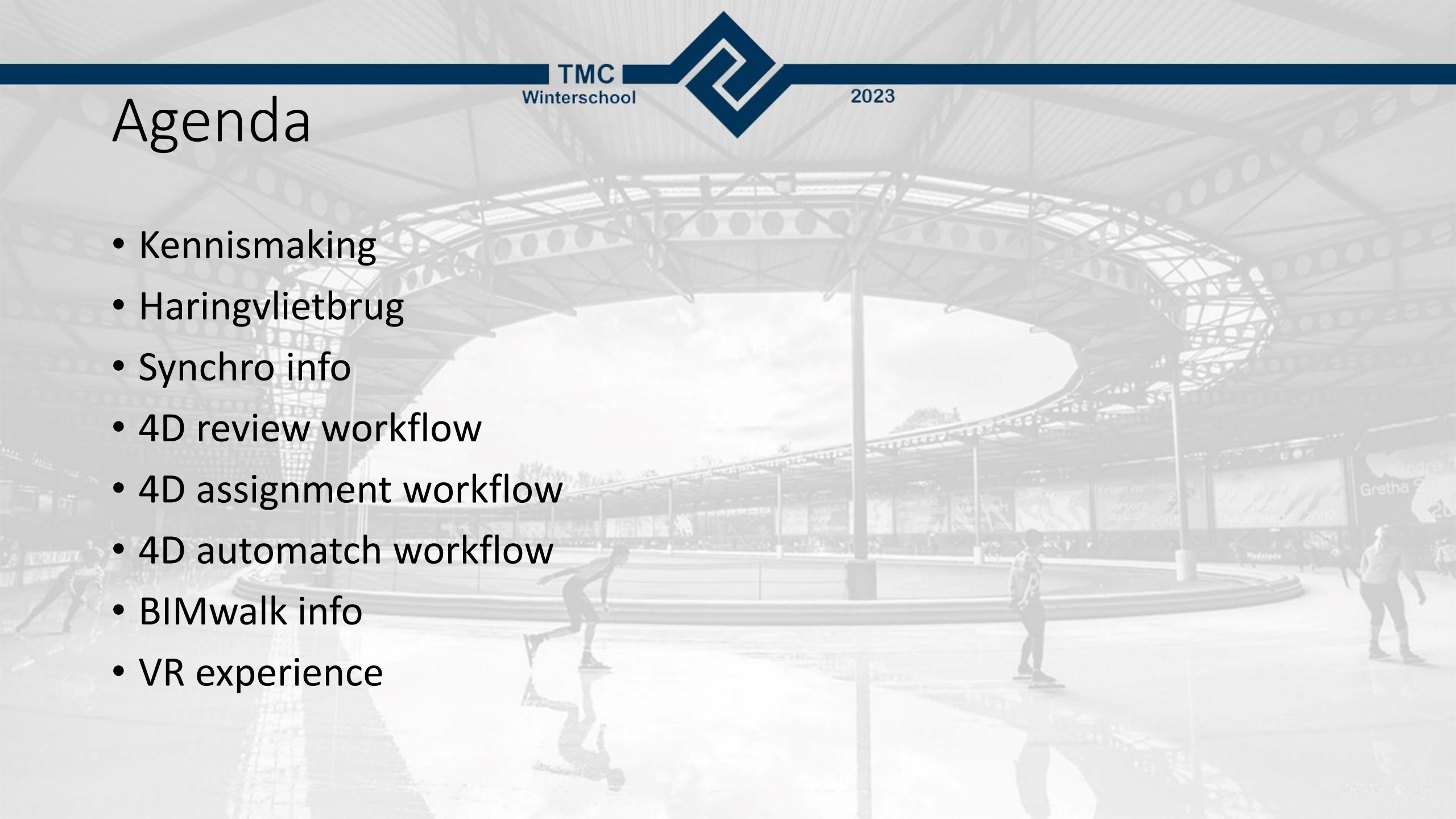
## Synchro





# Agenda

- Kennismaking
- Haringvlietbrug
- Synchro info
- 4D review workflow
- 4D assignment workflow
- 4D automatch workflow
- BIMwalk info
- VR experience





# Kennismaking

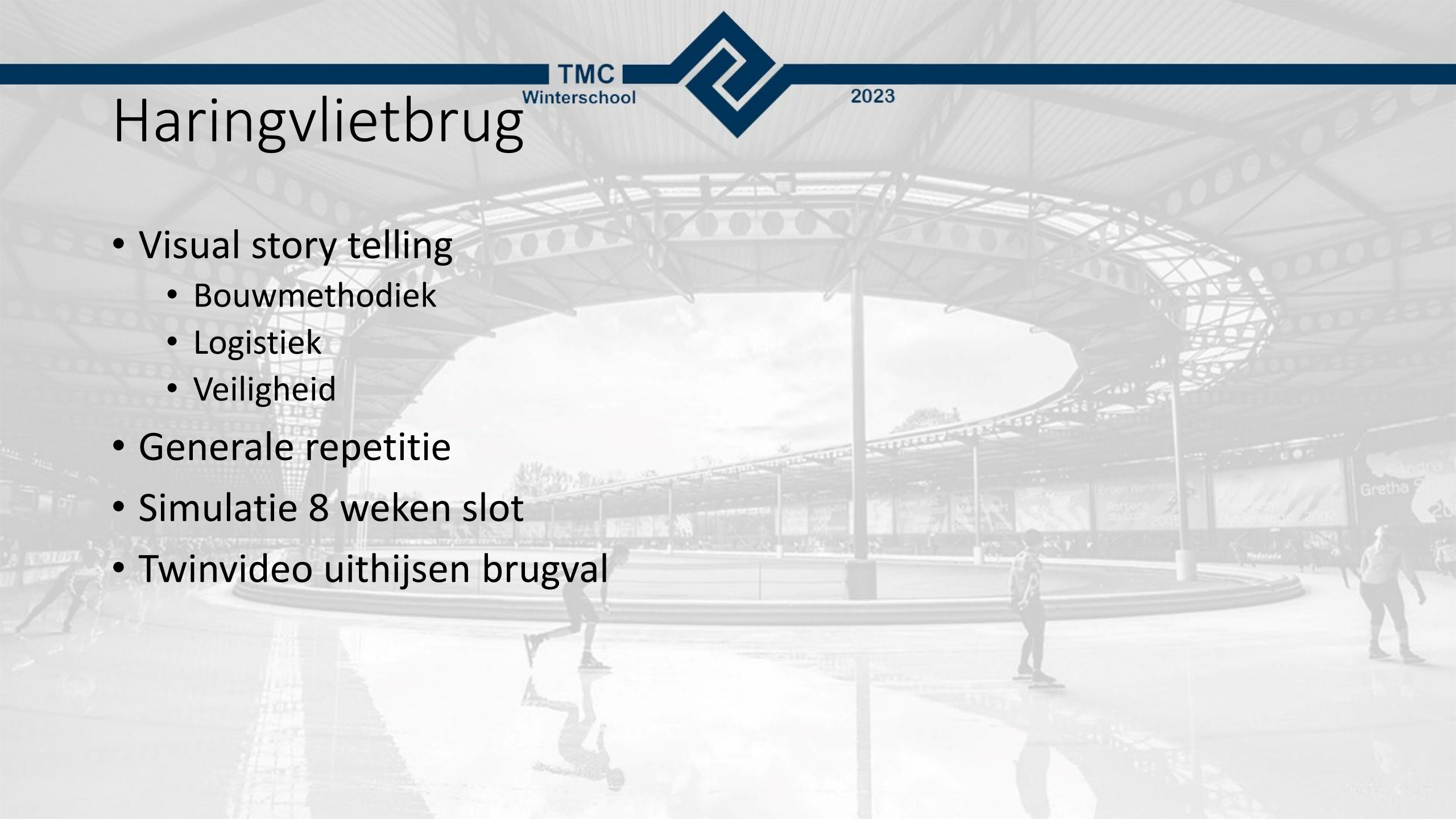
- Guus Zwaans
  - BIM consultant
  - Product specialist
- Cadvisual Benelux b.v.
  - Software
  - Training
  - Implementatie
- 4D/BIM
  - Synchro
  - Bexel
  - BIMwalk
- Bentley
  - Silver partner
  - Training partner





# Haringvlietbrug

- Visual story telling
  - Bouwmethodiek
  - Logistiek
  - Veiligheid
- Generale repetitie
- Simulatie 8 weken slot
- Twinvideo uithijzen brugval



# SYNCHRO applicatie



SYNCHRO.SP(X) 4D file format



## SYNCHRO 4D PRO

*Dé tool om 4D-modellen te maken en bewerken*



## SYNCHRO Scheduler

*Volwaardige CPM planning software*

*Exporteer naar .P6, .PP en .XML of .SPX en importeer in PRO om te koppelen*



## SYNCHRO Open Viewer

*4D-model viewer*

*Bekijk het 4D-model in de viewer in de bouwkeet, deel het met opdrachtgever of andere stakeholders*



## SYNCHRO Pro Plug-in for MicroStation

*exports models directly from MicroStation to .SPX format*



## SYNCHRO Pro Plug-in for Revit

*exports models directly from Autodesk Revit to .SPX format*

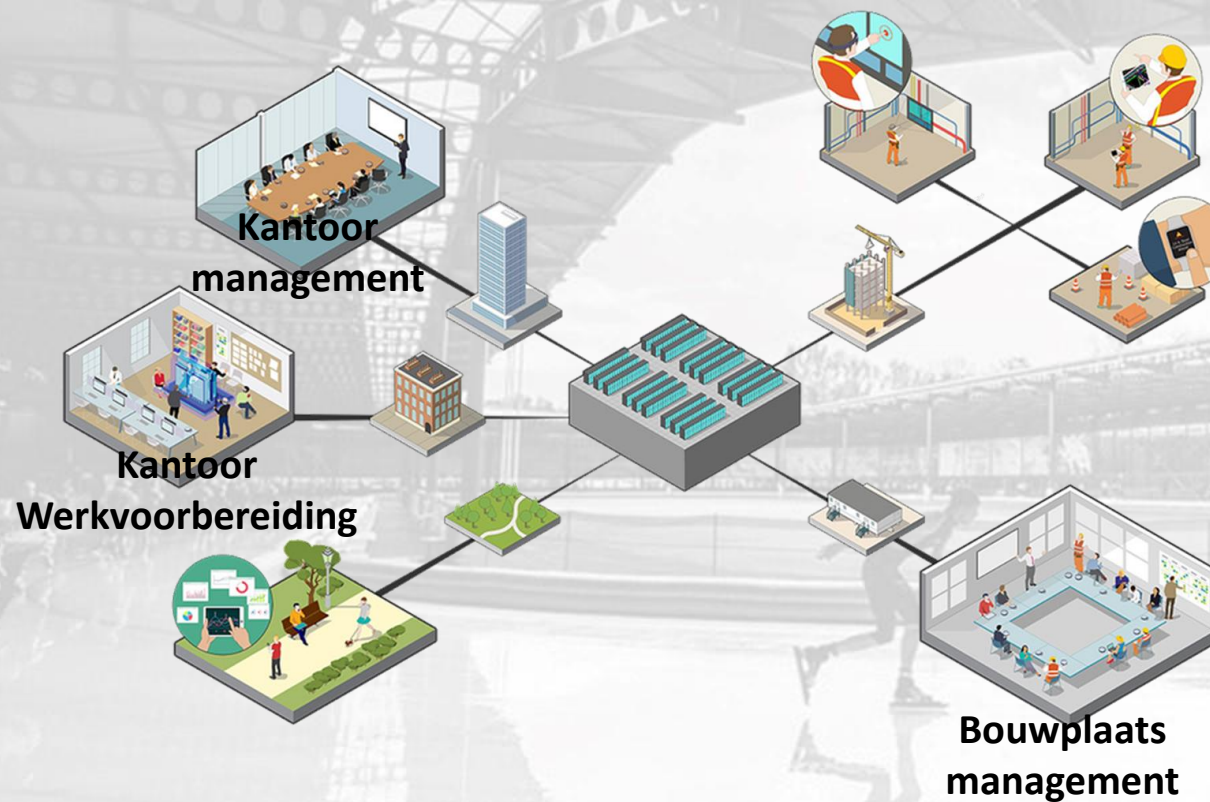


## SYNCHRO Pro Plug-in for Navisworks

*exports models directly from Autodesk Navisworks to .SPX format*



# SYNCHRO files



## SYNCHRO 4D PRO

*Dé tool om 4D-modellen te maken en bewerken*



## SYNCHRO Scheduler

*Volwaardige CPM planning software*

*Exporteer naar .P6, .PP en .XML of .SPX en importeer in PRO om te koppelen*

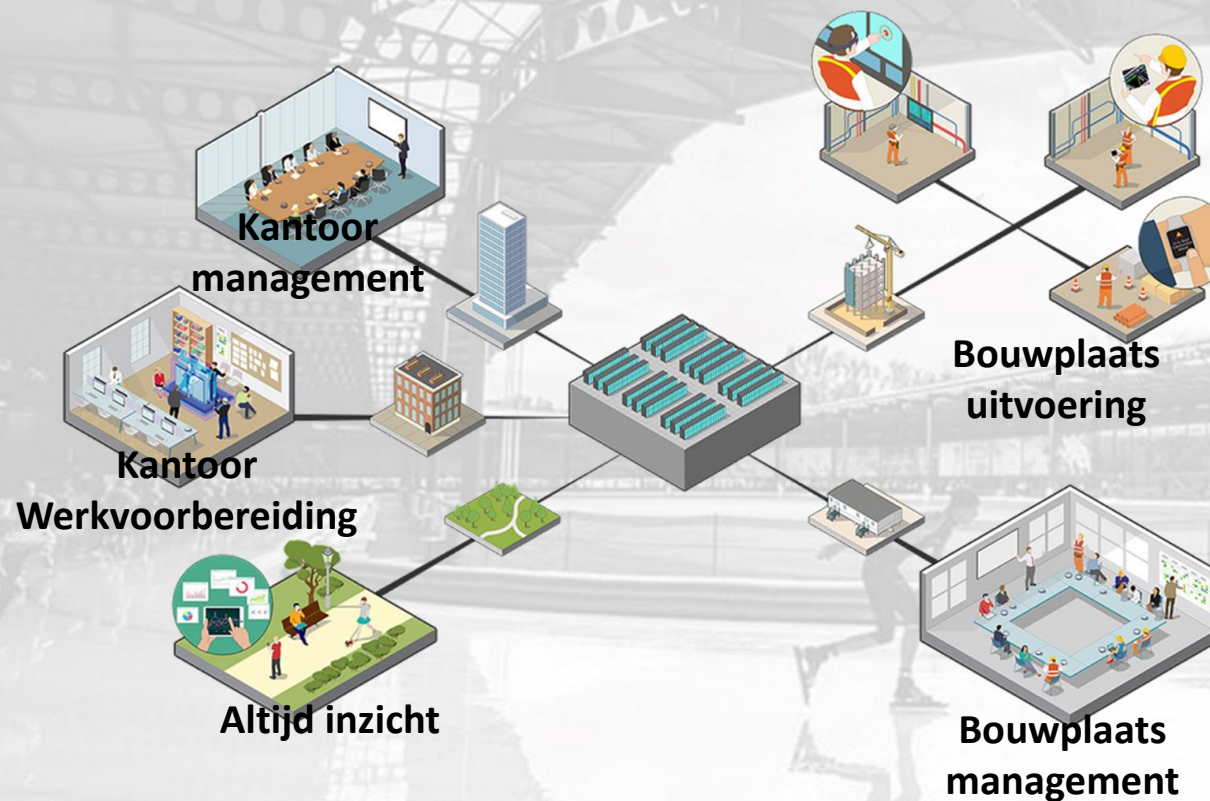


## SYNCHRO Open Viewer

*4D-model viewer*

*Bekijk het 4D-model in de viewer in de bouwkeet, deel het met opdrachtgever of andere stakeholders*

# SYNCHRO platform



## SYNCHRO 4D PRO

*Dé tool om 4D-modellen te maken en bewerken*



## SYNCHRO Scheduler

*Volwaardige CPM planning software  
Exporteer naar .P6, .PP en .XML of .SPX en importeer in PRO om te koppelen*



## SYNCHRO Open Viewer

*4D-model viewer  
Bekijk het 4D-model in de viewer in de bouwkeet, deel het met opdrachtgever of andere stakeholders*



## SYNCHRO iTwinmodel

*Host je 4D project in de cloud en werk realtime samen*



## SYNCHRO Field (app)

*Neem je 4D-model mee naar de bouwplaats voor voortgangsregistratie en kwaliteitsbewaking*



## SYNCHRO Control (web)

*Neem je 4D-model mee naar een presentatie of de bouwplaats, stream het 4D-model op locatie op ware grootte en registreer voortgang en kwaliteit*



## SYNCHRO Connector Power BI (web)

*exports data directly from Synchro to Power BI Synchro4DConnector.mez*





# Synchro

- Planning data
  - MS project
  - Primavera
  - Asta power project
  - Excel
  - Synchro
  - Enz.
- 3D Model data
  - Bentley data
  - Autodesk data
  - Trimble data
  - Nemetech data
  - Buildingsmart data
  - Enz.



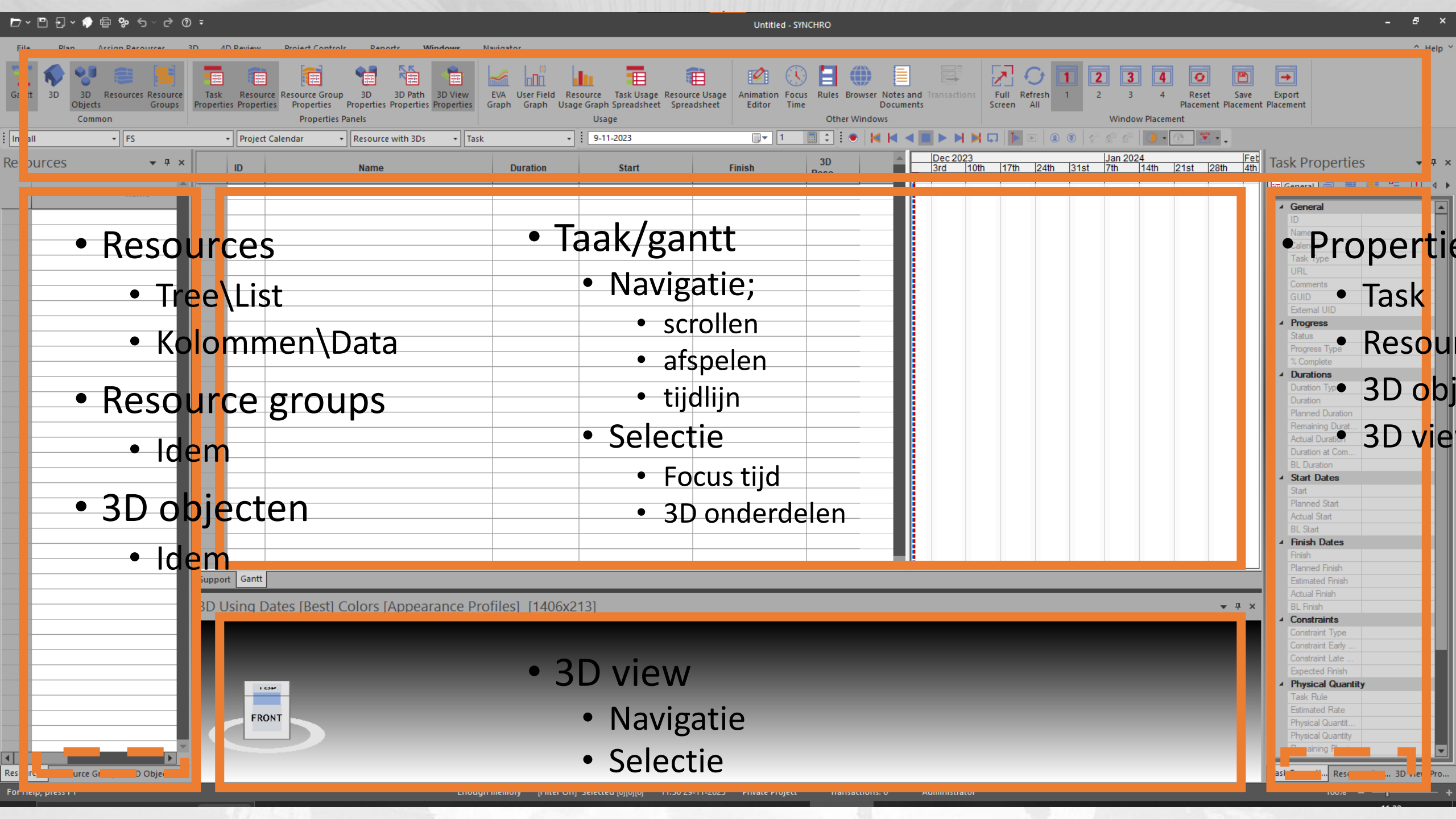
# Synchro interface default

- Resources
  - Tree/List
  - Kolommen/Data
- Resource groups
  - Idem
- 3D objecten
  - Idem

- Taak/gantt
  - Navigatie;
    - scrollen
    - afspelen
    - tijdlijn
  - Selectie
    - Focus tijd
    - 3D onderdelen

- 3D view
  - Navigatie
  - Selectie

- Properties
  - Task
  - Resource
  - 3D object
  - 3D view



- Resources
  - Tree/List
  - Kolommen\Data
- Resource groups
  - Idem
- 3D objecten
  - Idem

- Taak/gantt
  - Navigatie;
    - scrollen
    - afspelen
    - tijdlijn
  - Selectie
    - Focus tijd
    - 3D onderdelen

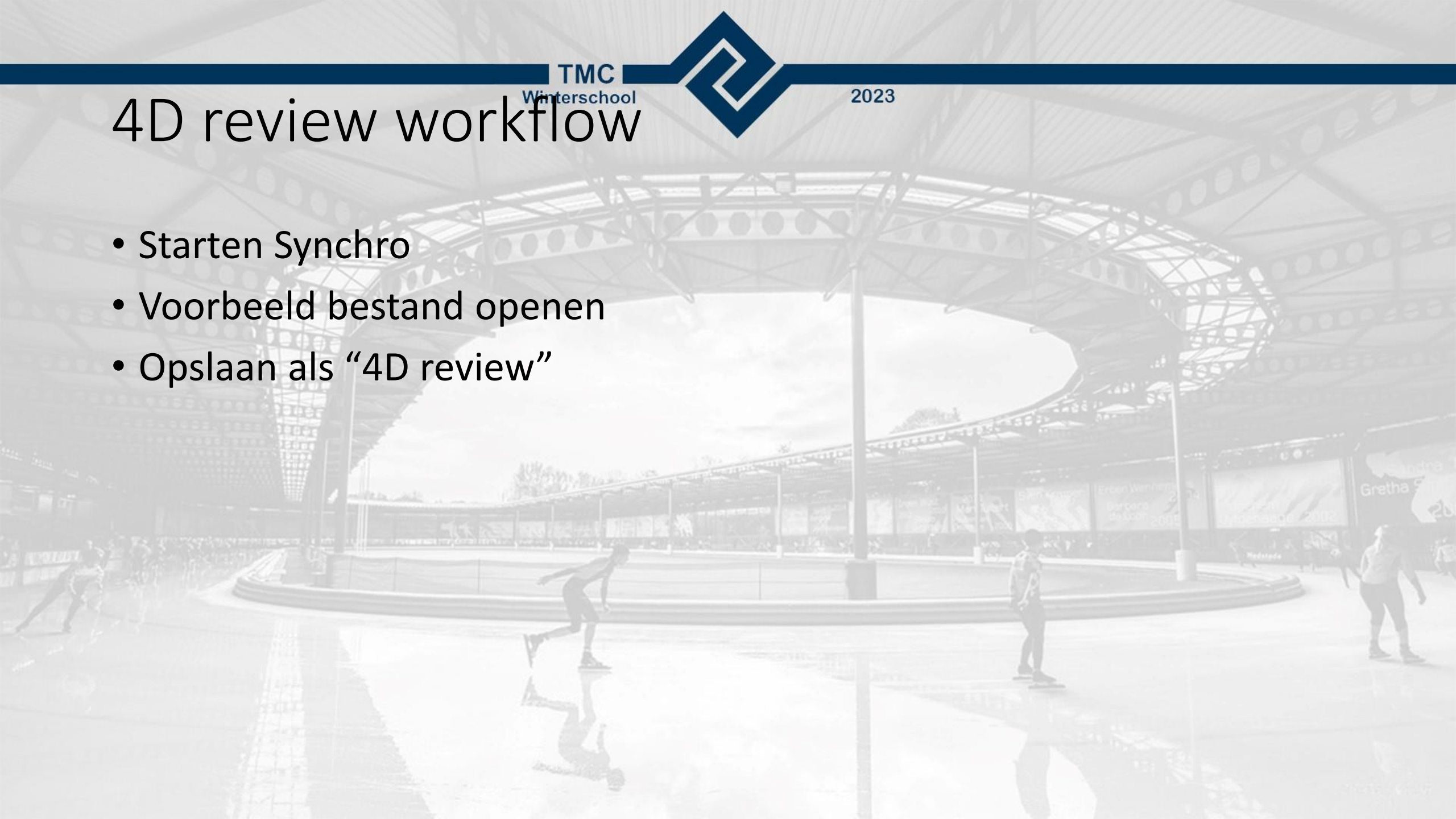
- 3D view
  - Navigatie
  - Selectie

- Properties
  - Task
  - Resource
  - 3D object
  - 3D view



# 4D review workflow

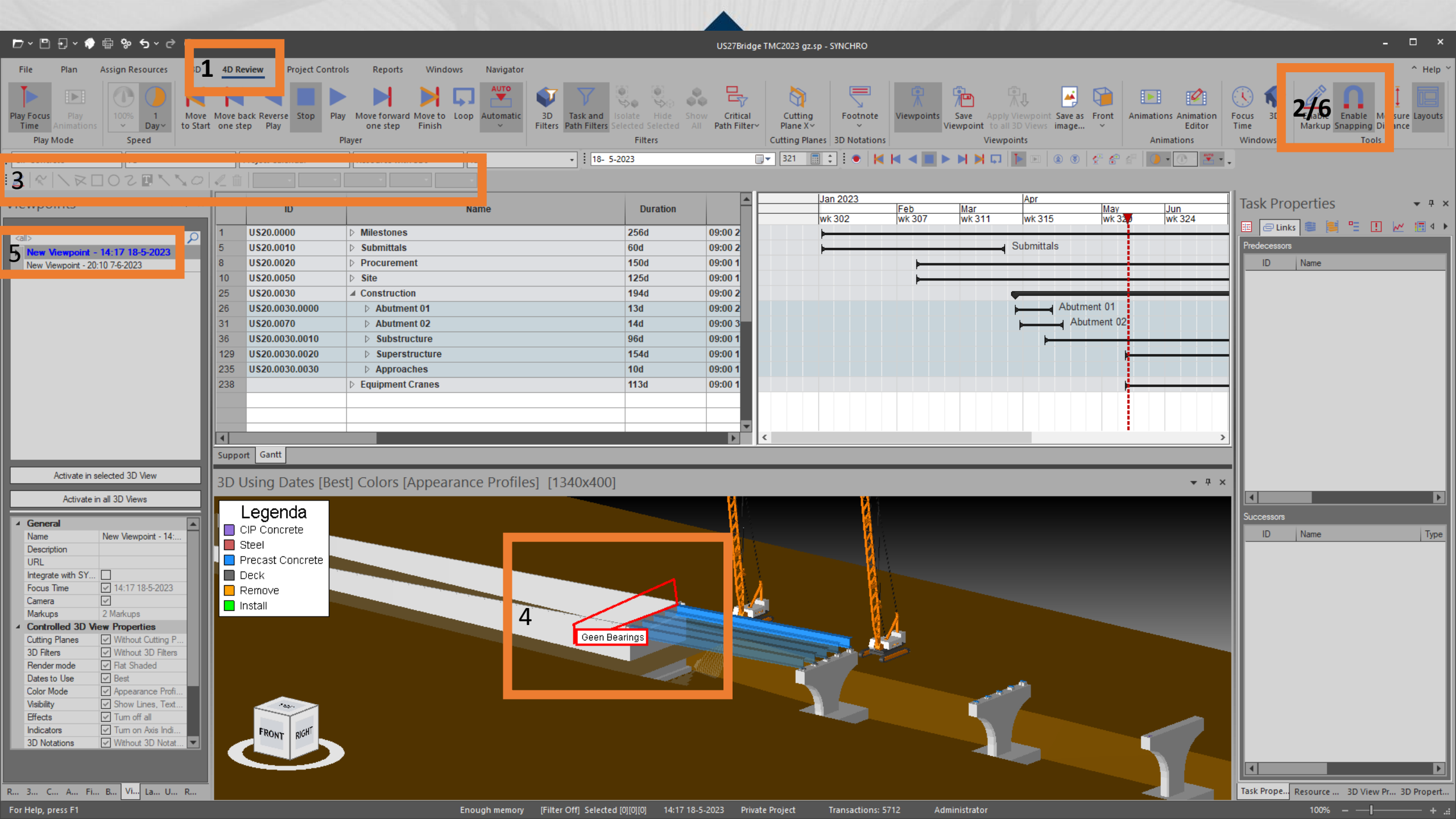
- Starten Synchro
- Voorbeeld bestand openen
- Opslaan als “4D review”



# 4D review workflow

- Ribbon 4D review
  - Onderzoek het 3D model
  - Onderzoek de planning
  - Onderzoek het 4D model
- Enable markup
  - Geef opmerking in tekst
  - Geef opmerking als tekening





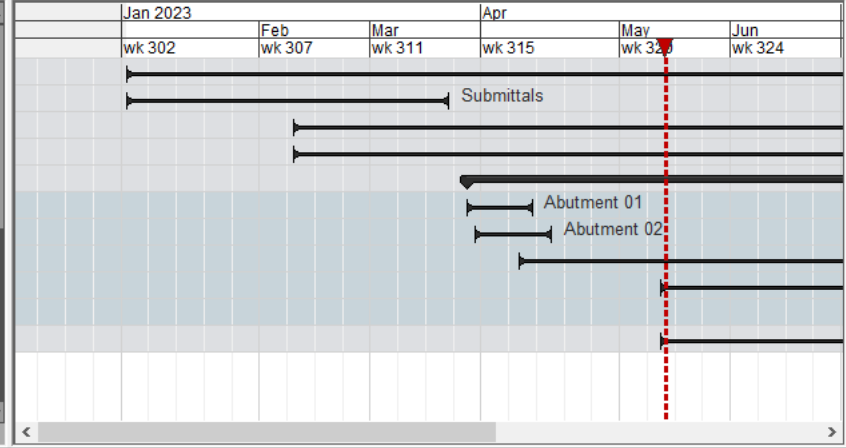
1 4D Review

2/6

3

5 New Viewpoint - 14:17 18-5-2023  
New Viewpoint - 20:10 7-6-2023

ID	Name	Duration	
1	US20.0000	256d	09:00 2
5	US20.0010	60d	09:00 2
8	US20.0020	150d	09:00 1
10	US20.0050	125d	09:00 1
25	US20.0030	194d	09:00 2
26	US20.0030.0000	13d	09:00 2
31	US20.0070	14d	09:00 3
36	US20.0030.0010	96d	09:00 1
129	US20.0030.0020	154d	09:00 1
235	US20.0030.0030	10d	09:00 1
238		113d	09:00 1



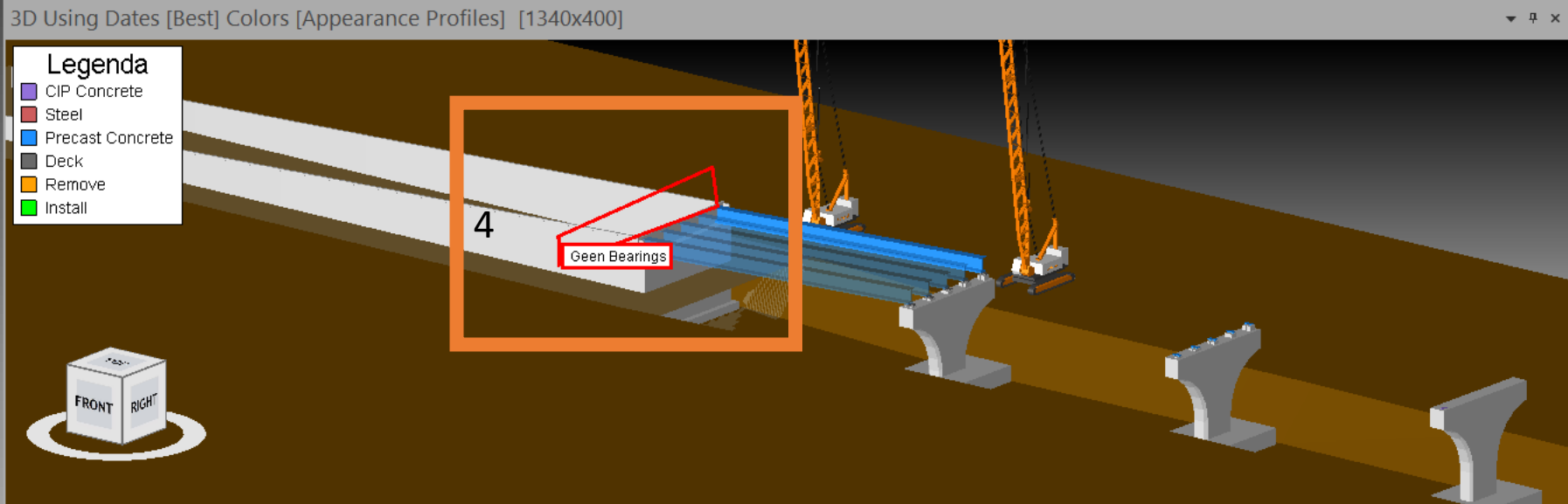
### Task Properties

Predecessors

ID	Name
----	------

Successors

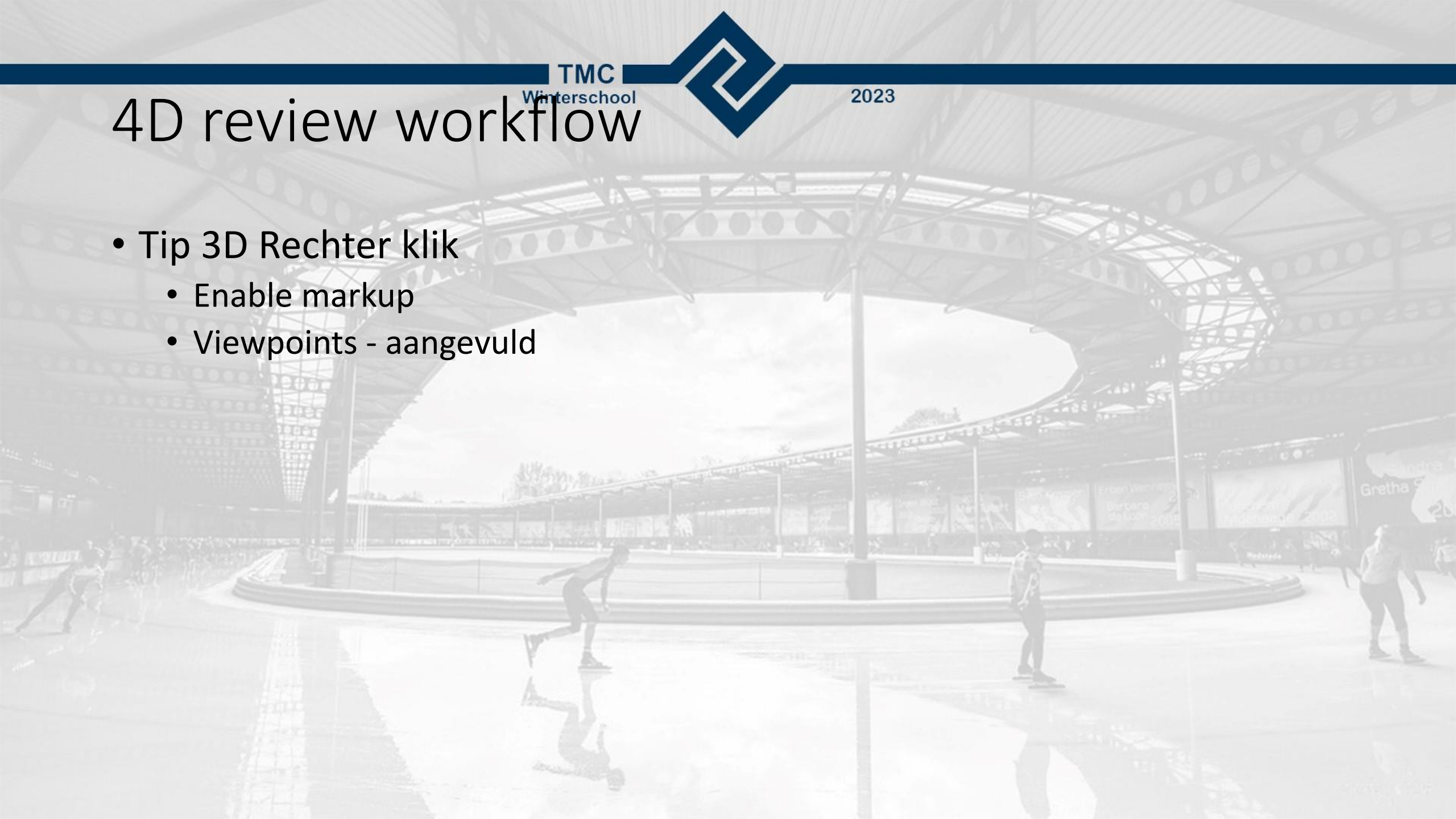
ID	Name	Type
----	------	------





# 4D review workflow

- Tip 3D Rechter klik
  - Enable markup
  - Viewpoints - aangevuld

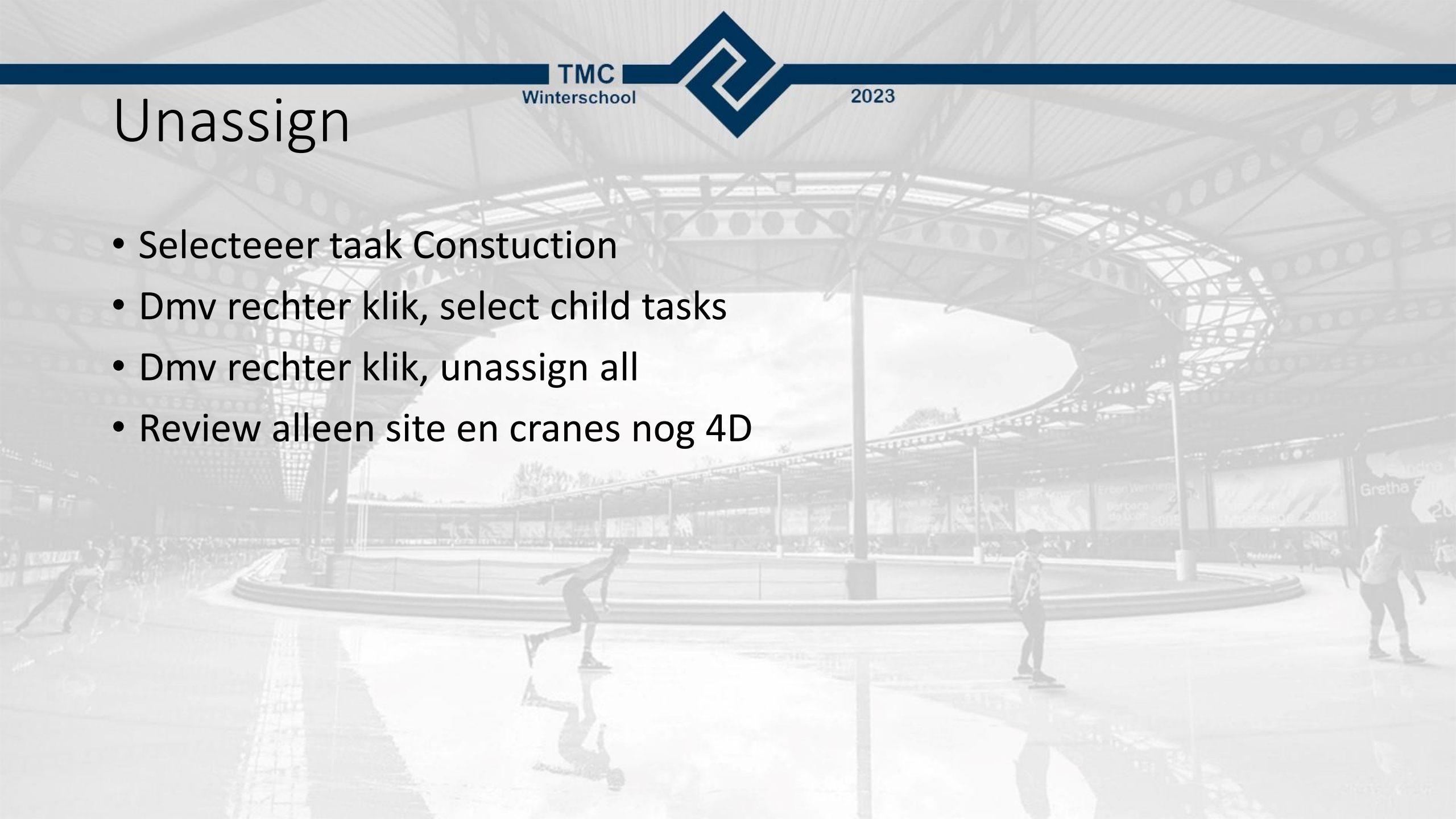






# Unassign

- Selecteer taak Constuction
- Dmv rechter klik, select child tasks
- Dmv rechter klik, unassign all
- Review alleen site en cranes nog 4D



File

Plan

Assign Resources

3D

4D Review

Project Controls

Appearance Profiles Project

Resources to Tasks

Resource Groups to Tasks

Resources to Resource Groups

3D Objects to Resources

Assign Resources Assign

CIP Concrete

FS

Project Calendar

Resources

Resources

-Non3D Resources

Barrier

Bearing Seats

Bearings

Caps

Columns

Cross Frames

Deck

Footings

GirderConcrete

GirderSteel

Hauch

Location Text

Piles

CivillInfo [10007]

CivillInfo [10022]

CivillInfo [10037]

CivillInfo [10052]

CivillInfo [10067]

CivillInfo [10082]

CivillInfo [10097]

CivillInfo [10112]

CivillInfo [10127]

CivillInfo [10142]

CivillInfo [10157]

CivillInfo [10172]

CivillInfo [10187]

CivillInfo [10202]

CivillInfo [10217]

CivillInfo [10232]

CivillInfo [10247]

CivillInfo [10262]

CivillInfo [10277]

CivillInfo [10292]

CivillInfo [10307]

Resources

Resource Groups

3D Objects

Select all child Tasks of all currently selected Tasks

Enough memory

[Filter Off] Selected [1][1][490]

06:05 15-1-2023

Private Project

Transactions: 6025

Administrator

100%

4

Select Assigned Resources

Assign Selected Resource(s) Ctrl+Shift+Alt+A

Unassign All Resources Ctrl+Shift+U

Reset 3D Transformations for All Assigned Resources

Cut Task(s)

Copy Task(s)

Paste Task(s)

Paste As Text

Fill Down

Rename Task

Change Colors

Delete Task(s)

Dissolve Task(s)

Move

Select All

Select Child Task(s)

Focus Time on Task

Clear Contents

Insert New Task

Divide Duration between Children

Progress

Baseline Tasks

Open URL...

Link Tasks

Remove Float

(Re)assign IDs

Filters

Collapse

Expand

Collapse To

Scroll

Find Task...

Find and Replace...

Spell Check

Task Properties Ctrl+]

2

1/3

US27Bridge TMC2023 gz.sp - SYNCHRO

Assign All Resources

Create Task(s)

At root level

Select All

Invert Selection

Deselect All

Zoom All

Selected Objects

Zoom

Isolate Selected

Hide Selected

Show All

Create Filter from Selected

3D Filters

Task and Path Filters

2023

2

Finish

3D Res...

Supplier

Appearance Type

17:00 25-12-...

17:00 24-3-2...

17:00 8-9-20...

17:00 25-12-... (3238)

17:00 14-4-2... (15)

17:00 19-4-2... (15)

17:00 22-8-2... (917)

17:00 18-12-... (2289)

17:00 25-12-... (2)

17:00 4-8-20... (23)

10:00 21-10-... (800)

Concrete Company

Concrete Company

Jan 2023

2nd wk 1

9th wk 2

16th wk 3

23rd wk 4

30th wk 5

6th wk 6

13th wk 7

20th wk 8

27th wk 9

Mar 6th wk 1

Task Properties

General

ID US20.0030

Name Construction

Calendar Project Calendar

Task Type

URL

Comments

GUID E2C26A27-71A2...

External UID

Progress

Status

Progress Type Automatic

% Complete 0.00

Durations

Duration Type

Duration 194d

Planned Duration 194d

Remaining Durat... 194d

Actual Duration

Duration at Com... 194d

BL Duration

Start Dates

Start 09:00 29-3-2023

Planned Start 09:00 29-3-2023

Actual Start

BL Start

Finish Dates

Finish 17:00 25-12-2023

Planned Finish 17:00 25-12-2023

Estimated Finish

Actual Finish

BL Finish

Constraints

Constraint Type

Constraint Early ...

Constraint Late ...

Expected Finish

Physical Quantity

Task Rule

Estimated Rate

Physical Quantit... 0.00

Physical Quantity 0.00

Remaining Physi... 0.00

Legend

CIP Concrete

Steel

Precast Concrete

Deck

Reinforcement

Installation

FRONT



# 4D assignment workflow

- Filter

- Groep Taken
- Groep 3D Objecten

1. Select: Task
2. Select: Appearance profile
3. Select: 3D
4. Assign

- Assign

- Vanuit taak
- Vanuit 3D
- Sneltoets
- 3D Drag n drop (alt+shift)
- Resourcelist

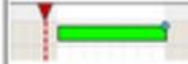



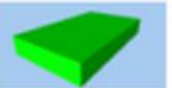
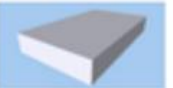
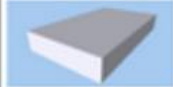
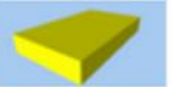
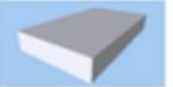



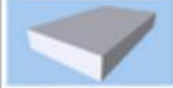
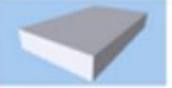
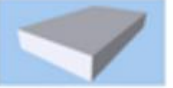
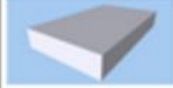
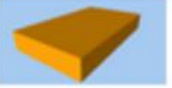
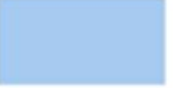

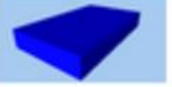

## 7.3 Appearance Profiles

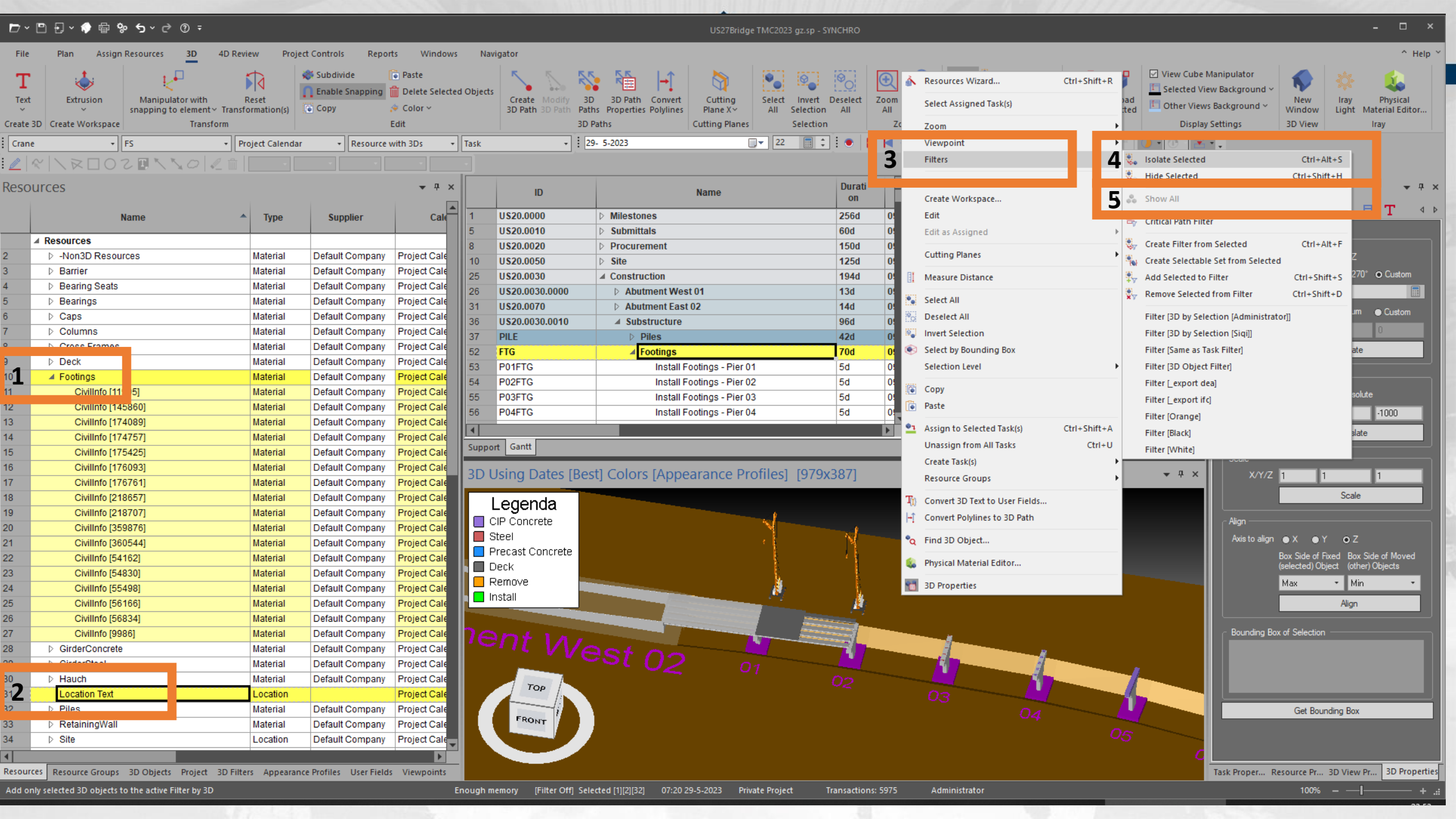
Resource **Appearance Profile** bepaalt:

- Wanneer een Resource zichtbaar is in het 3D Window
- De kleur van de Resource vóór, gedurende én na de taak
- De verschijningsvorm (groeit, transparant, massief)

### 5 System Appearance Profiles:

1. Install
2. Maintain
3. Neutral
4. Temporary
5. Remove

	BEFORE	DURING	AFTER
			
INSTALL	 Start Appearance	 Active Appearance	 End Appearance
MAINTAIN	 Start Appearance	 Active Appearance	 End Appearance
NEUTRAL	 Start Appearance	 Active Appearance	 End Appearance
	 Start Appearance	 Active Appearance	 End Appearance
REMOVE	 Start Appearance	 Active Appearance	 End Appearance
TEMPORARY	 Start Appearance	 Active Appearance	 End Appearance



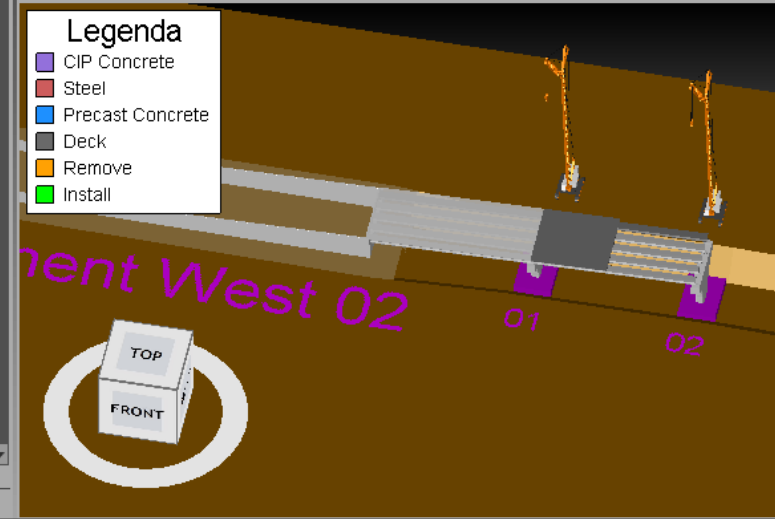
## Resources

	Name	Type	Supplier	Calendar
1	Resources			
2	-Non3D Resources	Material	Default Company	Project Calendar
3	Barrier	Material	Default Company	Project Calendar
4	Bearing Seats	Material	Default Company	Project Calendar
5	Bearings	Material	Default Company	Project Calendar
6	Caps	Material	Default Company	Project Calendar
7	Columns	Material	Default Company	Project Calendar
8	Cross Frames	Material	Default Company	Project Calendar
9	Deck	Material	Default Company	Project Calendar
10	Footings	Material	Default Company	Project Calendar
11	CivInfo [111 5]	Material	Default Company	Project Calendar
12	CivInfo [145860]	Material	Default Company	Project Calendar
13	CivInfo [174089]	Material	Default Company	Project Calendar
14	CivInfo [174757]	Material	Default Company	Project Calendar
15	CivInfo [175425]	Material	Default Company	Project Calendar
16	CivInfo [176093]	Material	Default Company	Project Calendar
17	CivInfo [176761]	Material	Default Company	Project Calendar
18	CivInfo [218657]	Material	Default Company	Project Calendar
19	CivInfo [218707]	Material	Default Company	Project Calendar
20	CivInfo [359876]	Material	Default Company	Project Calendar
21	CivInfo [360544]	Material	Default Company	Project Calendar
22	CivInfo [54162]	Material	Default Company	Project Calendar
23	CivInfo [54830]	Material	Default Company	Project Calendar
24	CivInfo [55498]	Material	Default Company	Project Calendar
25	CivInfo [56166]	Material	Default Company	Project Calendar
26	CivInfo [56834]	Material	Default Company	Project Calendar
27	CivInfo [9986]	Material	Default Company	Project Calendar
28	GirderConcrete	Material	Default Company	Project Calendar
29	GirderSteel	Material	Default Company	Project Calendar
30	Hauch	Material	Default Company	Project Calendar
31	Location Text	Location	Default Company	Project Calendar
32	Piles	Material	Default Company	Project Calendar
33	RetainingWall	Material	Default Company	Project Calendar
34	Site	Location	Default Company	Project Calendar

	ID	Name	Duration	Other
1	US20.0000	Milestones	256d	0%
5	US20.0010	Submittals	60d	0%
8	US20.0020	Procurement	150d	0%
10	US20.0050	Site	125d	0%
25	US20.0030	Construction	194d	0%
26	US20.0030.0000	Abutment West 01	13d	0%
31	US20.0070	Abutment East 02	14d	0%
36	US20.0030.0010	Substructure	96d	0%
37	PILE	Piles	42d	0%
52	FTG	Footings	70d	0%
53	P01FTG	Install Footings - Pier 01	5d	0%
54	P02FTG	Install Footings - Pier 02	5d	0%
55	P03FTG	Install Footings - Pier 03	5d	0%
56	P04FTG	Install Footings - Pier 04	5d	0%

Support Gantt

3D Using Dates [Best] Colors [Appearance Profiles] [979x387]



- Resources Wizard... Ctrl+Shift+R
- Select Assigned Task(s)
- Zoom
- Viewpoint
- Filters
- Create Workspace...
- Edit
- Edit as Assigned
- Cutting Planes
- Measure Distance
- Select All
- Deselect All
- Invert Selection
- Select by Bounding Box
- Selection Level
- Copy
- Paste
- Assign to Selected Task(s) Ctrl+Shift+A
- Unassign from All Tasks Ctrl+U
- Create Task(s)
- Resource Groups
- Convert 3D Text to User Fields...
- Convert Polylines to 3D Path
- Find 3D Object...
- Physical Material Editor...
- 3D Properties

- View Cube Manipulator
- Selected View Background
- Other Views Background
- Display Settings
- Isolate Selected Ctrl+Alt+S
- Hide Selected Ctrl+Shift+H
- Show All
- Critical Path Filter
- Create Filter from Selected Ctrl+Alt+F
- Create Selectable Set from Selected
- Add Selected to Filter Ctrl+Shift+S
- Remove Selected from Filter Ctrl+Shift+D
- Filter [3D by Selection [Administrator]]
- Filter [3D by Selection [Sqi]]
- Filter [Same as Task Filter]
- Filter [3D Object Filter]
- Filter [export dea]
- Filter [export ifc]
- Filter [Orange]
- Filter [Black]
- Filter [White]

X/Y/Z 1 1 1

Scale

Align

Axis to align X Y Z

Box Side of Fixed (selected) Object

Box Side of Moved (other) Objects

Max Min

Align

Bounding Box of Selection

Get Bounding Box

Resources Resource Groups 3D Objects Project 3D Filters Appearance Profiles User Fields Viewpoints

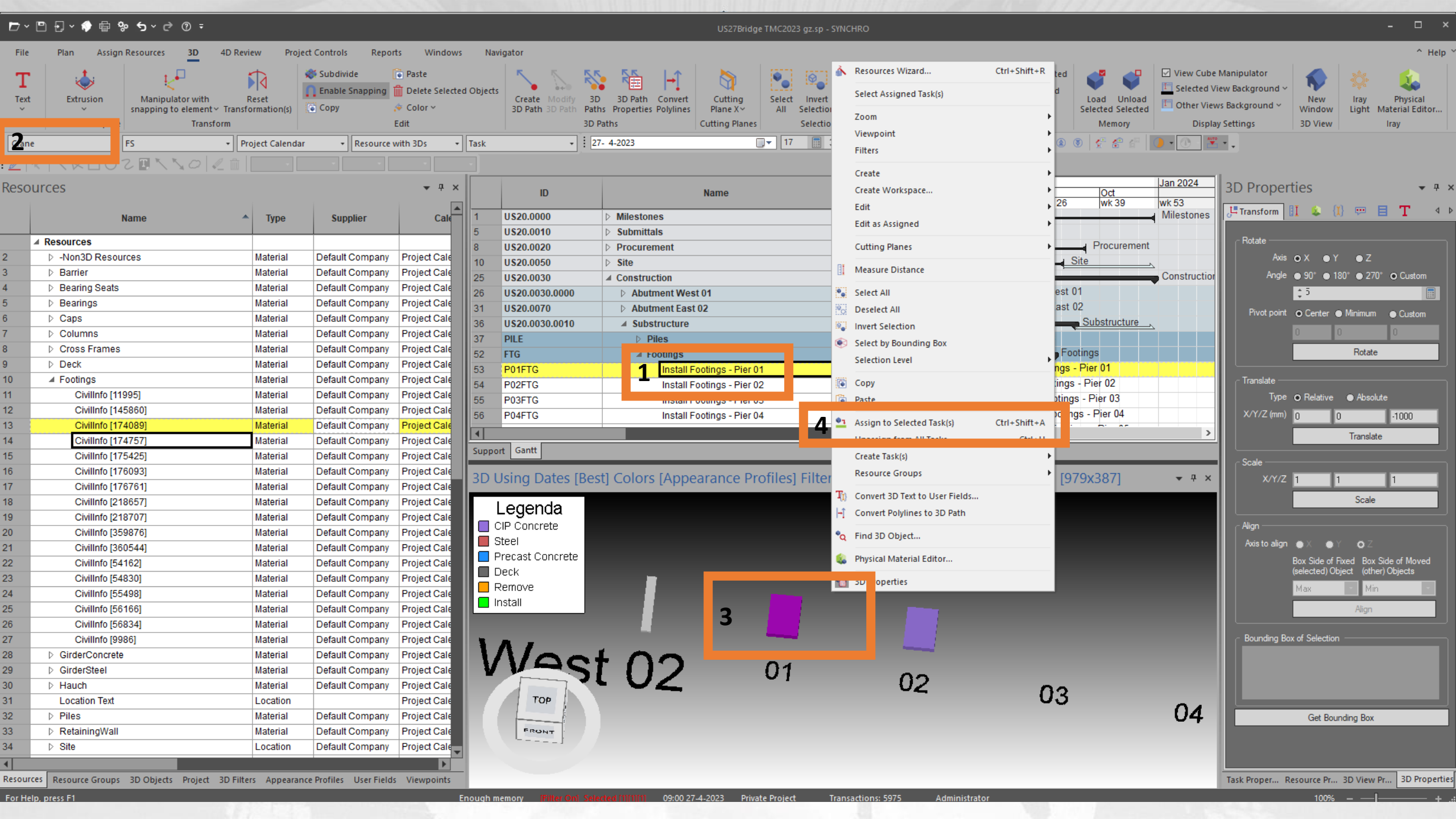
Add only selected 3D objects to the active Filter by 3D

Enough memory [Filter Off] Selected [1][2][32] 07:20 29-5-2023 Private Project Transactions: 5975 Administrator

Task Proper... Resource Pr... 3D View Pr... 3D Properties

100% - +





Text Extrusion Manipulator with snapping to element Transform Reset Transformation(s) Copy Subdivide Paste Delete Selected Objects Color Edit Create Modify 3D Path 3D Paths 3D Path Properties Polyline Cutting Plane X Select All Invert Selection

Plane FS Project Calendar Resource with 3Ds Task 27- 4-2023 17

Resources

Name	Type	Supplier	Calendar
Resources			
-Non3D Resources	Material	Default Company	Project Calendar
Barrier	Material	Default Company	Project Calendar
Bearing Seats	Material	Default Company	Project Calendar
Bearings	Material	Default Company	Project Calendar
Caps	Material	Default Company	Project Calendar
Columns	Material	Default Company	Project Calendar
Cross Frames	Material	Default Company	Project Calendar
Deck	Material	Default Company	Project Calendar
Footings	Material	Default Company	Project Calendar
CivilInfo [11995]	Material	Default Company	Project Calendar
CivilInfo [145860]	Material	Default Company	Project Calendar
CivilInfo [174089]	Material	Default Company	Project Calendar
CivilInfo [174757]	Material	Default Company	Project Calendar
CivilInfo [175425]	Material	Default Company	Project Calendar
CivilInfo [176093]	Material	Default Company	Project Calendar
CivilInfo [176761]	Material	Default Company	Project Calendar
CivilInfo [218657]	Material	Default Company	Project Calendar
CivilInfo [218707]	Material	Default Company	Project Calendar
CivilInfo [359876]	Material	Default Company	Project Calendar
CivilInfo [360544]	Material	Default Company	Project Calendar
CivilInfo [54162]	Material	Default Company	Project Calendar
CivilInfo [54830]	Material	Default Company	Project Calendar
CivilInfo [55498]	Material	Default Company	Project Calendar
CivilInfo [56166]	Material	Default Company	Project Calendar
CivilInfo [56834]	Material	Default Company	Project Calendar
CivilInfo [9986]	Material	Default Company	Project Calendar
GirderConcrete	Material	Default Company	Project Calendar
GirderSteel	Material	Default Company	Project Calendar
Hauch	Material	Default Company	Project Calendar
Location Text	Location	Default Company	Project Calendar
Piles	Material	Default Company	Project Calendar
RetainingWall	Material	Default Company	Project Calendar
Site	Location	Default Company	Project Calendar

ID	Name
1	US20.0000 Milestones
5	US20.0010 Submittals
8	US20.0020 Procurement
10	US20.0050 Site
25	US20.0030 Construction
26	US20.0030.0000 Abutment West 01
31	US20.0070 Abutment East 02
36	US20.0030.0010 Substructure
37	PILE Piles
52	FTG Footings
53	P01FTG 1 Install Footings - Pier 01
54	P02FTG Install Footings - Pier 02
55	P03FTG Install Footings - Pier 03
56	P04FTG Install Footings - Pier 04

Support Gantt

3D Using Dates [Best] Colors [Appearance Profiles] Filter

Legenda

- CIP Concrete
- Steel
- Precast Concrete
- Deck
- Remove
- Install



Resources Wizard... Ctrl+Shift+R

- Select Assigned Task(s)
- Zoom
- Viewpoint
- Filters
- Create
  - Create Workspace...
- Edit
- Edit as Assigned
- Cutting Planes
- Measure Distance
- Select All
- Deselect All
- Invert Selection
- Select by Bounding Box
- Selection Level
- Copy
- Paste
- Assign to Selected Task(s) Ctrl+Shift+A
- Unassign from All Tasks Ctrl+Shift+U
- Create Task(s)
- Resource Groups
- Convert 3D Text to User Fields...
- Convert Polyline to 3D Path
- Find 3D Object...
- Physical Material Editor...
- 3D Properties

Load Selected Memory Unload Selected Memory View Cube Manipulator Selected View Background Other Views Background Display Settings New Window 3D View Iray Light Iray Physical Material Editor...

3D Properties

Transform Rotate Translate Scale Align Bounding Box of Selection

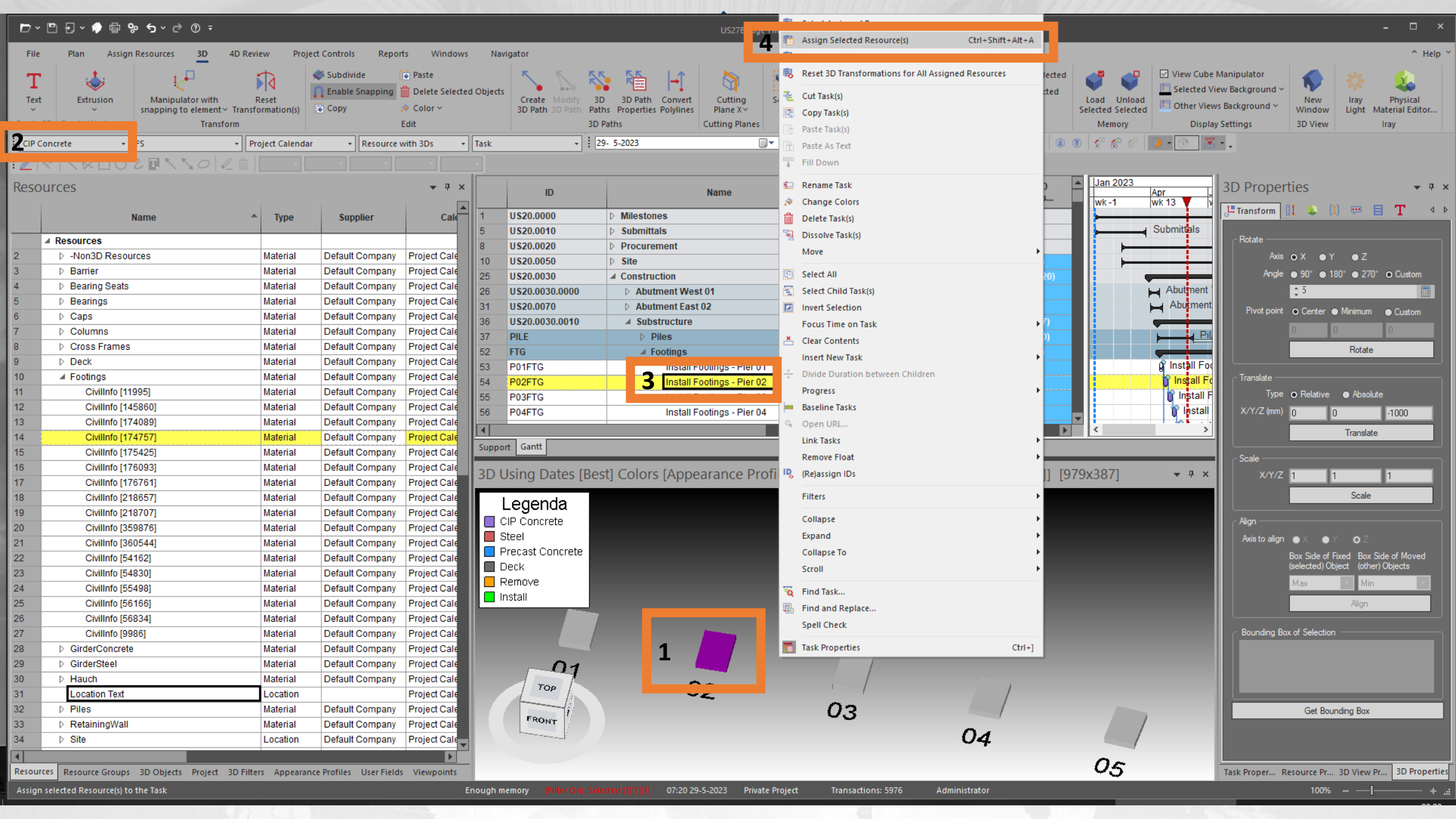
Rotate: Axis X Y Z Angle 90° 180° 270° Custom 5 Pivot point Center Minimum Custom 0 0 0 Rotate

Translate: Type Relative Absolute X/Y/Z (mm) 0 0 -1000 Translate

Scale: X/Y/Z 1 1 1 Scale

Align: Axis to align X Y Z Box Side of Fixed (selected) Object Box Side of Moved (other) Objects Max Min Align

Bounding Box of Selection: Get Bounding Box



2 CIP Concrete

4 Assign Selected Resource(s) Ctrl+Shift+Alt+A

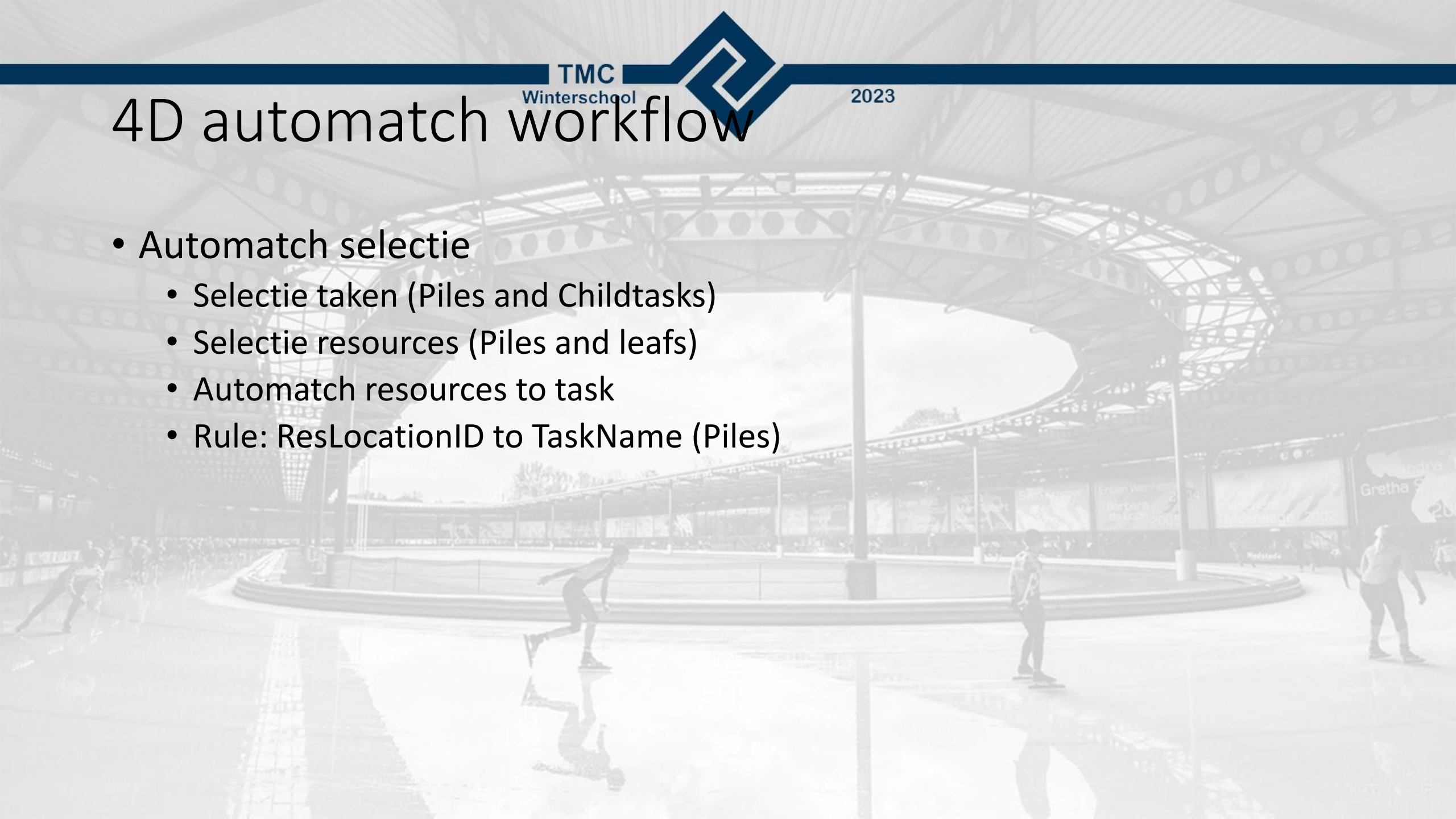
3 Install Footings - Pier 02

Legenda  
CIP Concrete  
Steel  
Precast Concrete  
Deck  
Remove  
Install

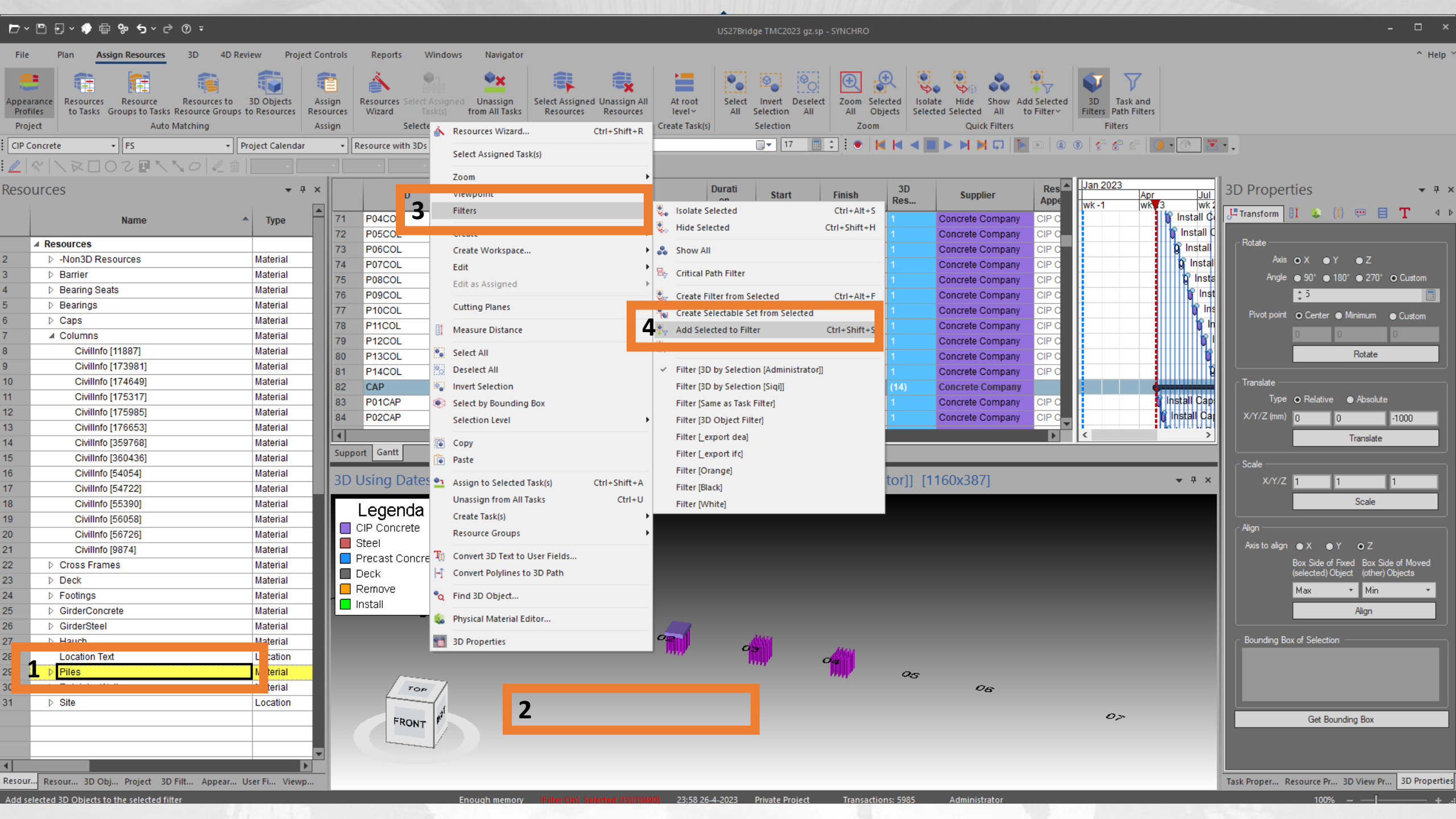


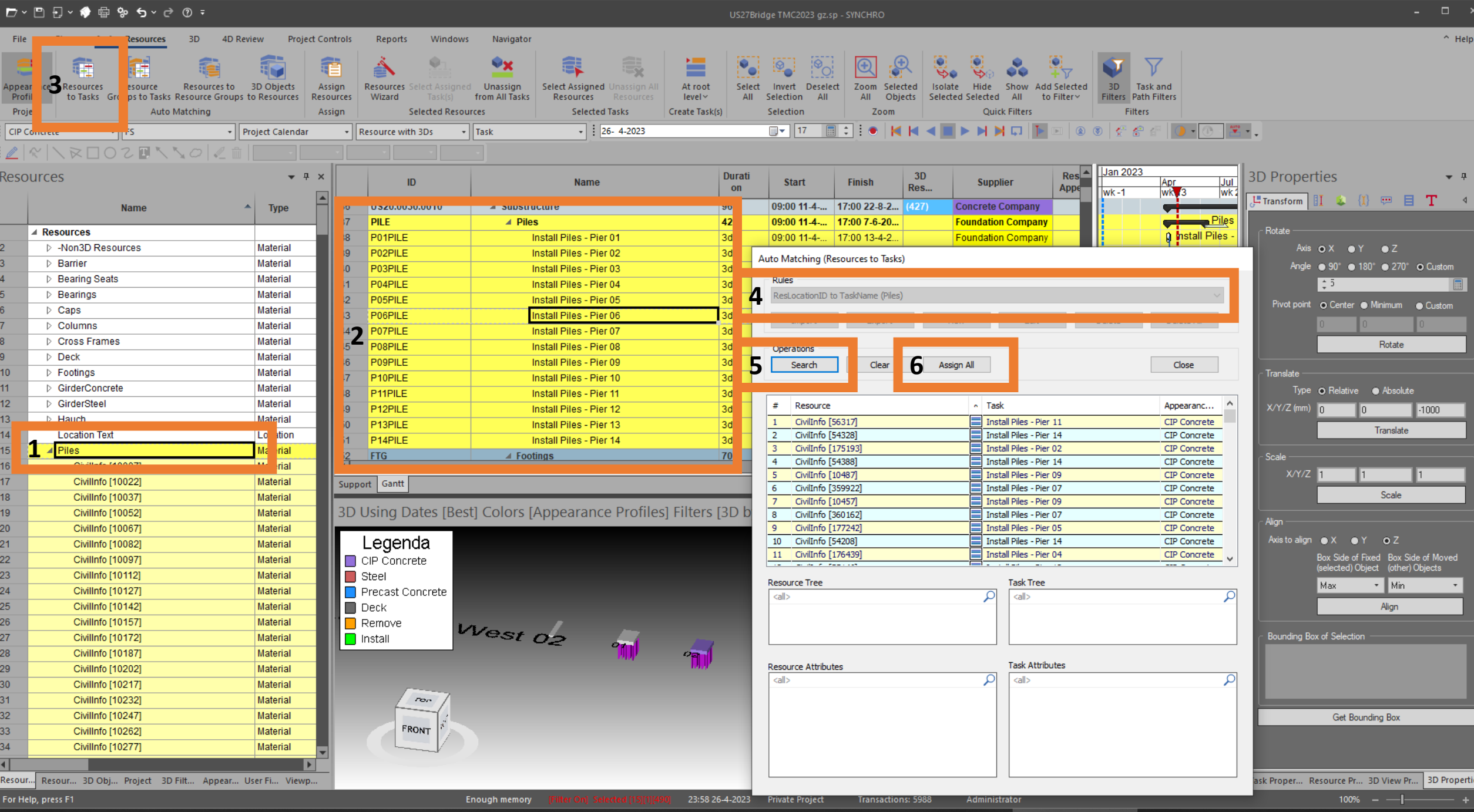
# 4D automatch workflow

- Automatch selectie
  - Selectie taken (Piles and Childtasks)
  - Selectie resources (Piles and leafs)
  - Automatch resources to task
  - Rule: ResLocationID to TaskName (Piles)





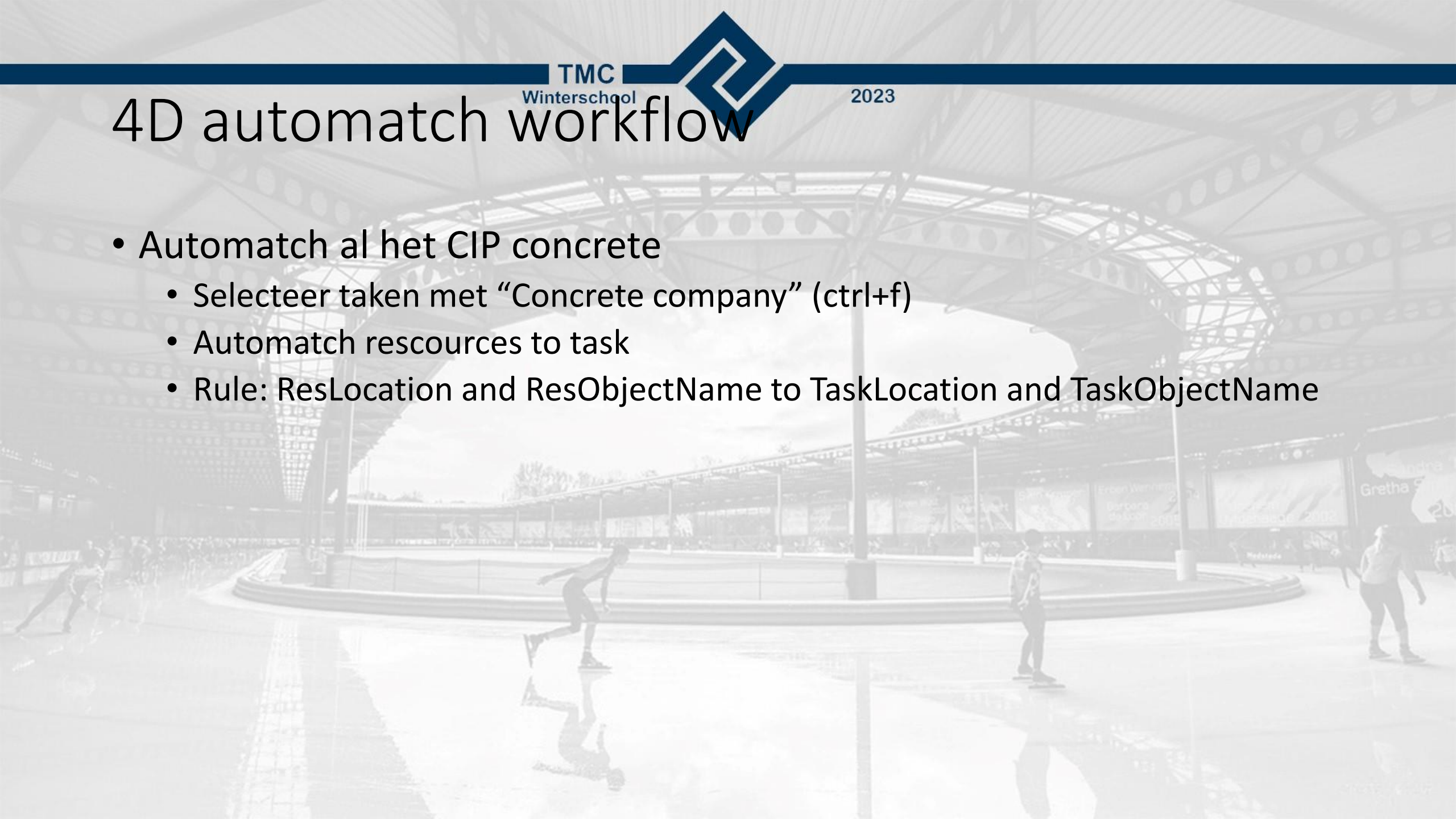






# 4D automatch workflow

- Automatch al het CIP concrete
  - Selecteer taken met “Concrete company” (ctrl+f)
  - Automatch resources to task
  - Rule: ResLocation and ResObjectName to TaskLocation and TaskObjectName







# BIMwalk beta

- BIMwalk
  - BIM toegankelijk voor iedereen
  - Intuïtief en makkelijk
  - Bouw, Infra, GWW
  - Ontwerp, Realisatie en Beheer
- VR/desktop/AR
- Ifc bim models
- Online model acces
- 3D/4D





# BIMwalk experience

- StandAlone Model
  - Headset/controllers
  - Polsmenu/schieten
  - Modellen
    - Bridge
    - Amazones
    - Charley



# BIMwalk experience

- Scale
  - 1:1
  - 1:1000
- Telport
  - to model
  - to active plane
- Time
  - Jaar, maand, uur, min (daglicht)
- 4D
  - Enable
  - Afspelsnelheid
  - Afspelen/pause
  - Reset en Afspelen