

Dynamo für Civil 3D

Das Multitool in Infrastrukturprojekten

Frederic Classon

Technical Sales Specialist

Autodesk



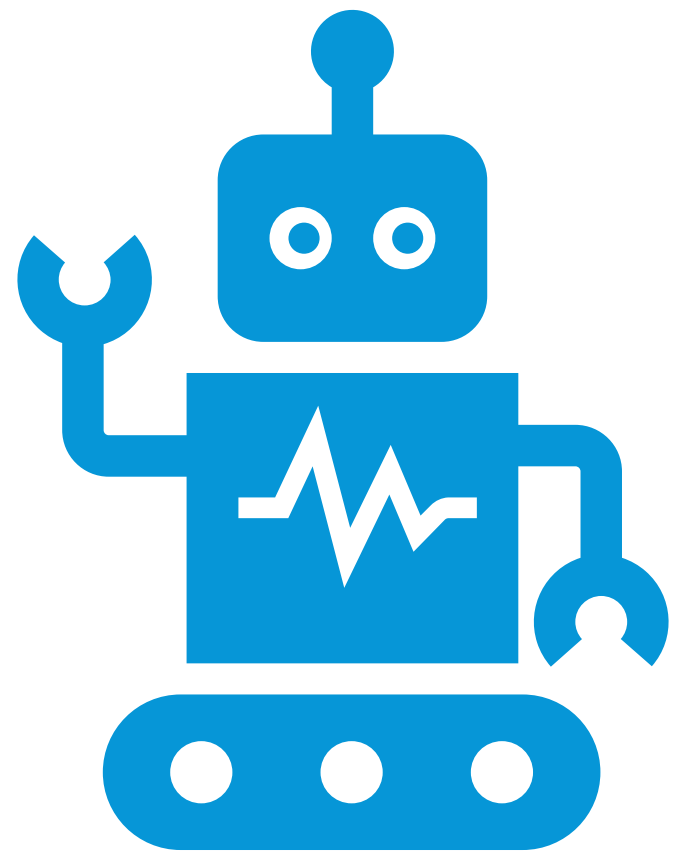
Frederic Classon
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  FredericClasson



Was ist drin für Sie?



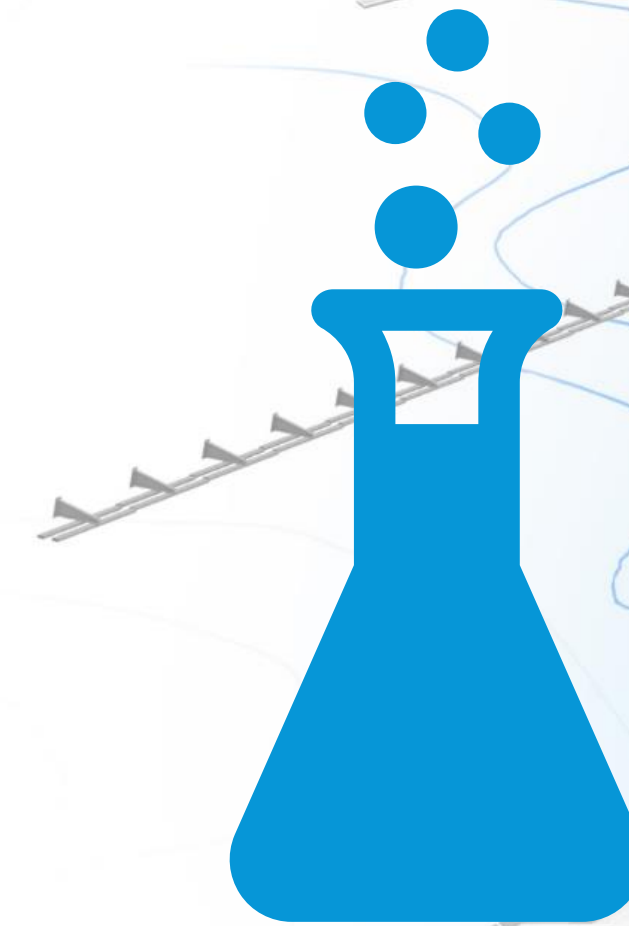
**Arbeitsschritte
automatisieren**



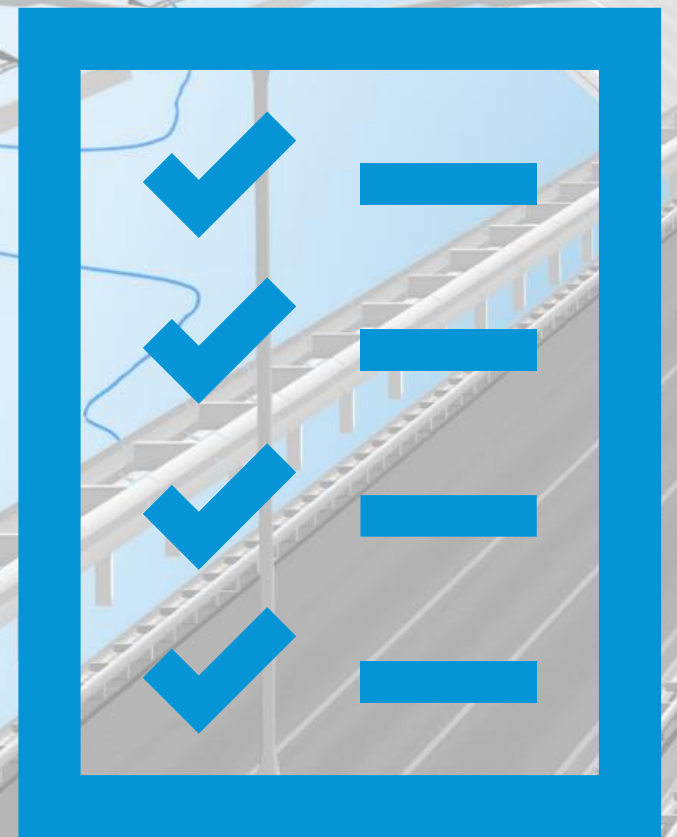
**Workflows
optimieren**



**Arbeitsstunden
reduzieren**



**Workflows
erfinden**



**Vollständigkeit
garantieren**

Dynamo

Übersicht

- Open Source
- Visuelle Programmierung
- Logische Routinen

 **AUTODESK®
REVIT®**
ab Version 2016

 **AUTODESK®
CIVIL 3D®**
ab Version 2020

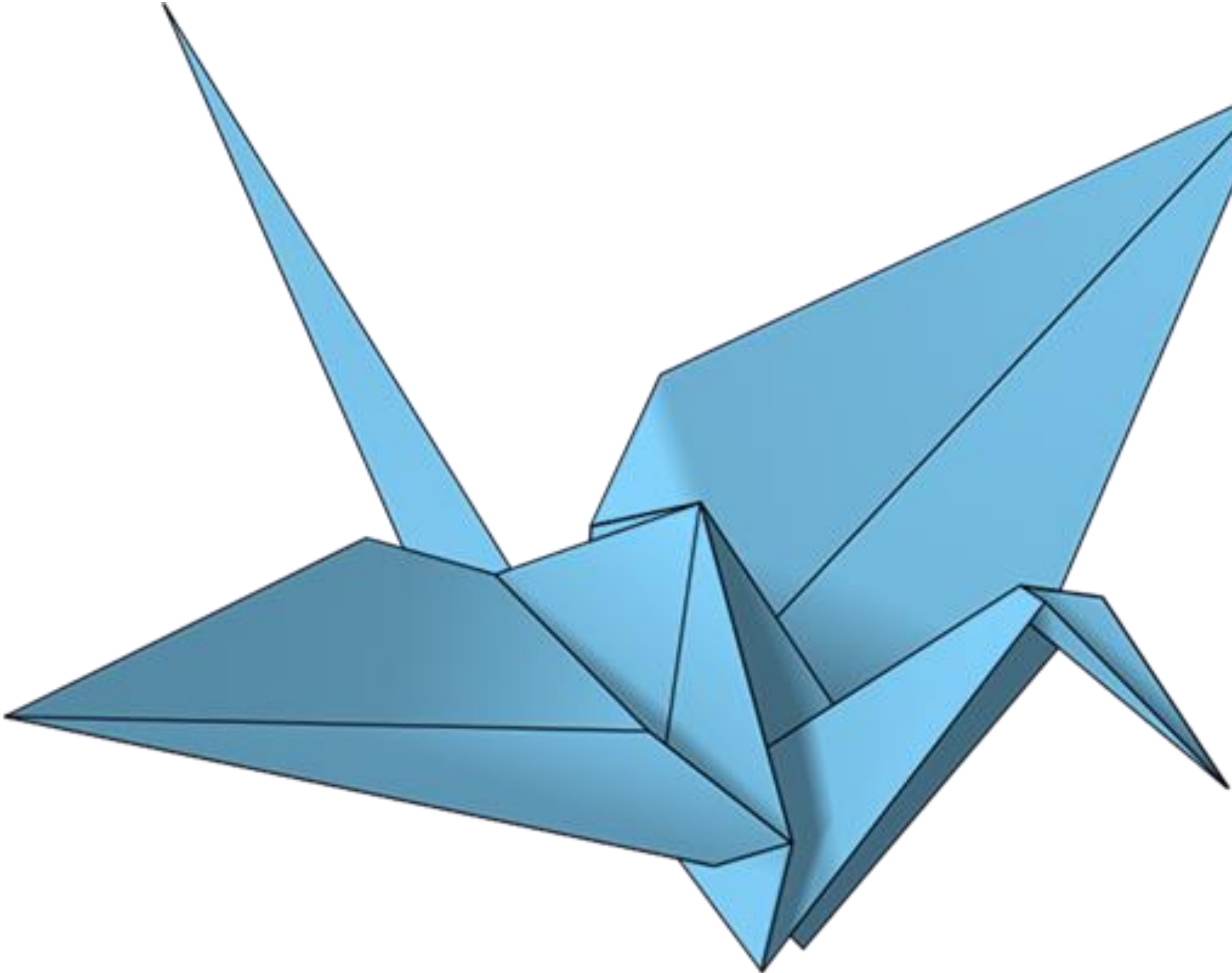
 **AUTODESK®
ADVANCE STEEL**
ab Version 2017 R2

 **AUTODESK®
FORMIT®**



Dynamo

Visuelle Programmierung

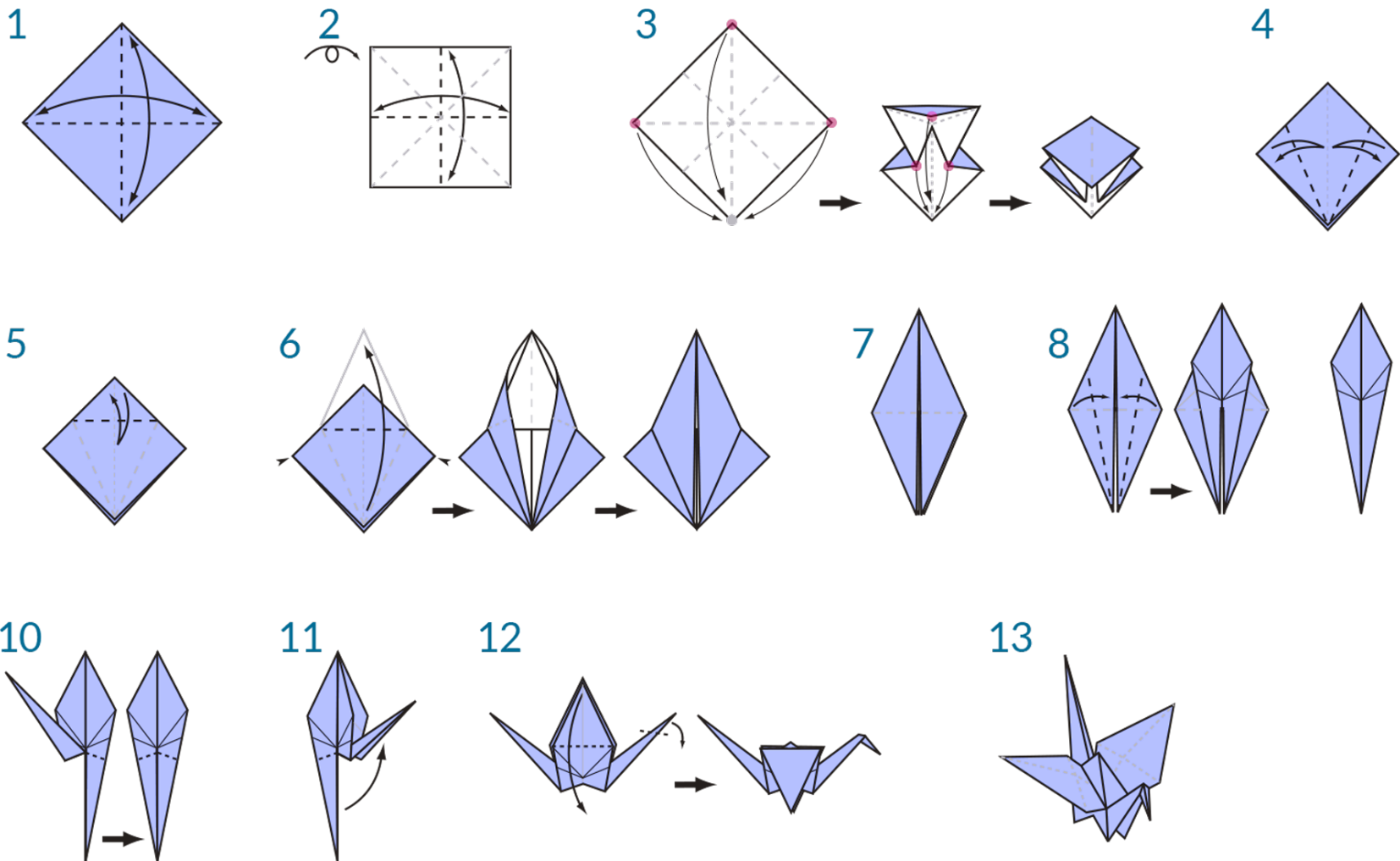


TEXT
=
KLASSISCHE
PROGRAMMIERSPRACHE



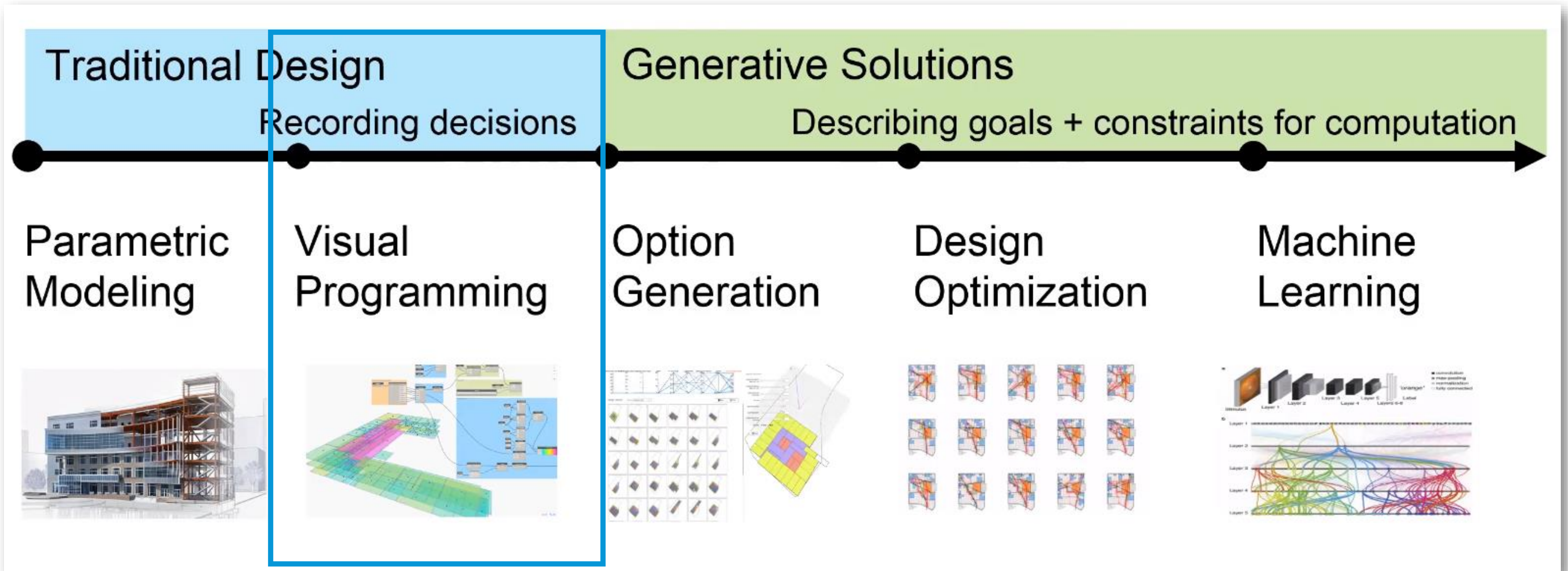
Start with a square piece of paper, coloured side up. Fold in half and open. Then fold in half the other way.
Turn the paper over to the white side. Fold the paper in half, crease well and open, and then fold again in the other direction.
Using the creases you have made, Bring the top 3 corners of the model down to the bottom corner. Flatten model.
Fold top triangular flaps into the center and unfold.
Fold top of model downwards, crease well and unfold.
Open the uppermost flap of the model, bringing it upwards and pressing the sides of the model inwards at the same time. Flatten down, creasing well.
Turn model over and repeat Steps 4-6 on the other side.
Fold top flaps into the center.
Repeat on other side.
Fold both 'legs' of model up, crease very well, then unfold.
Inside Reverse Fold the "legs" along the creases you just made.
Inside Reverse Fold one side to make a head, then fold down the wings.
You now have a crane.

VISUELLE SKIZZE
=
VISUELLE
PROGRAMMIERUNG



Dynamo

Die Reise des Designs



Dynamo

Benutzeroberfläche & Erster Eindruck

The screenshot displays the Dynamo software interface with a workflow and its results. The workflow consists of the following nodes and connections:

- Number** node: Set to 0; connected to the **start** input of the **Number Sequence** node.
- amount** node: Set to 5; connected to the **amount** input of the **Number Sequence** node.
- step** node: Set to 2; connected to the **step** input of the **Number Sequence** node.
- Number Sequence** node: Outputs a sequence to the **Point.ByCoordinates** node.
- Point.ByCoordinates** node: Outputs a list of points.

The results are displayed in two ways:

- ERGBNIS VORSCHAU**: A text preview of the output list.
- ERGBNIS GRAFISCH**: A 3D visualization of the points on a grid.

Labels with arrows point to various parts of the interface:

- KNOTENBIBLIOTHEK**: Points to the Library panel on the left.
- INPUT**: Points to the inputs of the **Number Sequence** node.
- OUTPUT**: Points to the output of the **Point.ByCoordinates** node.
- KNOTEN („Nodes“)**: Points to the **Number Sequence** node.

Library Panel (Left):

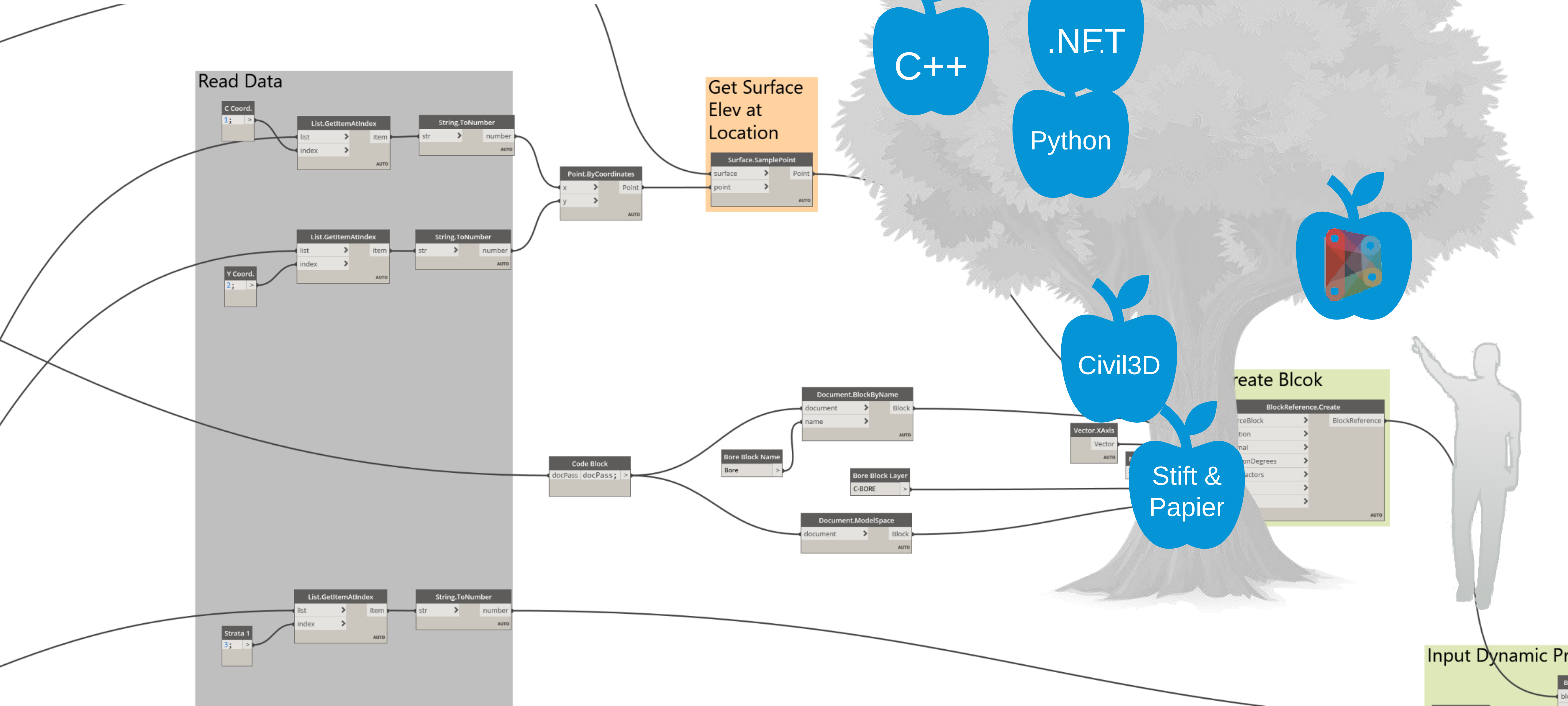
- SEARCH LIBRARY
- Analyze
- Bridge
- Builtin Functions
- Clockwork
- Core
- DSOffice
- Geometry
- LunchBox
- Migration
- Office
- Operators
- Revit
- Add

Point.ByCoordinates Output:

```
ist
[0] Point(X = 0.000, Y = 0.000, Z = 0.000)
[1] Point(X = 2.000, Y = 0.000, Z = 0.000)
[2] Point(X = 4.000, Y = 0.000, Z = 0.000)
[3] Point(X = 6.000, Y = 0.000, Z = 0.000)
[4] Point(X = 8.000, Y = 0.000, Z = 0.000)
```

Dynamo

Einführung

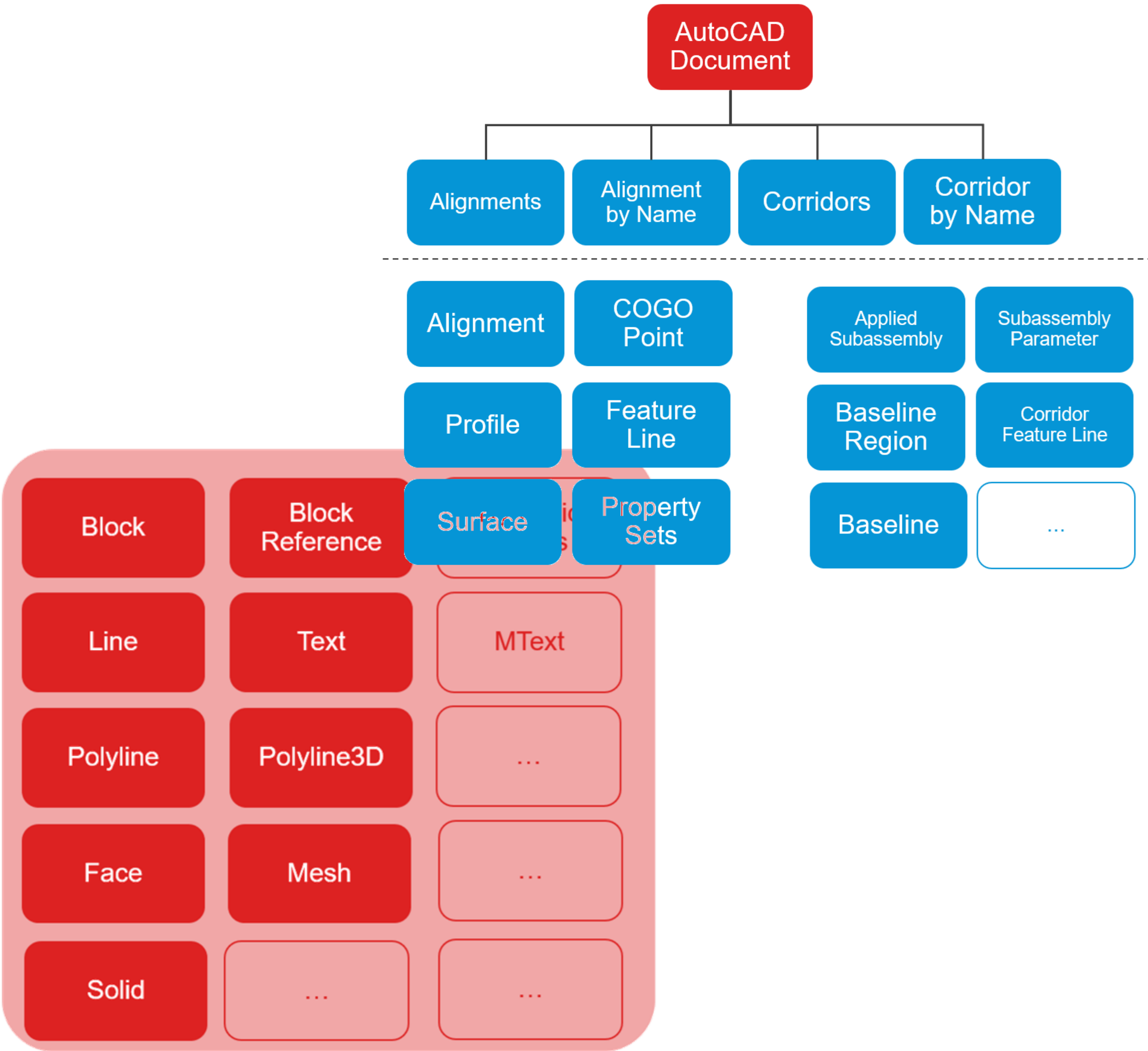
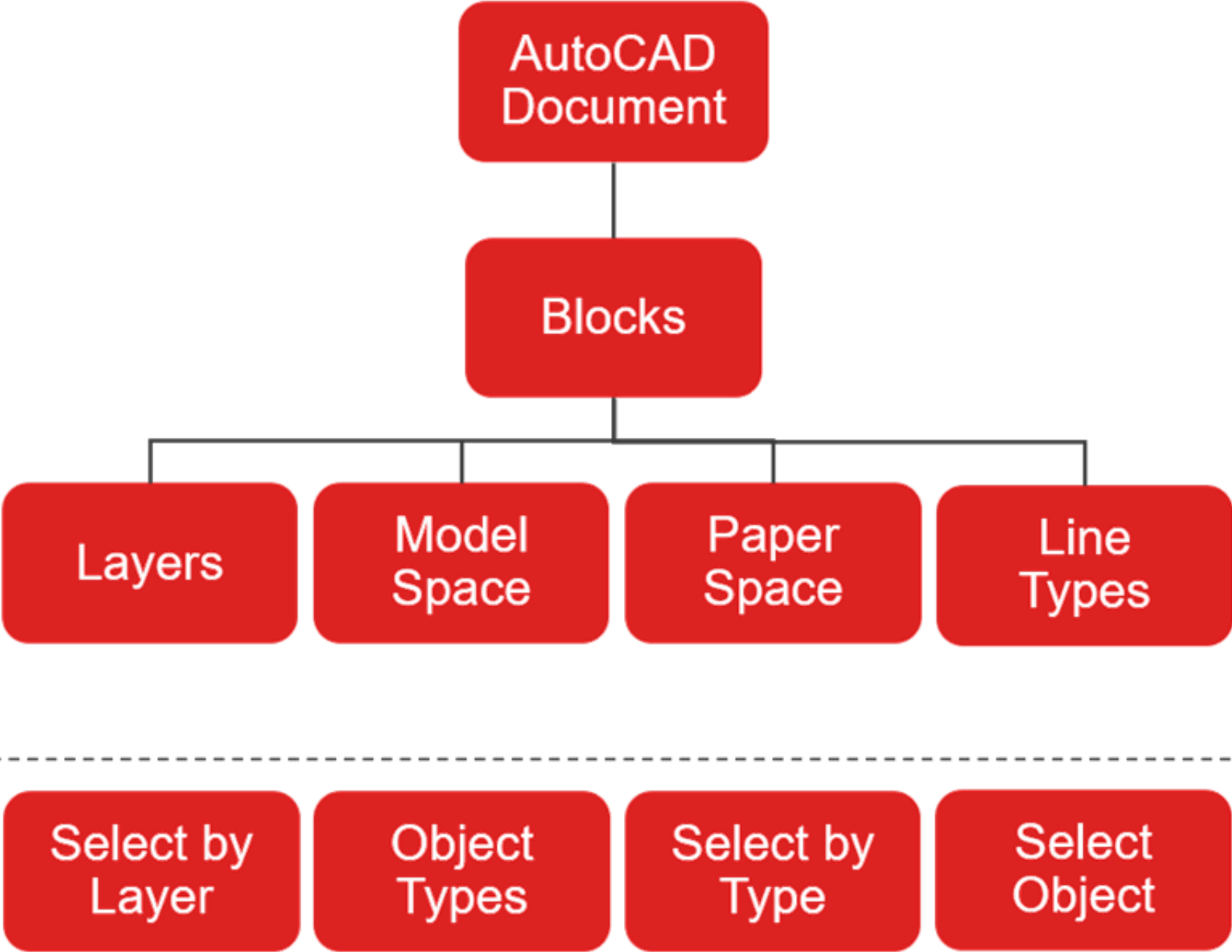


Dynamo für Civil 3D



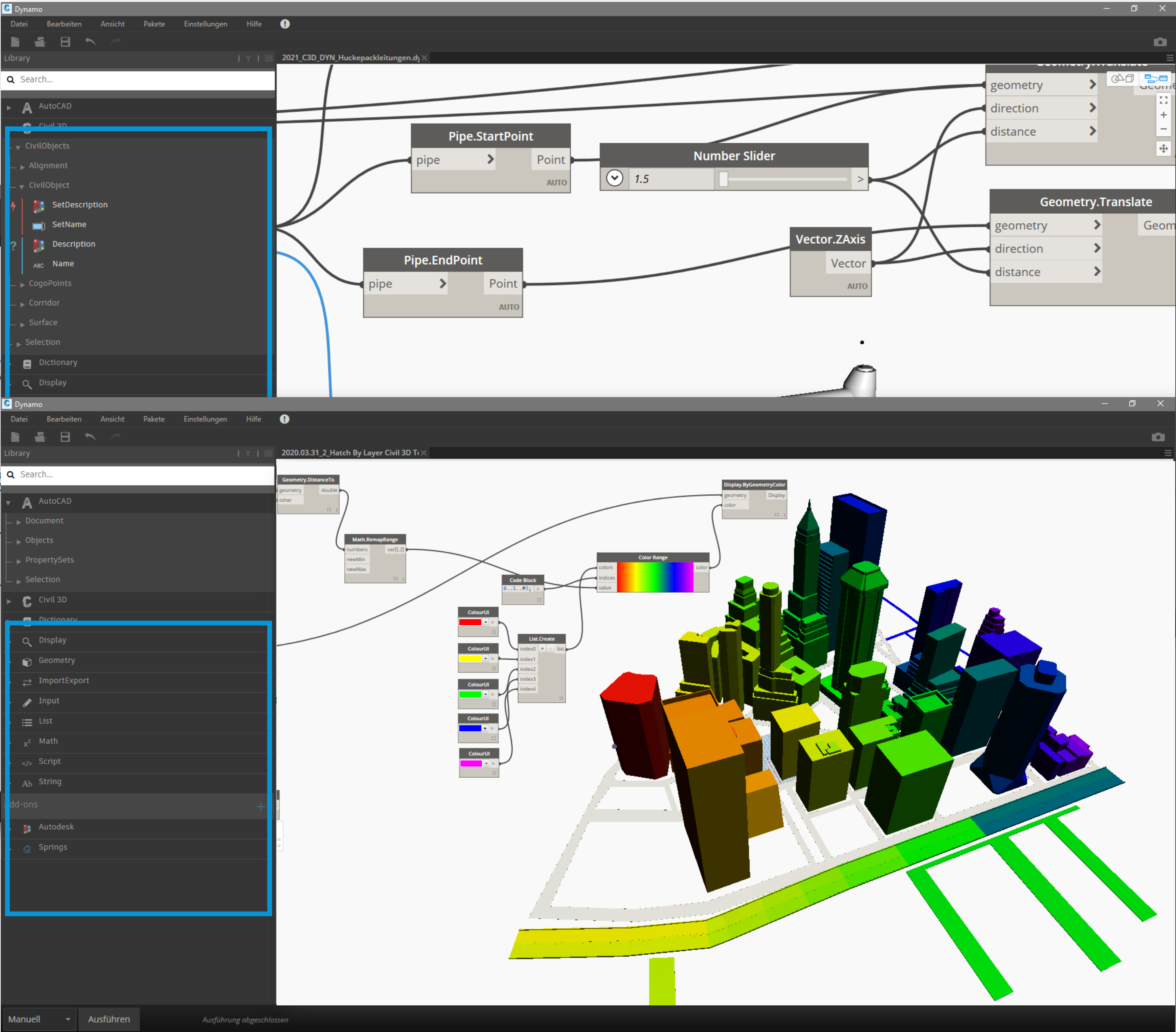
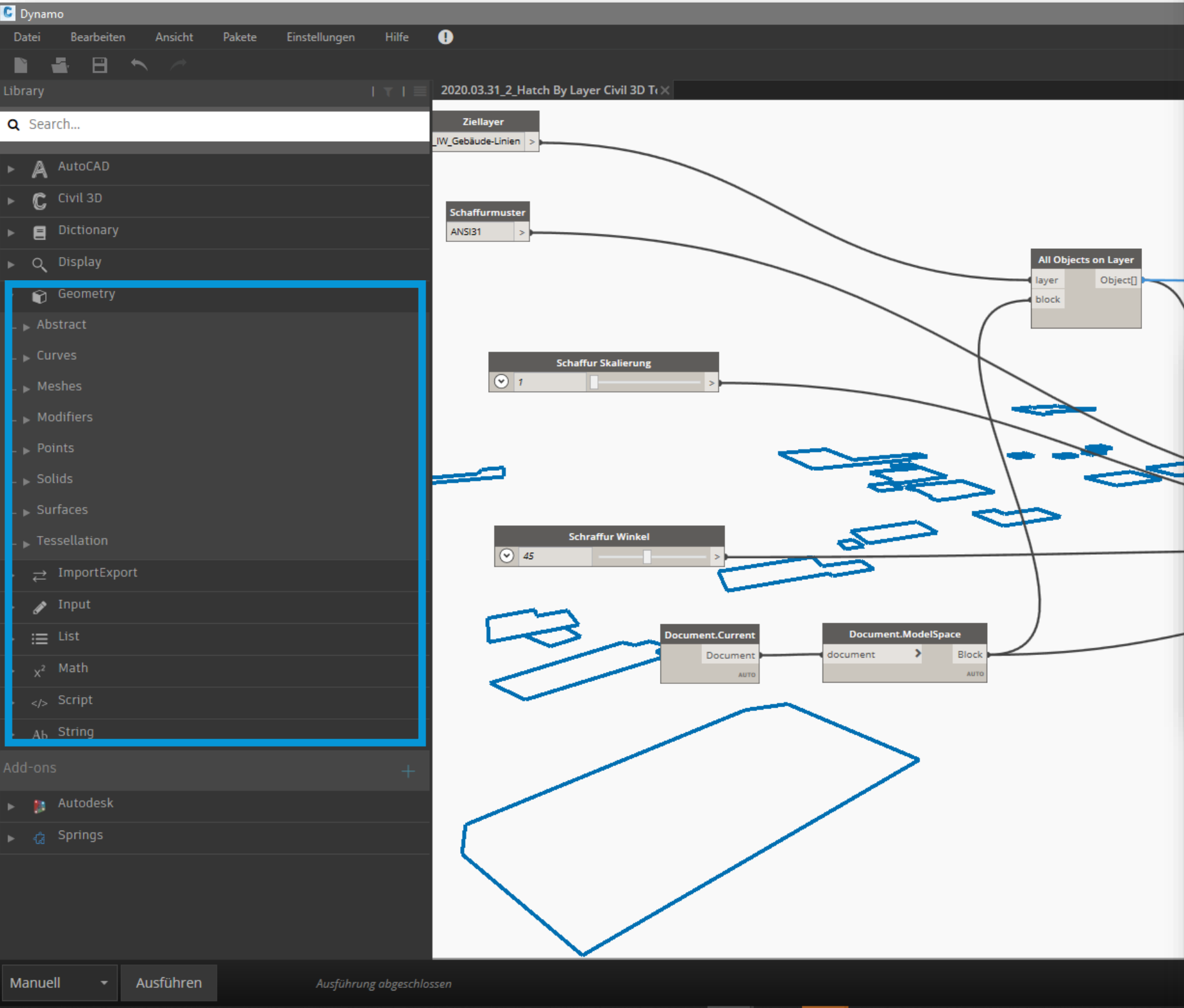
Dynamo 4 Civil 3D

Objekte & Knoten



Dynamo für Civil 3D

Objekte

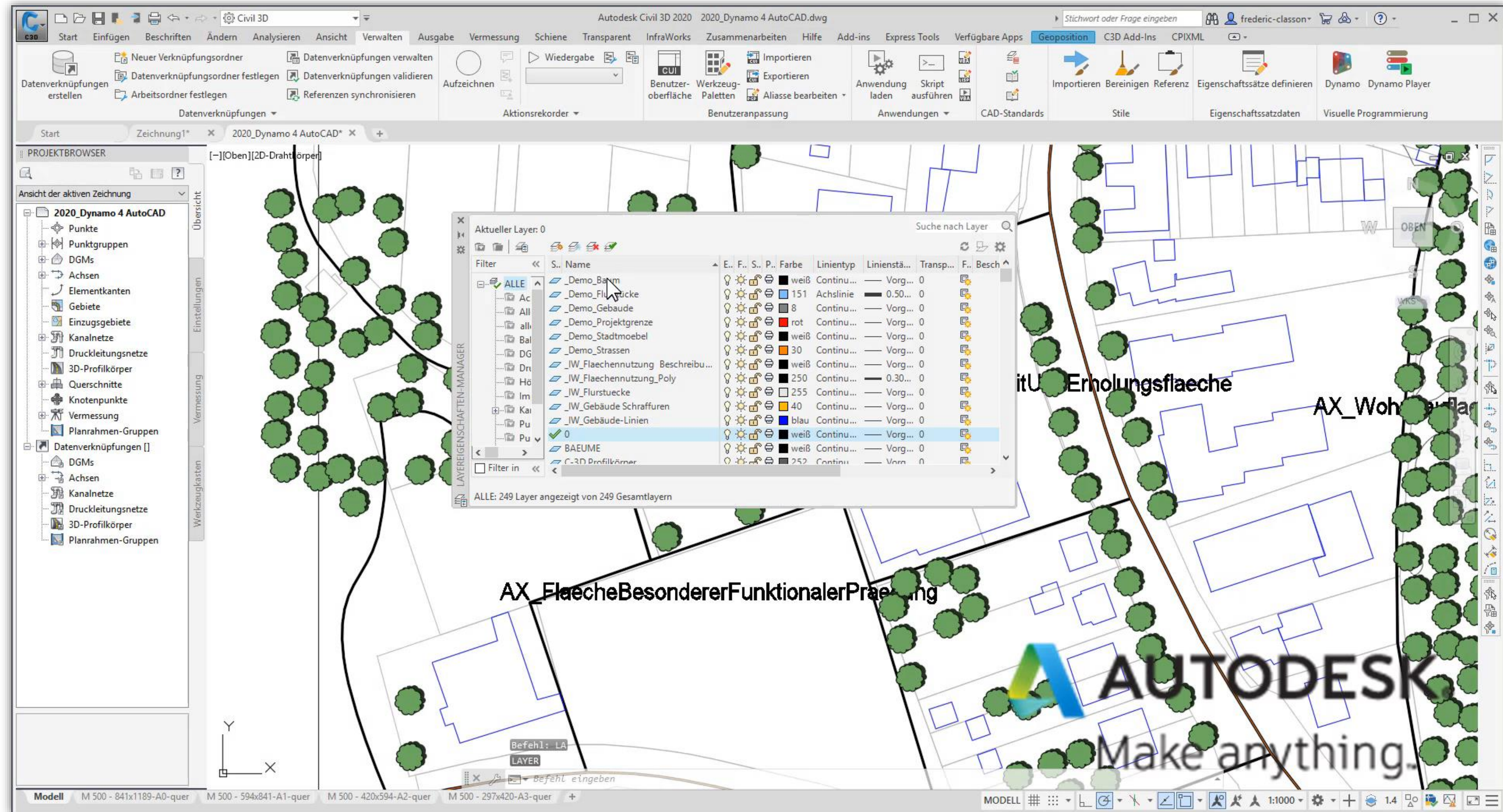


Dynamo für Civil 3D – Ein paar Anwendungsfälle



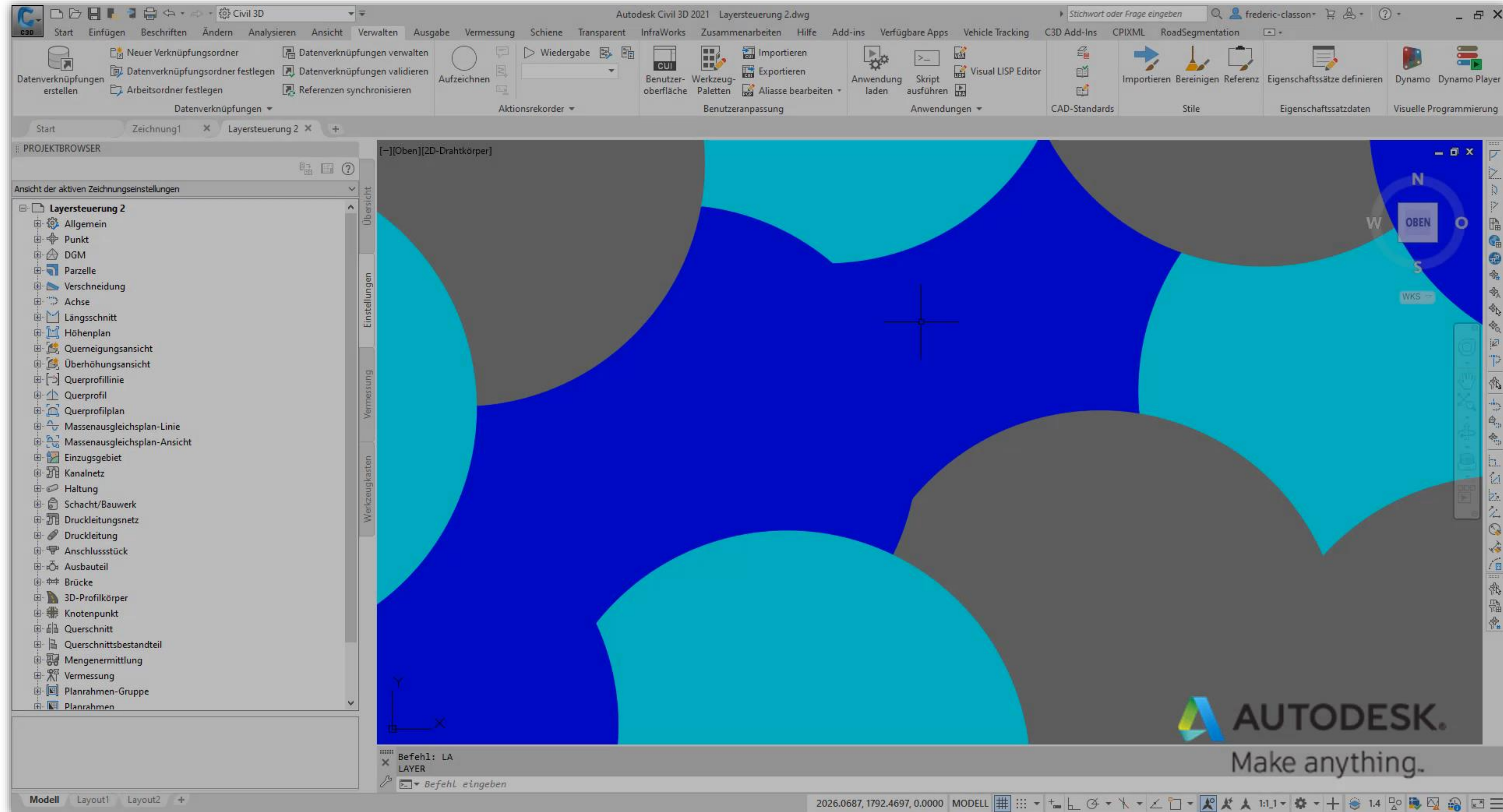
Dynamo für Civil 3D Anwendungsfälle

Langweiliges automatisieren: Schraffieren war gestern



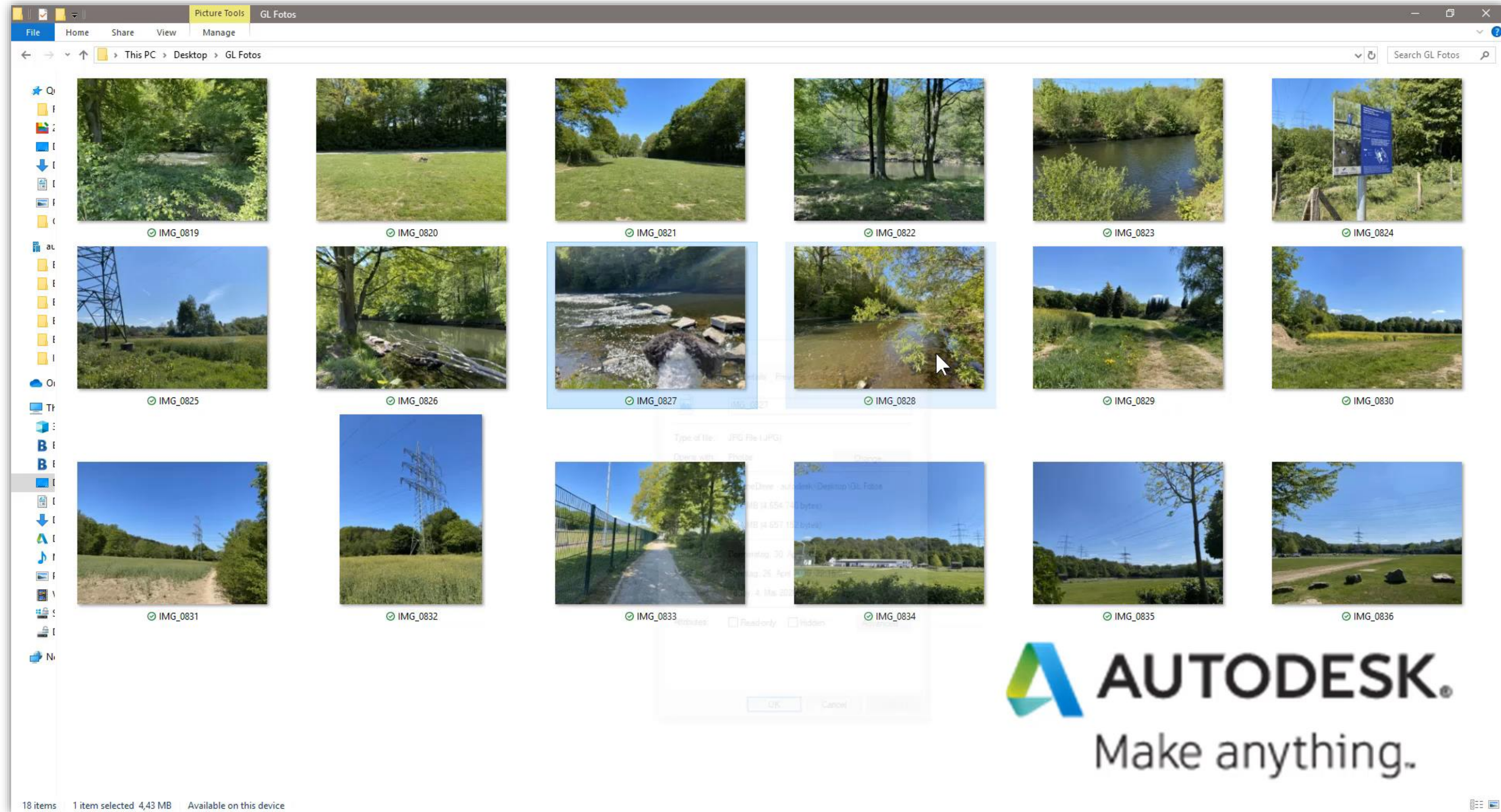
Dynamo für Civil 3D Anwendungsfälle

Fehler ausmerzen: Layer verbiegen



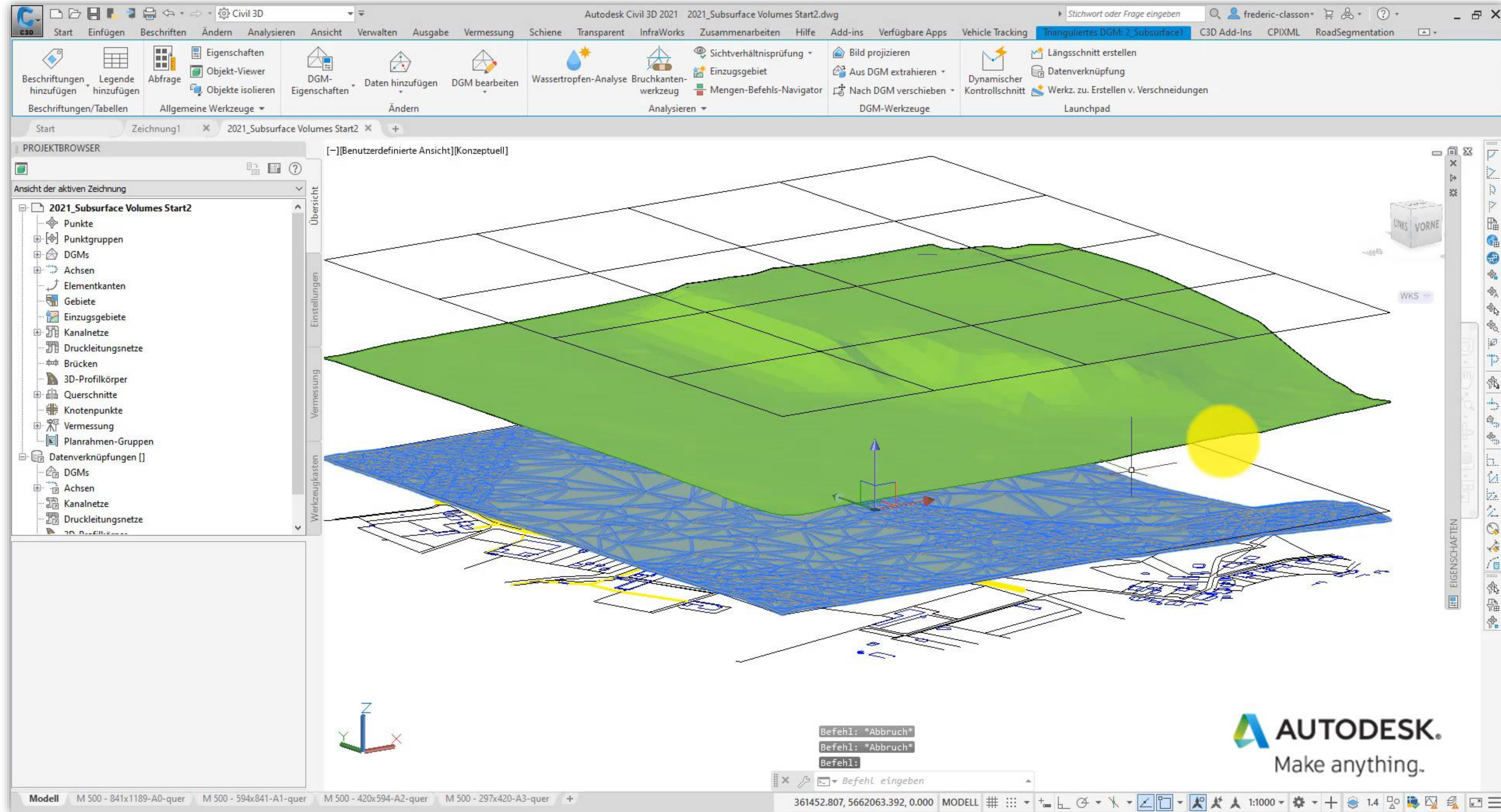
Dynamo für Civil 3D Anwendungsfälle

Neues Erfinden: Geofotos verarbeiten



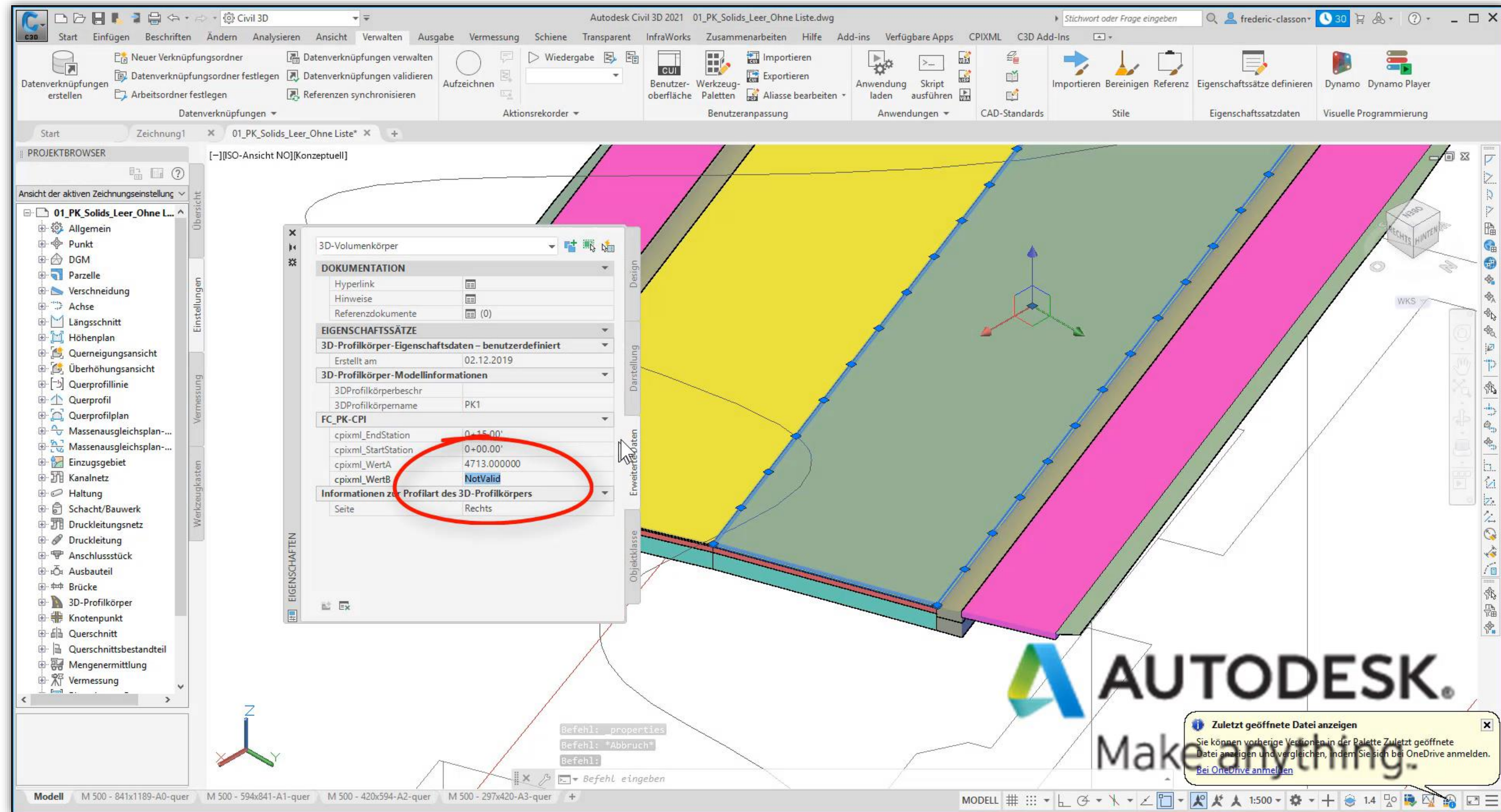
Dynamo für Civil 3D Anwendungsfälle

Unmögliches Möglich machen: Massendaten prozessieren



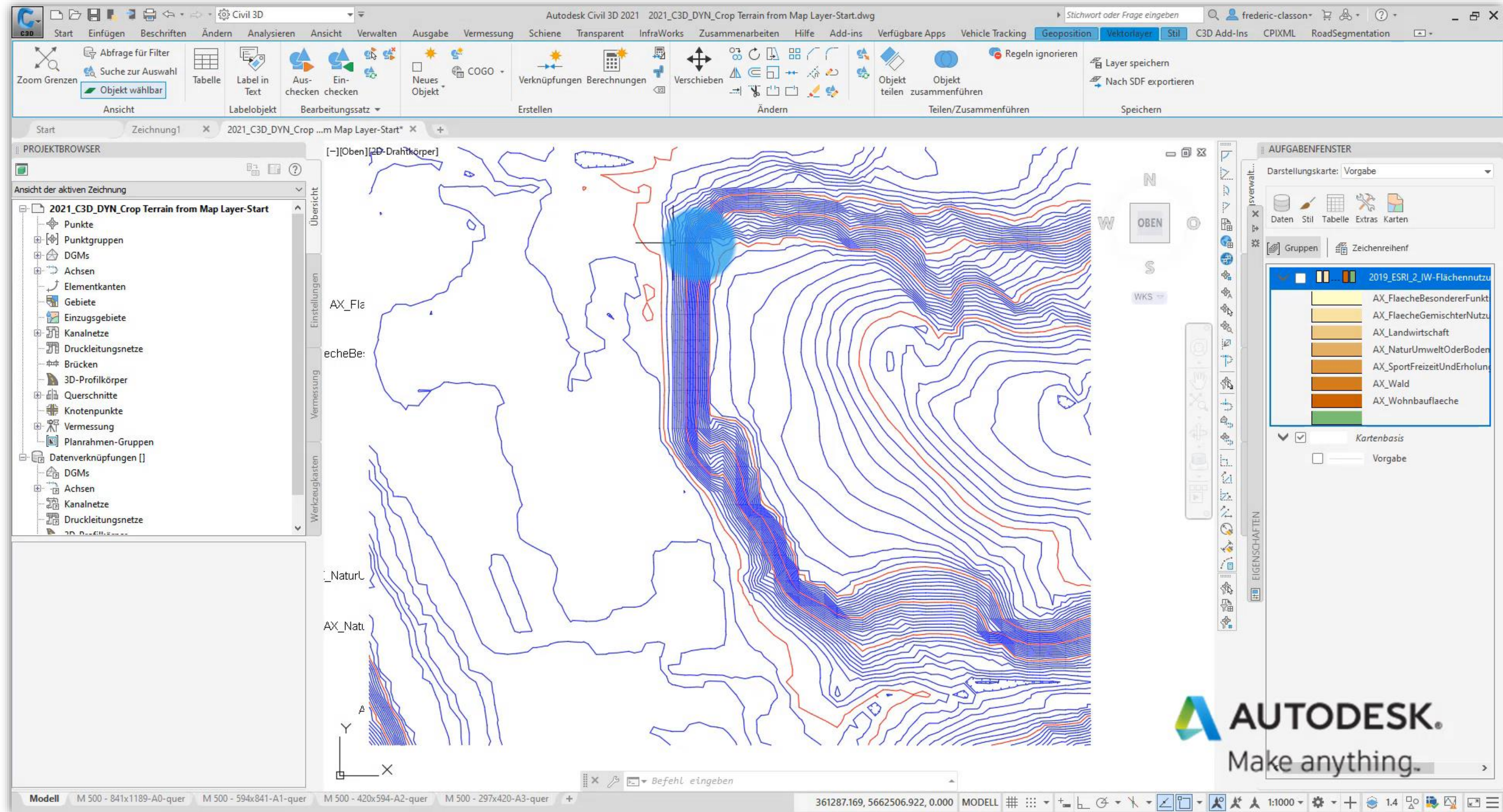
Dynamo für Civil 3D Anwendungsfälle

Auf Nummer sicher gehen: Daten validieren



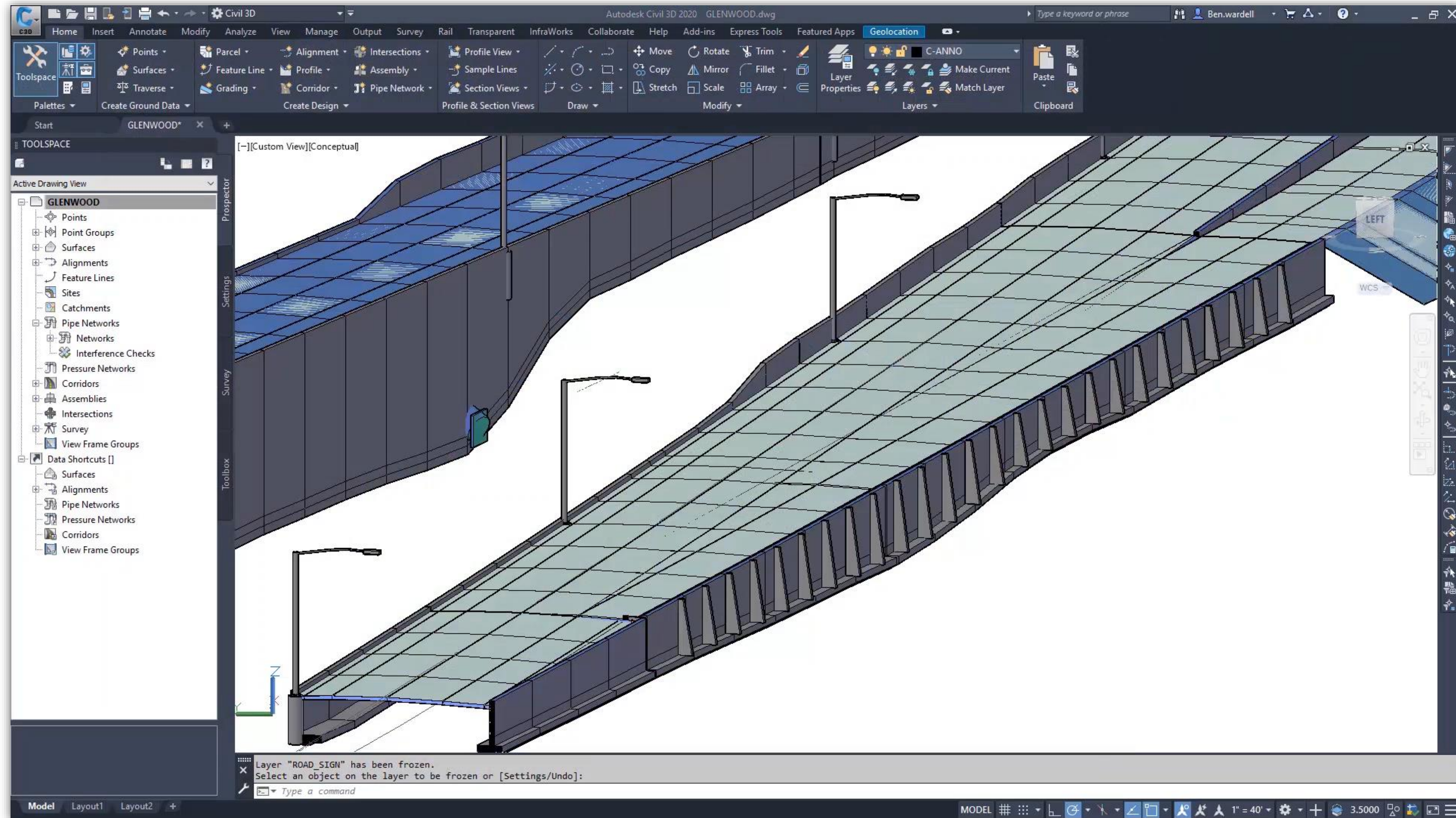
Dynamo für Civil 3D Anwendungsfälle

Welten verbinden: GIS-Daten und BIM-Anwendungsfälle zusammenbringen



Dynamo für Civil 3D Anwendungsfälle

Modelle aufwerten: Aus 2D mach 3D



Dynamo für Civil 3D Anwendungsfälle

Datensilos verbinden: Excel und BIM

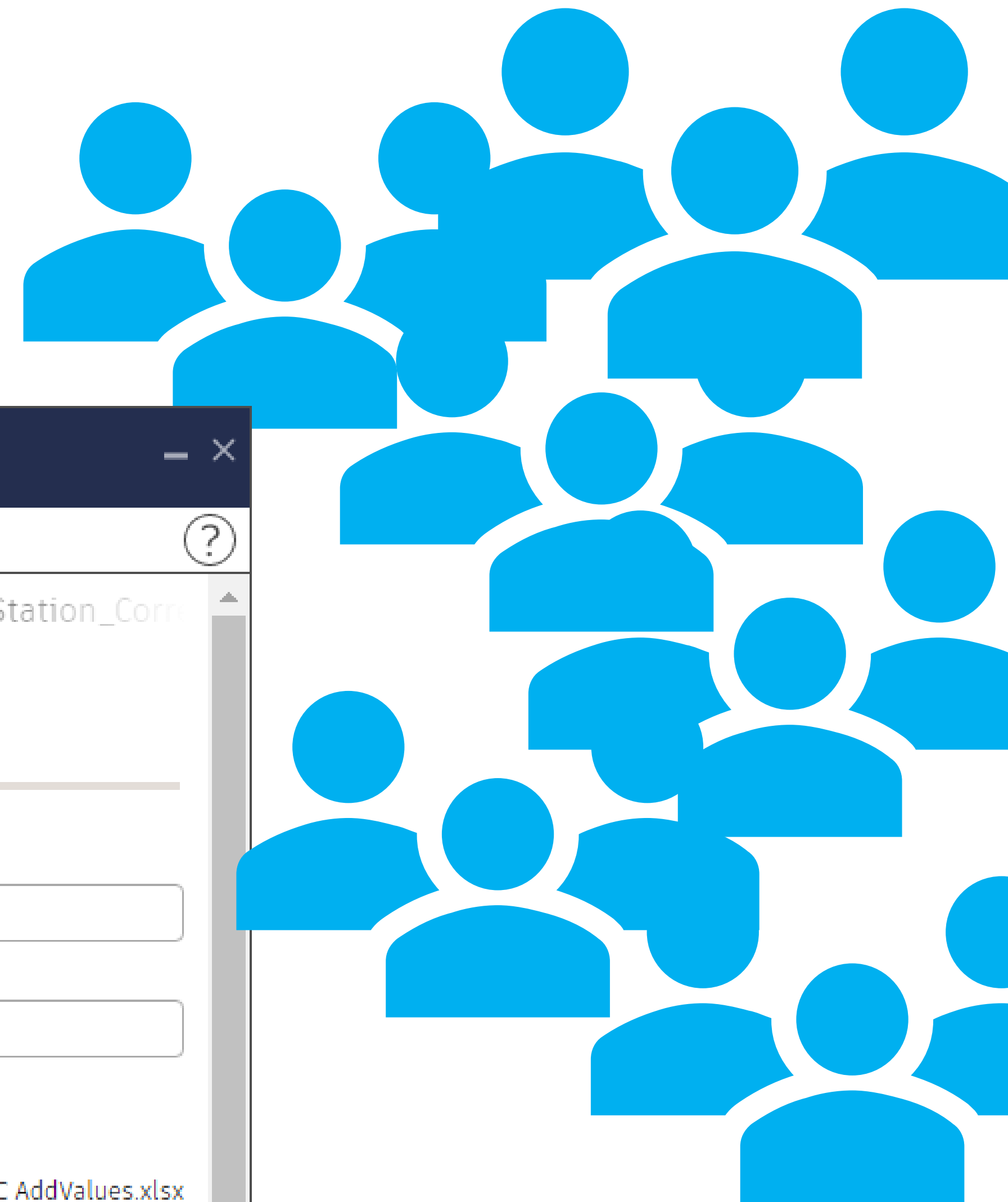
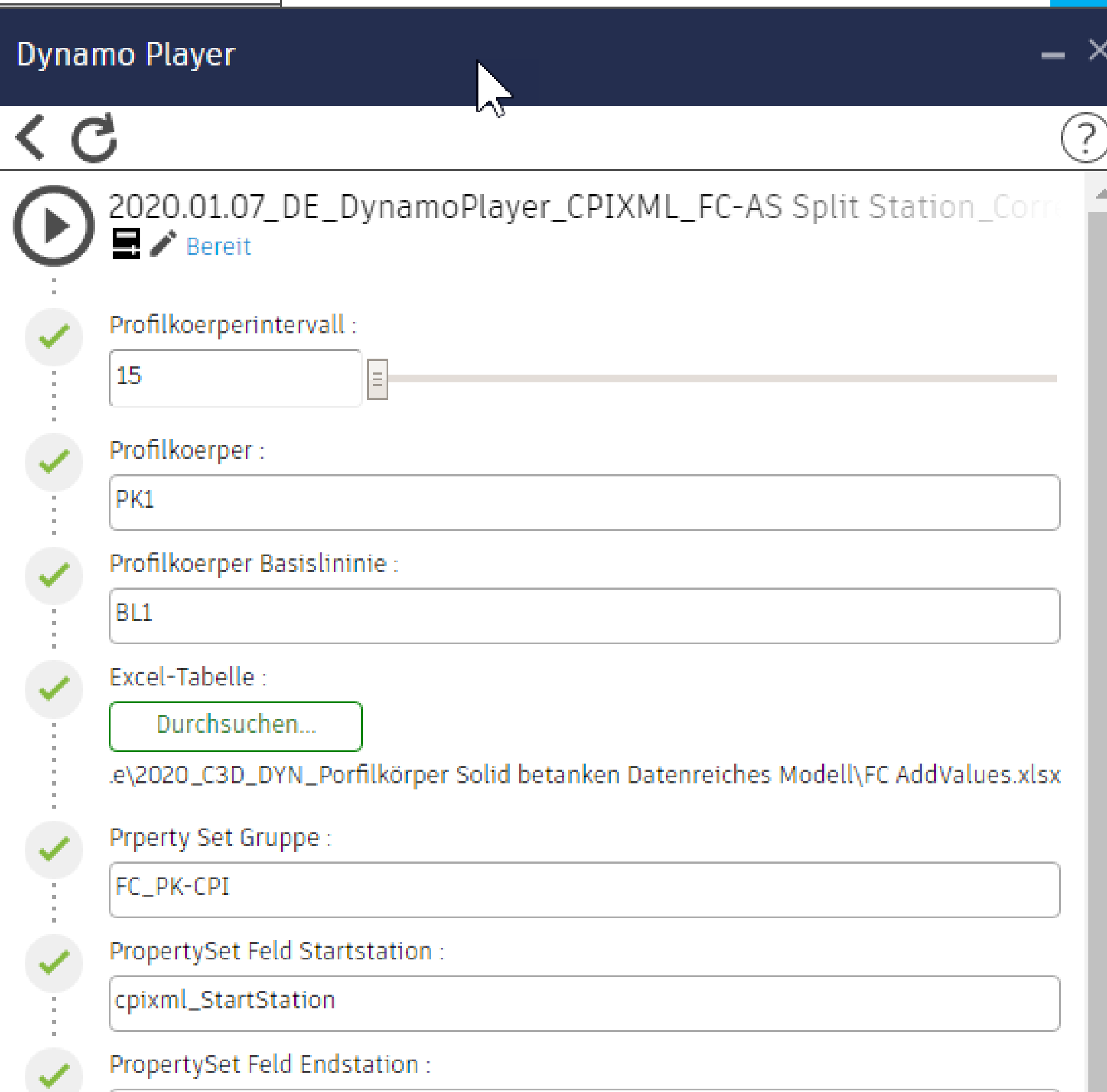
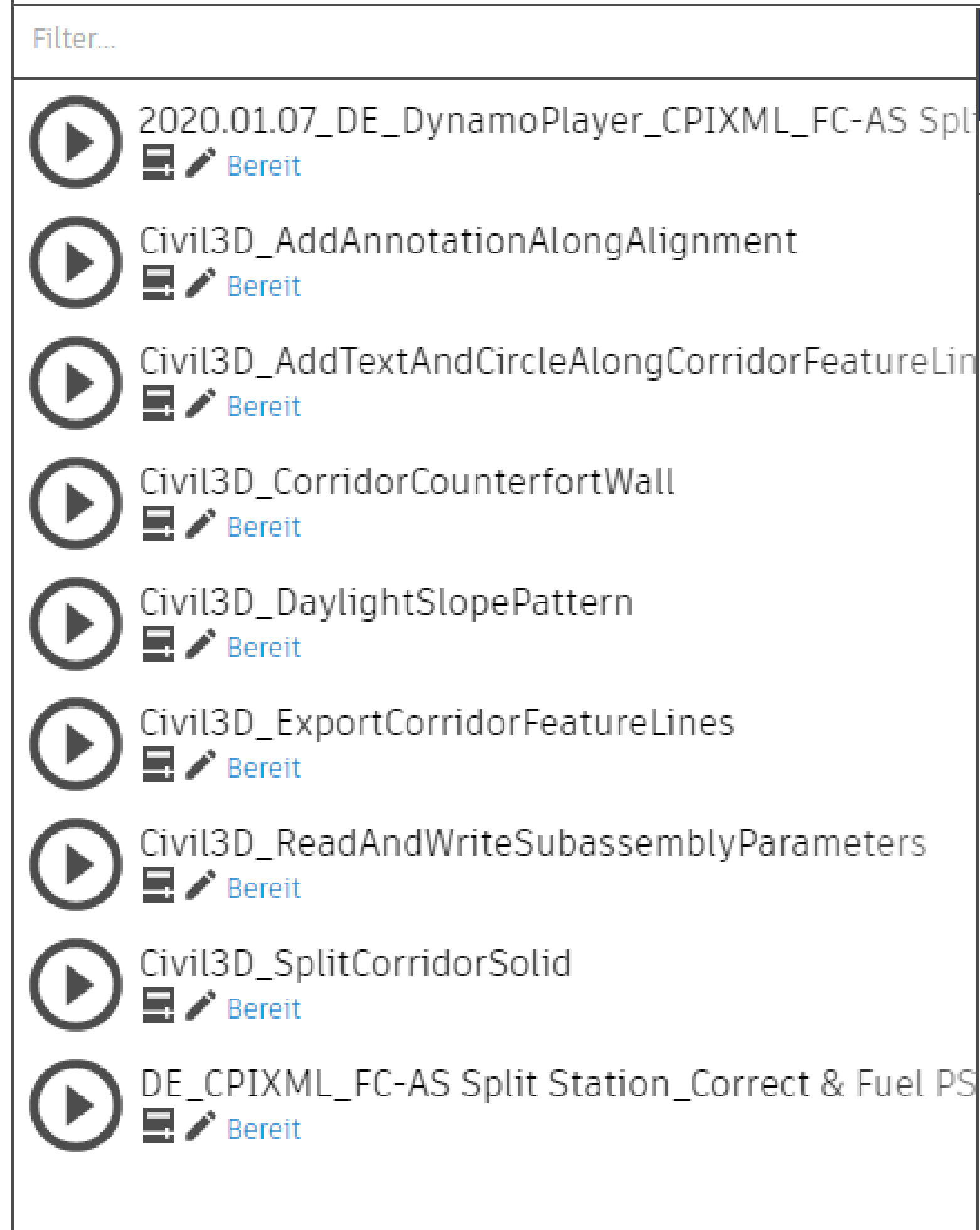
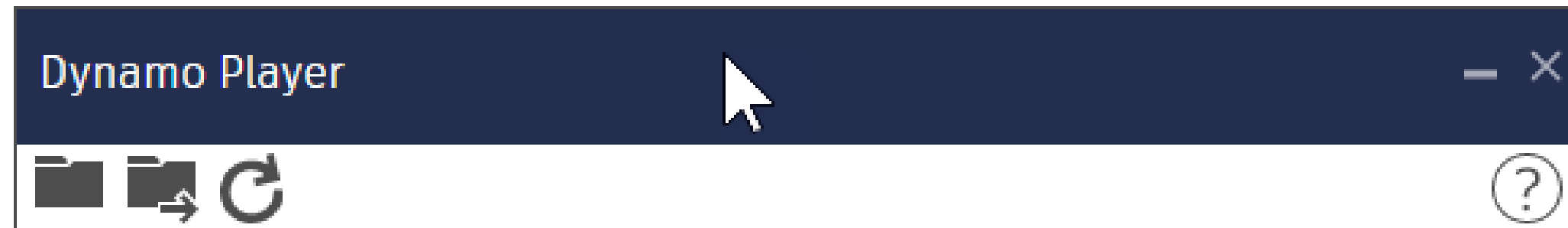


The background features a stylized, light-colored illustration of a highway interchange. The roads are depicted with simple lines and shading, suggesting a 3D perspective. A large, white, semi-transparent geometric shape, resembling a large 'L' or a corner of a building, is positioned on the left side of the image, partially obscuring the road. The overall aesthetic is clean and modern, with a focus on infrastructure.

Automatisierung für jedermann

Automatisierung für jedermann

Dynamo Player



Automatisierung für jedermann

Dynamo Player



Dynamo – Offen und Erweiterbar



Offen und Erweiterbar

DesignScript

Knoten (Nodes)

Code Block

```
coordinates(0.0,0.0)
```

```
Point.ByCoordinates(x, y, z)  
DistanceTo(attractorPoint)  
ByCenterPointRadius(radius)
```

```

    e('RevitAPI')
    ce('RevitAPIUI')
    .Revit.DB import *
    desk

    C:\Autodesk\Dynamo\Core'
    ch = r'C:\Autodesk\Dynamo\Core\dll'
    ch.append(path)
    path.append(exec_path)
    AddReference('LibGNet')
    Autodesk.LibG import *
    r.AddReference('DynamoPython')
    r.AddReference('DynamoCore')
    r.AddReference("DynamoUtilities")
    r.AddReference("DynamoRevit")
    import Dynamo

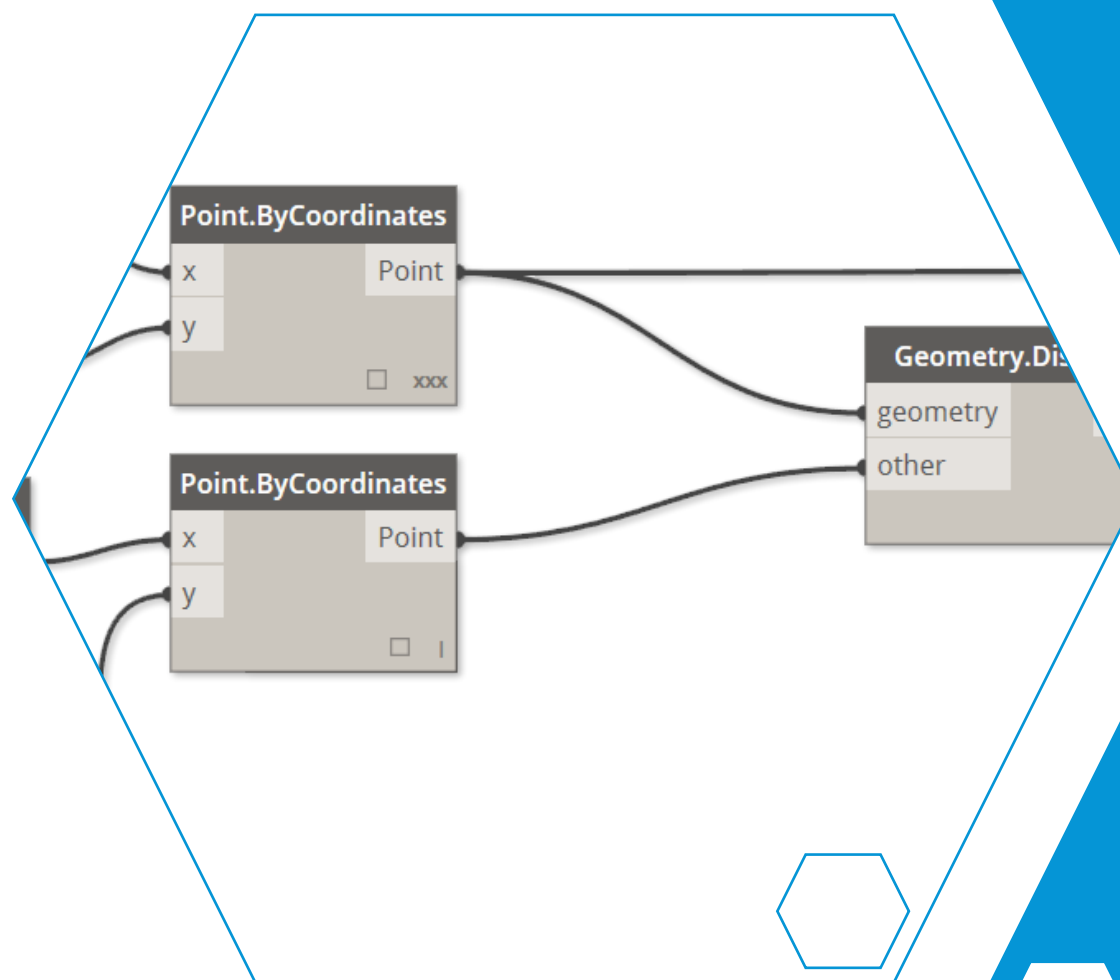
    The input to this node will be stored in the IN variable.
    EnteringNode = IN

    Application.Documents
    Dynamo.Utilities.dynRevitSettings.Revit.Application.Documents

    []
    x:
    append(doc)

    The output to the OUT variable

```



Dynamo

Community Pakete

The image displays three screenshots of the Dynamo software interface, illustrating the process of finding and installing community packages.

Left Screenshot: Shows the main Dynamo window with the 'Pakete' (Packages) menu open. The menu options are: Suchen nach Paket... (Search for package...), Pakete verwalten... (Manage packages...), Neues Paket veröffentlichen... (Publish new package...), Ausgewählte Blöcke veröffentlichen... (Publish selected blocks...), and Aktuellen Arbeitsbereich veröffentlichen... (Publish current workspace...). The 'Suchen nach Paket...' option is highlighted with a blue circle.

Middle Screenshot: Shows the 'Online-Suche nach Paket' (Online search for package) window. The search bar contains 'civil 3d too'. The results list several packages, including 'Civil3DToolkit' (version 1.0.16, 1721 downloads, 30 Mar 2020), 'Civil-Prokon' (version 1.0.2, 447 downloads, 20 May 2019), 'IterisCivilDynamo' (version 2.0.0, 752 downloads, 12 Dec 2019), and 'BIM4Struc.BridgeDesign' (version 1.2.1, 5979 downloads, 30 Oct 2019). The search bar and the first result, 'Civil3DToolkit', are highlighted with a blue circle.

Right Screenshot: Shows the 'Dynamo' window with the 'Pakete' (Packages) panel open. The panel displays a list of installed and available packages under the 'Add-ons' section. The 'Civil3DToolkit' package is highlighted with a blue circle. The package list includes: Autodesk, Civil3DToolkit, AutoCAD, Civil3D, Collaboration, GIS, LandDevelopment, PipeNetworks, and Tunnel.

The background of the screenshots shows a Dynamo workspace with a graph containing nodes like 'All Objects on Layer', 'layer', 'block', and 'ObjectID'.

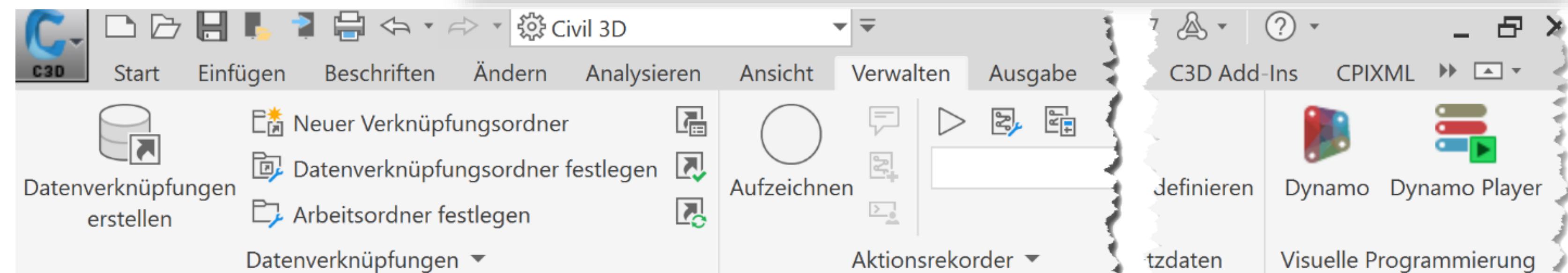
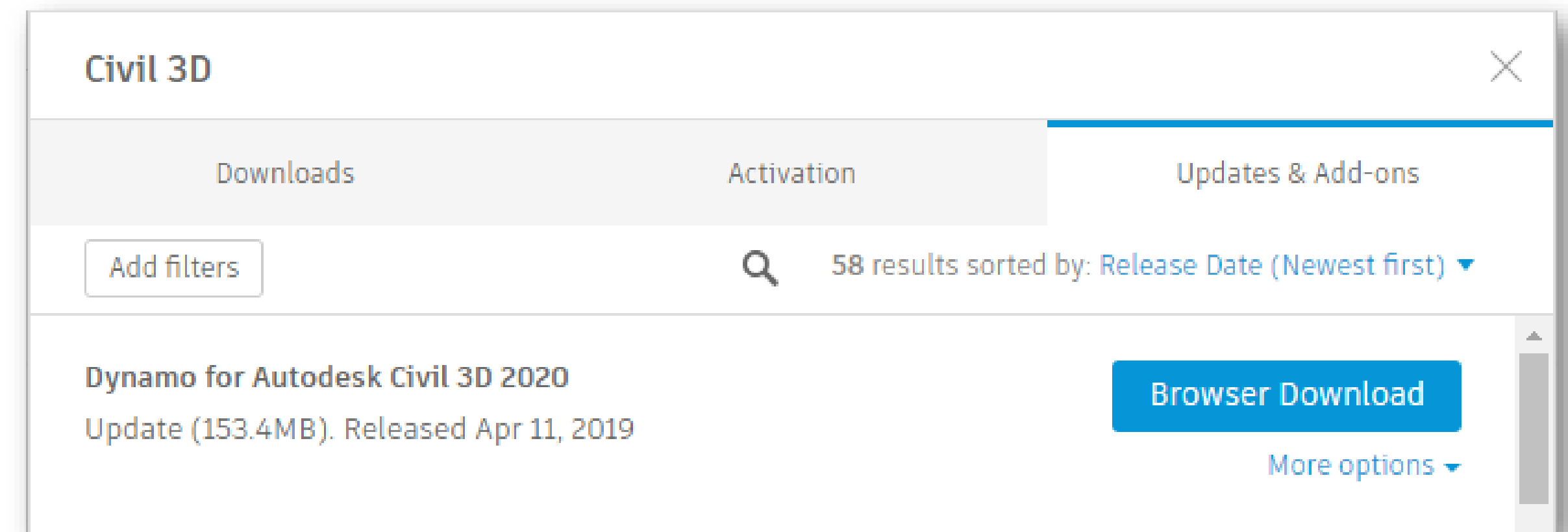
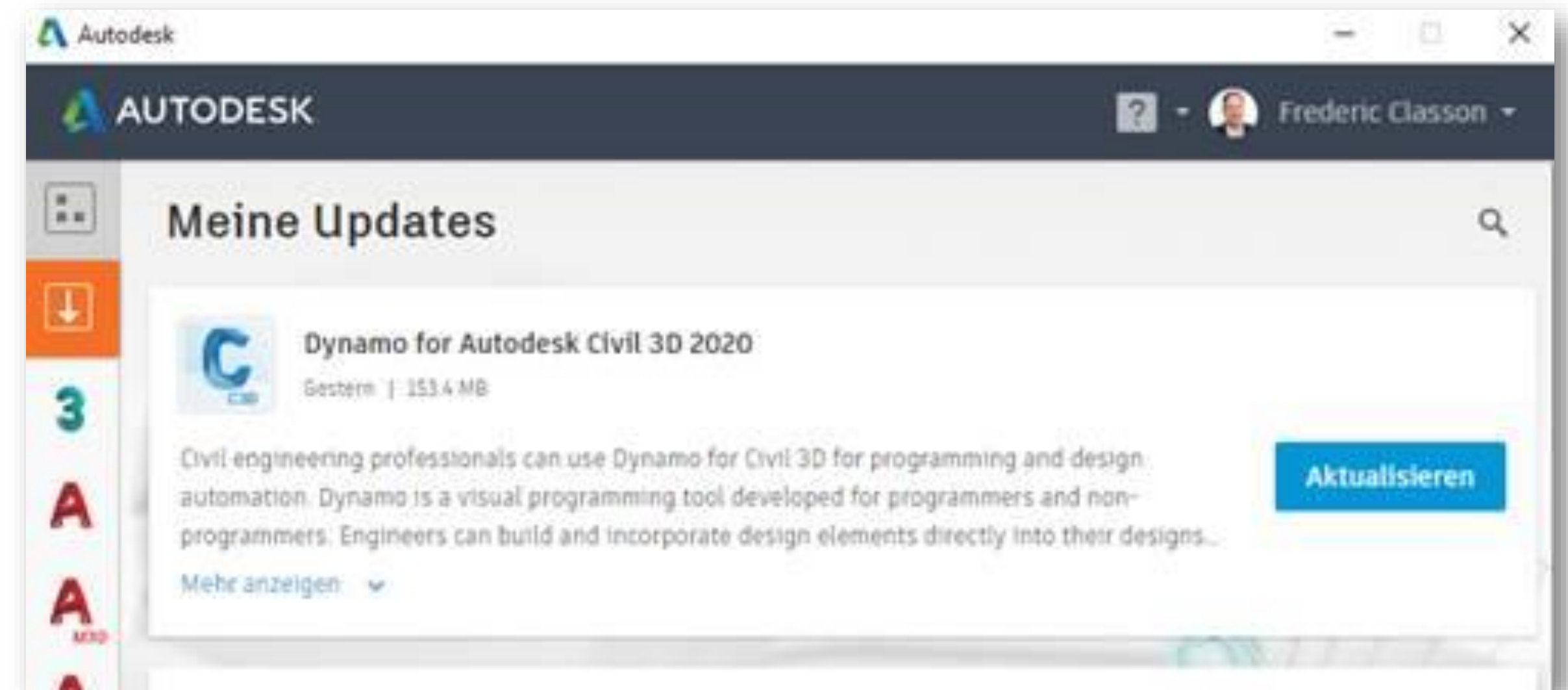
Ressourcen & Wissenswertes



Dynamo für Civil 3D

Ressourcen & Wissenswertes: Installer

- < 2021: Eigener Installer
 - Via Autodesk Desktop App
 - Via Autodesk Account
- > 2021: In Civil 3D enthalten
- Neue Gruppe im Ribbon Verwalten
 - Visuelle Programmierung
- User Interface oder Befehlszeilenaufruf
- Dynamo Player



Dynamo für Civil 3D

Ressourcen & Wissenswertes: Beispiele

Name	Date modified	Type	Size	Folder
AutoCAD_AddPropertySetByDefinition.dyn	30.12.2019 03:33	DYN File	23 KB	AutoCAD (C:\Pro...
AutoCAD_Python_PSet_CreatePropertySetDefinitionsByJSON.dyn	30.12.2019 03:33	DYN File	6 KB	AutoCAD (C:\Pro...
AutoCAD_Python_PSet_DumpPropertySetDefinitionsToJSON.dyn	30.12.2019 03:33	DYN File	7 KB	AutoCAD (C:\Pro...
AutoCAD_Python_PSet_DumpPropertySetValuesToCSV.dyn	30.12.2019 03:33	DYN File	7 KB	AutoCAD (C:\Pro...
AutoCAD_Python_PSet_UpdatePropertySetValuesByCSV.dyn	30.12.2019 03:33	DYN File	8 KB	AutoCAD (C:\Pro...
AutoCAD_RunScriptCommandToChangeLayers.dyn	30.12.2019 03:33	DYN File	10 KB	AutoCAD (C:\Pro...
Civil3D_AddAnnotationAlongAlignment.dyn	30.12.2019 03:33	DYN File	43 KB	Civil 3D (C:\Progr...
Civil3D_AddTextAndCircleAlongCorridorFeatureLine.dyn	30.12.2019 03:33	DYN File	44 KB	Civil 3D (C:\Progr...
Civil3D_CorridorCounterfortWall.dyn	30.12.2019 03:33	DYN File	62 KB	Civil 3D (C:\Progr...
Civil3D_DaylightSlopePattern.dyn	30.12.2019 03:33	DYN File	90 KB	Civil 3D (C:\Progr...
Civil3D_ExportCorridorFeatureLines.dyn	30.12.2019 03:33	DYN File	33 KB	Civil 3D (C:\Progr...
Civil3D_ReadAndWriteSubassemblyParameters.dyn	30.12.2019 03:33	DYN File	50 KB	Civil 3D (C:\Progr...
Civil3D_SplitCorridorSolid.dyn	30.12.2019 03:33	DYN File	24 KB	Civil 3D (C:\Progr...
Basics_Basic01.dyn	11.09.2019 10:45	DYN File	10 KB	Basics (C:\Progra...
Basics_Basic02.dyn	11.09.2019 10:45	DYN File	14 KB	Basics (C:\Progra...
Basics_Basic03.dyn	11.09.2019 10:45	DYN File	16 KB	Basics (C:\Progra...
Core_AttractorPoint.dyn	11.09.2019 10:45	DYN File	29 KB	Core (C:\Program...
Core_CodeBlocks.dyn	11.09.2019 10:45	DYN File	135 KB	Core (C:\Program...
Core_ListAtLevel.dyn	11.09.2019 10:45	DYN File	37 KB	Core (C:\Program...
Core_ListLacing.dyn	11.09.2019 10:45	DYN File	38 KB	Core (C:\Program...
Core_Math.dyn	11.09.2019 10:45	DYN File	319 KB	Core (C:\Program...
Core_PassingFunctions.dyn	11.09.2019 10:45	DYN File	29 KB	Core (C:\Program...
Core_Python.dyn	11.09.2019 10:45	DYN File	28 KB	Core (C:\Program...
Core_RangeSyntax.dyn	11.09.2019 10:45	DYN File	50 KB	Core (C:\Program...
Core_Strings.dyn	11.09.2019 10:45	DYN File	57 KB	Core (C:\Program...
Geometry_Curves.dyn	11.09.2019 10:45	DYN File	29 KB	Geometry (C:\Pro...
Geometry_Points.dyn	11.09.2019 10:45	DYN File	22 KB	Geometry (C:\Pro...
Geometry_Solids.dyn	11.09.2019 10:45	DYN File	70 KB	Geometry (C:\Pro...
Geometry_Surfaces.dyn	11.09.2019 10:45	DYN File	68 KB	Geometry (C:\Pro...
ImportExport_CSV to Stuff.dyn	11.09.2019 10:45	DYN File	28 KB	ImportExport (C:\...
ImportExport_Data To Excel.dyn	11.09.2019 10:45	DYN File	20 KB	ImportExport (C:\...
ImportExport_Excel to Dynamo.dyn	11.09.2019 10:45	DYN File	20 KB	ImportExport (C:\...

The screenshot shows the Dynamo application window. The top menu bar includes 'Datei', 'Bearbeiten', 'Ansicht', 'Pakete', 'Einstellungen', and 'Hilfe'. The main workspace displays the 'Dynamo' logo and a list of installed packages: 'CONC-TIE_PLACEMENT_Corr' and 'Catenary_1'. On the right sidebar, there are links to 'Dynamo-Wörterbuch', 'GitHub-Repository', and 'Probleme senden'. A section titled 'Beispiele' (Examples) is highlighted with a blue box, showing a list of cases: 'Case 07 RunScriptCommandToChang', 'Case 08 DaylightSlopePattern.dyn', and 'Case 09 pset 01_Dump Property Set Defin, 02_Create Property Set Defin, 03_Dump Property Set Value, 04_Update Property Set Valu'. A mouse cursor is pointing at the 'Case 09' entry.

Dynamo für Civil 3D

Ressourcen & Wissenswertes: Beispiele



Dynamo 4 Civil 3D: Extract Pipenetwork Solids with Property Sets

Products and versions covered ▼

Frederic Classon, Technical Sales Specialist AEC at Autodesk AEC BAR

Jul 22 2020

SHARE

REPORT



Using the built in functions of Civil 3D to extract solids from pipe networks, unfortunately result in the the loss of its property sets. Dynamo for Civil 3D can fix this misbehavior :-). Solids can be extrated from the pipes and structures and the property sets can be attached subsequently.

Have look at the video and the script below as a reference.





Dynamo 4 Civil 3D: Segmentation of Corridor Solids from a Station List

Aug 4, 2020

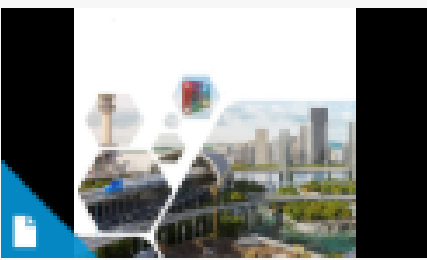
Corridor modelling with C3D is easy and handy. Simply combine an alignment a Profile and profile assemblies to get a 3D model of your Road, dyke trench etc (<https://autode.sk/2DmlmFo>) . From this corridor, you can calculate volumes...



Dynamo 4 Civil 3D: Change multiple styles at once to meet company standards or customer requirements

Jul 22, 2020

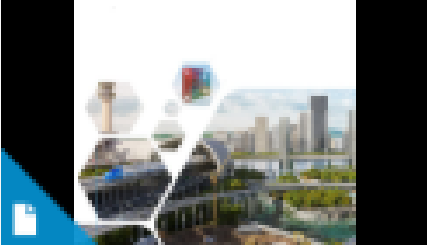
Civil 3D object styles and label styles make it easy to adjust drawings to meet company standards or customer requirements. The use of Dynamo for Civil 3D makes it even easier to adjust drawings to meet customer requiremen...



Dynamo 4 Civil 3D: Sample Scripts for Autodesk Dynamo for Civil 3D

Aug 5, 2020

To kickstart you with Automation in Infrastructure Projects, Dynamo for Civil 3D is being installed with several sample scripts that are ready to use for automating workflows. You can also use these scripts to understand and ex...



Dynamo 4 C3D: One Click Survey Workflow #1: Survey Data Import & Terrain Generation

Jul 22, 2020

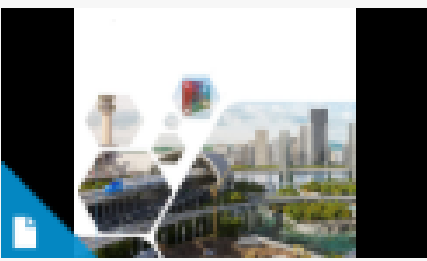
Use Dynamo for Civil 3D for automating repetitive task, such as importing survey data into a drawing, creating point groups, building a terrain model from the point group and assigning styles. The video shows how use the dynamo s...



Dynamo 4 Civil 3D: One Click Survey Workflow #2; Cogo Points, Cogo Point Groups & Breakline Points

Jul 22, 2020

Although Civil 3D has the best in class modeling capabilities when it comes to terrain modeling, there is always room for improvement: Dynamo for Civil 3D can save you a few clicks by automating repetitive tasks. See in the video belo...



Dynamo 4 Civil 3D: Extract Pipenetwork Solids with Pproperty Sets

Jul 22, 2020

Using the built in functions of Civil 3D to extract solids from pipe networks, unfortunately result in the the loss of its property sets. Dynamo for Civil 3D can fix this misbehavior :-). Solids can be extrated from the pipes and structures ...



Dynamo 4 Civil 3D: Process & Load Geocoded Photos in Site Plans

Jul 22, 2020

Ressourcen & Wissenswertes: Handout

- Hintergründe
- Vokabular
- Bausteine
- Häufige Knoten
- Erweiterung
- Beispiele
- Player
- Uvm.



Dynamo für Civil 3D

Community & Ressourcen

- Partner Training
- DynamoBIM.org
- DynamoPrimer.org
- BIMBlog
- Autodesk University on Demand

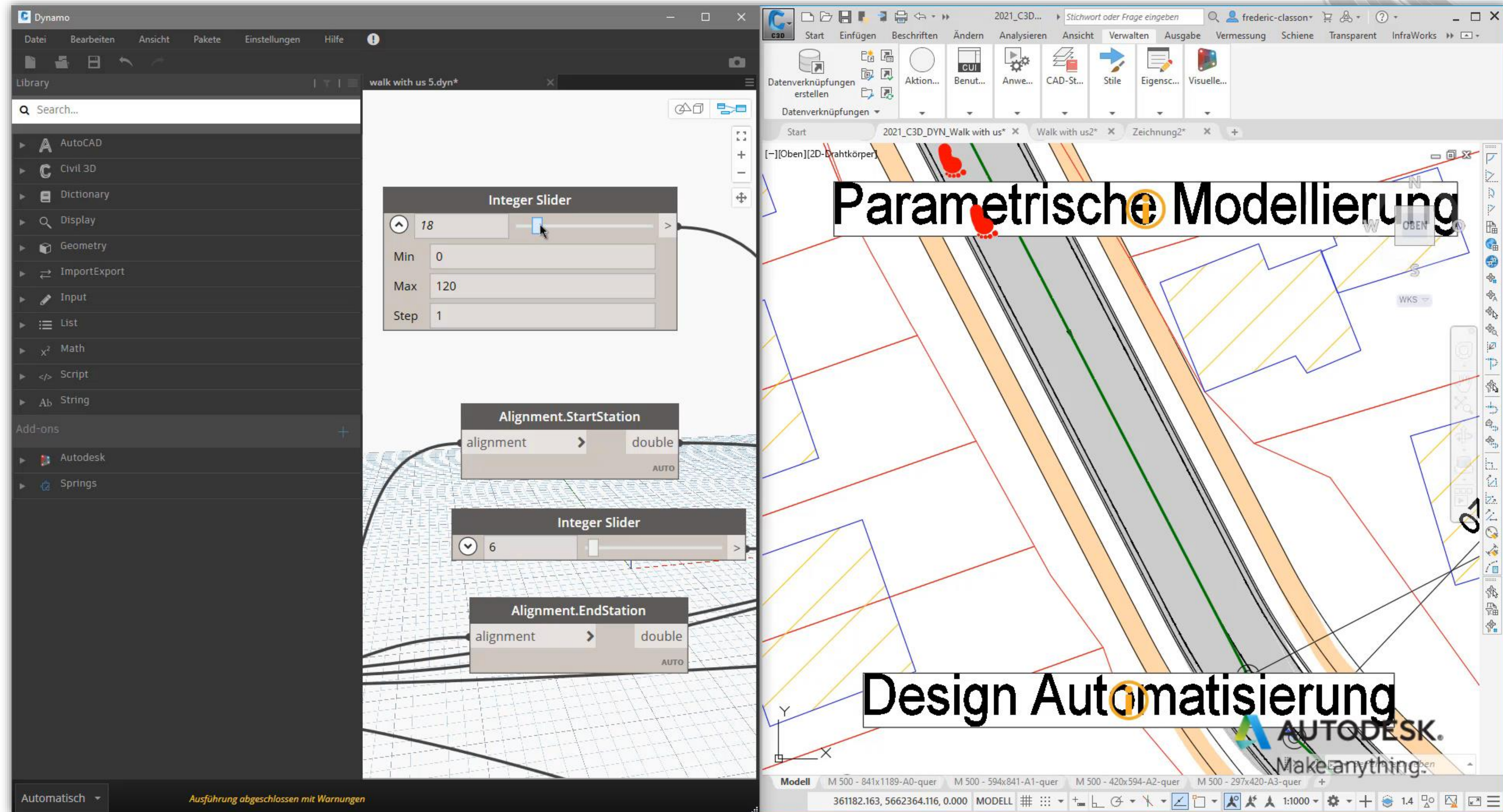
The screenshot displays the Dynamo forum interface. The top navigation bar includes links for Learn, Explore, Blog, Help Center, and Forum, along with social media icons, a DOWNLOAD button, and a Log In button. The main content area is divided into two columns. The left column features a sidebar with category links: Lists-Logic (10 / week), DesignScript (5 / week), Civil3D (2 / week), Alias (27), Jobs (28), and Site Feedback (30). The right column lists individual forum posts with their titles, user avatars, tags, and timestamps.

Category	Count / Week
Lists-Logic	10 / week
DesignScript	5 / week
Civil3D	2 / week
Alias	27
Jobs	28
Site Feedback	30

Post Title	User	Tags	Timestamp
Linked Element geometry not in the correct place	A	Revit	4 2h
Bimorph view input	[Avatar]	Revit	1 2h
Rename family names	R	Share, clockwork, dynamo, data-shapes	39 2h
Slab bottom elevation to last point of elbow	A	Revit	4 2h
Export Shared Parameter from Family	K		4 3h
Due to same name of parameter dynamo found confution	S	Revit	2 4h
Modify Revit Elements With Sound Waves	[Icon]	Share	12 4h
Dynamo Revit	N	Packages, revit, dynamo	0 4h
Dynamo Sandbox without Revit - current status?	[Icon]	Revit	5 5h
Graphic Overrides Imported Categories	1		0 5h

Dynamo für Civil 3D

Los GEHT es!





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