

How to document a tower with forty different floor plates?

Maciej Wypych

Design Technology Coordinator at BVN

Adam Walmsley

Senior Technical Specialist Autodesk





About the speaker

Maciej Wypych

Maciej is a Design Technology Coordinator at BVN, previously Warren and Mahoney Architects and Design Information Management Sessional Tutor at UNSW. He is a committee member and frequent speaker at Dynamo User Group Sydney as well as BUILT ANZ, Wellington Digital Design User Group and other conferences. He has over 15 years' experience in the architecture and building industry in Australia and UK. Maciej brings extensive knowledge in architectural design technology, parametric 3d modelling and the rationalization and delivery of geometrical complex designs.



About the speaker

Adam Walmsley

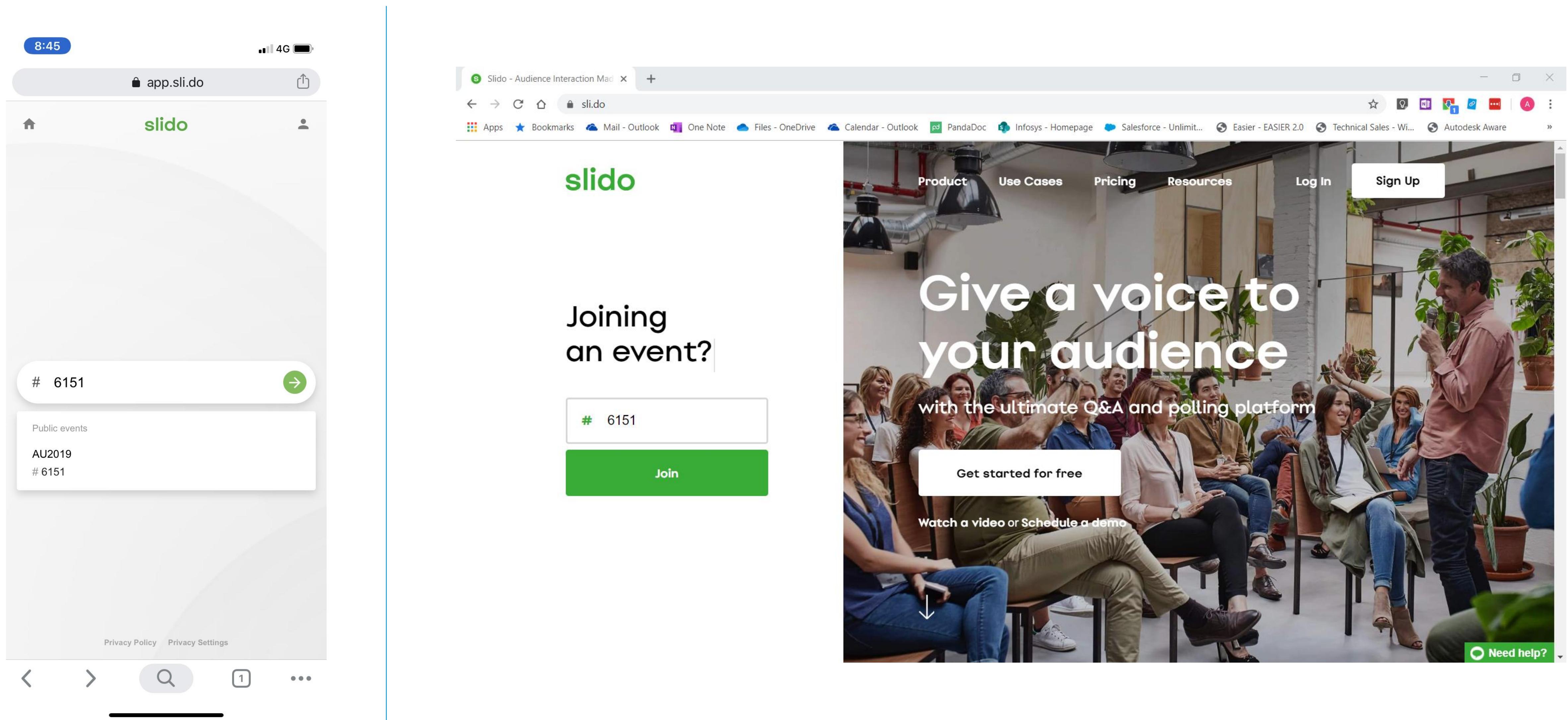
Adam Walmsley is a Civil Infrastructure Technical Specialist for Autodesk based in Sydney, Australia.

He focuses on enabling the industry to design, document and construct Civil Infrastructure projects using improved connected workflows. His passion lies in using computational design processes to help automate and improve design.

Prior to joining Autodesk in April 2019, Adam had worked for 12 years in the structural design and civil construction industry, holding lead Digital Engineering roles on challenging major projects in Australia.

Ask questions at Slido.com

Event Number: 6151



The image shows a side-by-side comparison of the Slido mobile app interface (left) and the Slido website interface (right), both displaying the event number 6151.

Mobile App (Left):

- Header: 8:45, 4G signal, battery level.
- Address bar: app.sli.do
- Slido logo.
- Event details: # 6151, AU2019, # 6151.
- Buttons: Privacy Policy, Privacy Settings, back, forward, search, refresh, and a bottom navigation bar with a '1' icon.

Website (Right):

- Header: Slido - Audience Interaction Made Simple, sli.do
- Toolbar: Apps, Bookmarks, Mail - Outlook, One Note, Files - OneDrive, Calendar - Outlook, PandaDoc, Infosys - Homepage, Salesforce - Unlimited, Easier - EASIER 2.0, Technical Sales - Wi..., Autodesk Aware.
- Slido logo.
- Text: Joining an event?
- Input field: # 6151.
- Button: Join.
- Text: Give a voice to your audience with the ultimate Q&A and polling platform.
- Buttons: Get started for free, Watch a video or Schedule a demo, Need help?.
- Navigation: Product, Use Cases, Pricing, Resources, Log In, Sign Up.
- Image: A man speaking into a microphone in front of an audience.

LEARNING OBJECTIVES:

- PROJECT TIMELINE
- MODEL SPLIT
- LINKS VS GROUPS
- BUILDING FORM
- AUTOMATION
- FAÇADE ELEMENTS
- SUMMARY

SYDNEY
MELBOURNE
AUCKLAND
TAURANGA
WELLINGTON
CHRISTCHURCH
QUEENSTOWN

Warren and Mahoney is an architectural and design practice with seven locations functioning as a single studio.

The practice has nearly 300 people - working across architecture, interior design, masterplanning, urban design, customer experience, workplace strategy consultancy and sustainable design.

Our one studio approach allows us to draw from the wider group for skills and experience on every project, regardless of the location.

Our design philosophy is founded on the belief that human experience is improved through enduring design excellence, delivered through formal simplicity and material quality

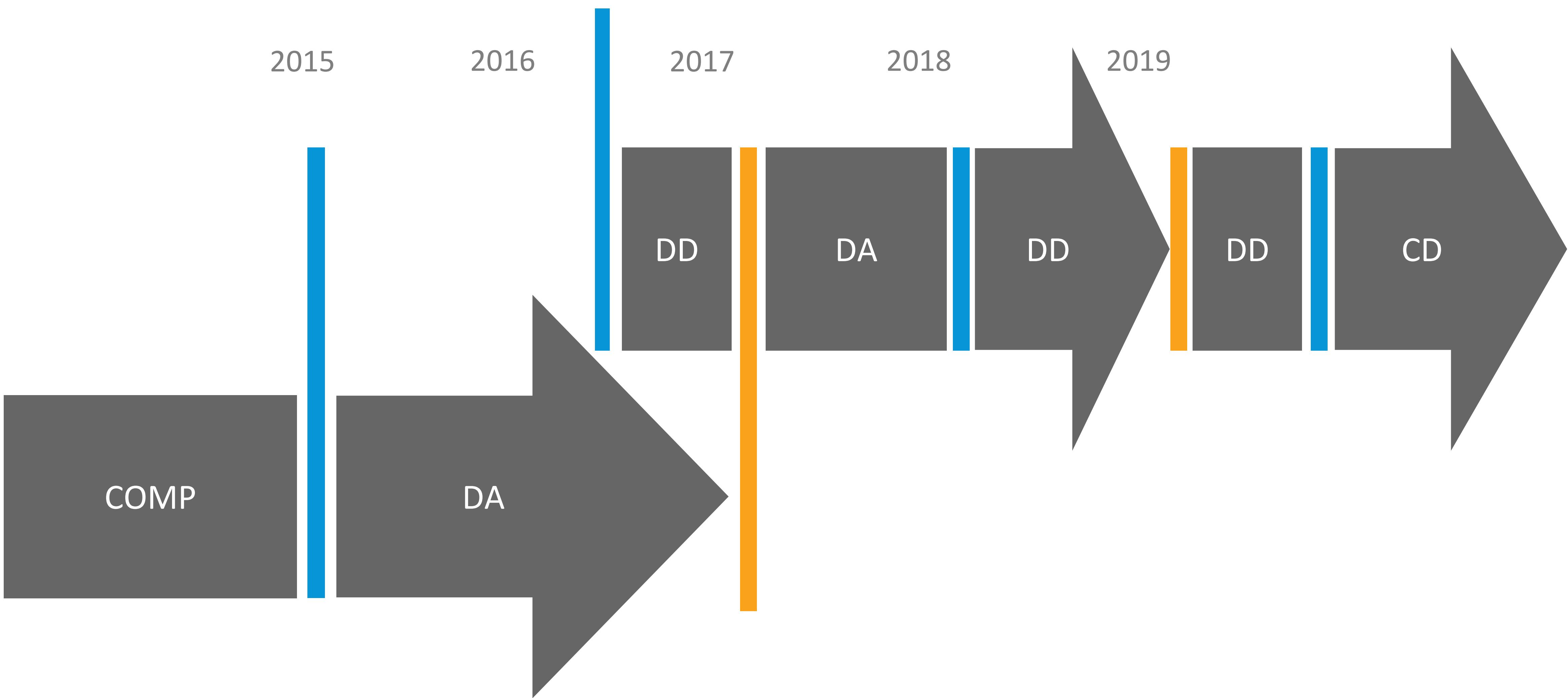




PROJECT TIMELINE



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MAHONEY®





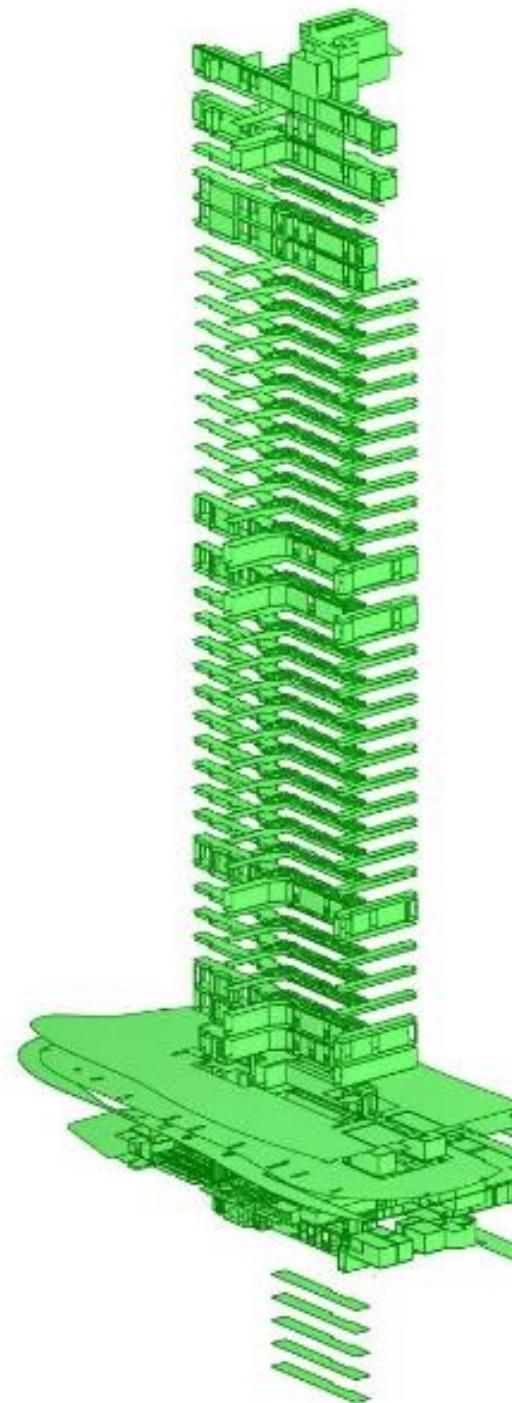
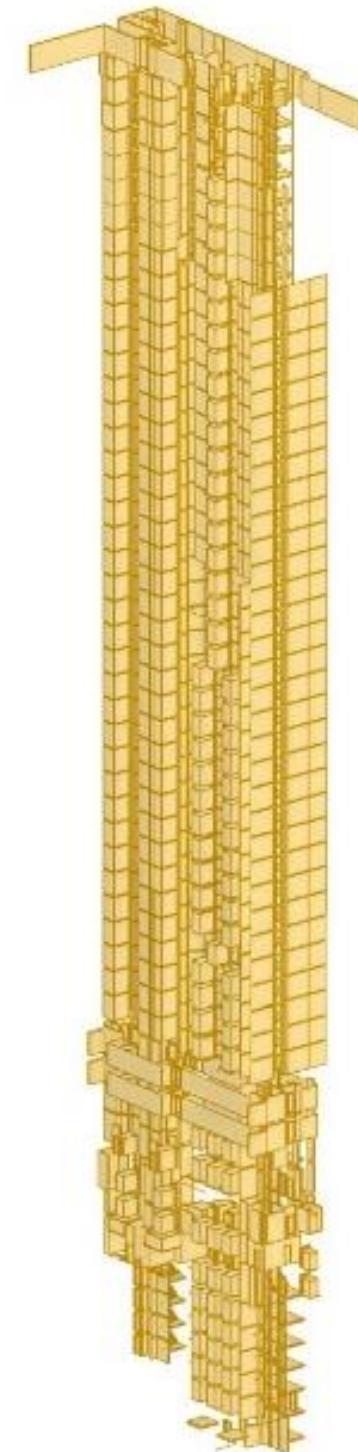
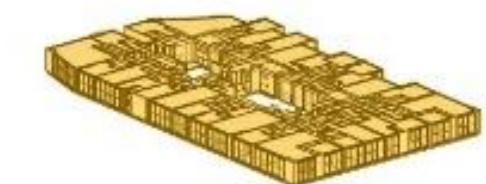
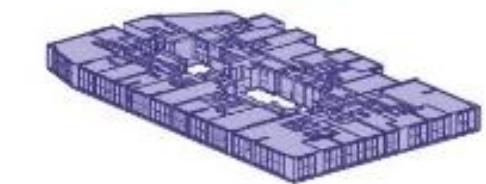
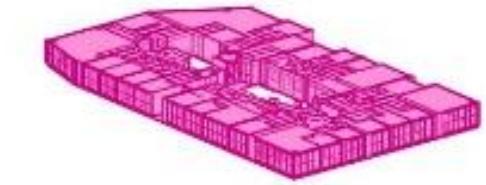
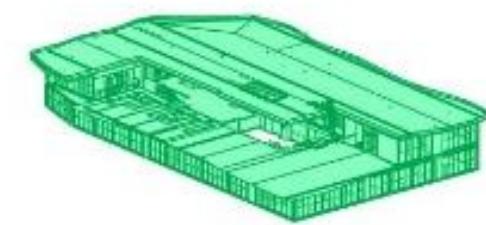
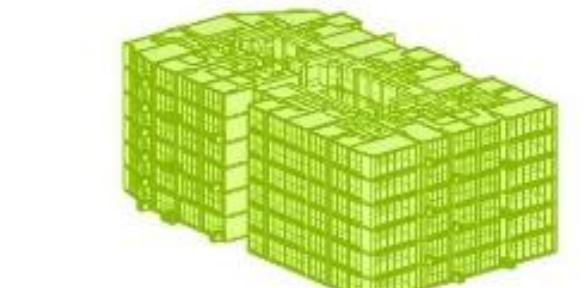
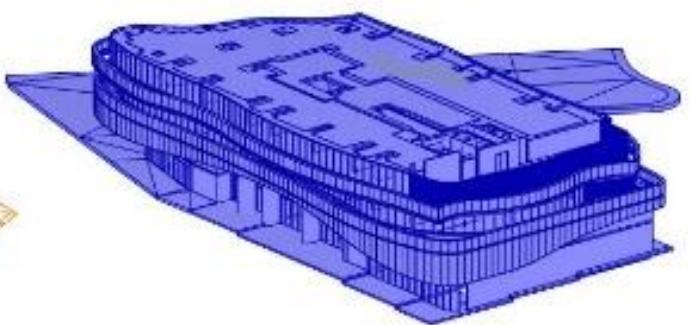
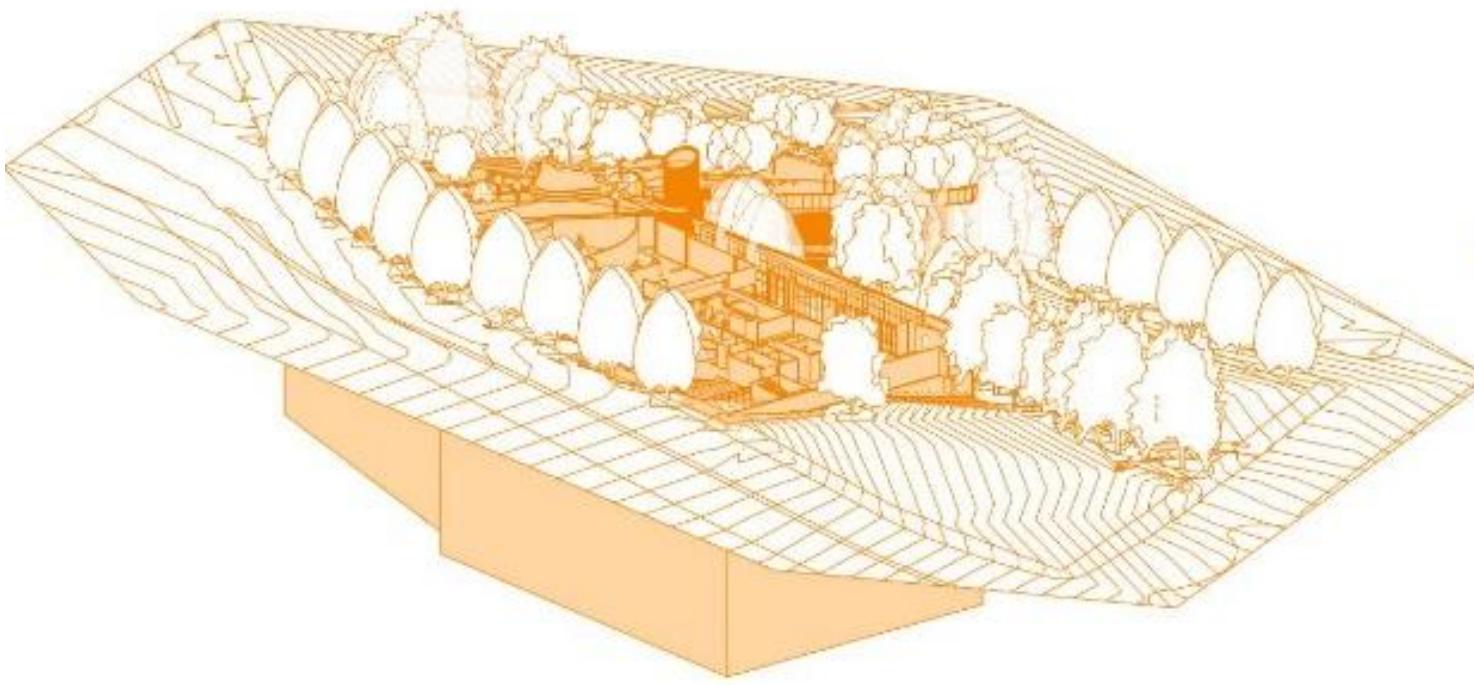
THE BUILDING

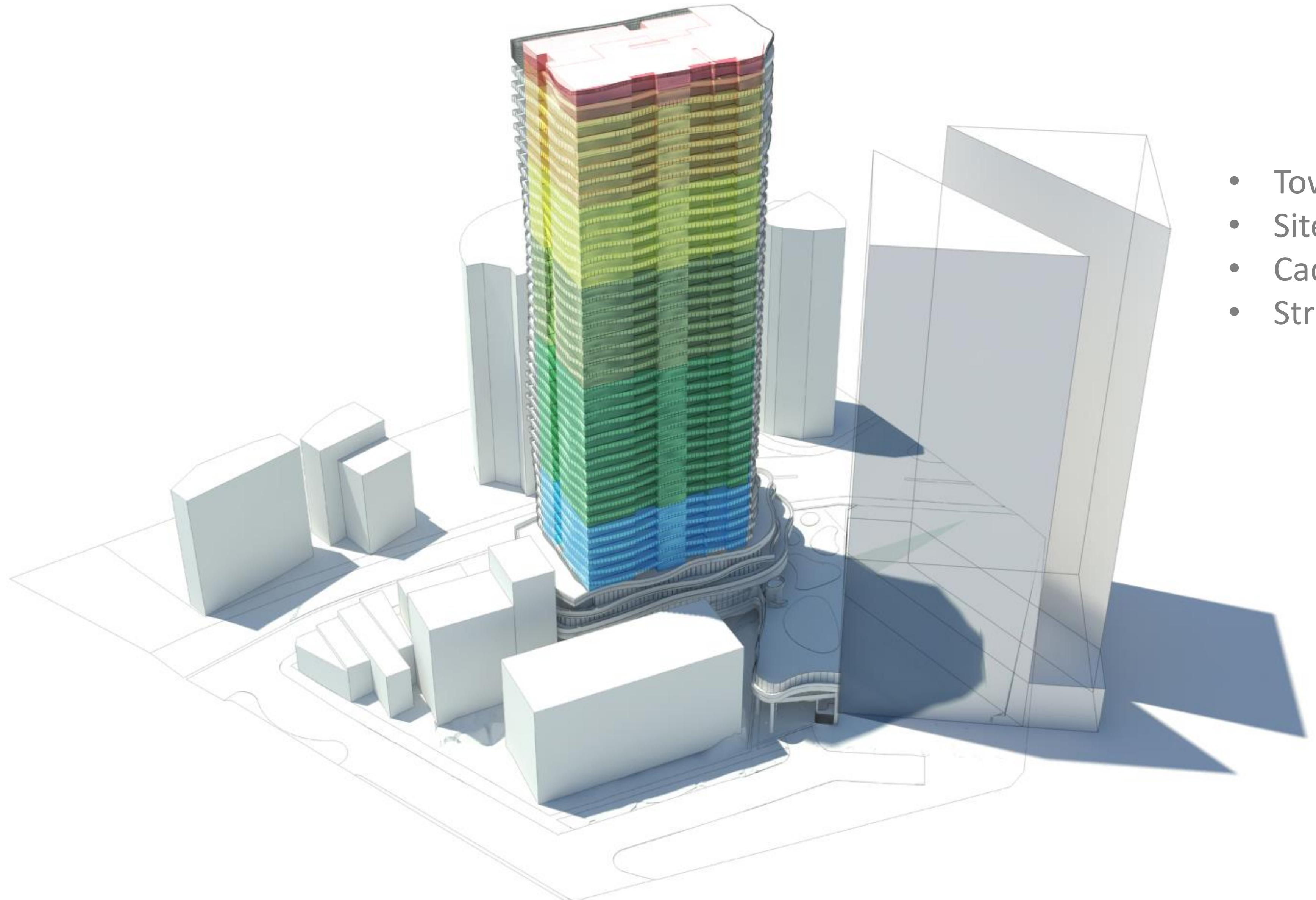


MODEL SPLIT



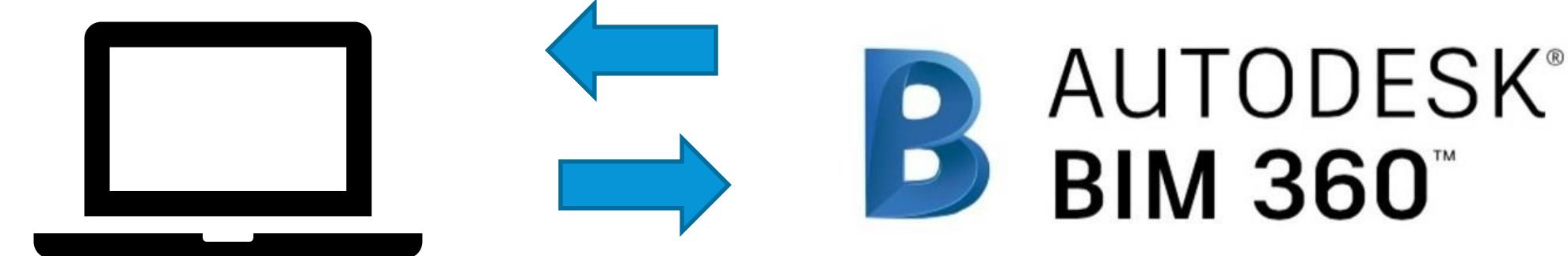
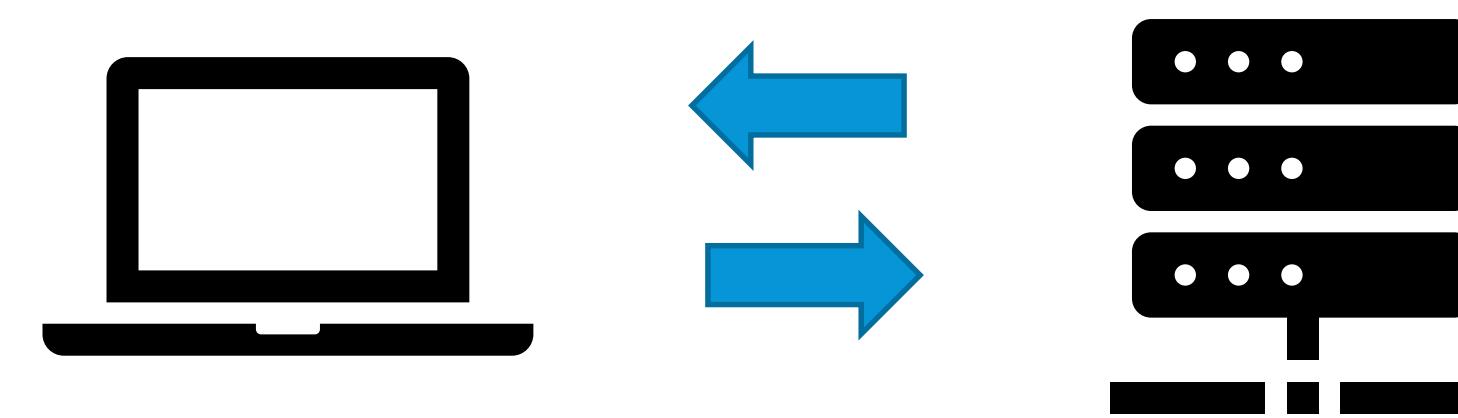
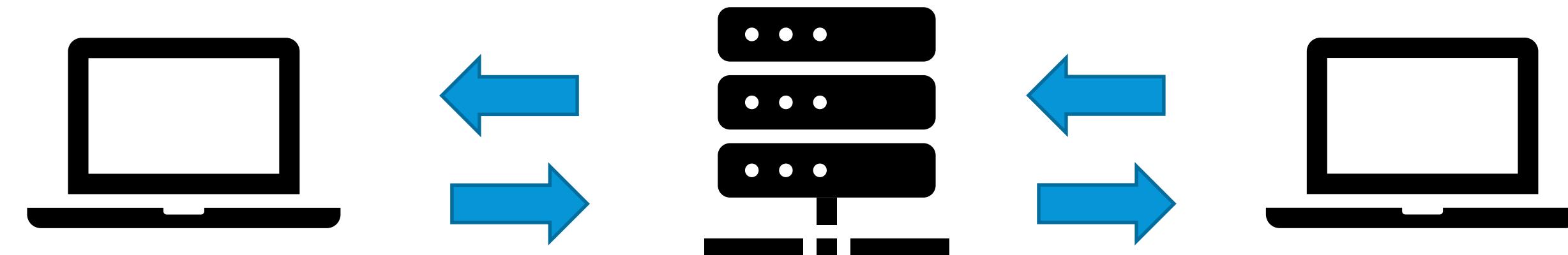
- Container file
- Master Federated
- Site
- Typical Levels x9
- Façade
- Core
- Interiors
- Furniture(Selected Levels)





- Tower
- Site
- Cad Links
- Structure(Architectural)*

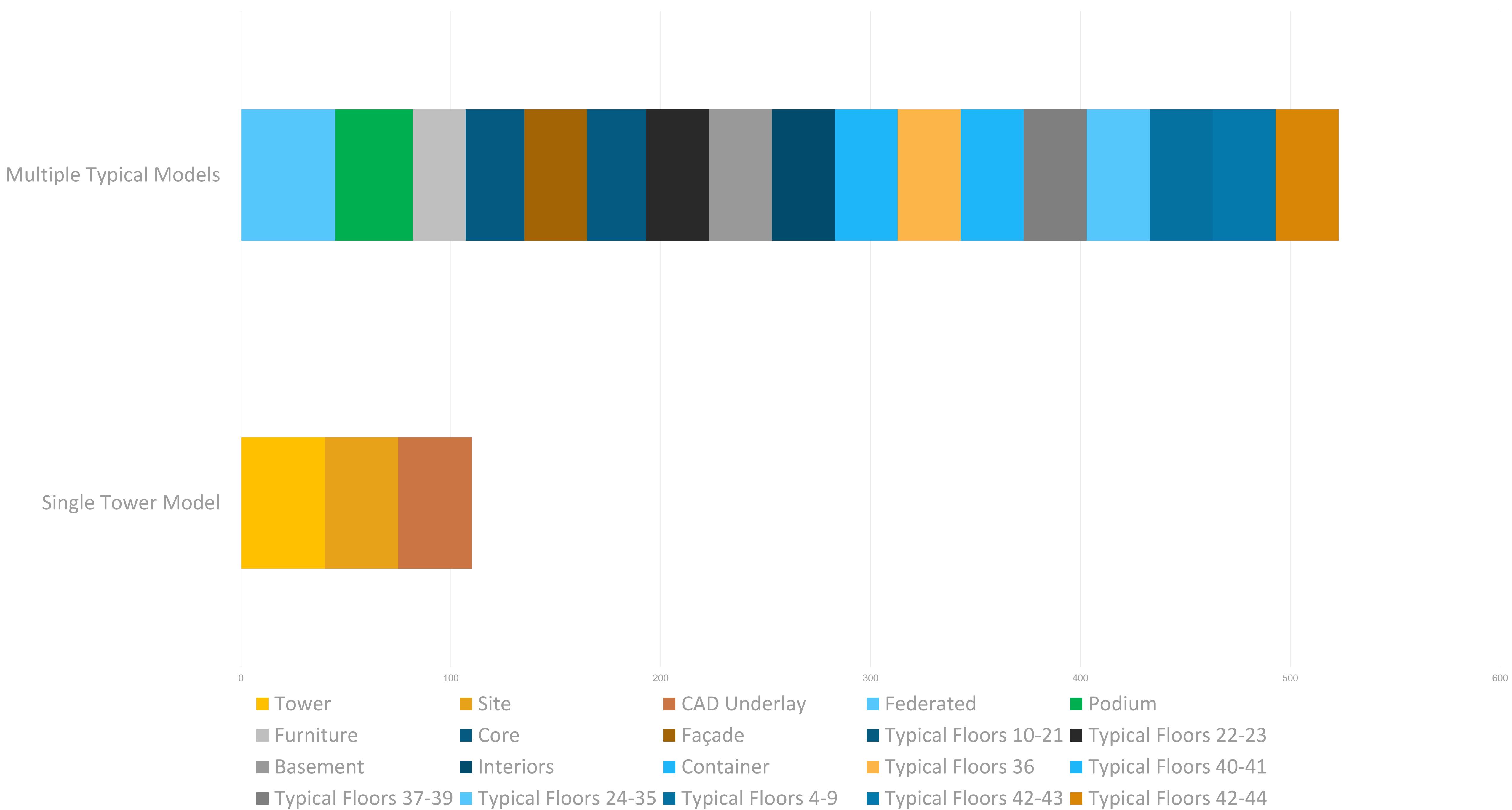
panura



LINKS VS GROUPS

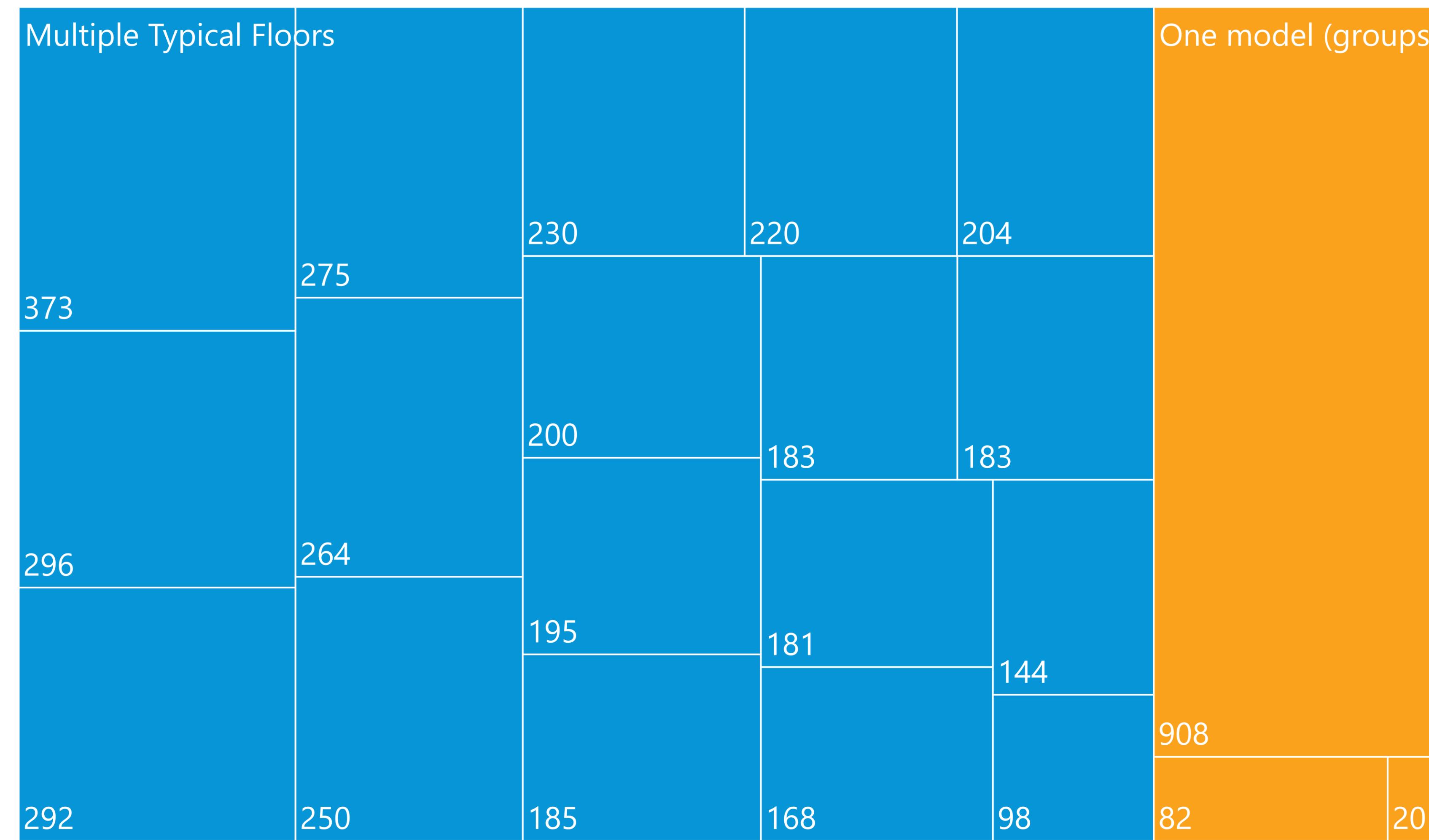


Sync Times (Seconds)



Model Size

- Multiple Typical Floors
- One model (groups)

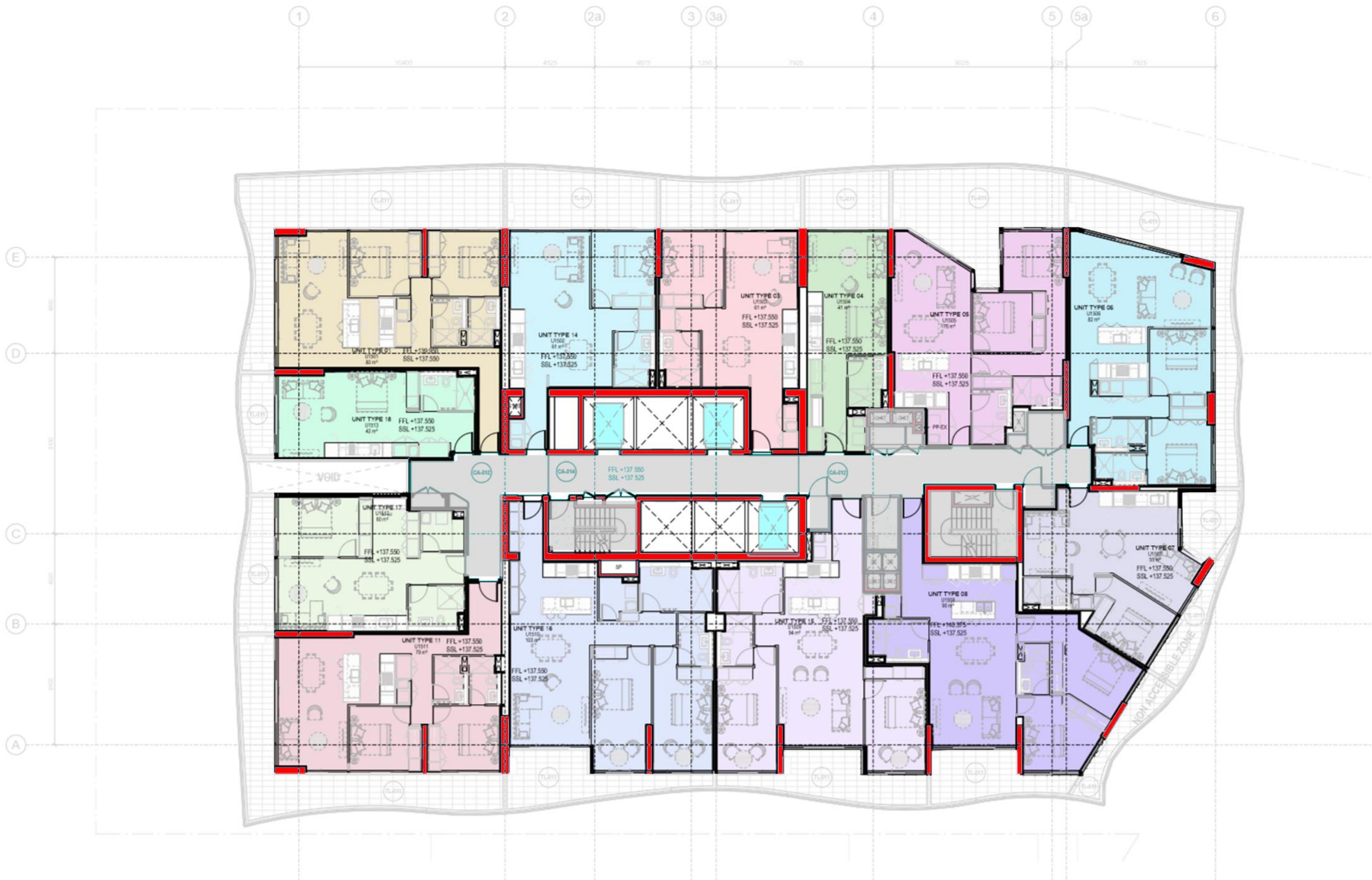


LINKS

- Annotation is dropping off
- Need to open multiple files
- Harder to maintain consistency
- Bigger and slower overall
- Not flexible if design changes
- Can't reference between files

GROUPS

- Break if you don't follow best practice
- All within one file
- Bigger file but smaller project overall
- Flexible if design changes
- Drawing references within single file



Groups:

- Structure*
- Core
- Individual Apartments

Working with Revit groups:

- Plan
- Don't ungroup
- Don't group if it's not repeated
- Don't exclude
- Don't nest
- Unjoin walls

BUILDING FORM



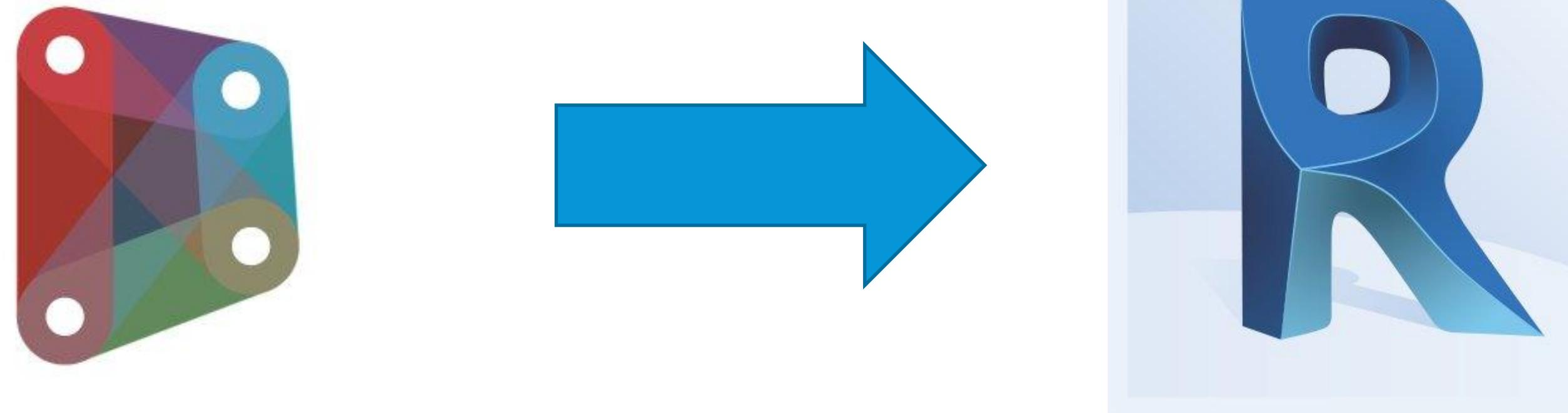


INITIAL WORKFLOW



700+ Lines per floor outline

CURRENT WORKFLOW



20-30 Arcs & Lines per
floor outline

MODEL USING DYNAMO

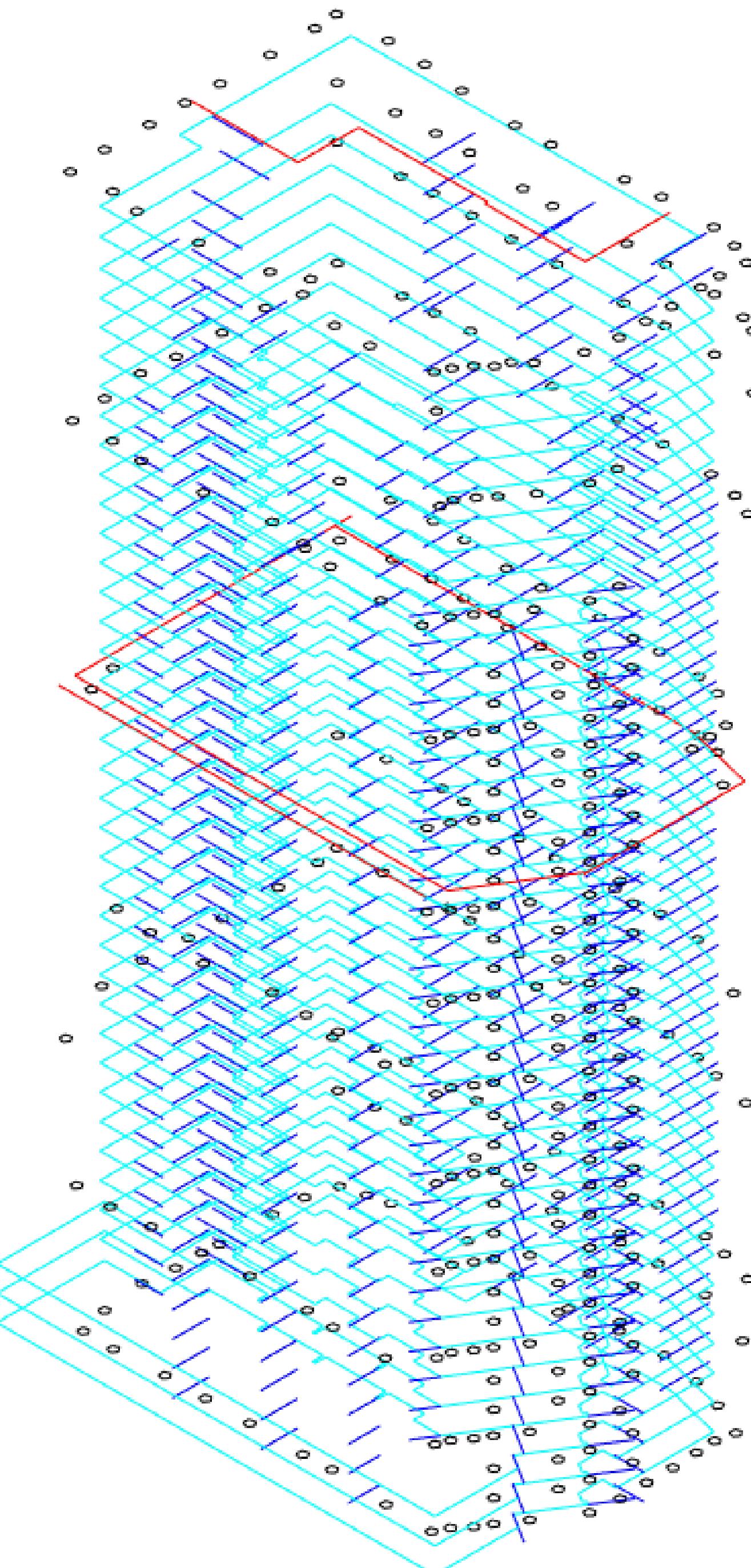
Process



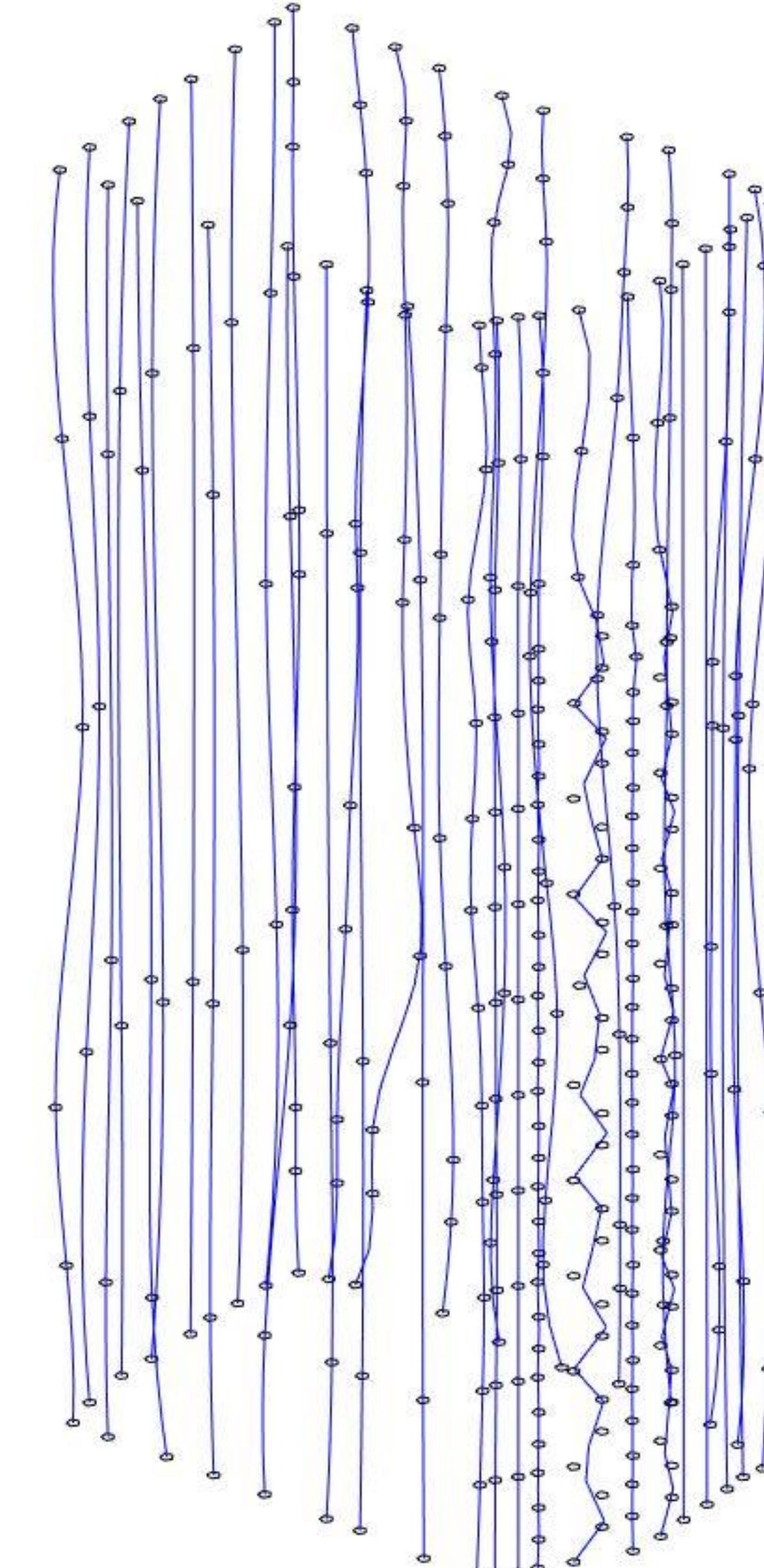
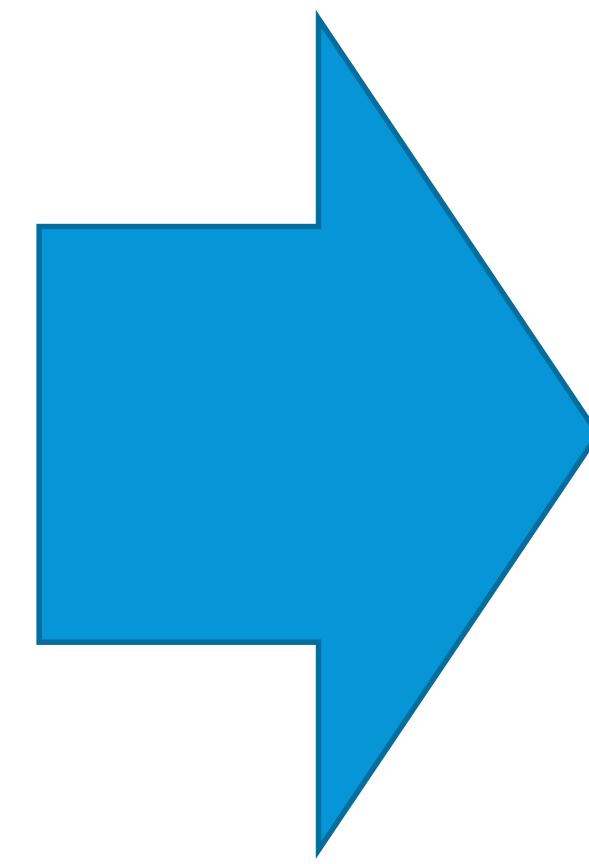
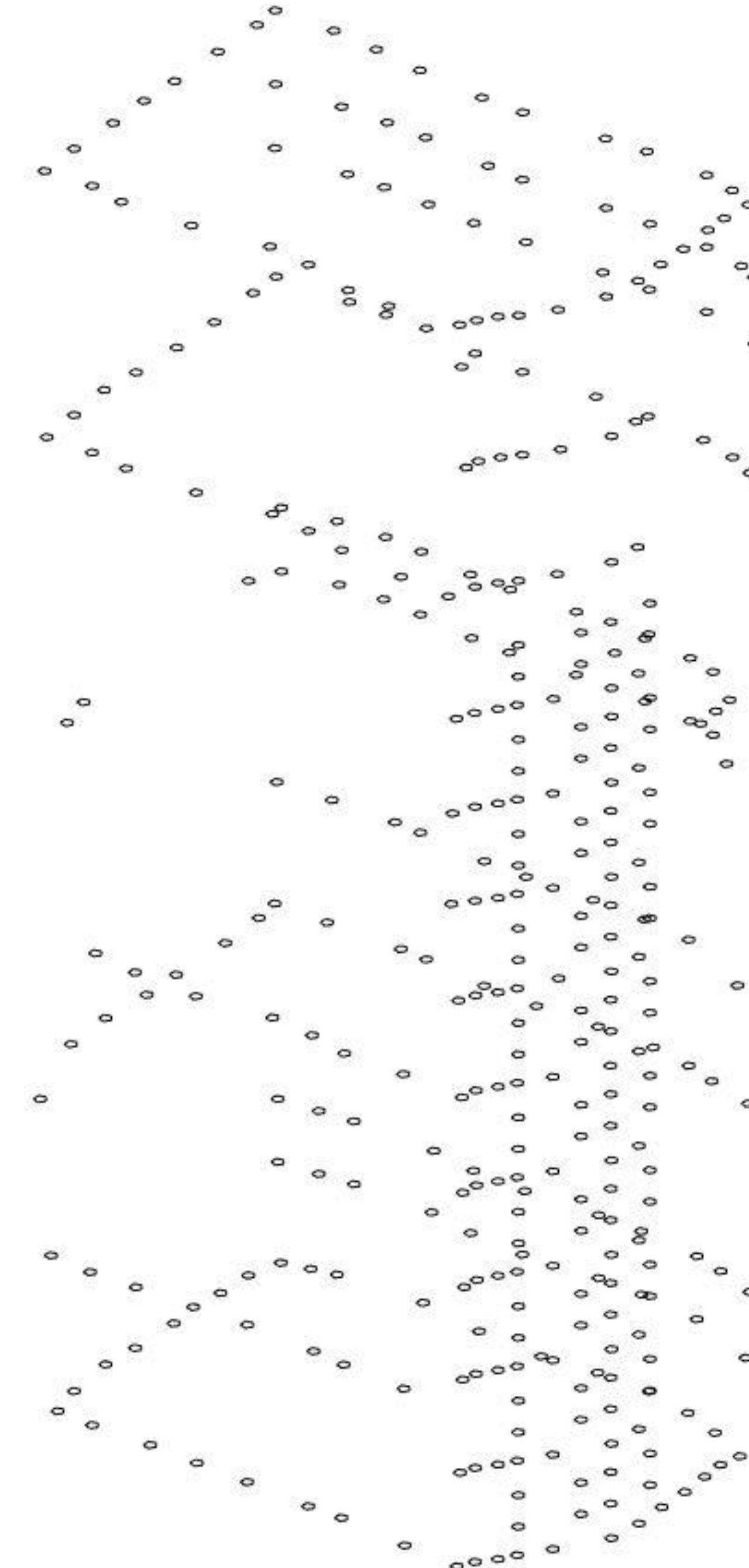
Design

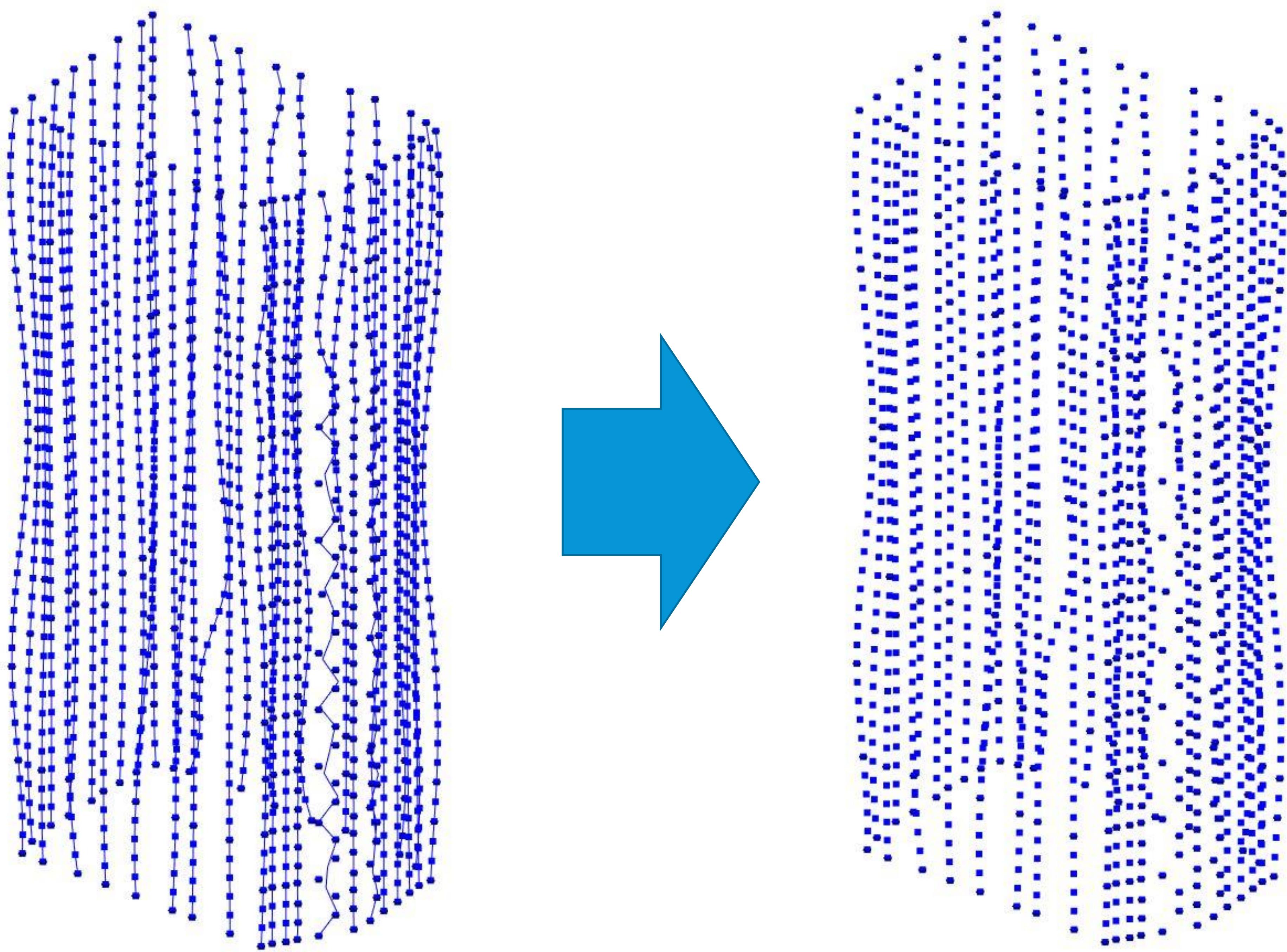


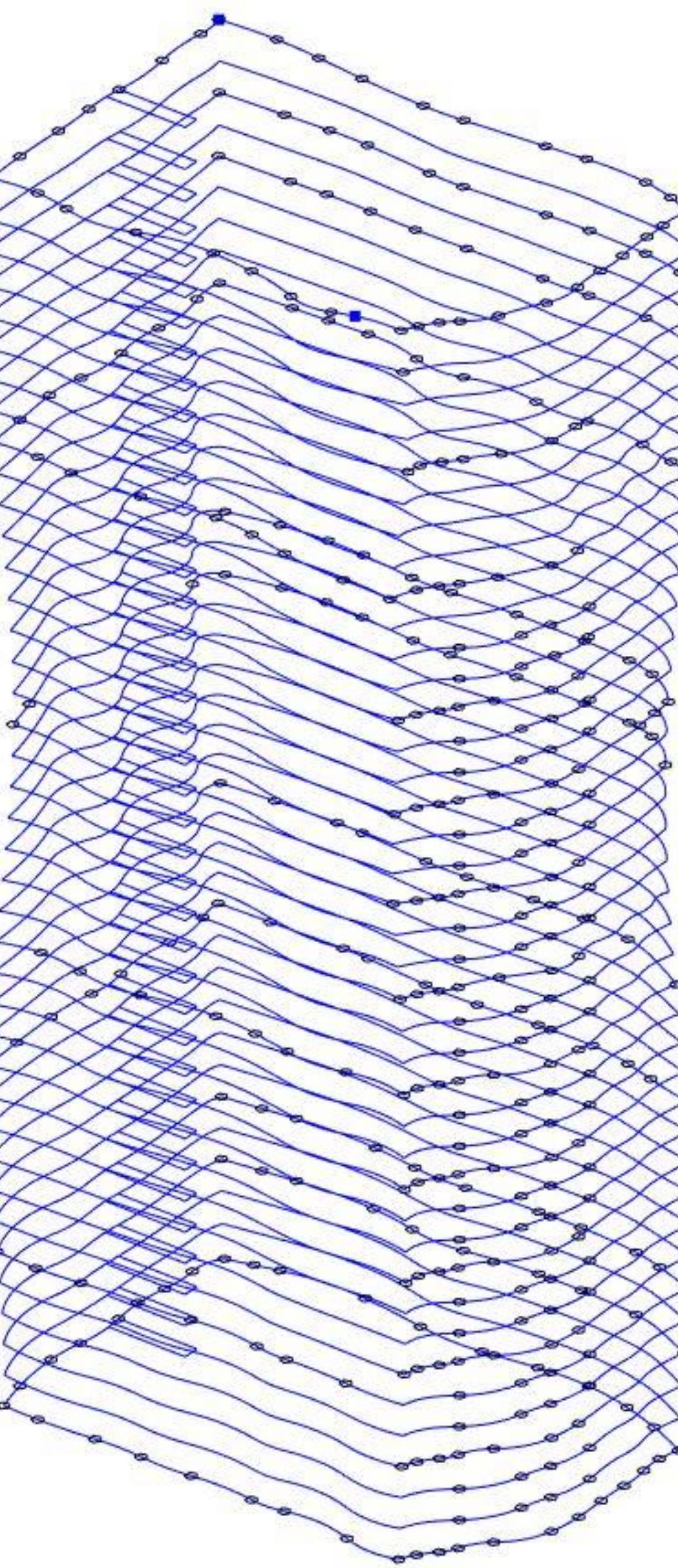
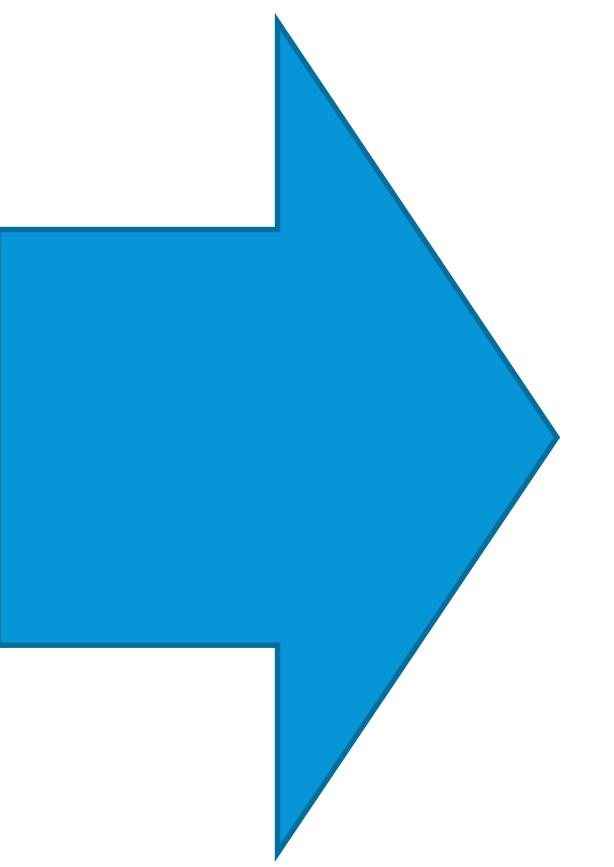
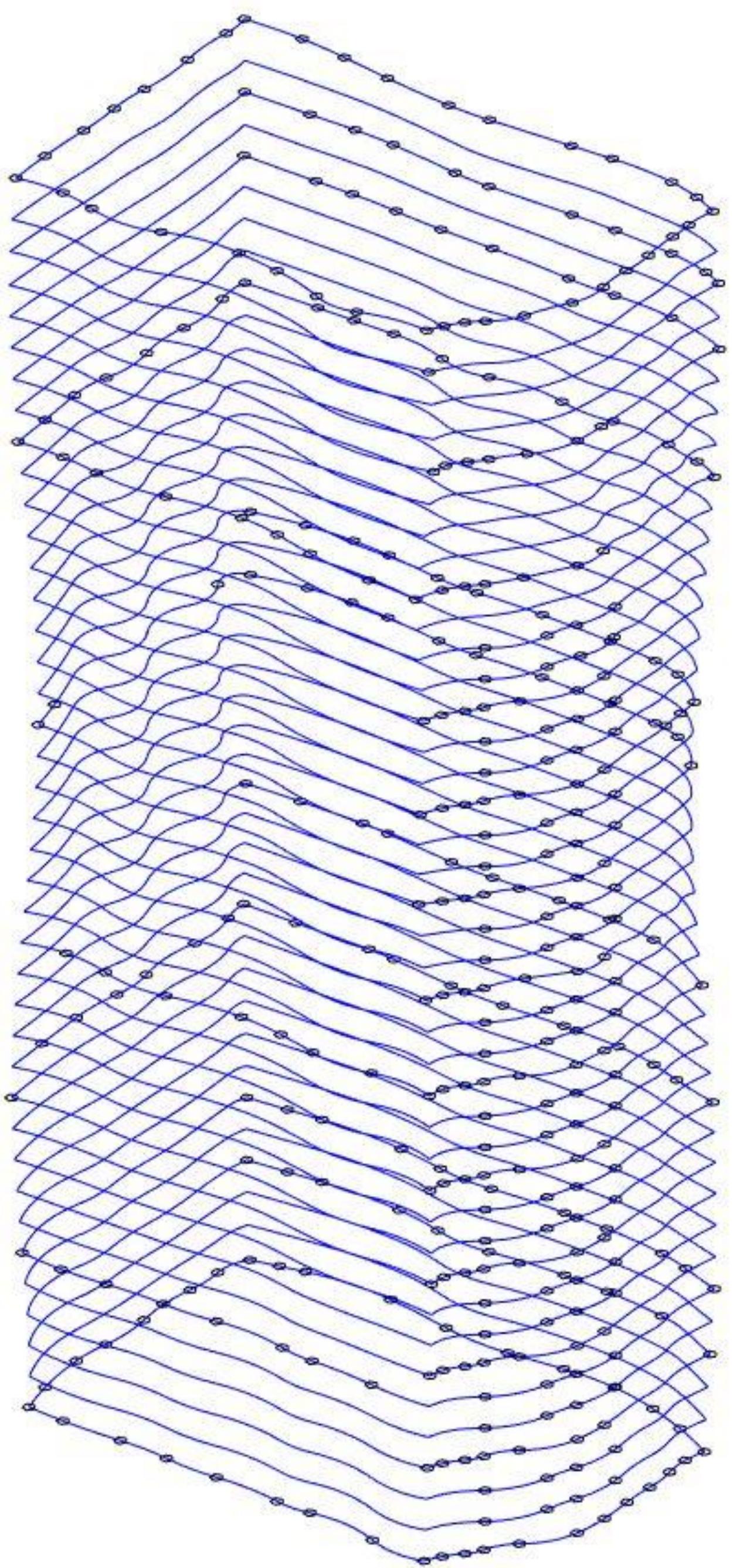
Create

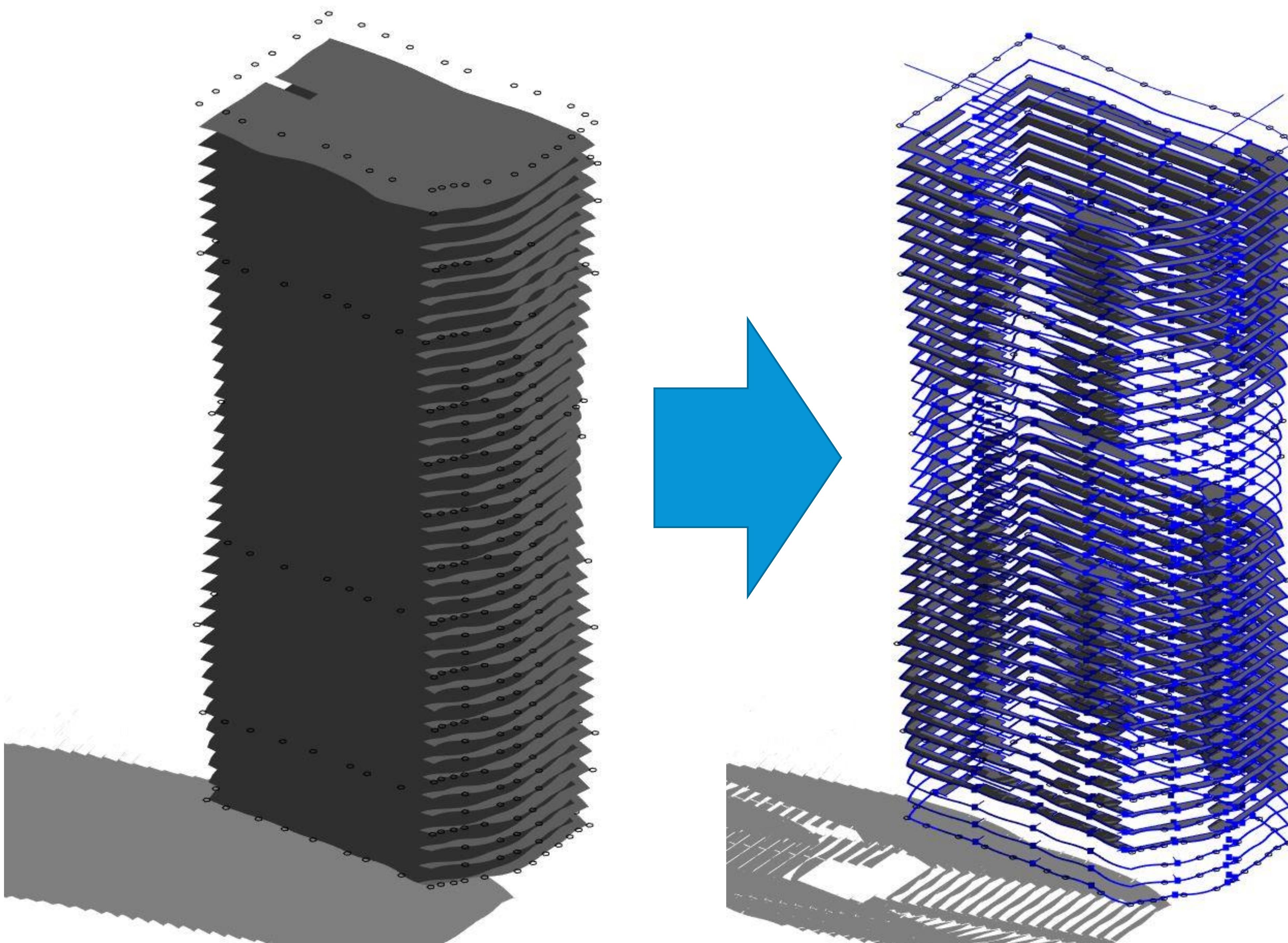


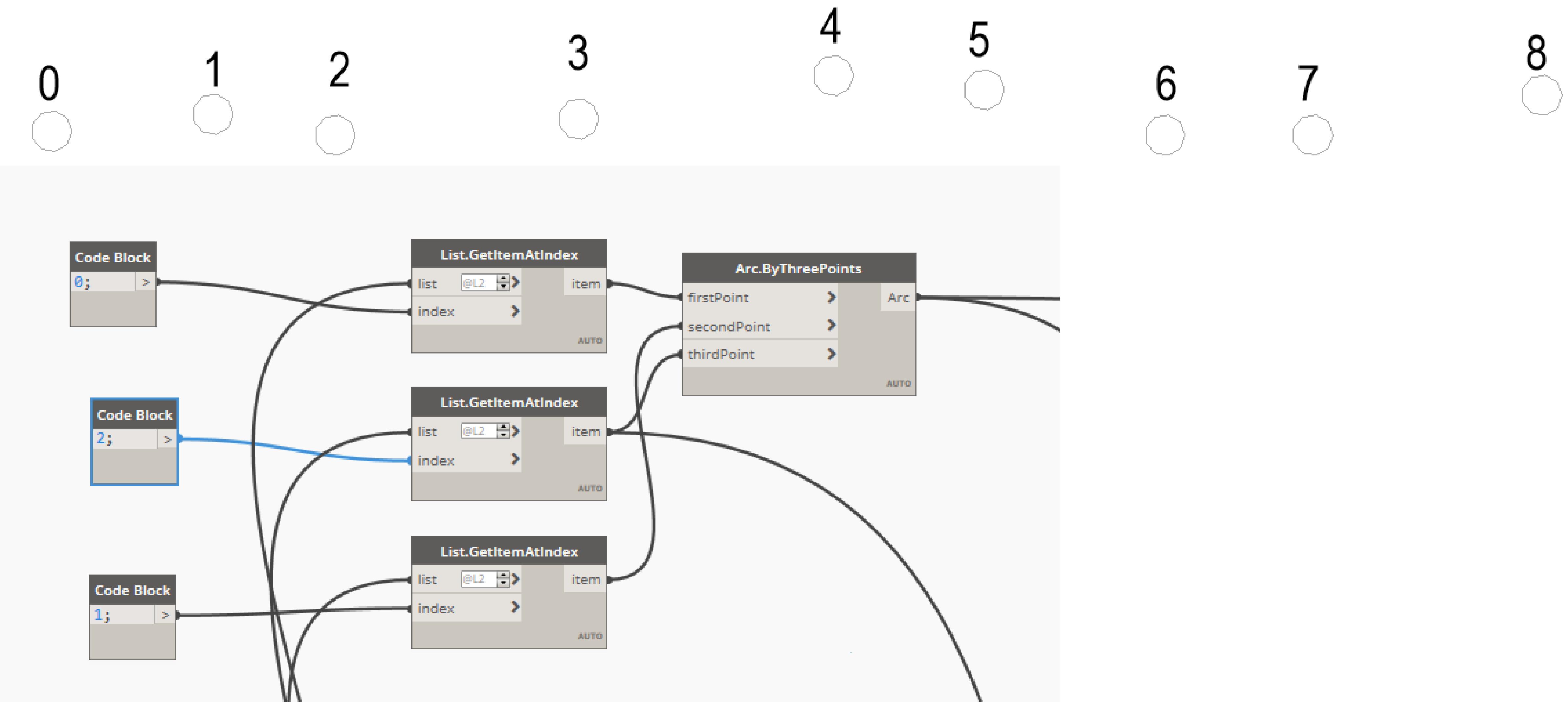
CONSTRAINTS CREATED USING MODEL
LINES AND GENERIC MODEL FAMILIES

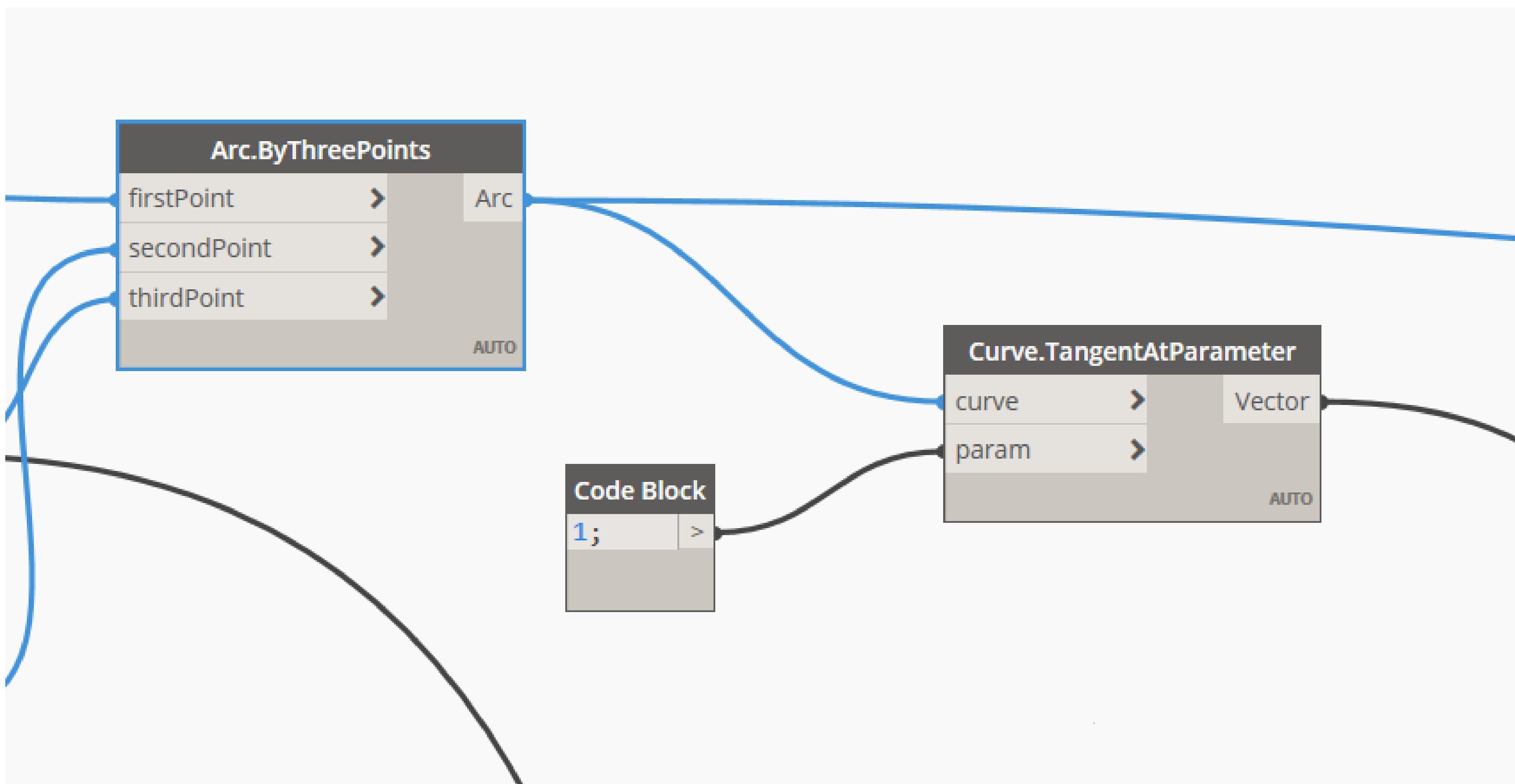


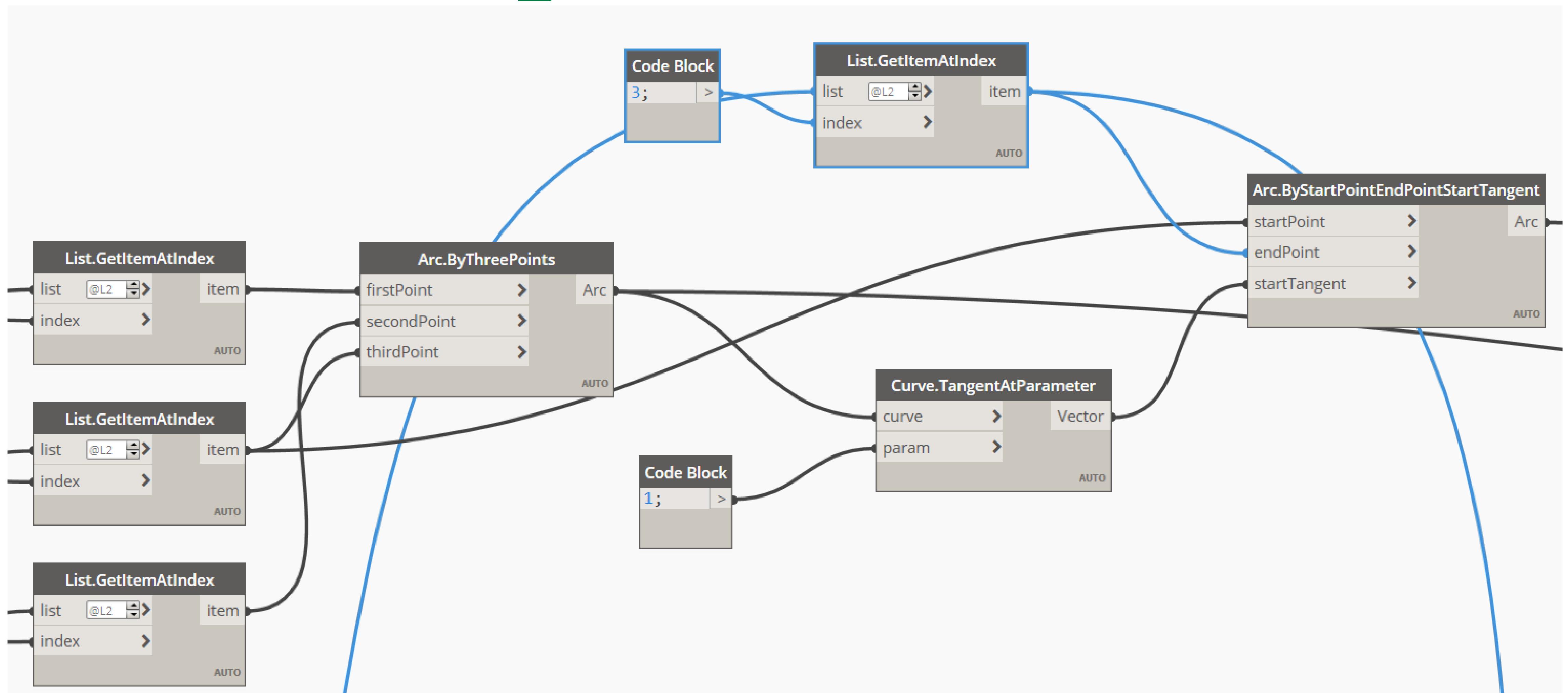
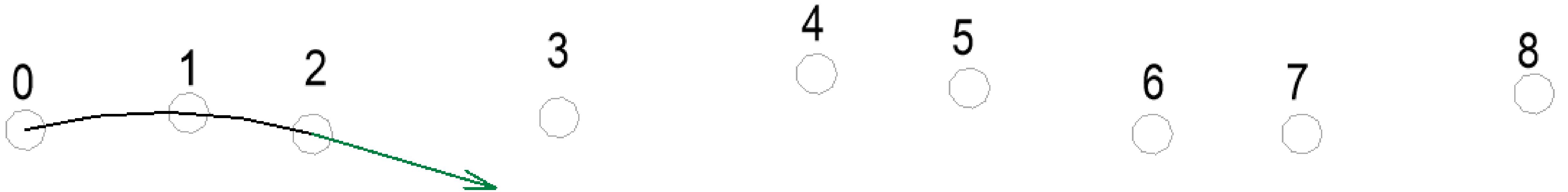


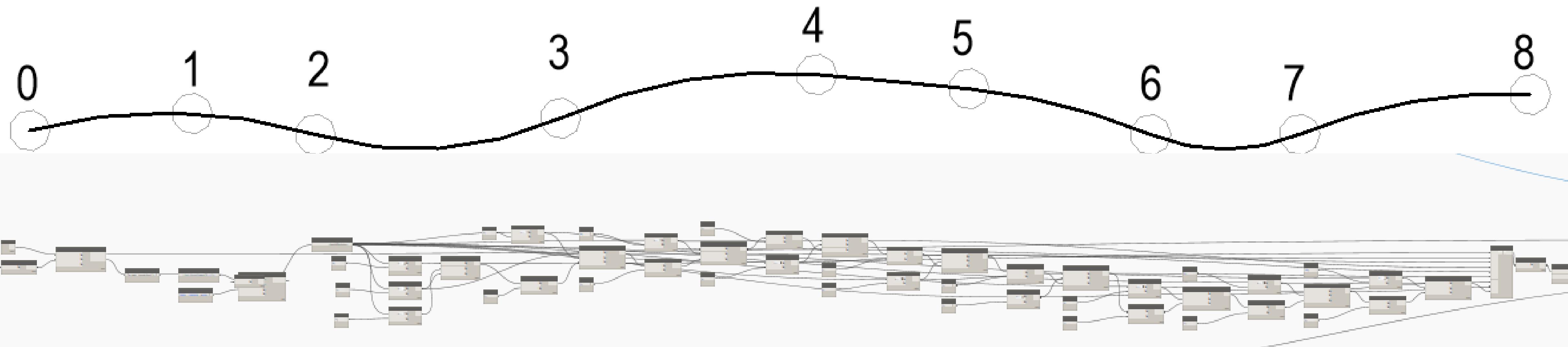




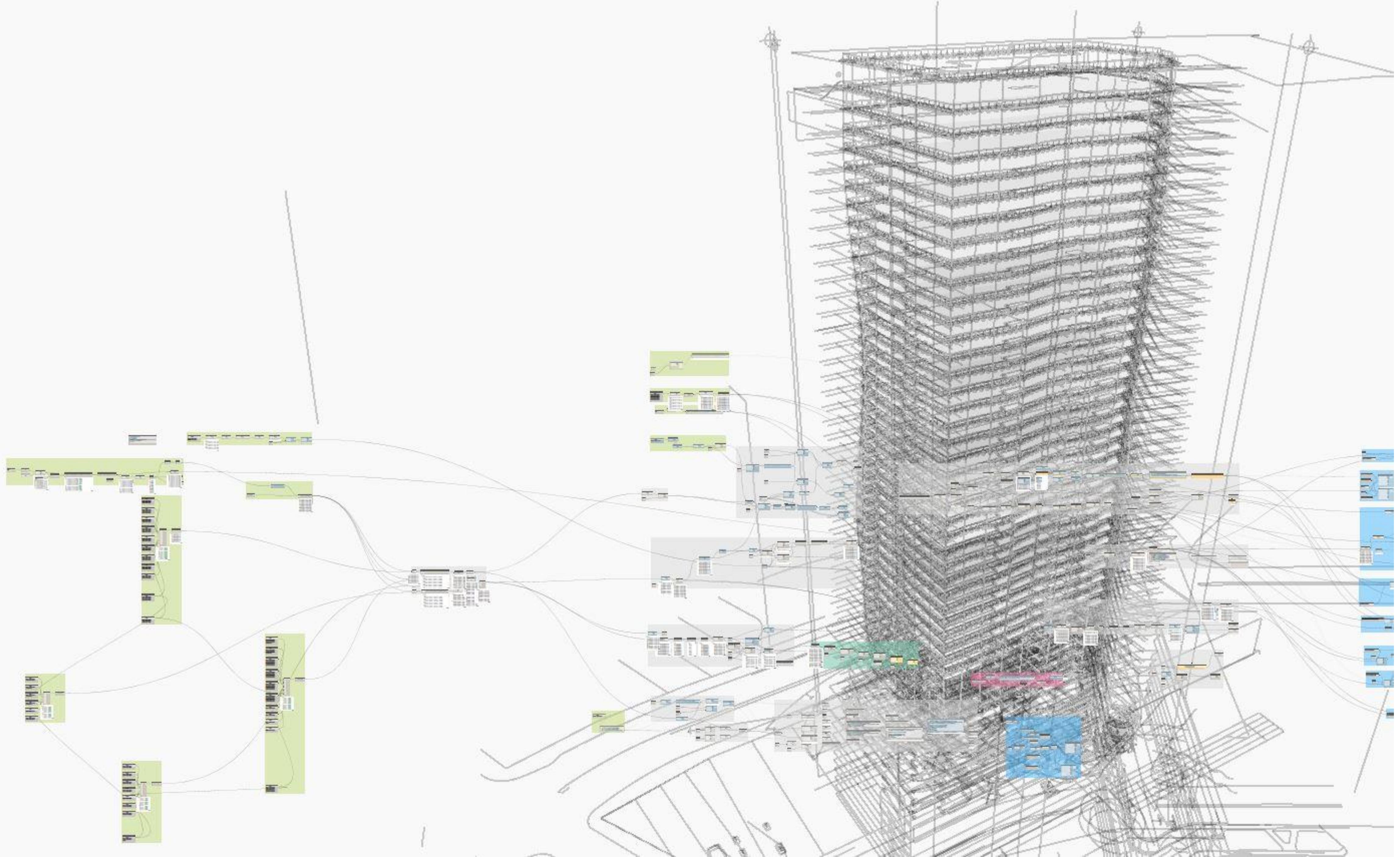


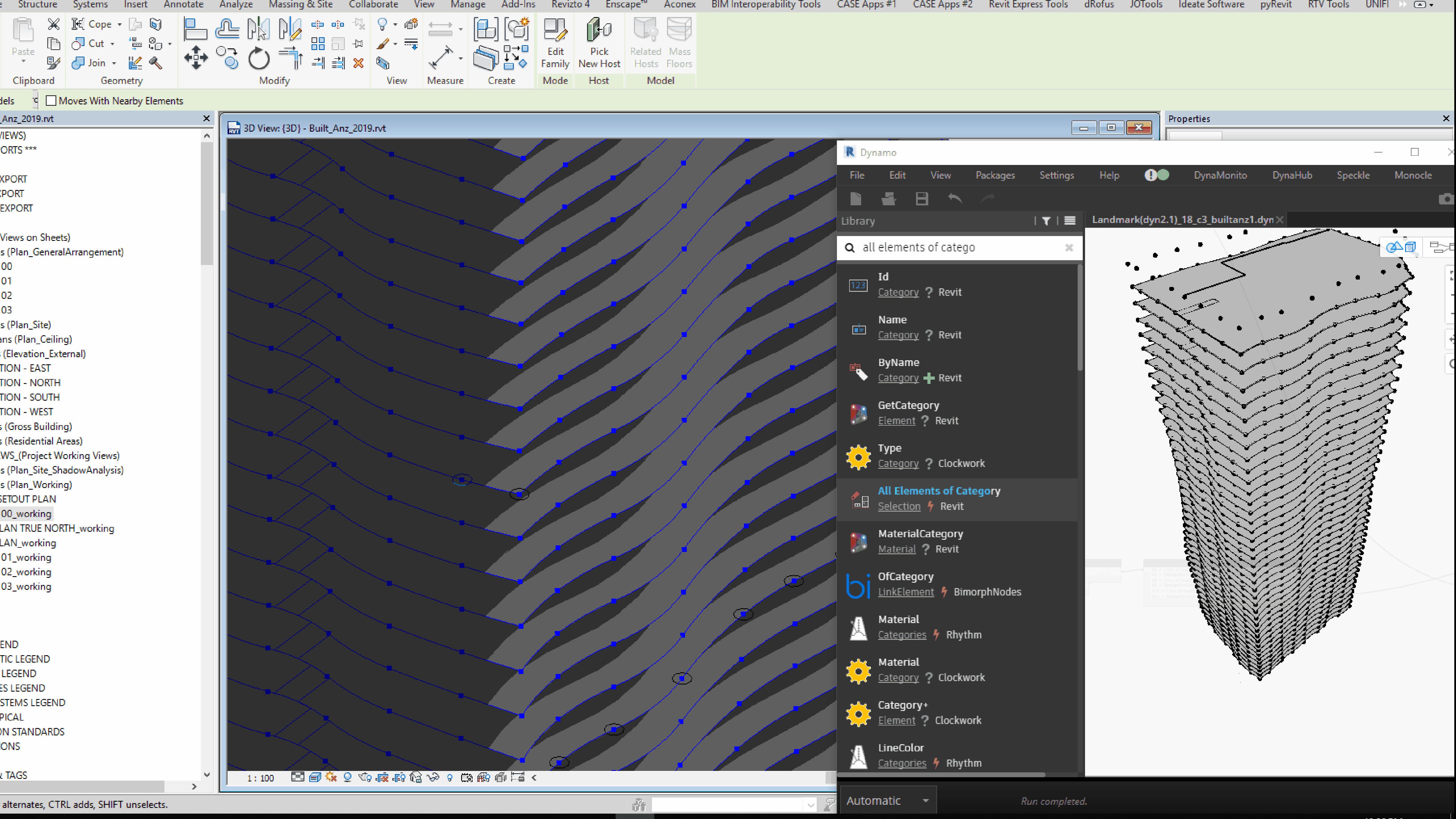


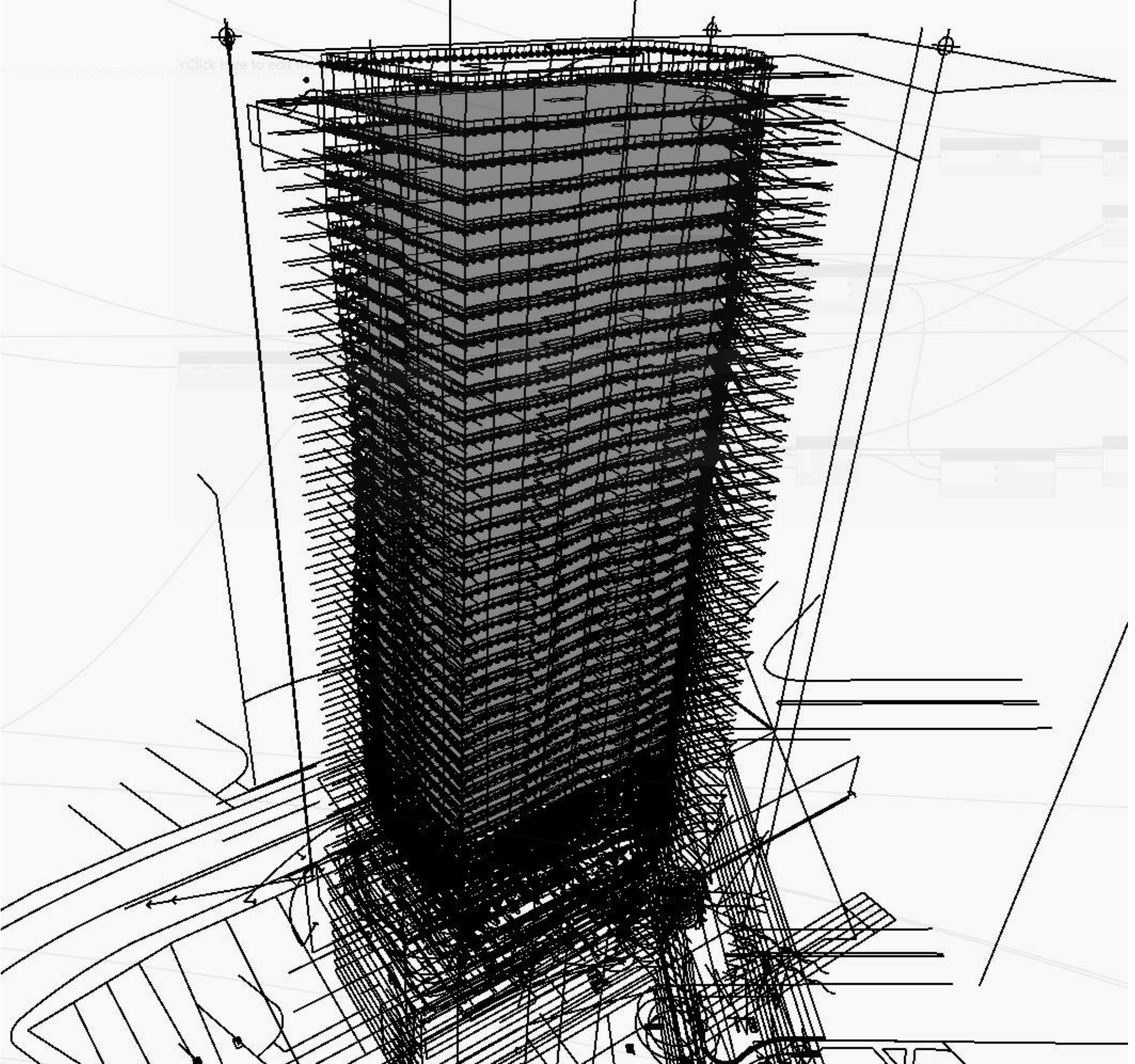


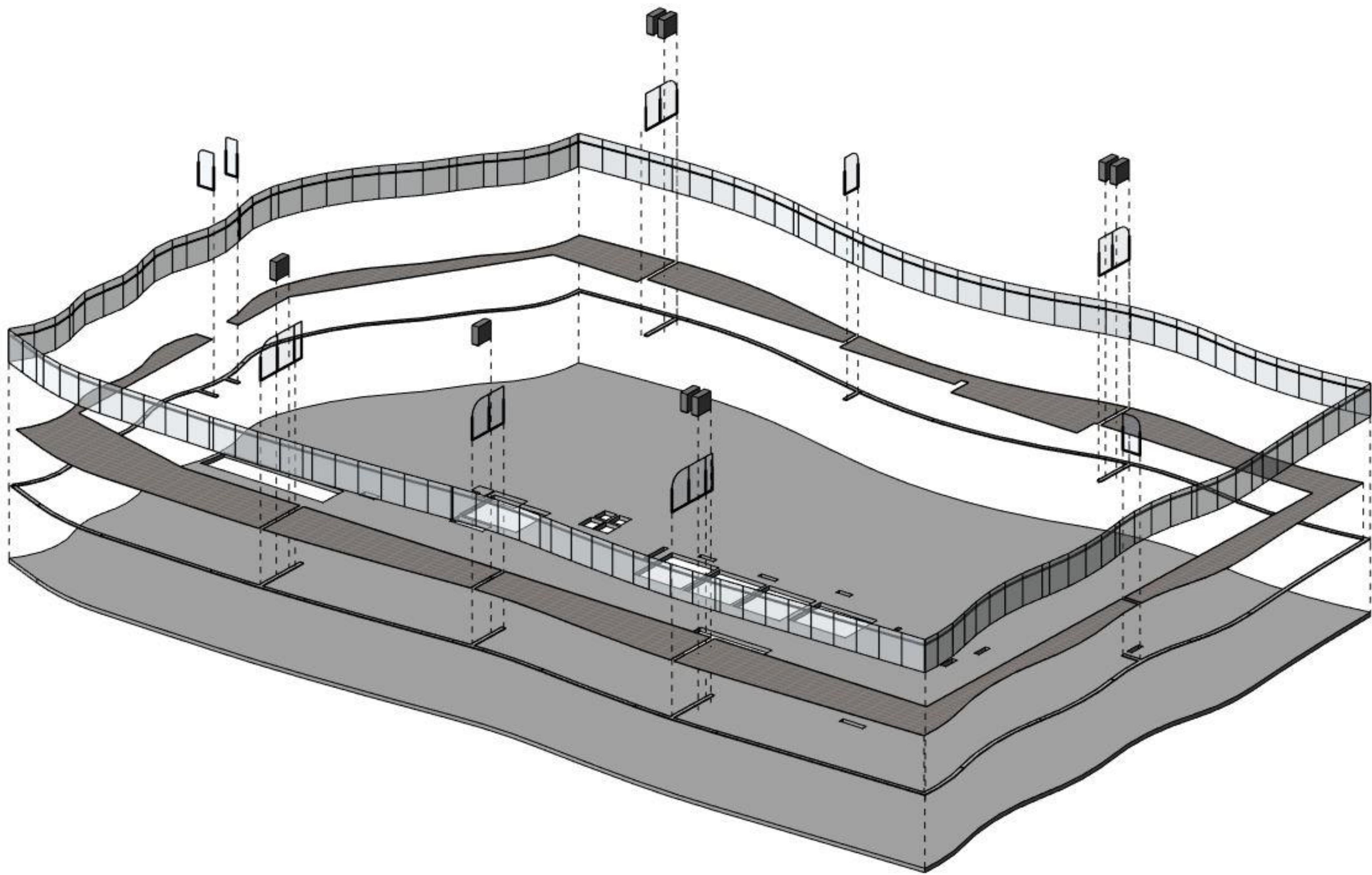


```
12 try:
13     errorReport = None
14     crvs = []
15     for e in pnts:
16
17         arcs = []
18         a1=Arc.ByThreePoints(e[0],e[1],e[2])
19         arcs.append(a1)
20
21
22         for ind, i in enumerate(e[3:]):
23             try:
24                 afnd = Arc.ByStartPointEndPointStartTangent(arcs[ind].EndPoint,i,arcs[ind].TangentAtParameter(1))
25                 arcs.append(afnd)
26             except:
27                 afnd = Line.ByStartPointEndPoint(arcs[ind].EndPoint,i)
28                 arcs.append(afnd)
29
30             crvs.append(PolyCurve.ByJoinedCurves(arcs))
31     except:
32         # if error occurs anywhere in the process catch it
33         import traceback
34         errorReport = traceback.format_exc()
35 #Assign your output to the OUT variable
36 if errorReport == None:
37     OUT = crvs
38 else:
39     OUT = errorReport
```

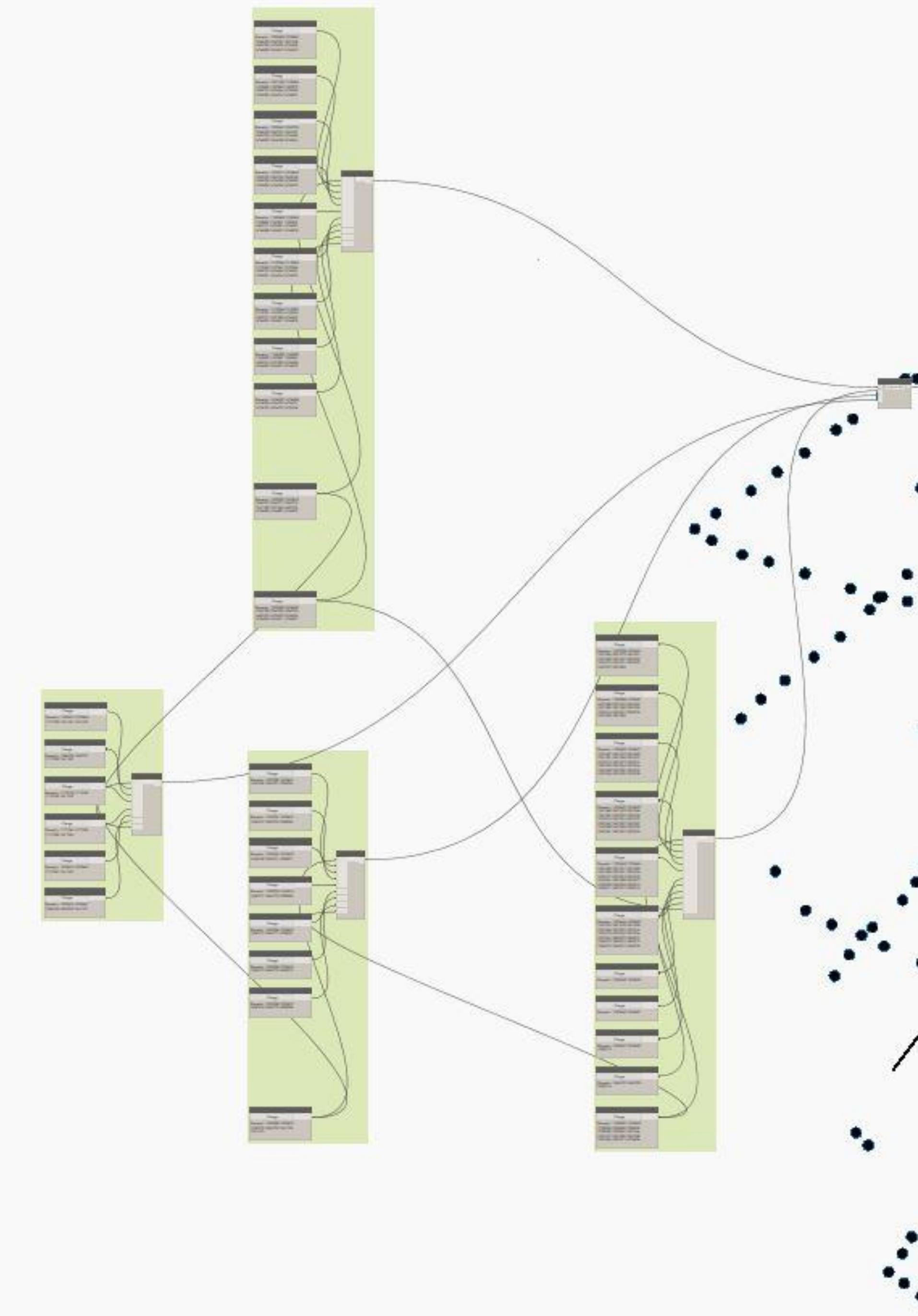
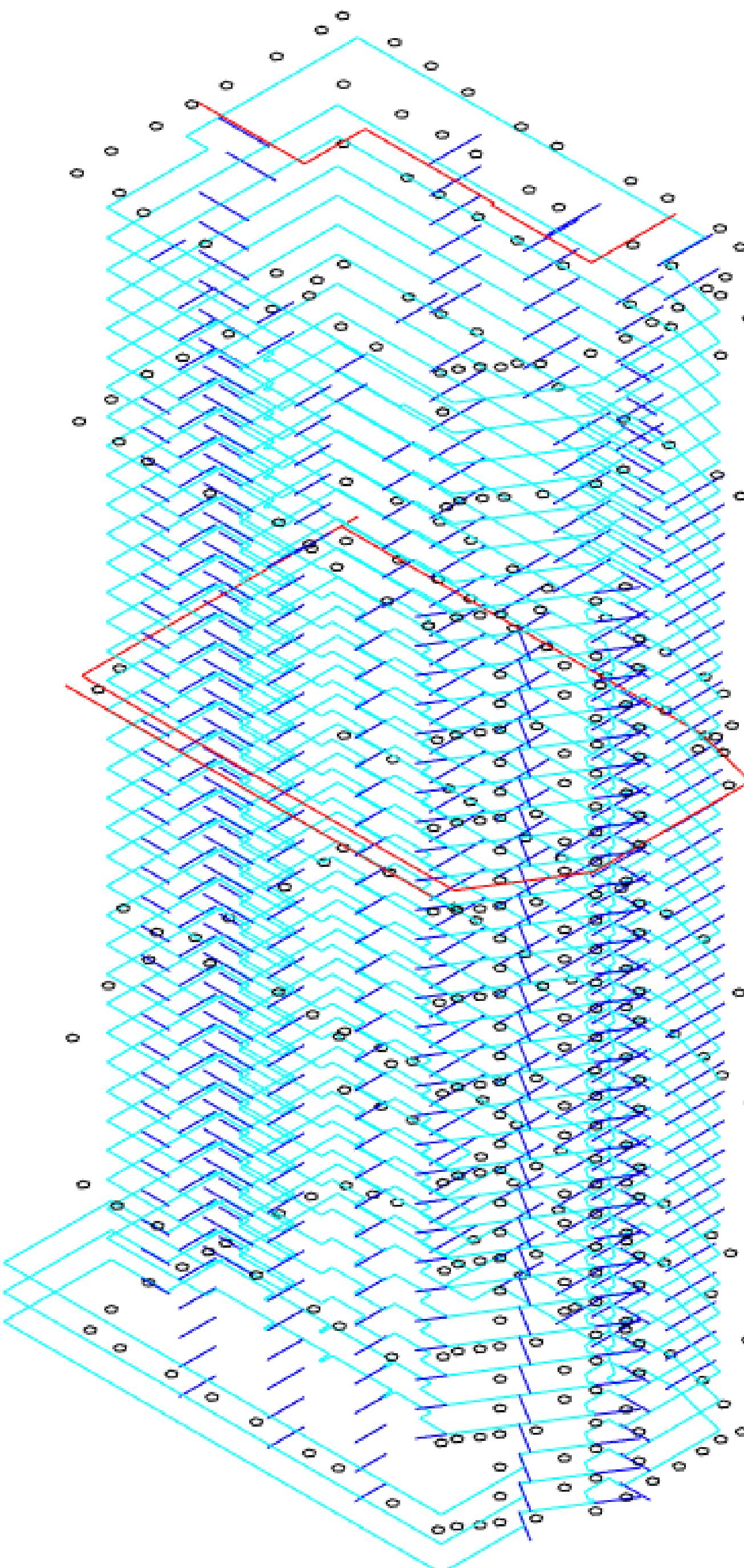








SELECTION

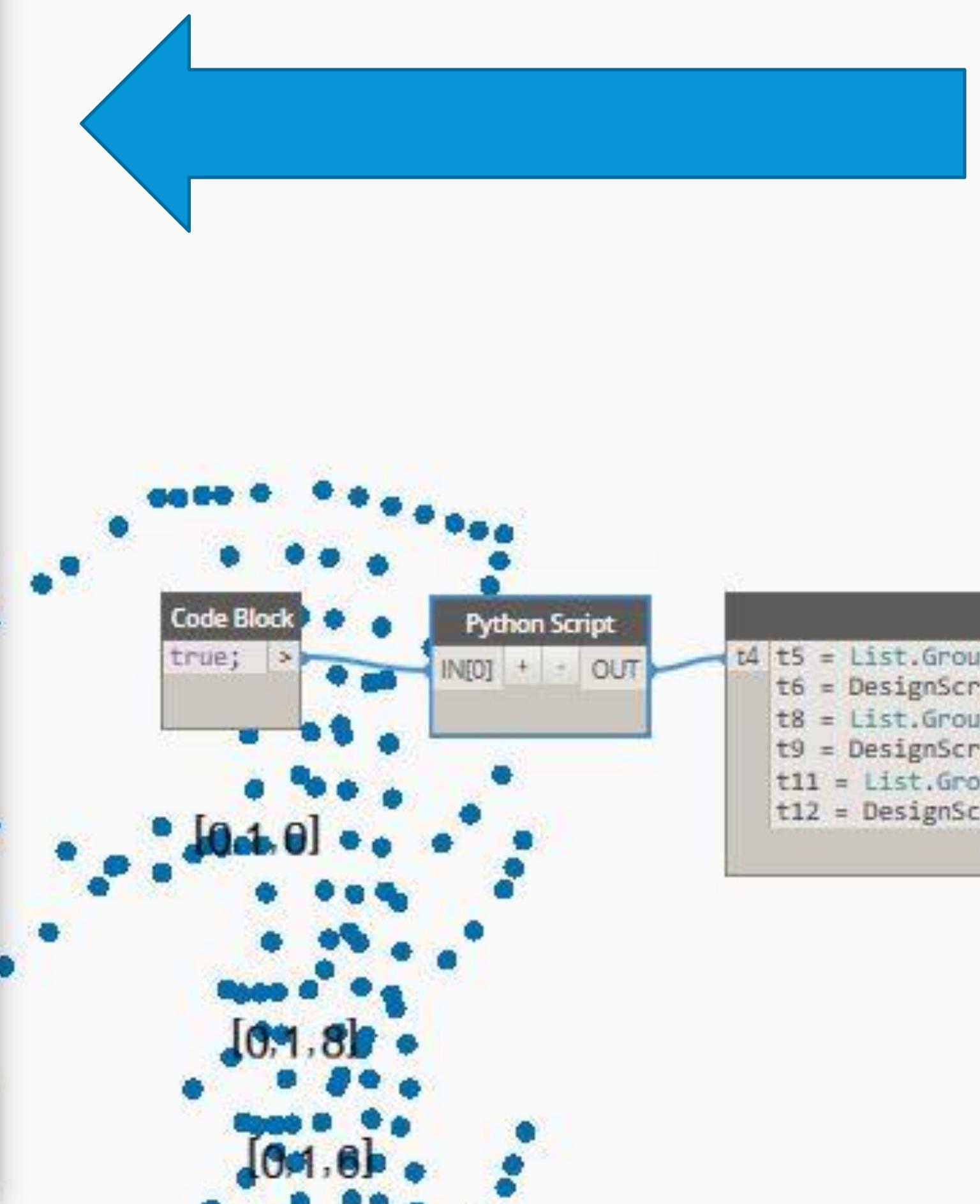


Select model
elements

R Python Script

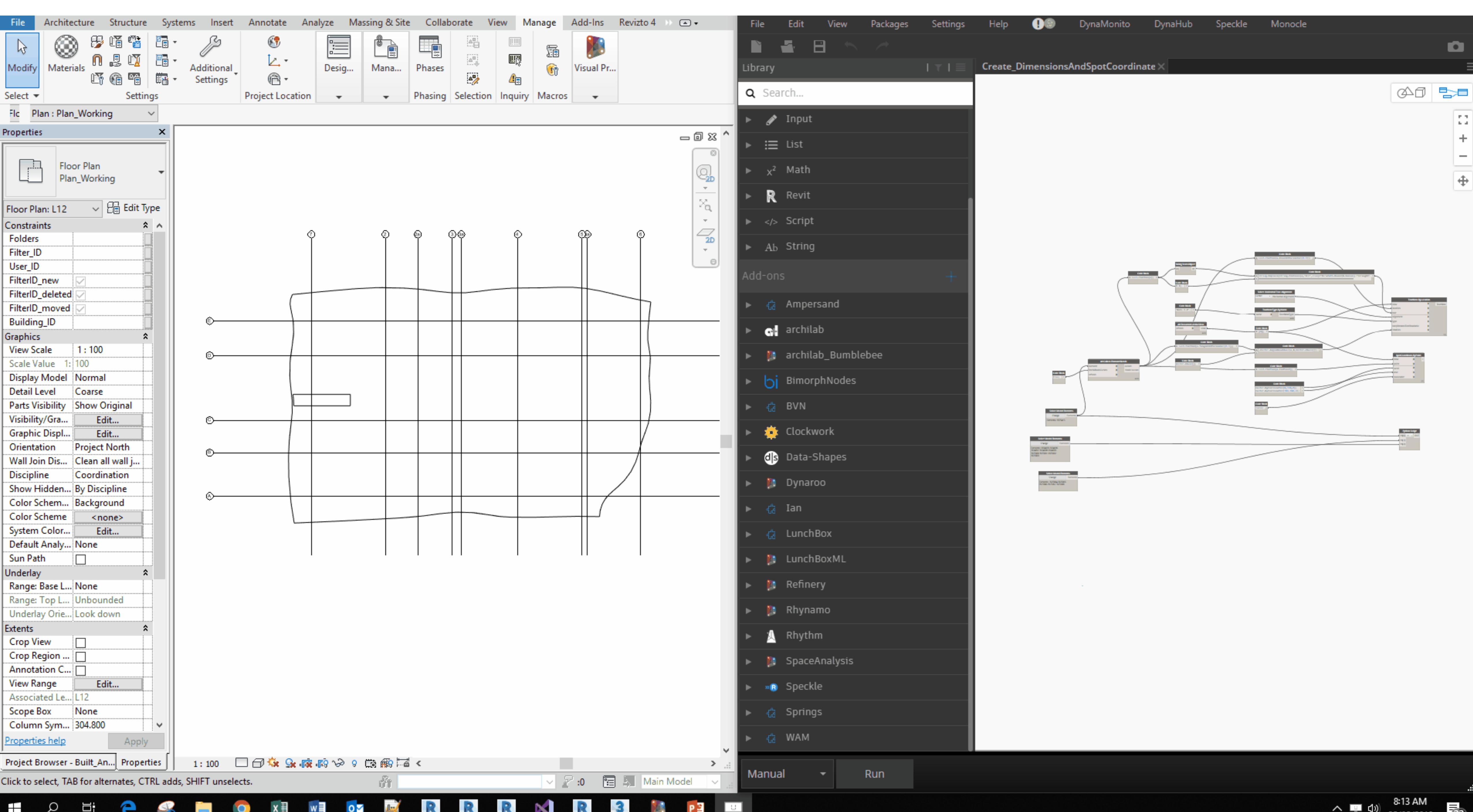
```
66     return e
67 if IN[0] == True:
68     collector = FilteredElementCollector(doc).OfCategory
69         (BuiltInCategory.OST_GenericModel).WhereElementIsNotElementType
70         ().ToElements()
71
72 gms = []
73 pnts = []
74 for i in collector:
75     if i.Name == "BalconyControls":
76         gms.append(i)
77         pnts.append(i.Location.PointToPoint())
78
79 comments = []
80 for i in gms:
81     comments.append(i.LookupParameter("Comments").AsString())
82
83 FilterID = []
84 for i in gms:
85     FilterID.append(i.LookupParameter("Filter_ID").AsString())
86
87 try:
88     # TransactionManager.Instance.EnsureInTransaction(doc)
89     # errorReport = None
90     # result1 = ProcessList(DoStuff, inelements)
91     # TransactionManager.Instance.TransactionTaskDone()
```

Run Save Changes Revert



Filtered Element
Collector

DIMENSIONS



try:

```
errorReport = None
TransactionManager.Instance.EnsureInTransaction(doc)
dimensions=[]
opt = Options()
opt.ComputeReferences=True
opt.IncludeNonVisibleObjects=True
opt.View = doc.ActiveView
for element in inelements:
    geometry = element.get_Geometry(opt)
    for solid in geometry:
        edges= solid.Edges
        #Count number of edges and get half
        n=(edges.Size-1)/2
        for i, edge in enumerate(edges):
            #Check if edges are flat and contained in second half of the enumeration
            if edge.Evaluate(1).Z == edge.Evaluate(0).Z and i>=n:
                #Create start point
                pnt =edge.Evaluate(0)
                #create lists for distance measurement for vertical and horizontal
                disth=[]
                distv=[]
                #create list of distances between curve start point and grid horizontal
                for h in hgridcurves:
                    disth.append(h.Curve.Distance(pnt))
                #get first item of the above list after sorting the values
                minh = sorted(disth)[0]
                #create list of distances between curve start point and grid vertical
                for v in vgridcurves:
                    distv.append(v.Curve.Distance(pnt))
                #get first item of the above list after sorting the values
                minv = sorted(distv)[0]
                #create horizontal lines from point for dim placement
                lh=Line.CreateUnbound(pnt,XYZ(0,1,0))
                for h in hgridcurves:
                    #check if the distance to grid is equal to minimum
                    if h.Curve.Distance(pnt) == minh:
                        refgh=h
                        break
                lv=Line.CreateUnbound(pnt,XYZ(1,0,0))
                for v in vgridcurves:
                    #check if the distance to grid is equal to minimum
                    if v.Curve.Distance(pnt) == minv:
                        refgv=v
                        break
                #Create reference arrays
                elementsRefh=ReferenceArray()
                elementsRefv=ReferenceArray()
                #get reference to curve start point
                pntref = edge.GetEndPointReference(0)
                #add references to arrays
                elementsRefh.Append(pntref)
                elementsRefh.Append(Reference(refgh))
                elementsRefv.Append(pntref)
                elementsRefv.Append(Reference(refgv))
                #create dimensions
                dimh= doc.Create.NewDimension(doc.ActiveView,lh,elementsRefh)
                dimv= doc.Create.NewDimension(doc.ActiveView,lv,elementsRefv)
                dimensions.append([dimh,dimv])
```

- Get solid of floor element
- Get edges of the solid
- Discard edges underside of slab
- Get Edge start points
- Calculate Distance between curve start point and each grid
- Create reference for grid at the minimal distance to point
- Add items to Reference Array
- Create dimension

*A reference **stable representation** string is a collection of UniqueIds combined with table indices, delimited by the colon : character. ... The structured data contained in the string can be used to reliably access geometry objects that are not completely exposed by the API.*

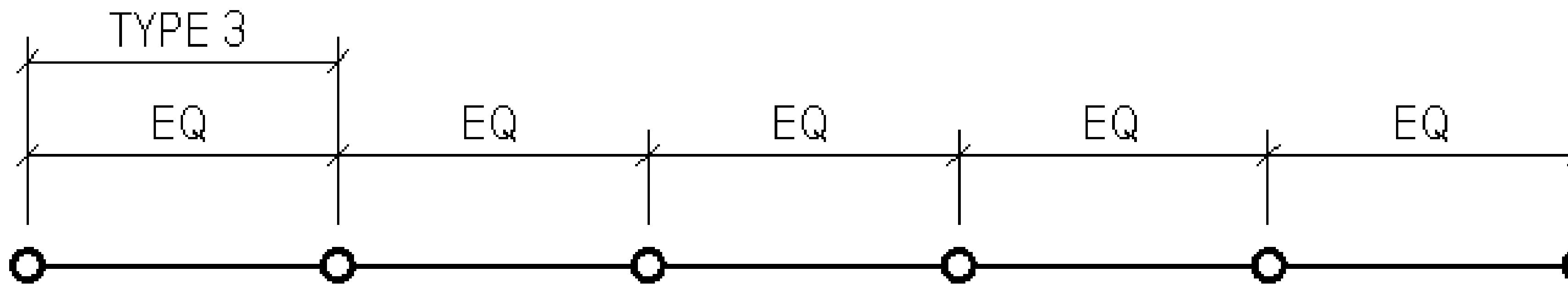
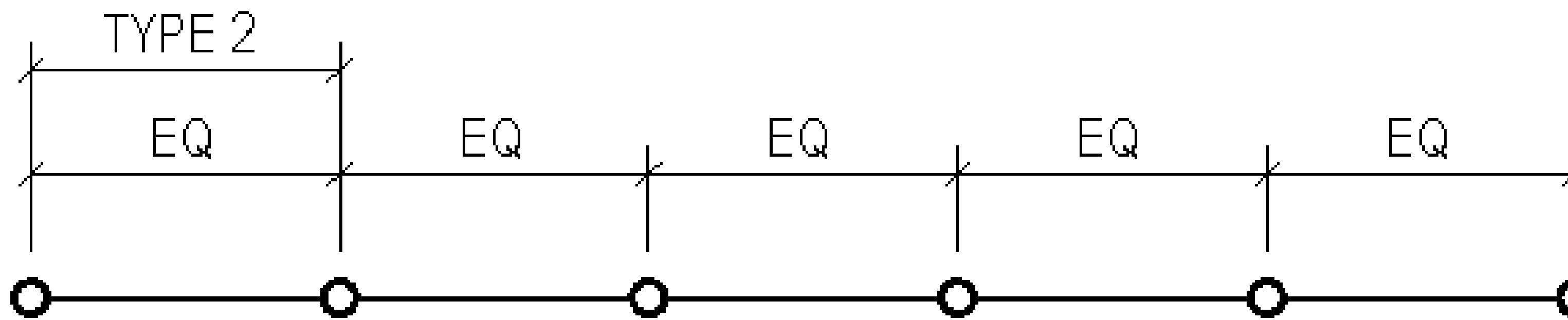
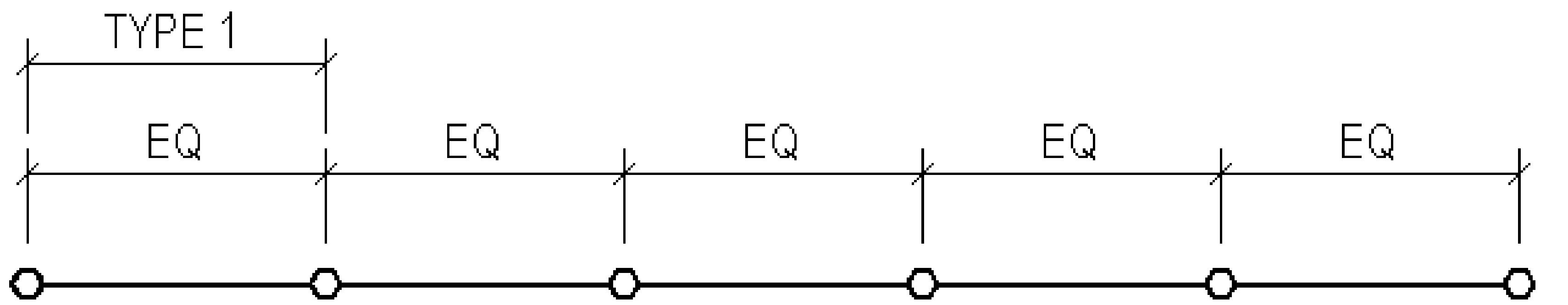
Jeremy Tammik

<https://thebuildingcoder.typepad.com/blog>

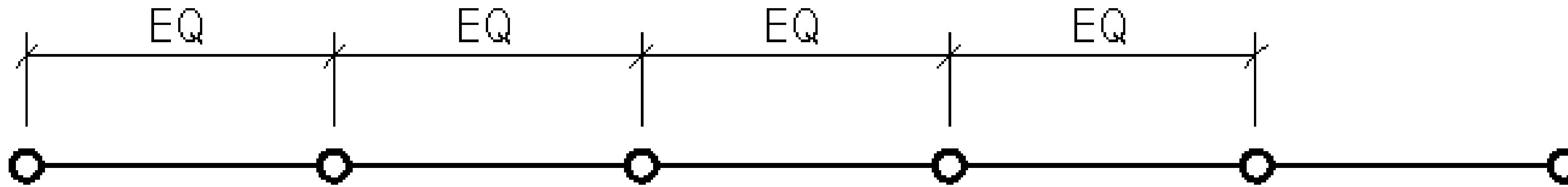
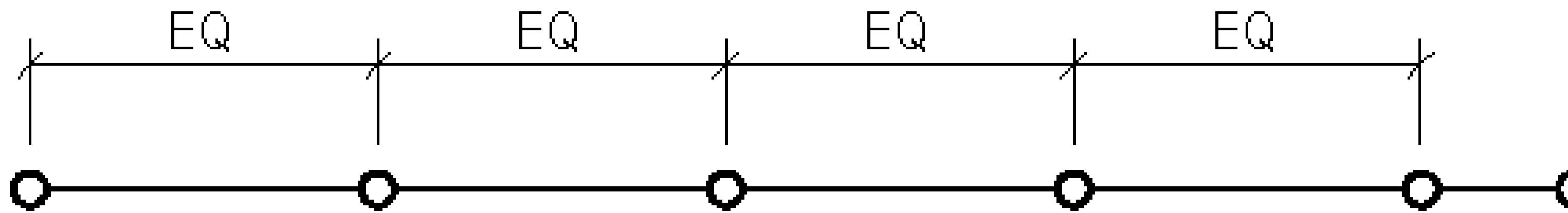
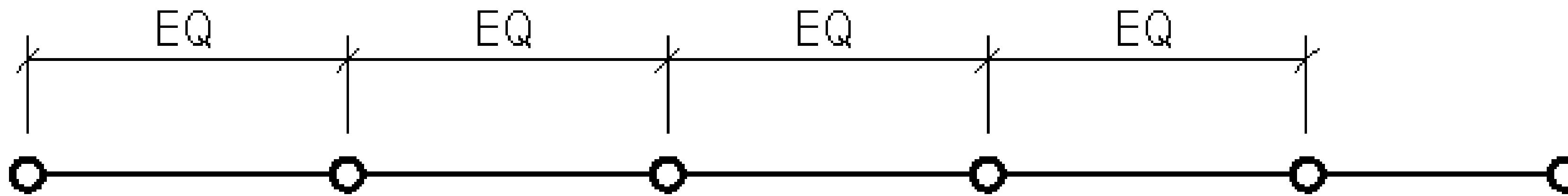
A reference string for a **PlanarFace** of a **FamilyInstance** element – accessed through its **GetSymbolGeometry** method – looks like this:

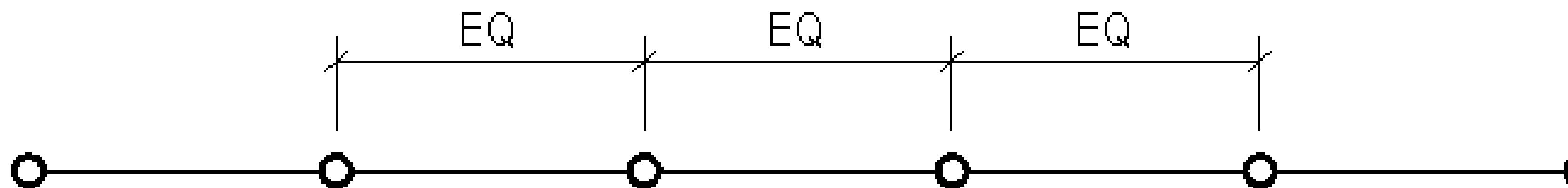
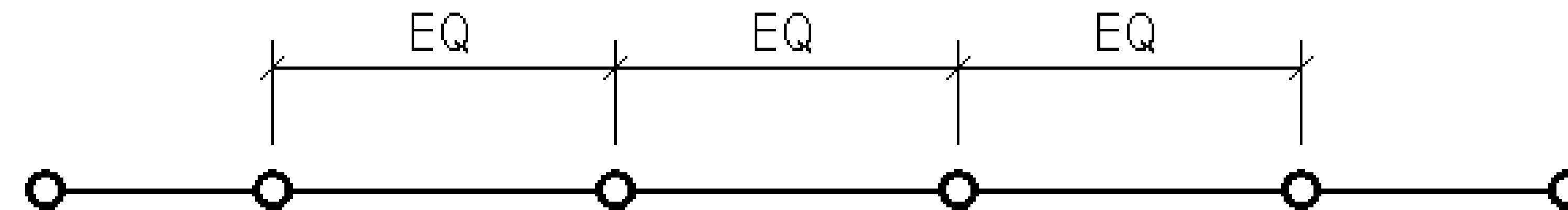
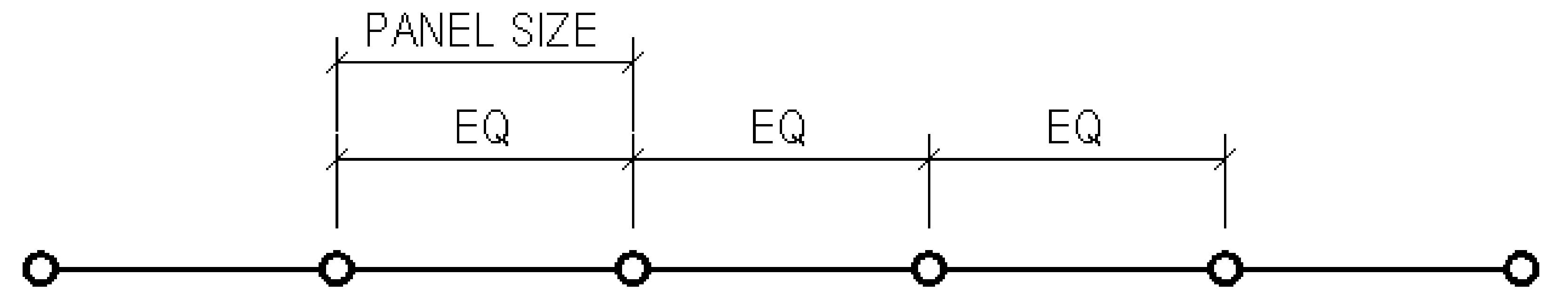
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0003ebf0:78:SURFACE

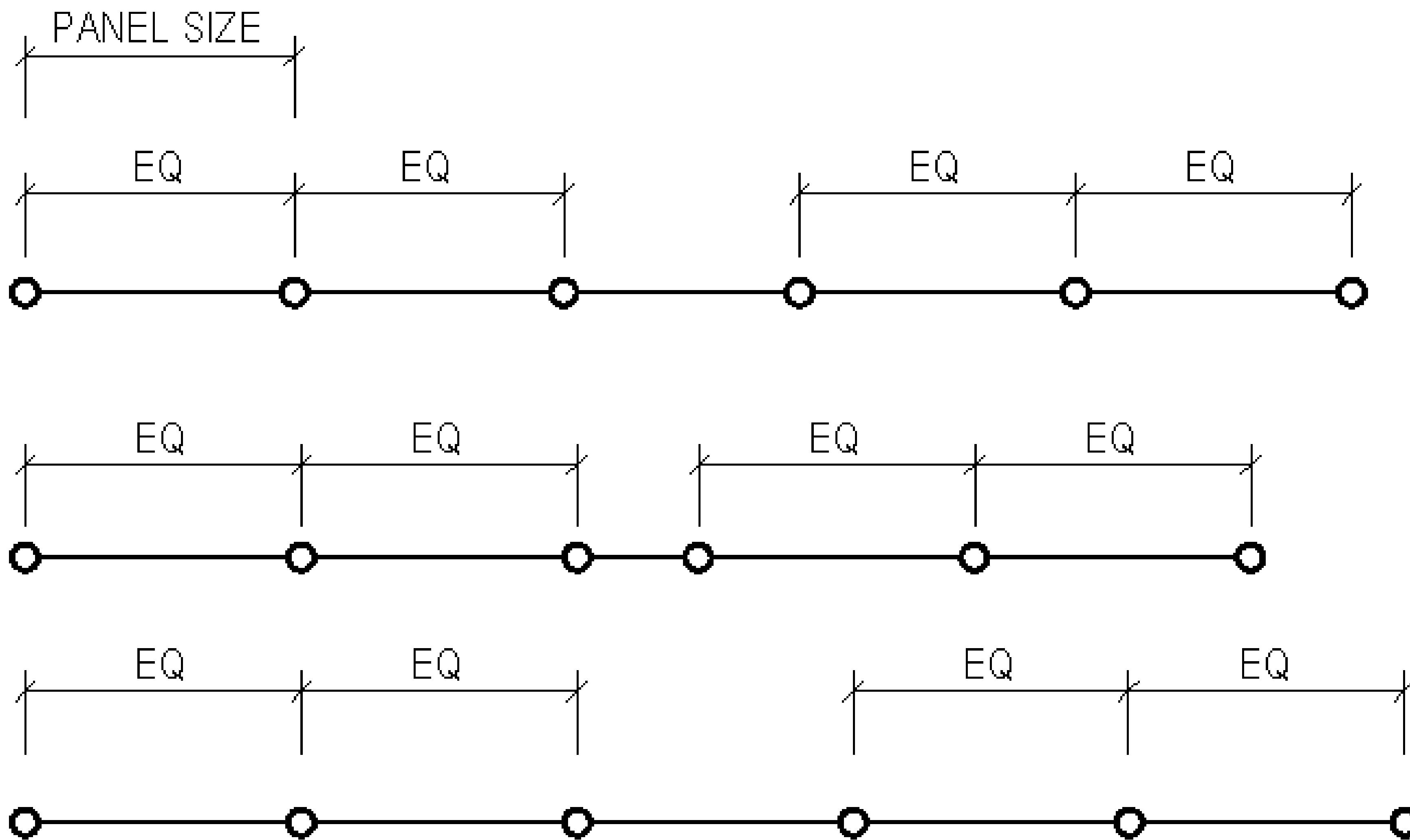
BALUSTRADE



PANEL SIZE



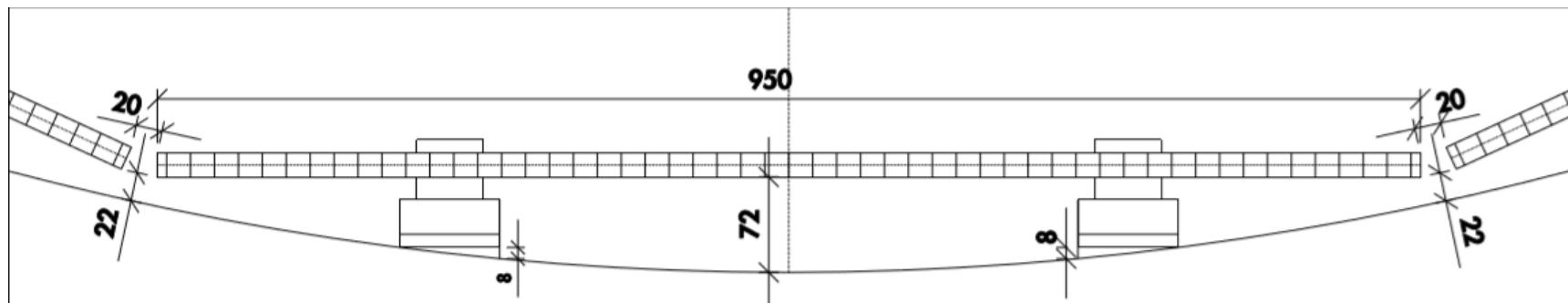




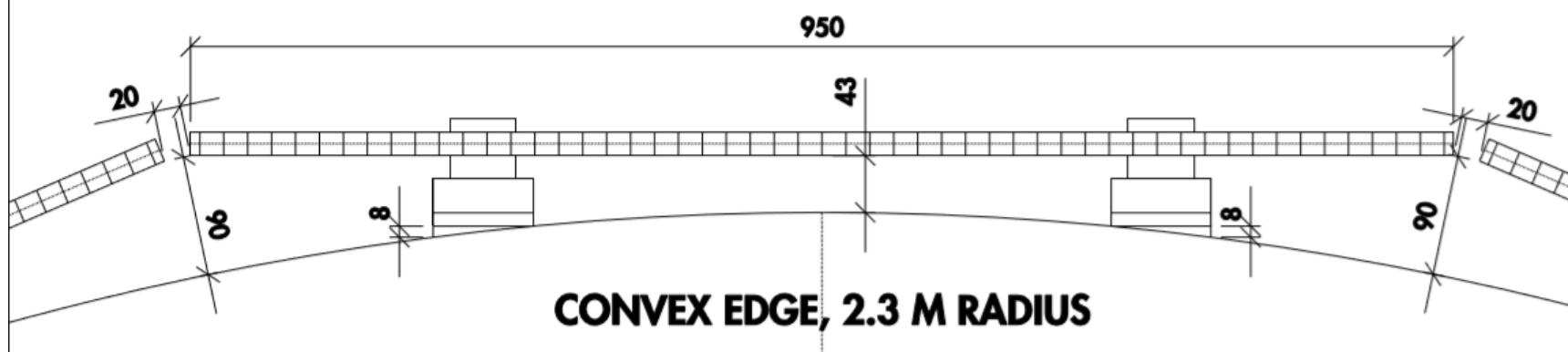
Code Block

```
pcList pc = pcList;
panelLength =1000;
divide =[Imperative]

{
    //create an empty list
    ret=[];
    for(i in 0..List.Count(pc)-1)
    {
        for(j in 0..List.Count(pc[i])-1)
        {
            //split polycurve in the middle
            split = pc[i][j].SplitByPoints(pc[i][j].PointAtParameter(0.5));
            //first curve add points at segment length from starting point
            split1 = split[0].PointsAtSegmentLengthFromPoint(
            split[0].StartPoint,panelLength);
            //second curve reverse add points at segment length from starting point
            split2 = List.Reverse(
            split[1].Reverse().PointsAtSegmentLengthFromPoint(
            split[1].EndPoint,panelLength)
            );
            //create a list
            ret[i][j]=pc[i][j].SplitByPoints(List.Flatten([split1,split2]));
        };
    };
    return = ret;
};
```



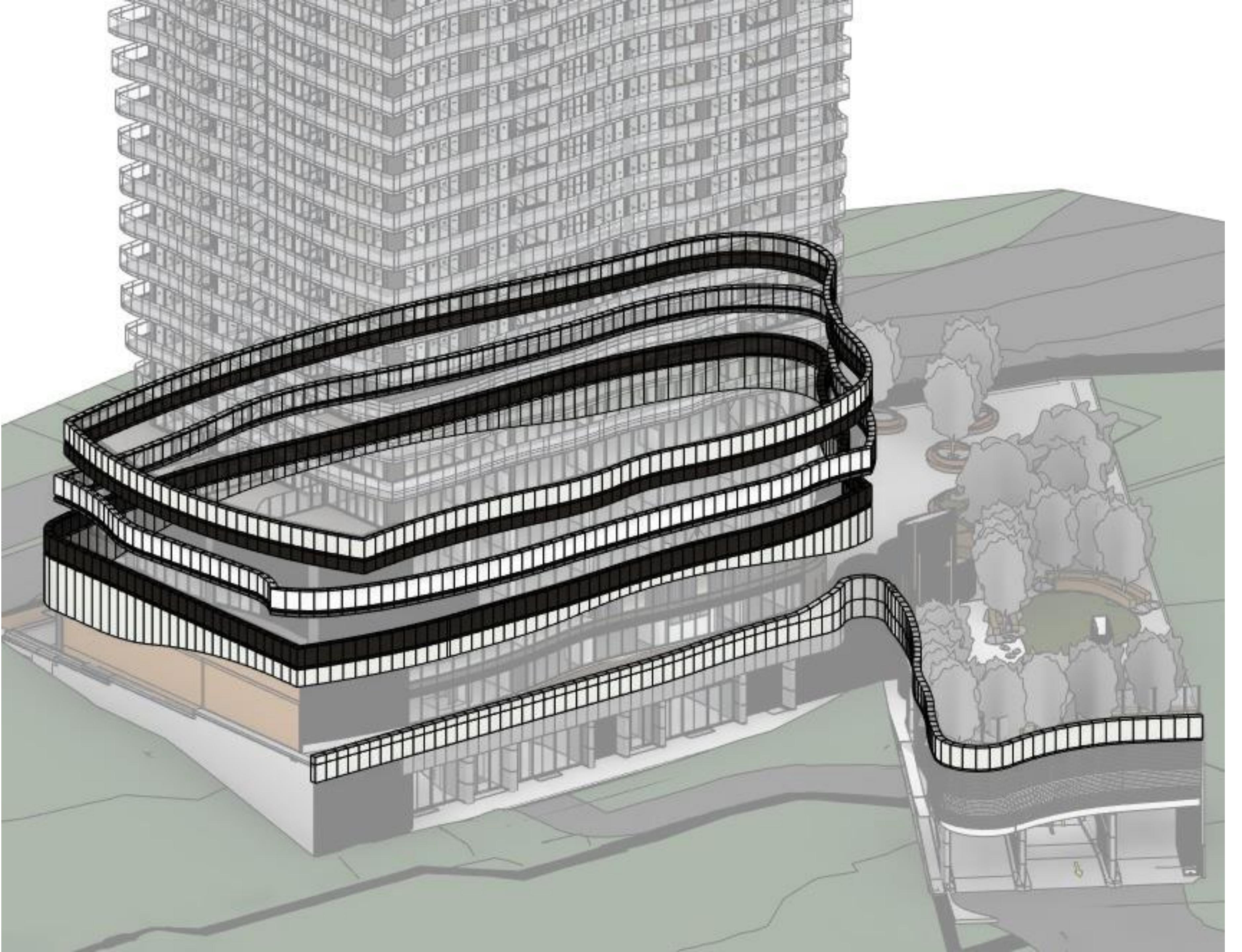
CONCAVE EDGE, 2.3 M RADIUS

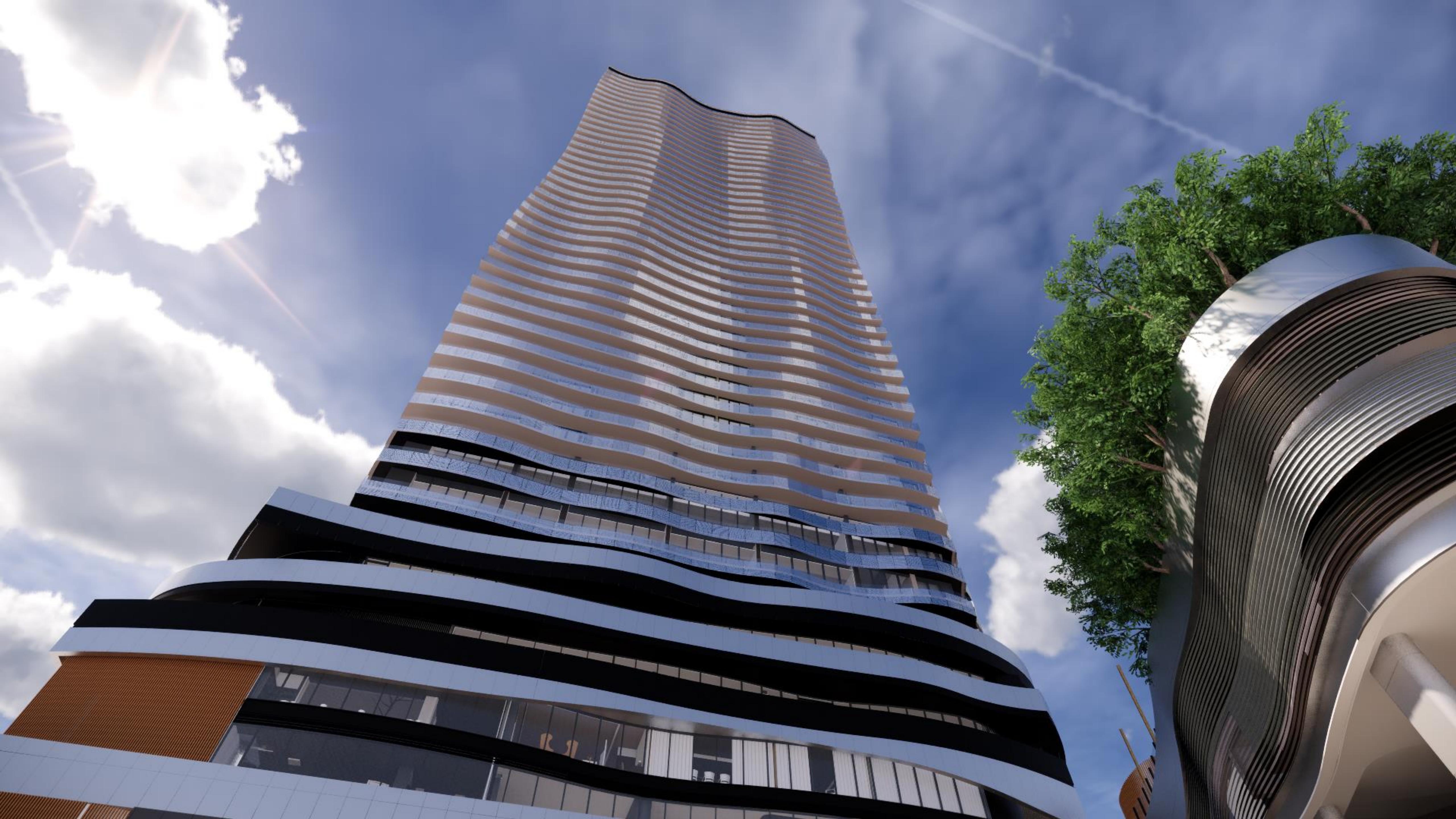


CONVEX EDGE, 2.3 M RADIUS

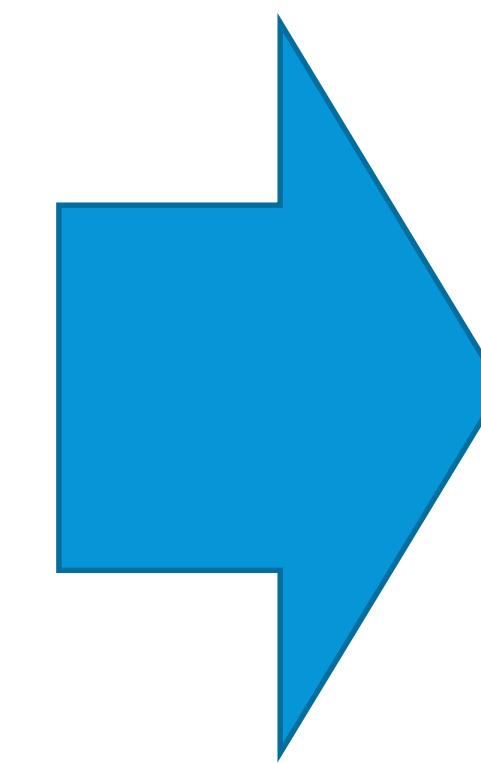
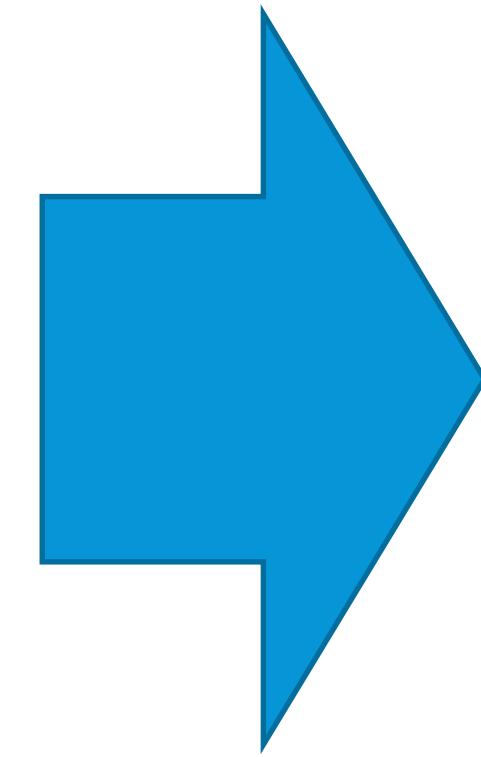
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L06	474030	41212	23313	12869	44503	43261	52310	69808	22137	7456.7	23849	8732.3	17036	10009	30306	13261	7751.8	8717.4	22211	29213	17786	17900	18869	7662.9	11822	8503	21439	34321	19090	25257	15011	5591.7
L07	1E+06	45306	20594	11914	41917	75827	37745	134411	20502	6766.3	23580	8721.8	16958	3991.3	29311	13039	7570.1	8868.2	19036	23468	17421	16947	17375	7748.6	13329	9645.1	19493	86968	24544	32191	17089	5671.2
L08	0	42019	24363	12785	47607	102480	34198	245095	21970	6209	3349.8	5035.5	7648.9	15305	37073	17705	9014.4	10985	12272	23015	19280	17685	16849	8313.9	16177	11750	19841	210505	26979	34564	17040	4449.3
L09	2E+06	38491	36554	15052	57776	114486	32129	2E+07	23638	5694.1	21498	8633.2	16320	9840.6	29964	12894	7347.2	9349.8	17639	26268	23954	20107	16916	9436.2	21853	15865	21920	196396	25058	31959	15607	3170.6
L10	0	38486	57367	17650	61707	210707	27935	33984	21554	5176.4	21354	8626.5	16273	9829.2	28863	12670	7193.6	9542	19683	35570	34738	24958	17400	11333	35923	25791	25995	102105	21021	27361	13786	2454.4
L11	577305	43921	59616	18484	51401	241601	22472	33691	16682	4651.8	3349.8	5035.5	7648.9	15304	35208	17038	8640.2	12286	16009	65413	70594	34530	18205	14472	109992	73106	33101	59087	17146	23019	12112	2300.6
L12	405835	51910	53927	18580	43183	88079	19039	21281	13417	4173.6	24493	8756.5	17218	10051	23011	11731	6715.7	9604.6	41885	856799	1E+06	56817	19255	19885	105620	92395	45777	39770	14168	19604	10740	2559
L13	522423	55568	56139	19321	41459	79327	17730	18233	11880	3855	24771	8766.5	17294	10068	21999	11490	6575.8	9746.9	39874	77237	63453	145659	20461	30160	37121	30104	70830	29801	12048	17075	9662.6	3198.2
L14	1E+06	48728	72038	21267	46798	129193	18115	19601	11471	3729.5	3349.8	5035.5	7648.9	15304	33522	16420	8366	13908	39826	38318	33632	373748	21636	53683	23489	18979	132039	24065	10576	15240	8832.3	4163
L15	5E+06	35099	133299	25052	65825	669741	20302	27762	11950	3780.6	19880	8553.3	15773	9705.7	25507	11799	6645.5	10657	167263	26563	23571	93364	22767	137653	17926	14488	379405	20537	9578.5	13926	8202.4	5182.1
L16	3E+07	23844	3E+06	31323	131287	87040	24597	74030	13235	3909.7	13309	8522.2	15567	9653.7	25405	11698	6588.6	10903	123714	21150	18666	58264	23451	1E+06	15106	18282	8925	13003	7733.5	5738.3		
L17	3E+06	18996	251277	36834	293302	62079	28841	136376	14745	4008.9	3349.8	5035.5	7648.9	15304	31991	15846	8176.7	15603	45034	18143	15831	44967	23638	174822	13557	10969	535415	167262	8496.3	12335	7376.3	5491.5
L18	765969	18887	227185	35856	244498	72024	29739	46689	15722	4000.9	37332	9077.1	19925	10611	15131	3803	5748.5	9467.8	168086	16330	14052	38299	23258	125428	12744	10411	522267	15589	8222	11840	7100.9	4807.8
L19	341597	21553	360211	30817	135460	117067	28589	31725	16186	3957	205579	9630	26414	11625	11325	8674.1	5216.5	8368.3	143422	15243	12915	34634	22286	128911	12449	10320	1E+06	14737	8064.6	11475	6893.1	4080.4
L20	188211	25248	802931	26561	97164	233127	28408	23910	16473	3984.8	2831.7	4387.5	6746.7	27942	16016	10386	6028.1	10385	42825	14689	12229	32727	20790	188231	12593	10619	610696	14100	8002.5	11217	6747.3	3483.5
L21	116570	28685	2E+06	24133	86088	345259	30576	18693	16592	4208.5	55928	10283	39900	12908	8867.6	7665.2	4729	7317	57891	14602	11899	32092	18940	1E+06	13176	11332	198775	13636	8022	11051	6661.9	30519
L22	79292	31868	4E+06	22732	84146	297526	35119	15379	16361	4863.3	819375	9795.7	29032	11941	10136	8123.9	4980.1	7794.7	15304	14942	11852	32476	16972	196259	14233	12585	107460	13312	8111.6	10965	6636.3	2753
L23	58321	35071	1E+07	21783	85312	219762	42178	13329	15750	6687.6	3349.8	5035.5	7648.9	15304	29315	14810	7399.8	16454	3424	15723	12044	33802	15092	81203	15866	14729	70405	13091	8258.2	10946	6669.3	2552.7
L24	45888	38513	2E+06	20961	86069	175782	51630	12110	14865	13144	8778.5	7410.4	10097	7898.2	145955	15582	8359.3	17415	68224	17013	12452	36087	13439	49300	18256	18695	51723	12929	8442.9	10972	6755.3	2425.2
L25	38390	42350	592316	20083	83423	159853	61602																									

FAÇADE ELEMENTS

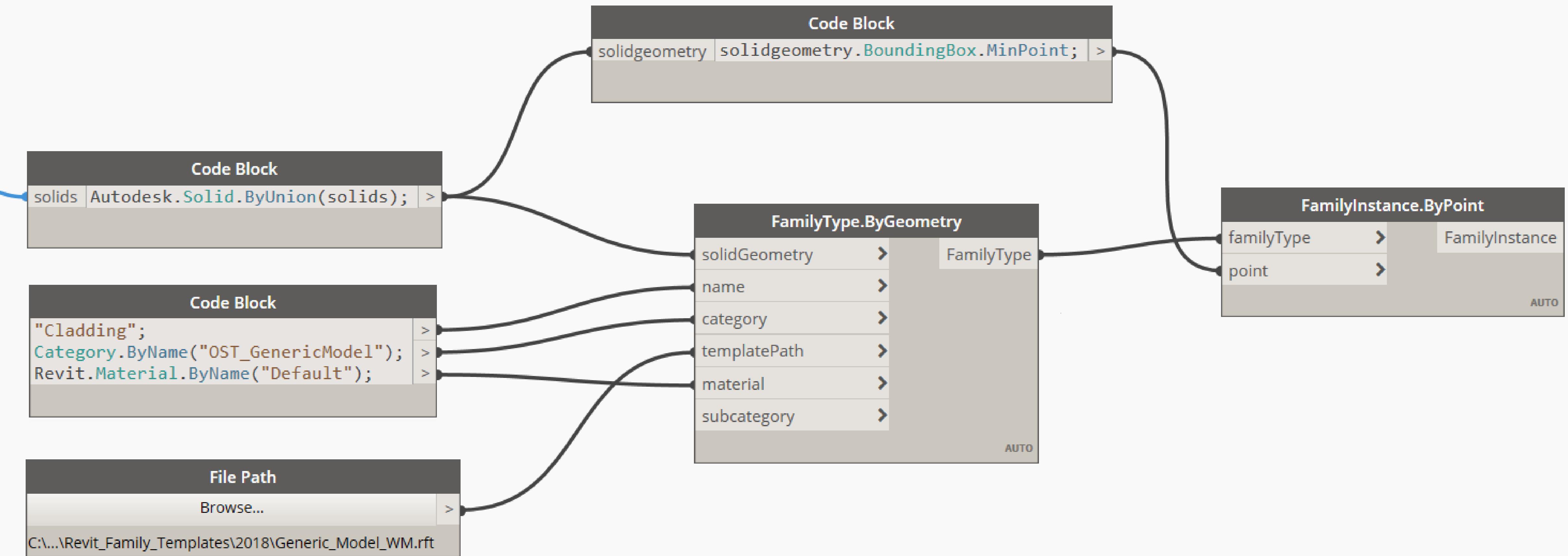


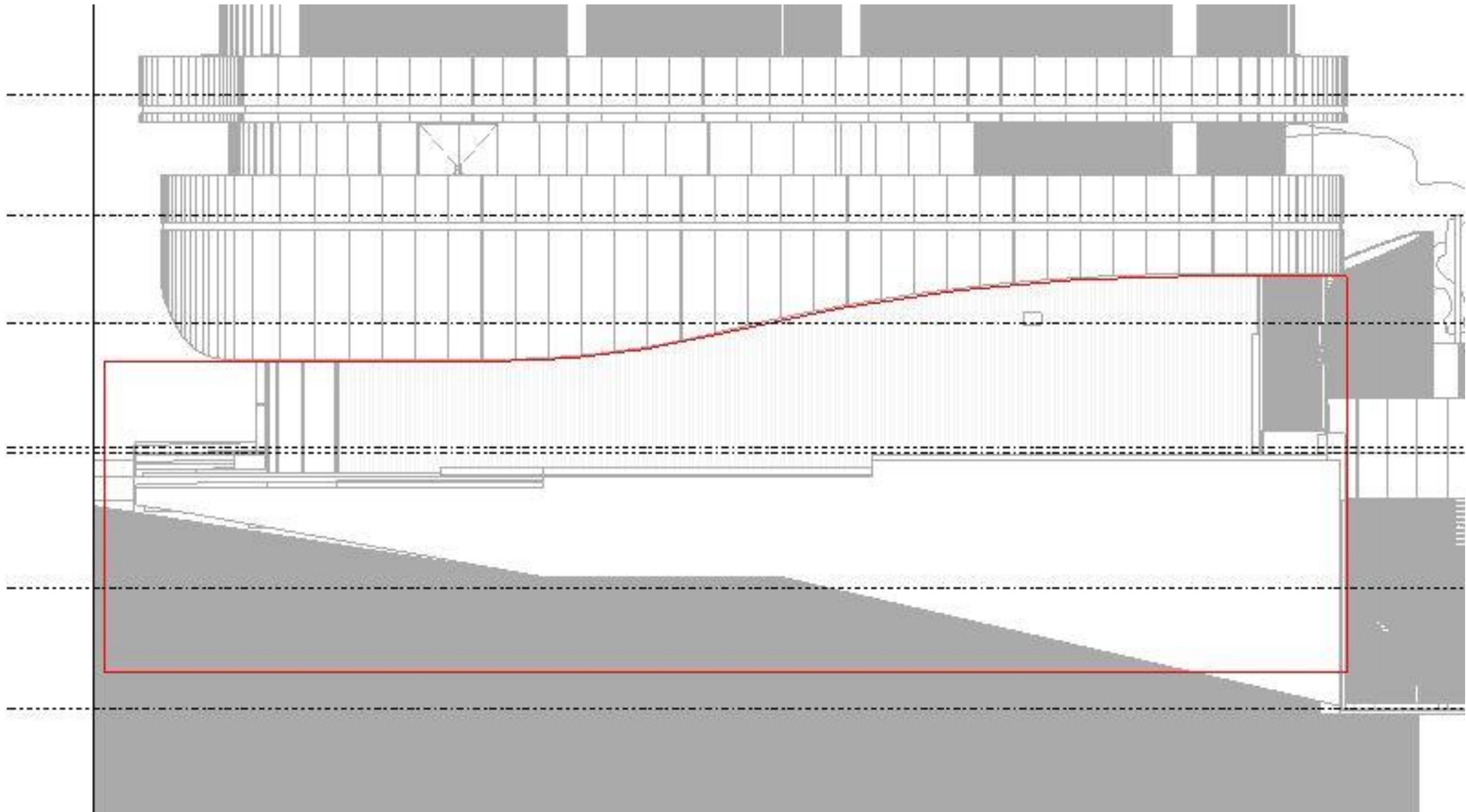




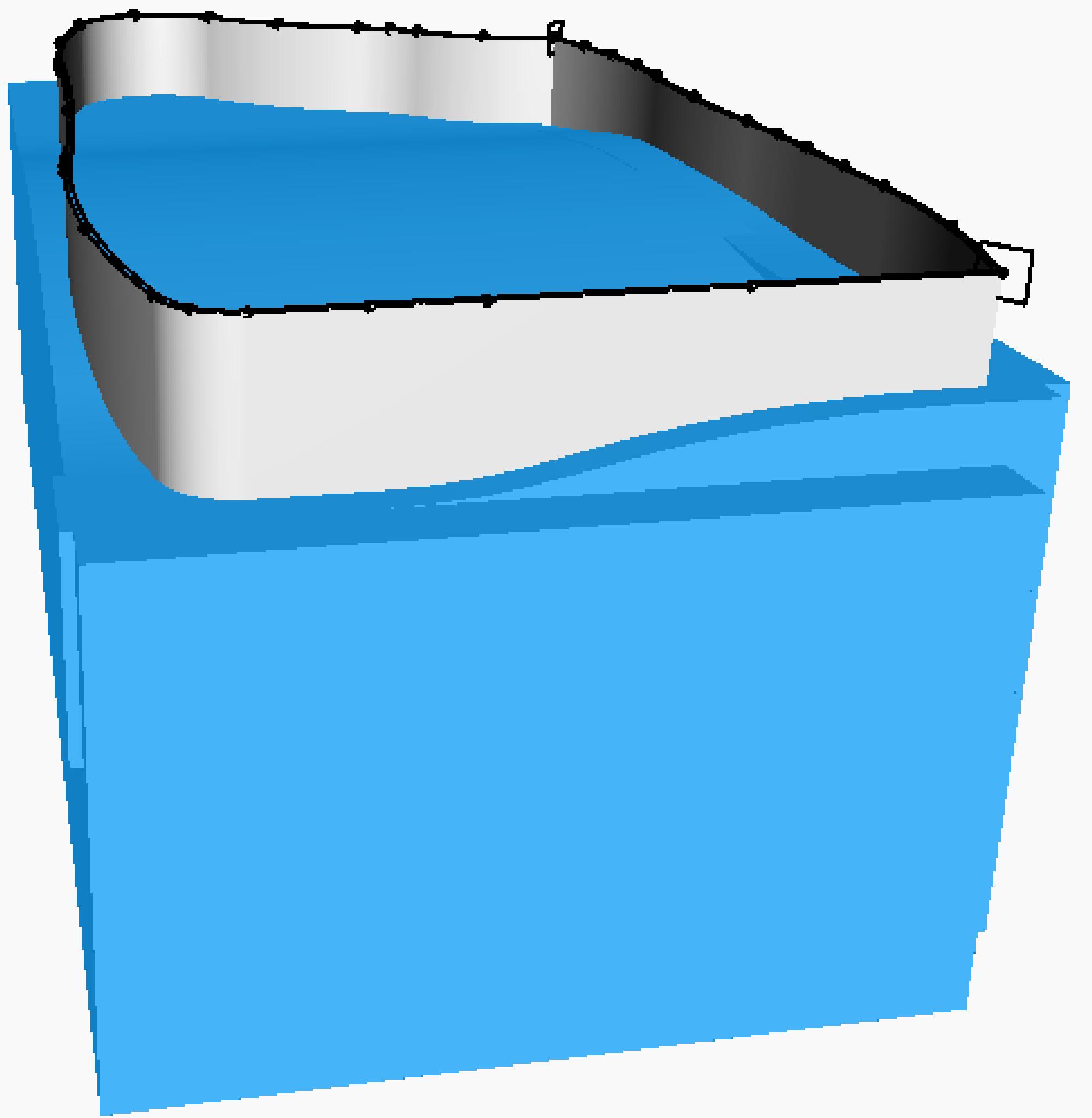


- GET FLOOR OUTLINES
- GET PROFILES
- CREATE FORM
- PLACE AND ADJUST PROFILES
- CREATE SOLIDS
- FILTER UNIQUE ELEMENTS
- CREATE FAMILY TYPES
- PLACE INSTANCES

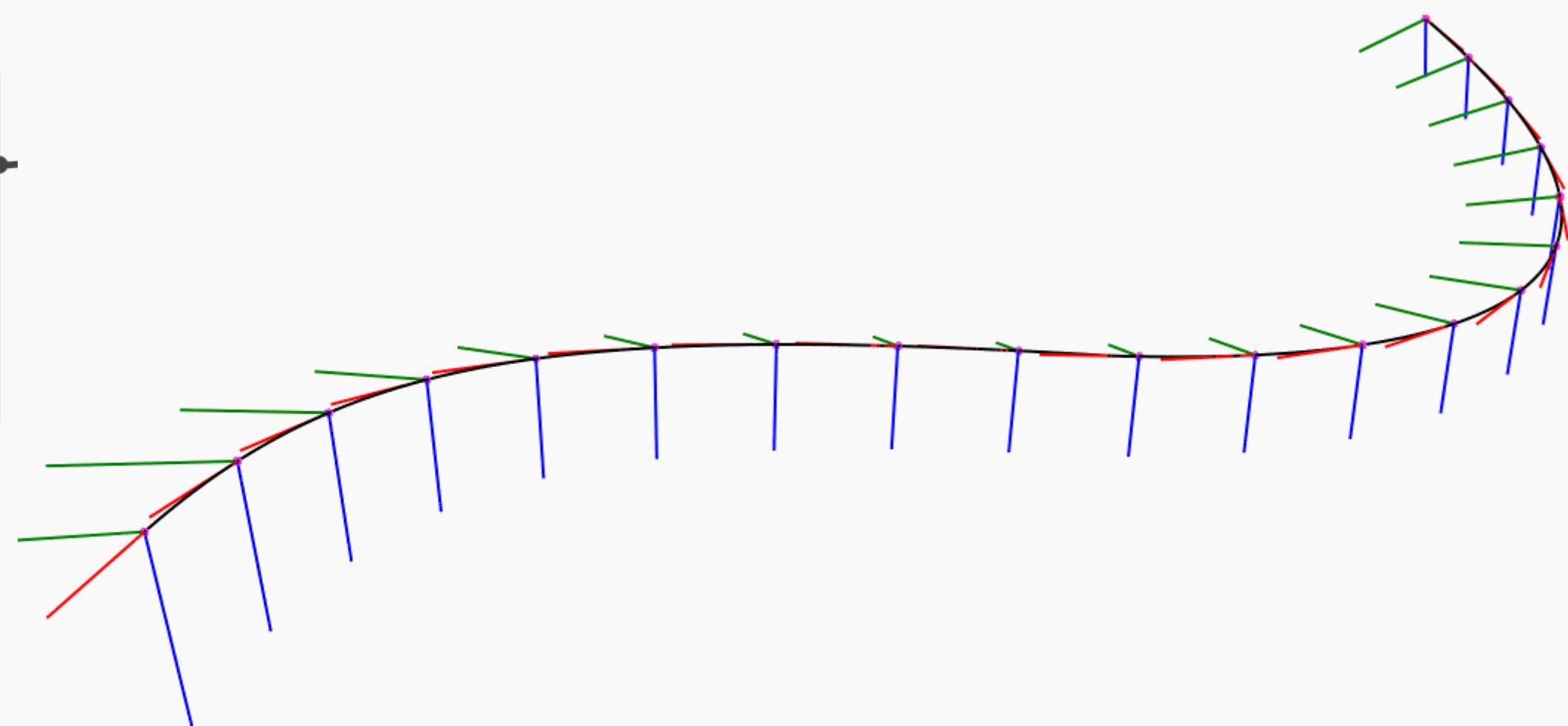
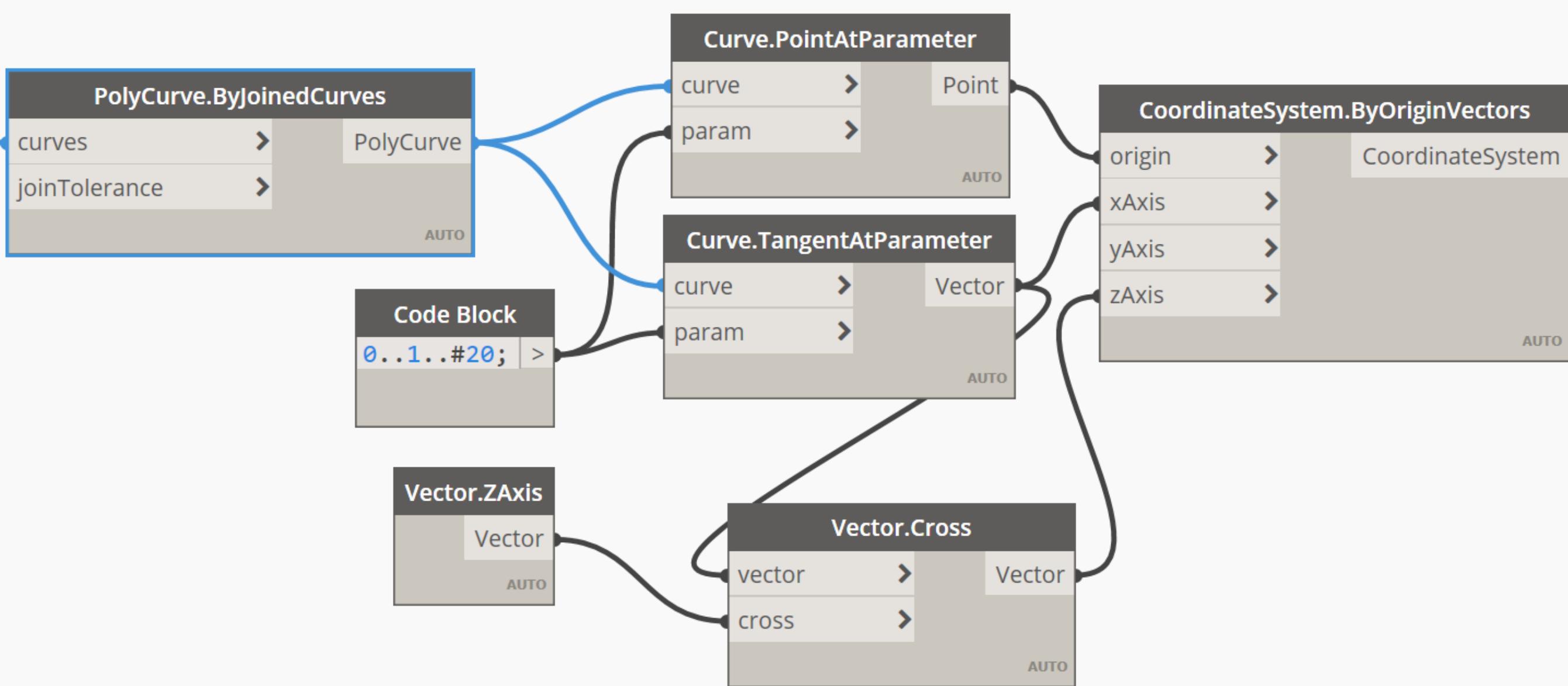
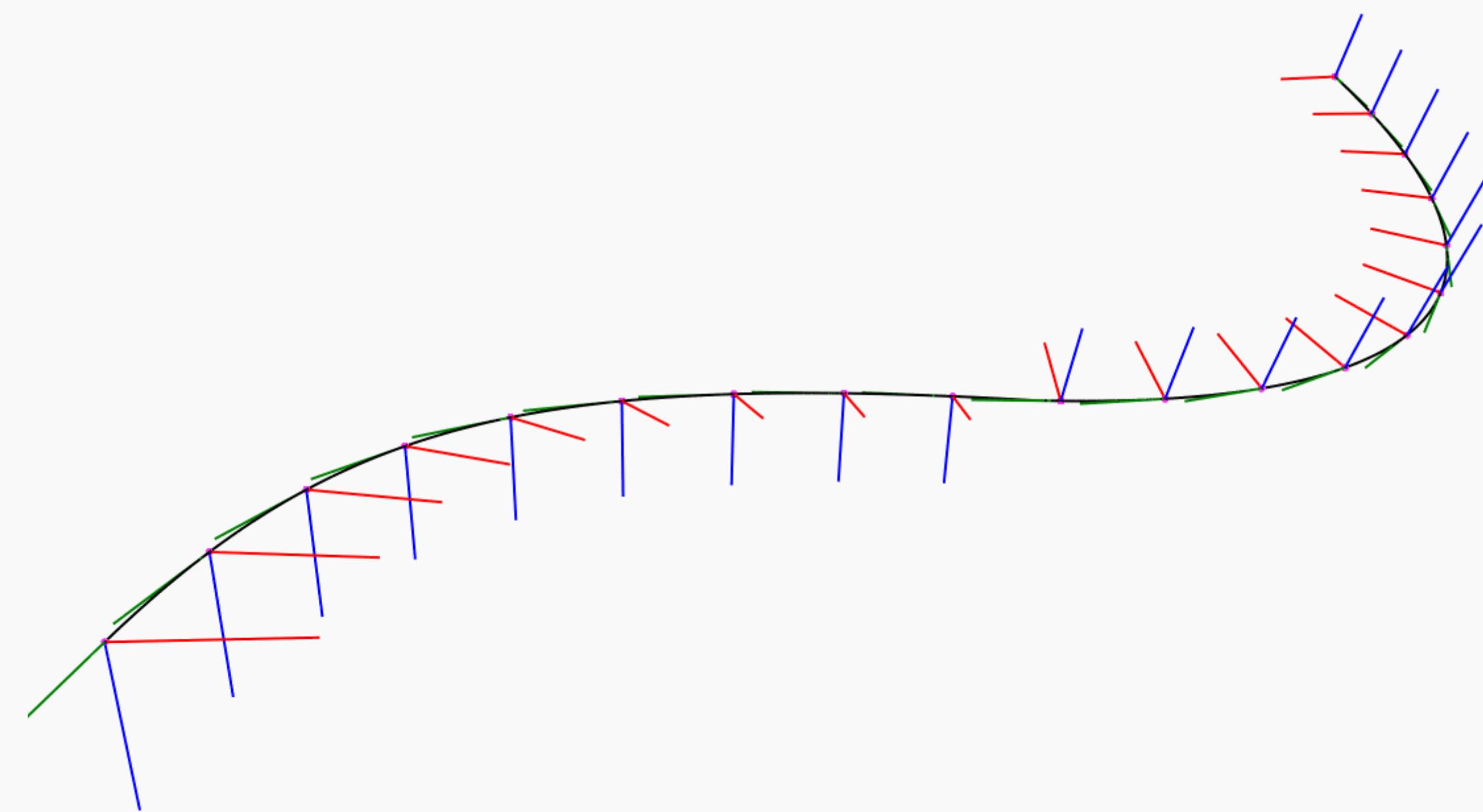
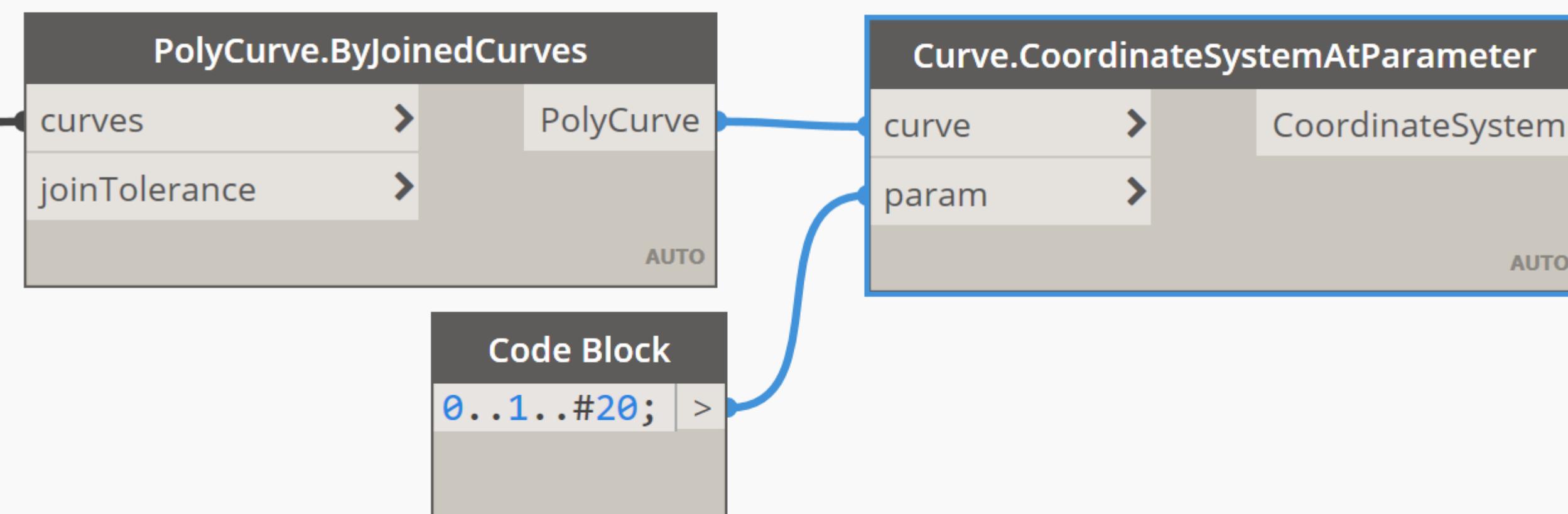


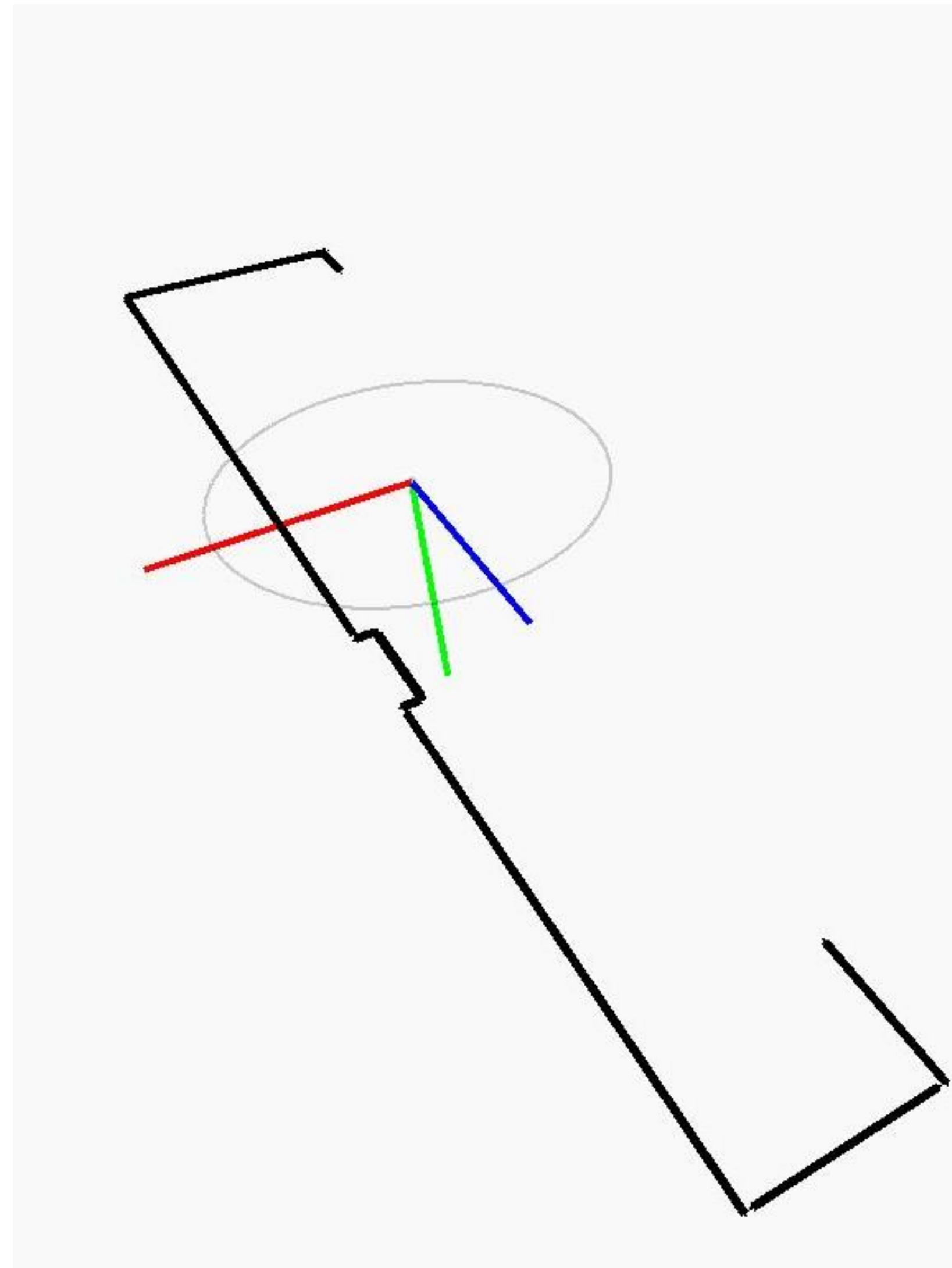


Constraints defined with
Detail Lines in sections

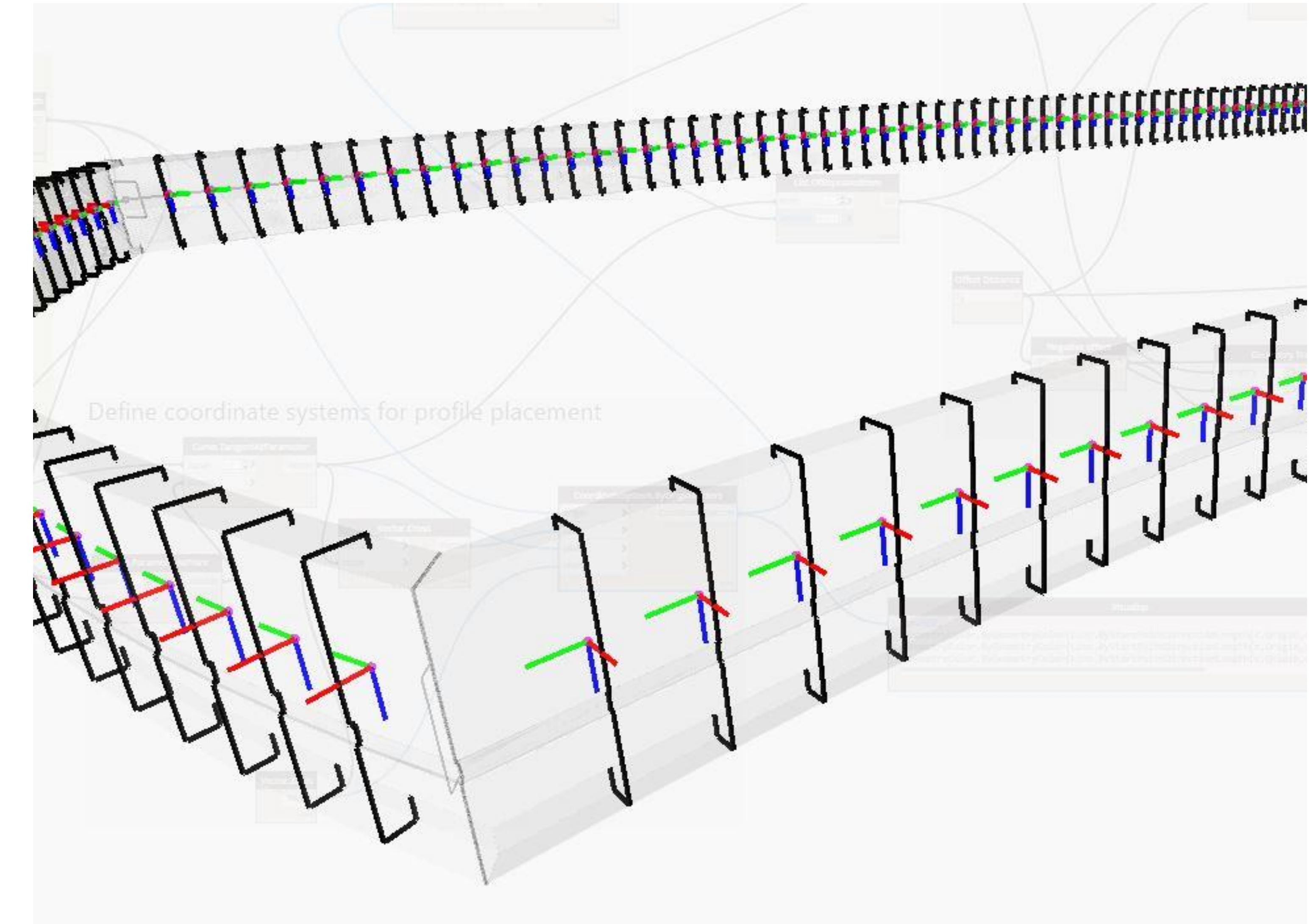


Constraints used to cut
geometry

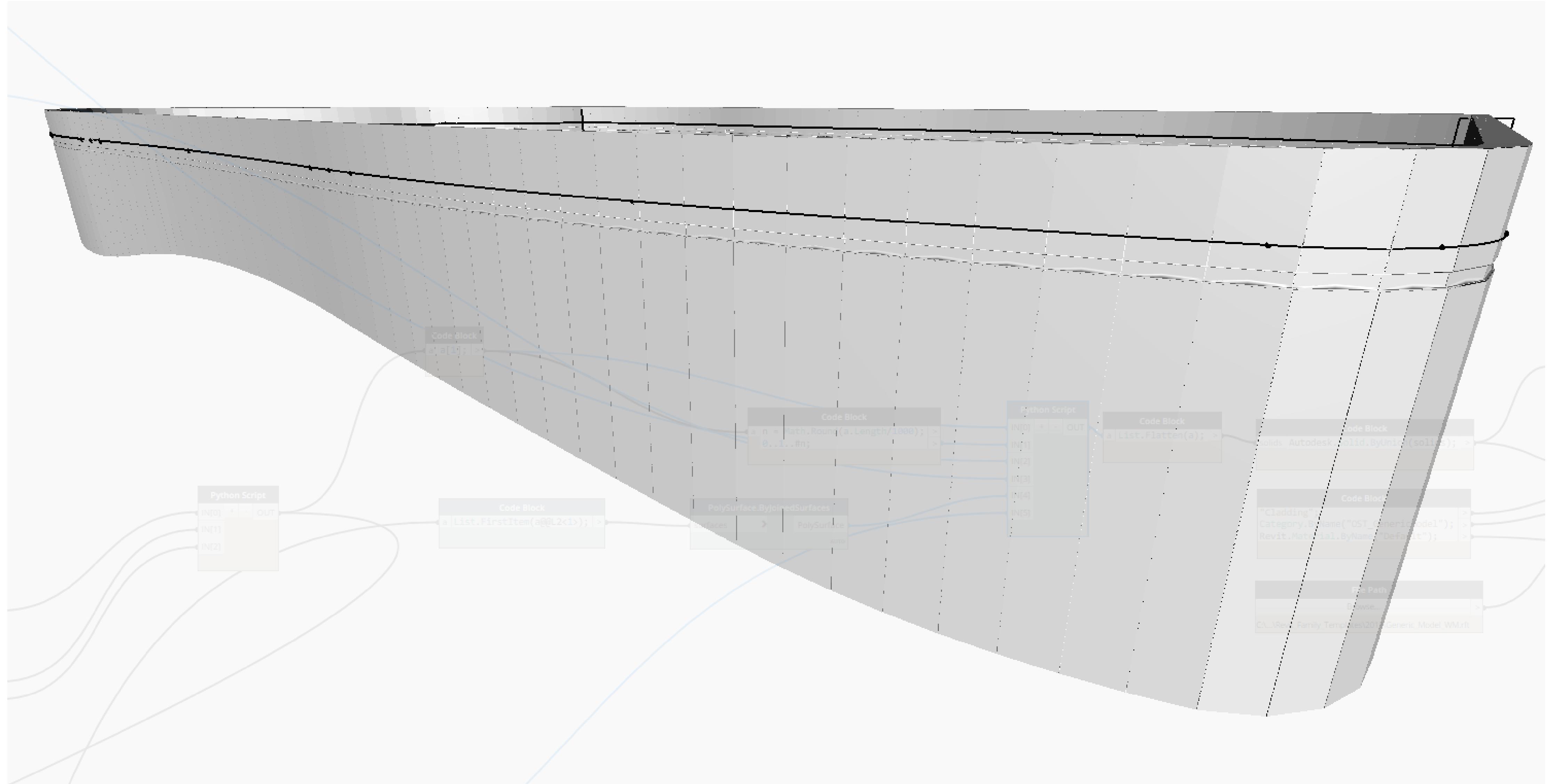


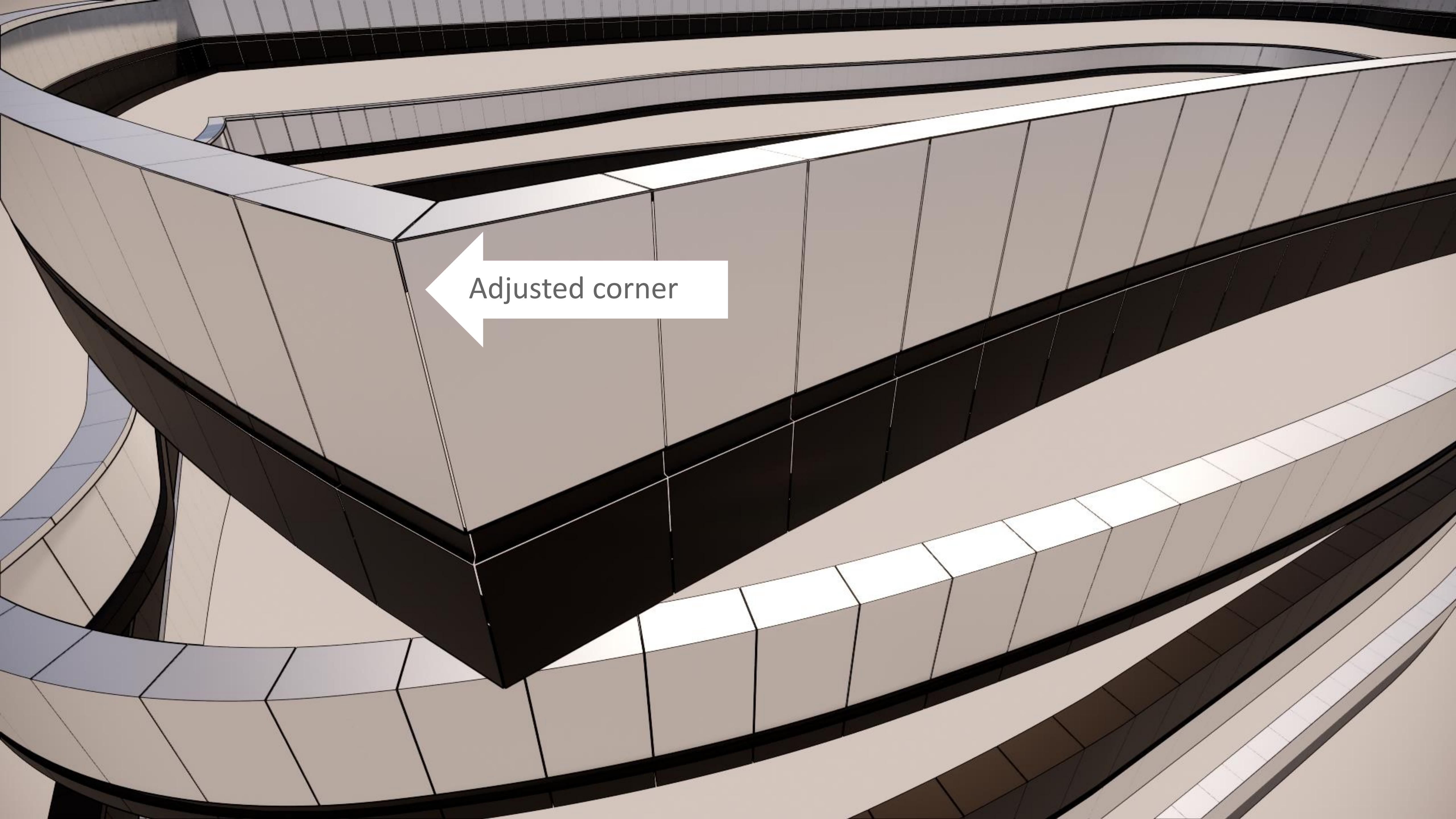


Profile from Revit

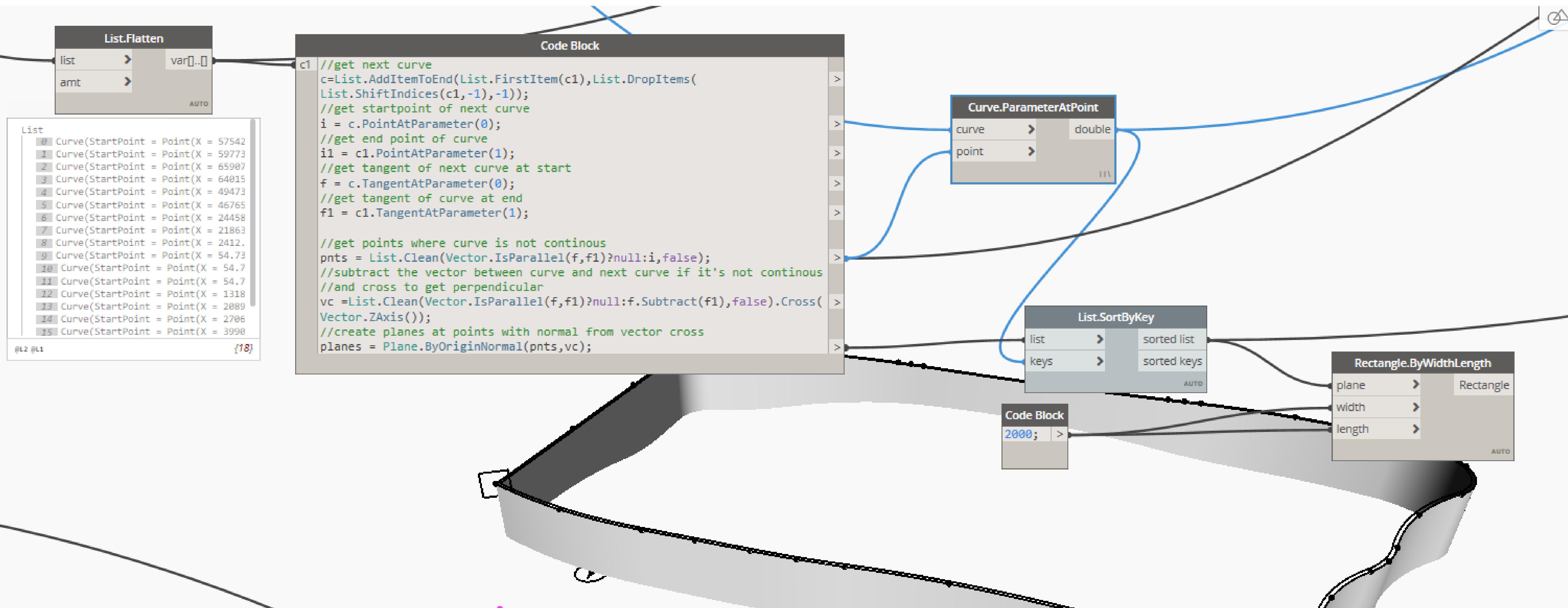


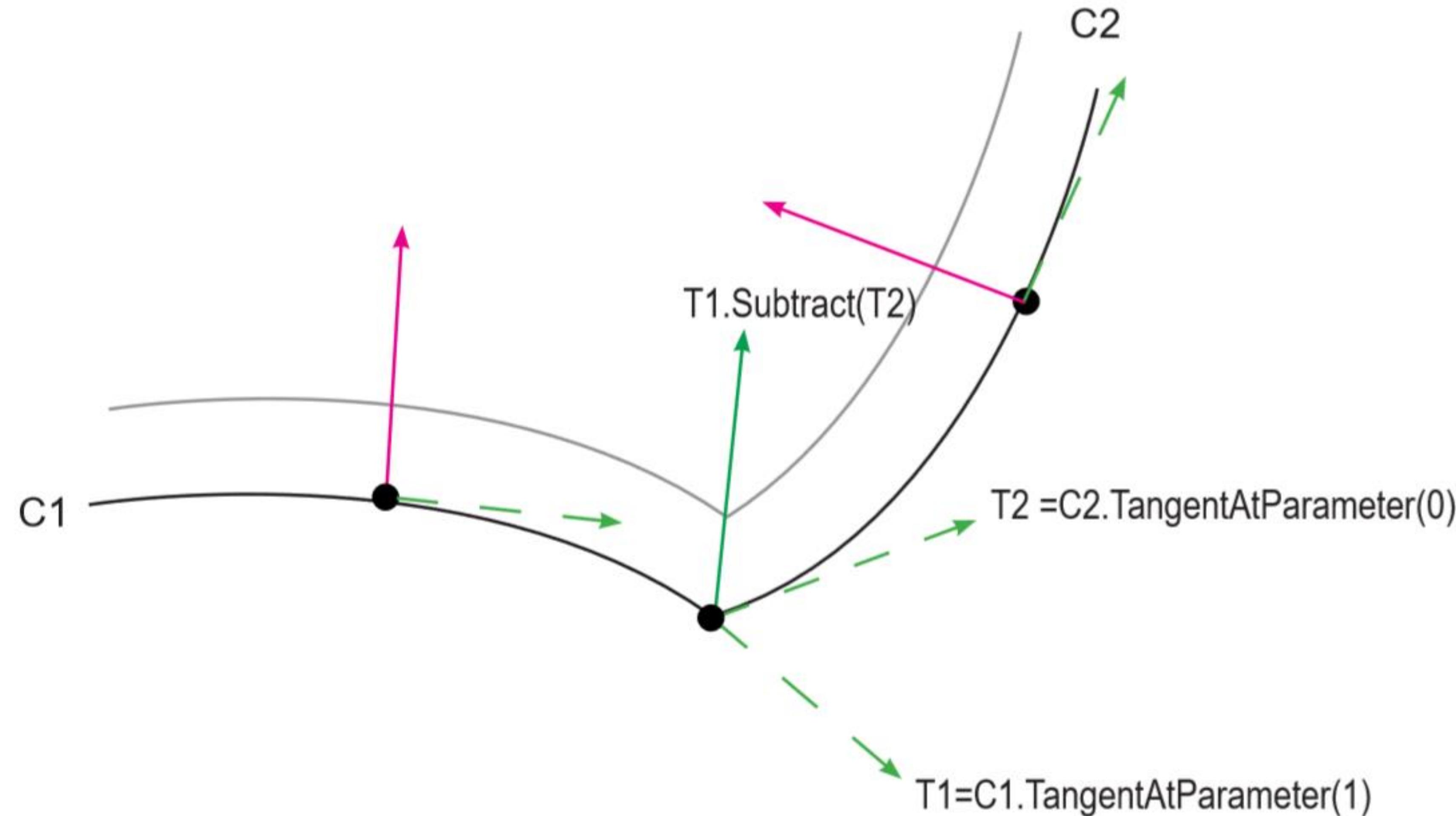
Transformed profiles



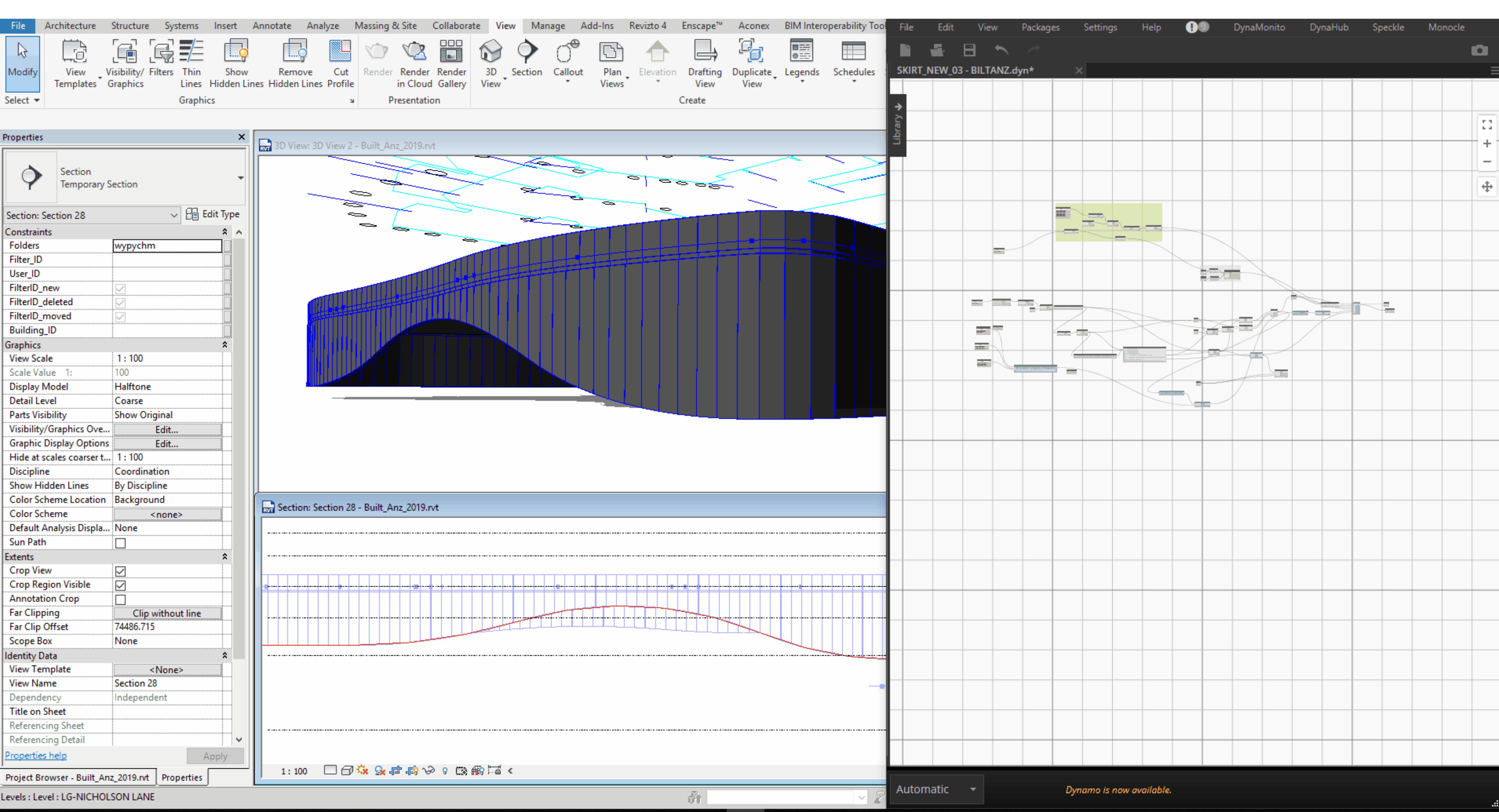


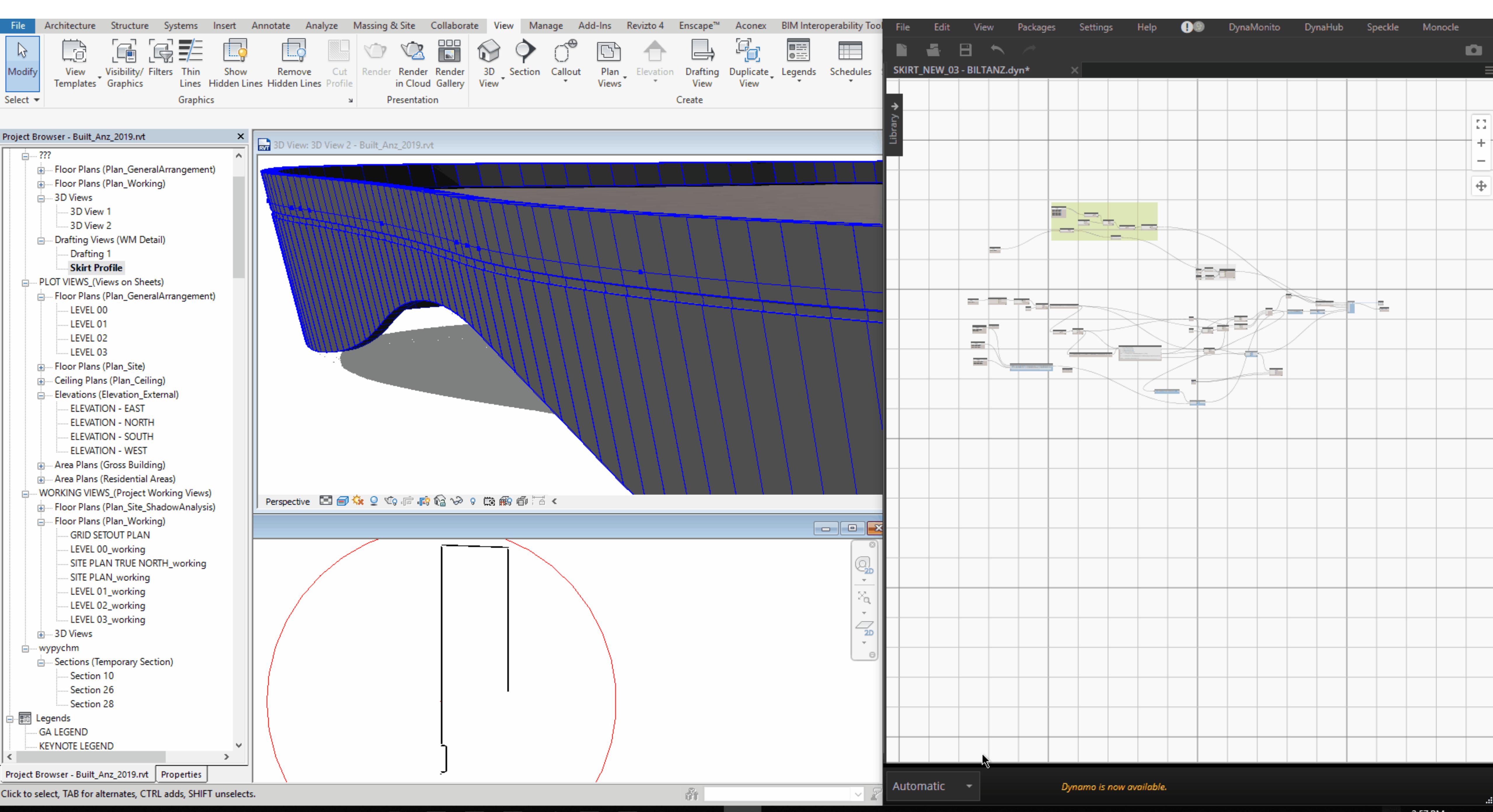
Adjusted corner





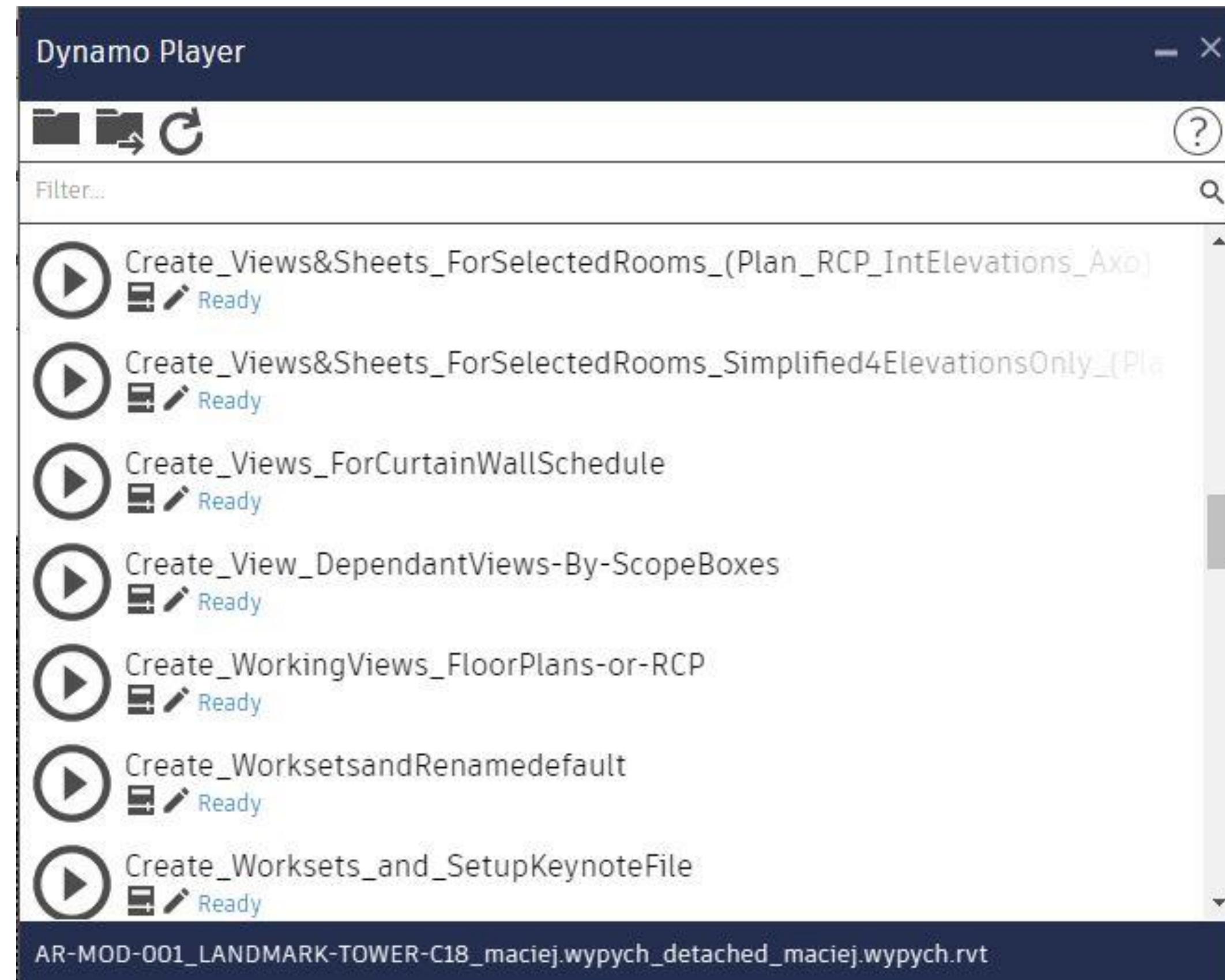
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Vector.ZAxis());
```



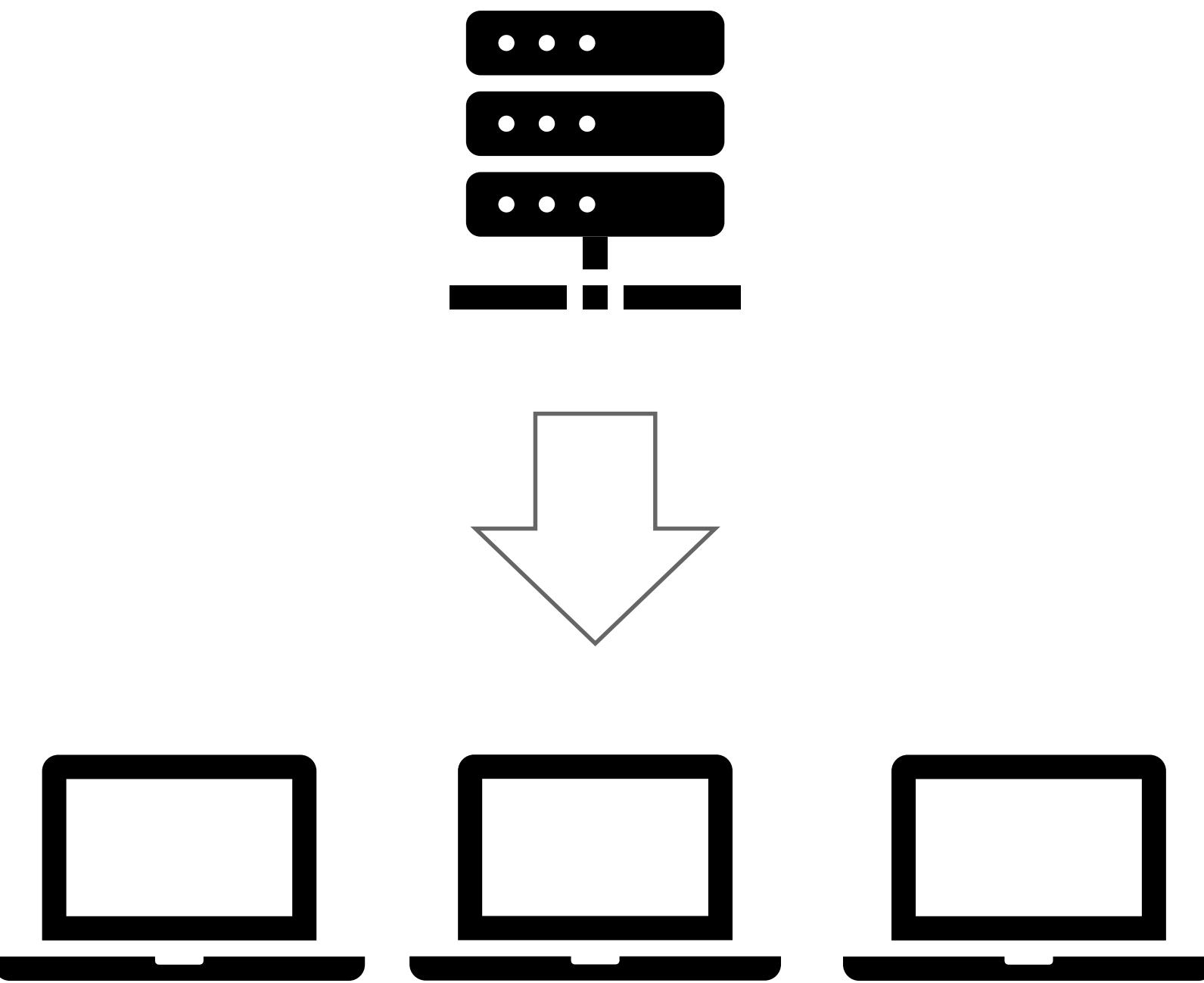


AUTOMATION

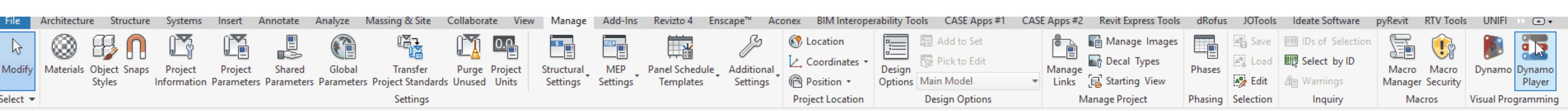
Definitions and packages accessed from C:
Drive



Centralized location for packages and
definitions



Push to users laptops at login

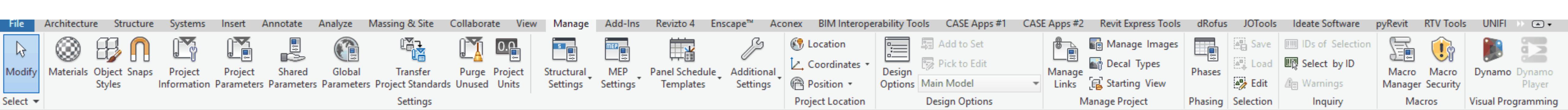


Project Browser - Built_Anz_2019.rvt

- Floor Plans (Plan_GeneralArrangement)
 - LEVEL 00
 - LEVEL 01
 - LEVEL 02
 - LEVEL 03
- Floor Plans (Plan_Site)
- Ceiling Plans (Plan_Ceiling)
- Elevations (Elevation_External)
 - ELEVATION - EAST
 - ELEVATION - NORTH
 - ELEVATION - SOUTH
 - ELEVATION - WEST
- Area Plans (Gross Building)
- Area Plans (Residential Areas)
- WORKING VIEWS_(Project Working Views)
 - Floor Plans (Plan_Site_ShadowAnalysis)
 - Floor Plans (Plan_Working)
 - GRID SETOUT PLAN
 - LEVEL 00_working
 - SITE PLAN TRUE NORTH_working
 - SITE PLAN_working
 - LEVEL 01_working
 - LEVEL 02_working
 - LEVEL 03_working
- 3D Views
- Legends
 - GA LEGEND
 - KEYNOTE LEGEND
 - WALL ACOUSTIC LEGEND
 - WALL FABRIC LEGEND
 - WALL FINISHES LEGEND
 - WALL FIRE SYSTEMS LEGEND
 - WALL TAG TYPICAL
 - x_ANNOTATION STANDARDS
 - x_FILLED REGIONS
 - x_LINE TYPES
 - x_SYMBOLS & TAGS
- Schedules/Quantities (Category)
- Sheets (W&M_SERIES)
 - ???
 - A00-001 - COVER SHEET
 - SK0001 - OPTION 1
 - ZZ - Starting_View

Properties

Elevation	Elevation_External
Elevation: ELEVATION - EAST	
Constraints	
Folders	PLOT VIEWS_(Views on Sheet)
Filter_ID	
User_ID	
FilterID_new	<input checked="" type="checkbox"/>
FilterID_deleted	<input checked="" type="checkbox"/>
FilterID_moved	<input checked="" type="checkbox"/>
Building_ID	
Graphics	
View Scale	1 : 100
Scale Value 1:	100
Display Model	Normal
Detail Level	Fine
Parts Visibility	Show Original
Visibility/Graphics Overrides	Edit...
Graphic Display Options	Edit...
Hide at scales coarser than	1 : 5000
Discipline	Architectural
Show Hidden Lines	By Discipline
Color Scheme Location	Background
Color Scheme	<none>
Default Analysis Display Style	None
Reference Label	
Sun Path	<input type="checkbox"/>
Extents	
Crop View	<input checked="" type="checkbox"/>
Crop Region Visible	<input checked="" type="checkbox"/>
Annotation Crop	<input type="checkbox"/>
Far Clipping	Clip without line
Far Clip Offset	66391.637
Scope Box	None
Associated Datum	None
Identity Data	
View Template	WM_A2_Elevations_External
View Name	ELEVATION - EAST
Dependency	Independent
Title on Sheet	
Referencing Sheet	
Referencing Detail	
Properties help	



Project Browser - Built_Anz_2019.rvt

A01

- A01.001 - GENERAL ARRANGEMENT PLAN LEVEL 01
 - A01.002 - GENERAL ARRANGEMENT PLAN LEVEL 02
 - A01.003 - GENERAL ARRANGEMENT PLAN LEVEL 03
 - A01.004 - GENERAL ARRANGEMENT PLAN LEVEL 04
 - A01.005 - GENERAL ARRANGEMENT PLAN LEVEL 05
 - A01.006 - GENERAL ARRANGEMENT PLAN LEVEL 06
 - A01.007 - GENERAL ARRANGEMENT PLAN LEVEL 07
 - A01.008 - GENERAL ARRANGEMENT PLAN LEVEL 08
 - A01.009 - GENERAL ARRANGEMENT PLAN LEVEL 09
 - A01.010 - GENERAL ARRANGEMENT PLAN LEVEL 10
 - A01.011 - GENERAL ARRANGEMENT PLAN LEVEL 11
 - A01.012 - GENERAL ARRANGEMENT PLAN LEVEL 12
 - A01.013 - GENERAL ARRANGEMENT PLAN LEVEL 13
 - A01.014 - GENERAL ARRANGEMENT PLAN LEVEL 14
 - A01.015 - GENERAL ARRANGEMENT PLAN LEVEL 15
 - A01.016 - GENERAL ARRANGEMENT PLAN LEVEL 16
 - A01.017 - GENERAL ARRANGEMENT PLAN LEVEL 17
 - A01.018 - GENERAL ARRANGEMENT PLAN LEVEL 18
 - A01.019 - GENERAL ARRANGEMENT PLAN LEVEL 19
 - A01.020 - GENERAL ARRANGEMENT PLAN LEVEL 20
 - A01.021 - GENERAL ARRANGEMENT PLAN LEVEL 21
 - A01.022 - GENERAL ARRANGEMENT PLAN LEVEL 22
 - A01.023 - GENERAL ARRANGEMENT PLAN LEVEL 23
 - A01.024 - GENERAL ARRANGEMENT PLAN LEVEL 24
 - A01.025 - GENERAL ARRANGEMENT PLAN LEVEL 25
 - A01.026 - GENERAL ARRANGEMENT PLAN LEVEL 26
 - A01.027 - GENERAL ARRANGEMENT PLAN LEVEL 27
 - A01.028 - GENERAL ARRANGEMENT PLAN LEVEL 28
 - A01.029 - GENERAL ARRANGEMENT PLAN LEVEL 29
 - A01.030 - GENERAL ARRANGEMENT PLAN LEVEL 30
 - A01.031 - GENERAL ARRANGEMENT PLAN LEVEL 31
 - A01.032 - GENERAL ARRANGEMENT PLAN LEVEL 32
 - A01.033 - GENERAL ARRANGEMENT PLAN LEVEL 33
 - A01.034 - GENERAL ARRANGEMENT PLAN LEVEL 34
 - A01.035 - GENERAL ARRANGEMENT PLAN LEVEL 35
 - A01.036 - GENERAL ARRANGEMENT PLAN LEVEL 36
 - A01.037 - GENERAL ARRANGEMENT PLAN LEVEL 37
 - A01.038 - GENERAL ARRANGEMENT PLAN LEVEL 38
 - A01.039 - GENERAL ARRANGEMENT PLAN LEVEL 39
 - A01.040 - GENERAL ARRANGEMENT PLAN LEVEL 40
 - A01.041 - GENERAL ARRANGEMENT PLAN LEVEL 41
 - A01.042 - GENERAL ARRANGEMENT PLAN LEVEL 42
 - A01.043 - GENERAL ARRANGEMENT PLAN LEVEL 43
 - A01.044 - GENERAL ARRANGEMENT PLAN LEVEL 44

Dynamo Player

shee

- Create_Plans & Sheets_MulitpleSequence Run completed with errors
- Create_Sheets_Duplicate-Sheets&Views Ready
- Create_Sheet_MulitpleSheetSequence Ready
- Create_VIEWS&Sheets_ForSelectedRooms_(Plan_RCP_IntElevations) Ready
- Create_VIEWS&Sheets_ForSelectedRooms_Simplified4ElevationsOn Ready
- Modify_Sheets_Renumber Ready
- Modify_Viewport_AlignLegendsOnSheets Ready
- Modify_Viewport_AlignViewportsOnSheets Ready
- Modify_Viewport_Change_TypesOnSheets Ready
- Place_Legend_OnMultipleSheets Ready

Built_Anz_2019.rvt

Project Browser - Built_Anz_2019.rvt

A01

A01.001 - GENERAL ARRANGEMENT PLAN LEVEL 01

A01.002 - GENERAL ARRANGEMENT PLAN LEVEL 02

A01.003 - GENERAL ARRANGEMENT PLAN LEVEL 03

A01.004 - GENERAL ARRANGEMENT PLAN LEVEL 04

A01.005 - GENERAL ARRANGEMENT PLAN LEVEL 05

A01.006 - GENERAL ARRANGEMENT PLAN LEVEL 06

A01.007 - GENERAL ARRANGEMENT PLAN LEVEL 07

A01.008 - GENERAL ARRANGEMENT PLAN LEVEL 08

A01.009 - GENERAL ARRANGEMENT PLAN LEVEL 09

A01.010 - GENERAL ARRANGEMENT PLAN LEVEL 10

A01.011 - GENERAL ARRANGEMENT PLAN LEVEL 11

A01.012 - GENERAL ARRANGEMENT PLAN LEVEL 12

A01.013 - GENERAL ARRANGEMENT PLAN LEVEL 13

A01.014 - GENERAL ARRANGEMENT PLAN LEVEL 14

A01.015 - GENERAL ARRANGEMENT PLAN LEVEL 15

A01.016 - GENERAL ARRANGEMENT PLAN LEVEL 16

A01.017 - GENERAL ARRANGEMENT PLAN LEVEL 17

A01.018 - GENERAL ARRANGEMENT PLAN LEVEL 18

A01.019 - GENERAL ARRANGEMENT PLAN LEVEL 19

A01.020 - GENERAL ARRANGEMENT PLAN LEVEL 20

A01.021 - GENERAL ARRANGEMENT PLAN LEVEL 21

A01.022 - GENERAL ARRANGEMENT PLAN LEVEL 22

A01.023 - GENERAL ARRANGEMENT PLAN LEVEL 23

A01.024 - GENERAL ARRANGEMENT PLAN LEVEL 24

A01.025 - GENERAL ARRANGEMENT PLAN LEVEL 25

A01.026 - GENERAL ARRANGEMENT PLAN LEVEL 26

A01.027 - GENERAL ARRANGEMENT PLAN LEVEL 27

A01.028 - GENERAL ARRANGEMENT PLAN LEVEL 28

A01.029 - GENERAL ARRANGEMENT PLAN LEVEL 29

A01.030 - GENERAL ARRANGEMENT PLAN LEVEL 30

A01.031 - GENERAL ARRANGEMENT PLAN LEVEL 31

A01.032 - GENERAL ARRANGEMENT PLAN LEVEL 32

A01.033 - GENERAL ARRANGEMENT PLAN LEVEL 33

A01.034 - GENERAL ARRANGEMENT PLAN LEVEL 34

A01.035 - GENERAL ARRANGEMENT PLAN LEVEL 35

A01.036 - GENERAL ARRANGEMENT PLAN LEVEL 36

A01.037 - GENERAL ARRANGEMENT PLAN LEVEL 37

A01.038 - GENERAL ARRANGEMENT PLAN LEVEL 38

A01.039 - GENERAL ARRANGEMENT PLAN LEVEL 39

A01.040 - GENERAL ARRANGEMENT PLAN LEVEL 40

A01.041 - GENERAL ARRANGEMENT PLAN LEVEL 41

A01.042 - GENERAL ARRANGEMENT PLAN LEVEL 42

A01.043 - GENERAL ARRANGEMENT PLAN LEVEL 43

A01.044 - GENERAL ARRANGEMENT PLAN LEVEL 44

Properties

Sheet

Sheet: GENERAL ARRANGEMENT PLAN LEVEL 02

Constraints

Filter_ID

User_ID

FilterID_new

FilterID_deleted

FilterID_moved

Building_ID

Graphics

Visibility/Graphics Overrides

Scale: 1:100

Text

Drawing Series: A01

Model File Name

Revit Build Number

Identity Data

Dependency: Independent

Referencing Sheet

Referencing Detail

Current Revision Issued

Current Revision Issued By

Current Revision Issued To

Current Revision Date

Current Revision Description

Current Revision

Approved By

Designed By

Checked By

Drawn By

Sheet Number: A01.002

Sheet Name: GENERAL ARRANGEMENT PL...

Sheet Issue Date: 05/05/19

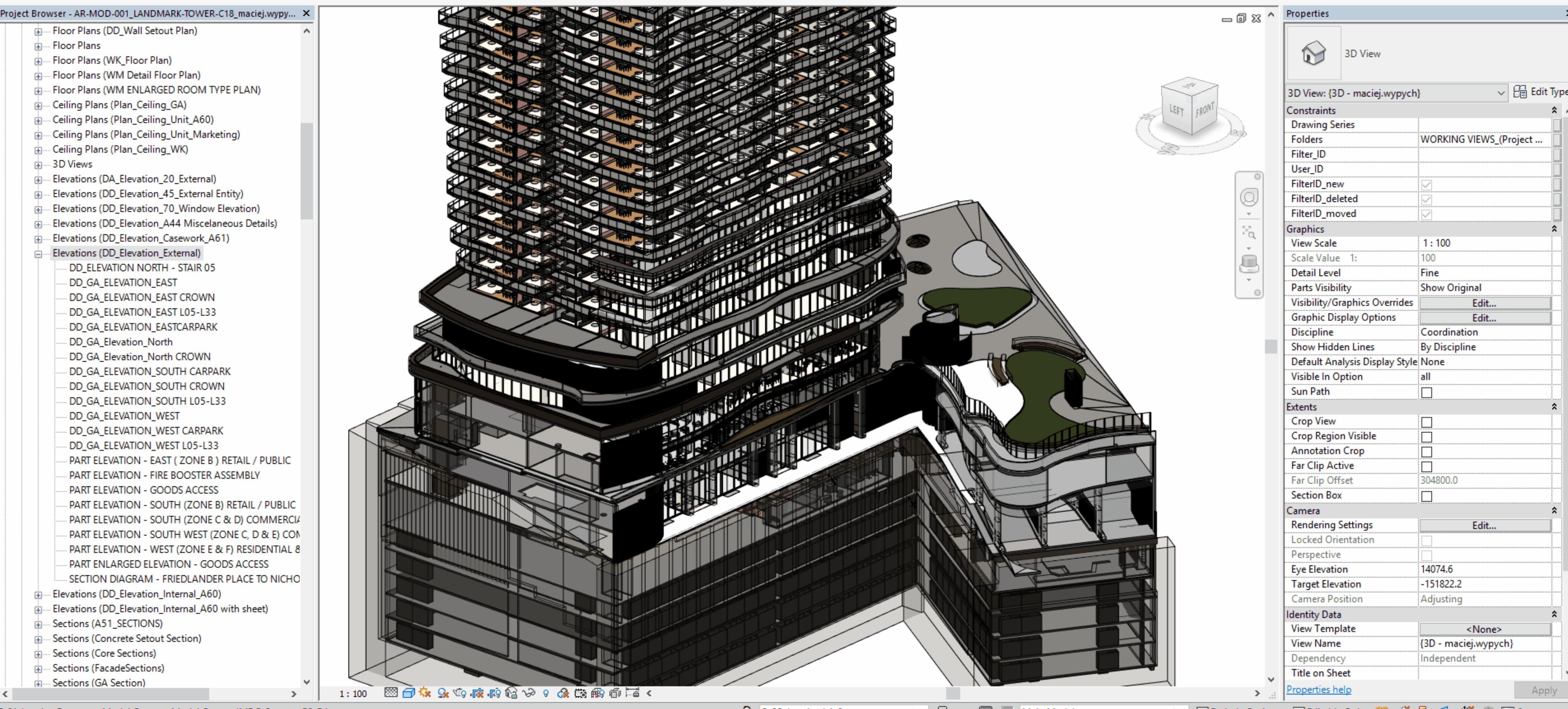
Appears In Sheet List

Revisions on Sheet

Other

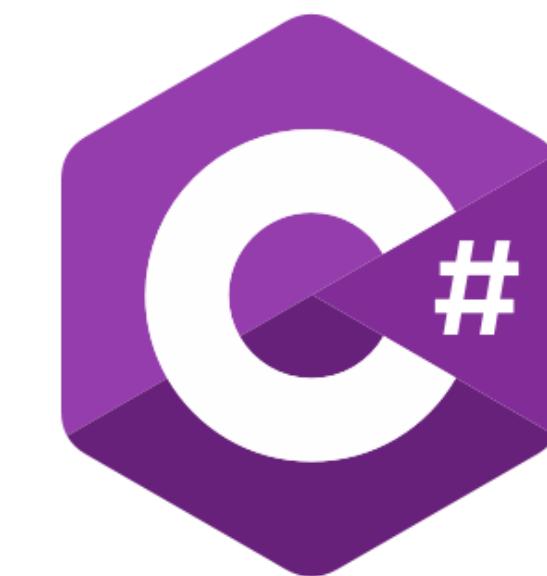
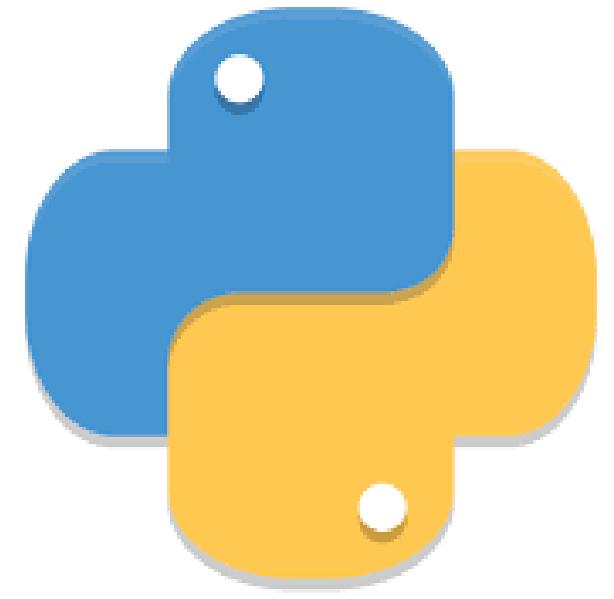
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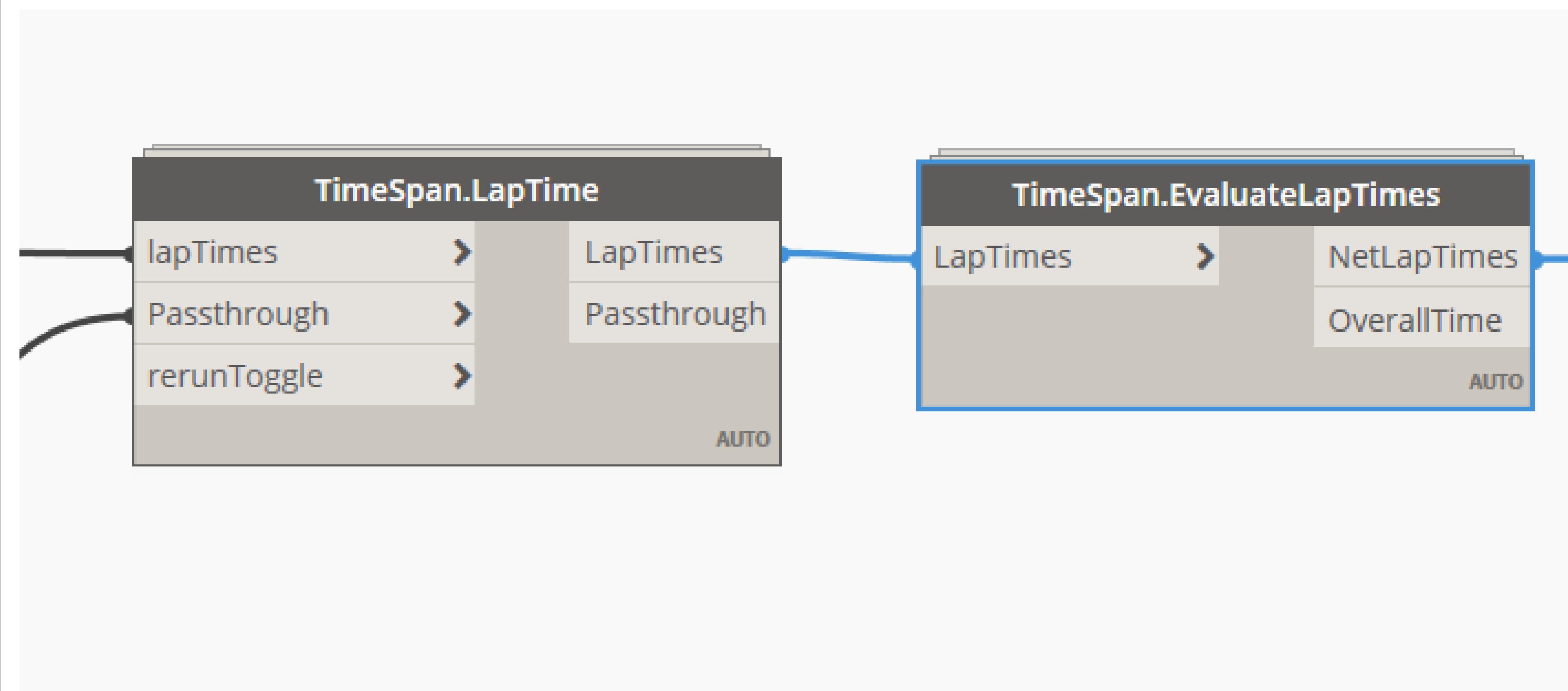
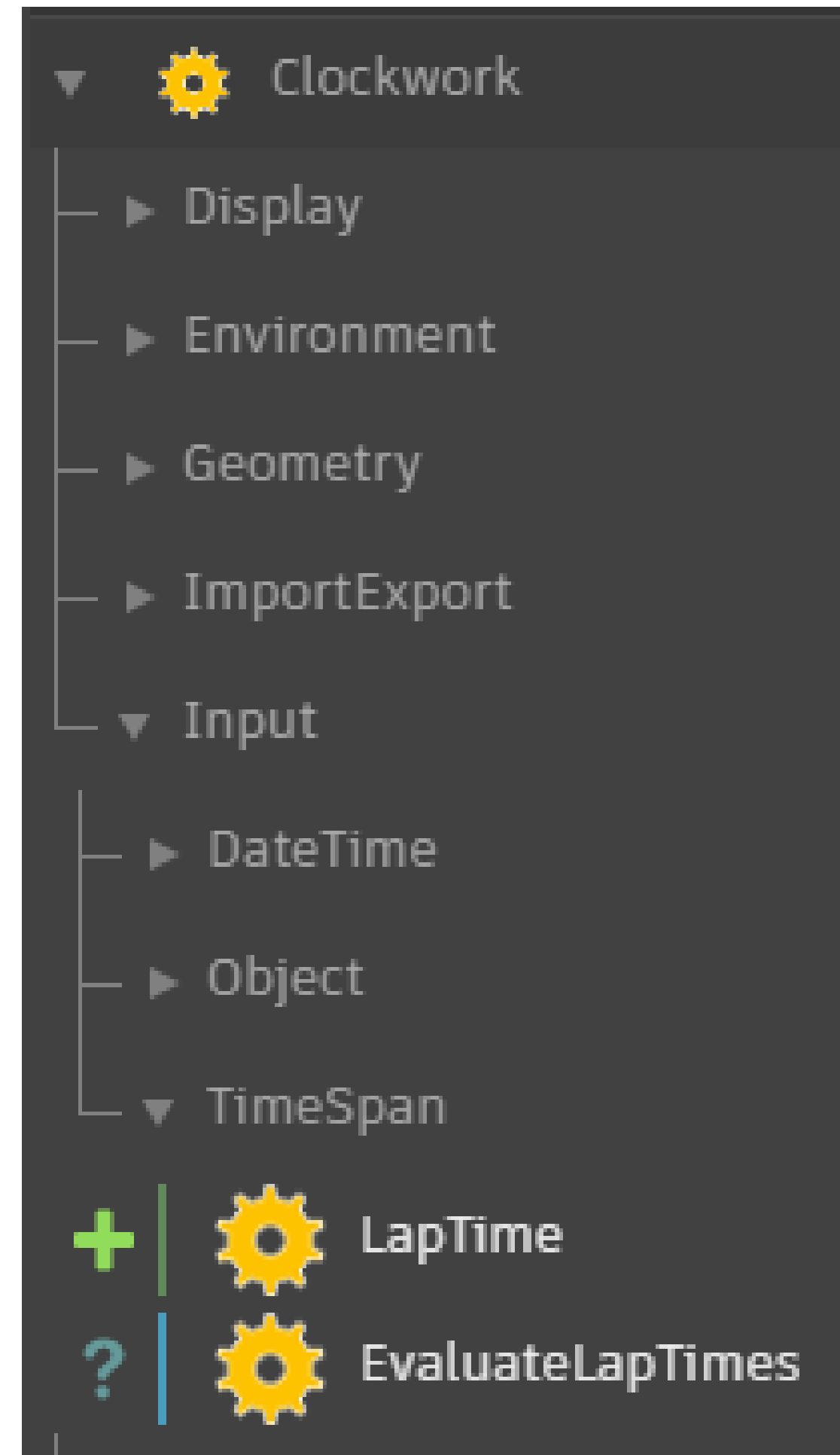
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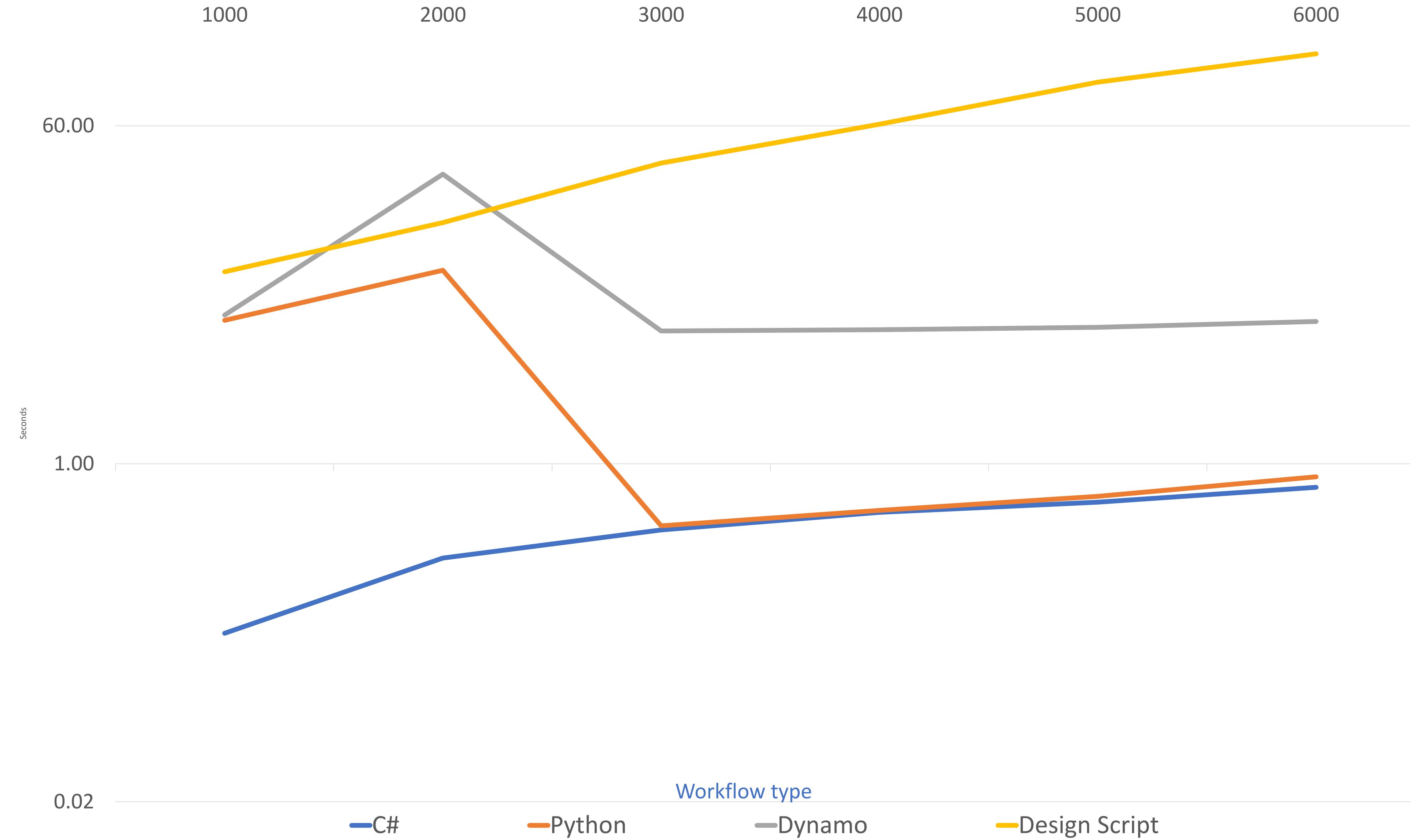
WHICH IS FASTER?

DESIGN
SCRIPT
IMPERATIVE
FUNCTION

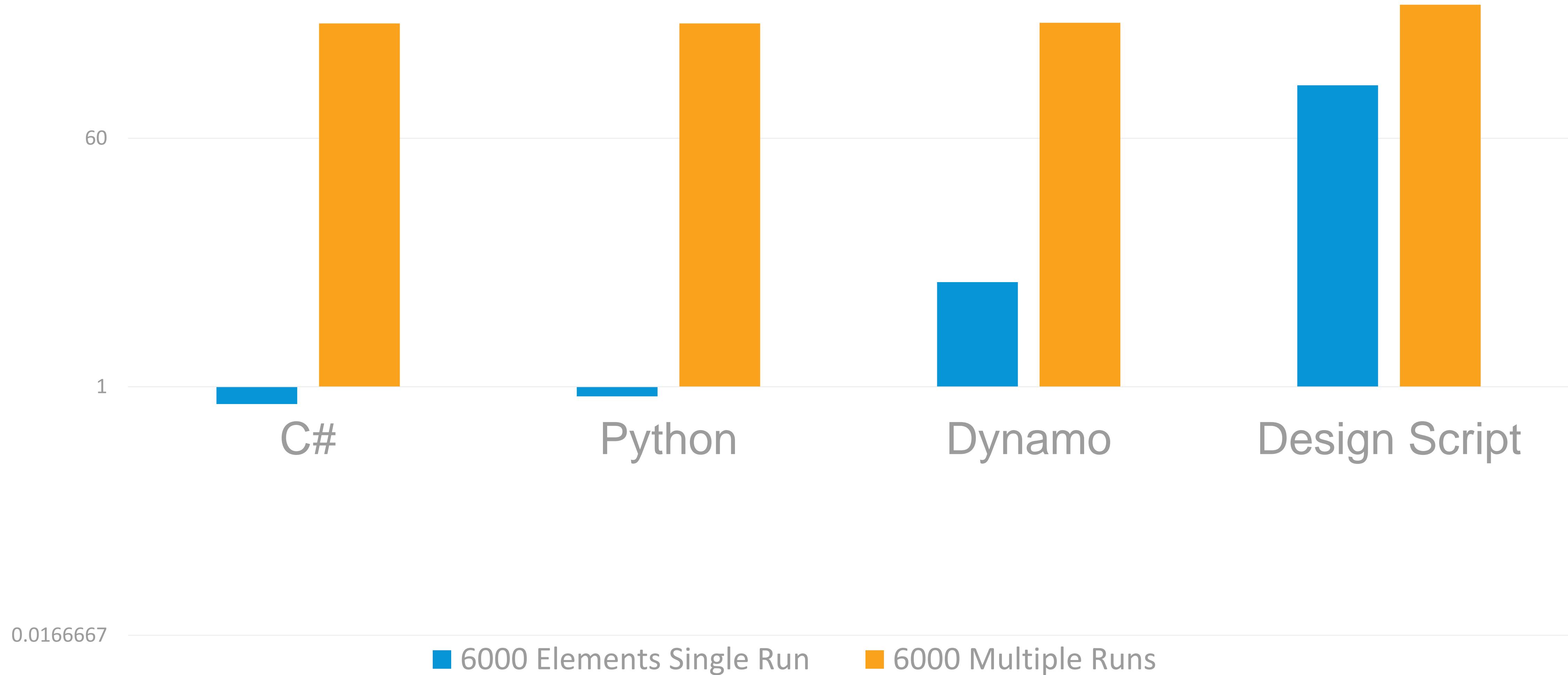




Number of elements

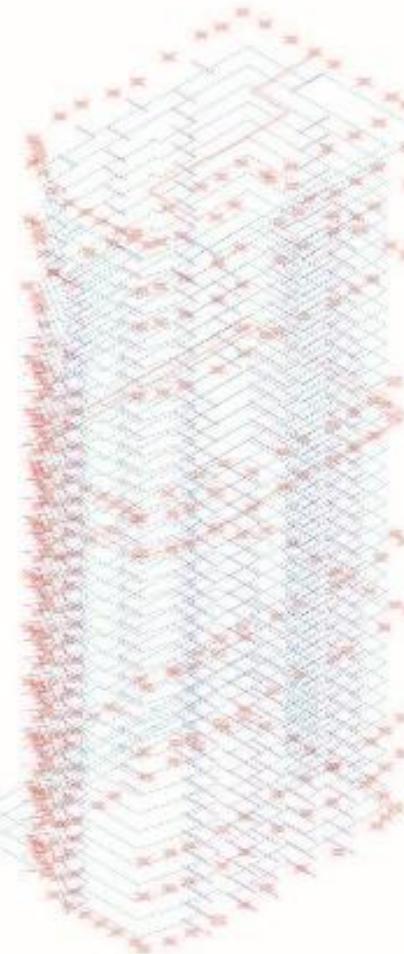
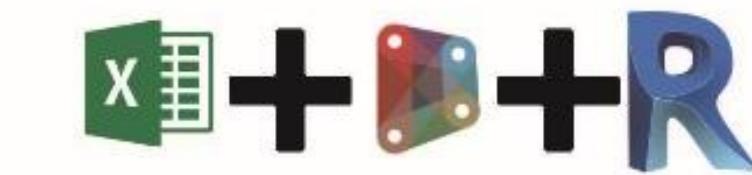
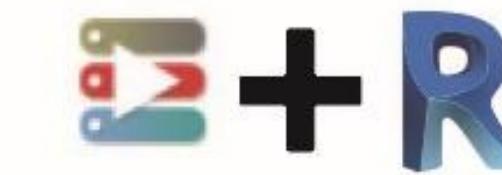


Single Run vs Multiple Runs

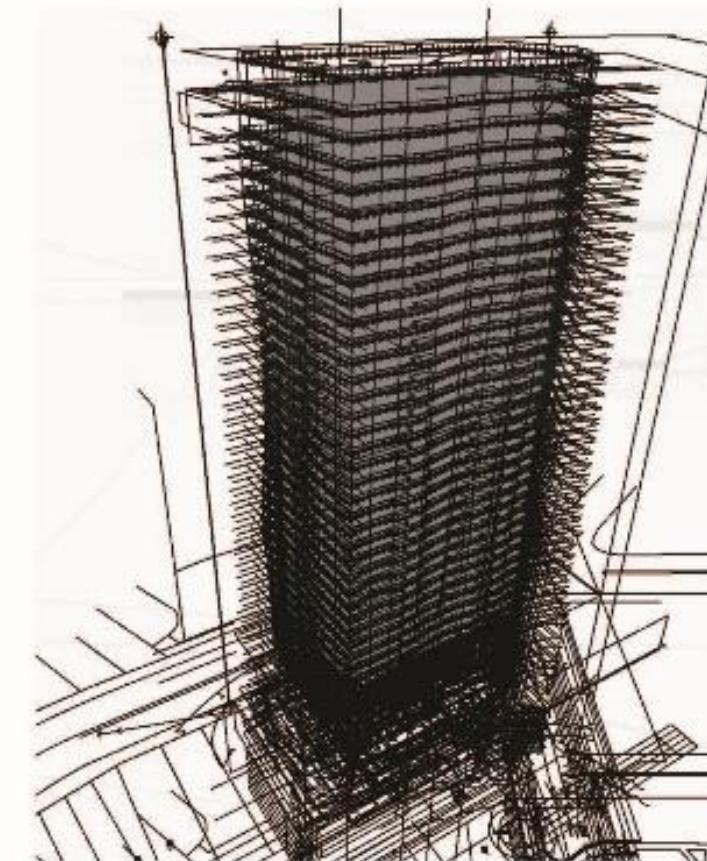


SUMMARY

THE LANDMARK - WORKFLOW



REVIT MODEL LINES
AND EXCEL DATA USED
TO CREATE TOWER
CONSTRAINTS



MULTIPLE DYNAMO
DEFINITIONS USED FOR
DESIGN EXPLORATION



19,942 MODEL ELEMENTS
CREATED OR PLACED
USING DYNAMO FOR REVIT
INCLUDING:

- STRUCTURAL SLABS
- FLOOR FINISHES
- ROOF
- CLADDING PANELS
- BALCONY DIVIDERS
- FLOOR UPSTANDS
- BALUSTRADES



23,508 MODEL ELEMENTS
PLACED MANUALLY AND
DISTRIBUTED ACCROSS
50 LEVELS INCLUDING 7
LEVELS OF BASEMENT
USING MODEL GROUPS

DYNAMO PLAYER USED TO
CREATE, POPULATE AND
ALIGN 200+ SHEETS.



EXCEL DATA FROM
CONSULTANTS IMPORTED
THROUGH DYNAMO TO
POPULATE ELEMENT
PARAMETERS

WE'VE ALWAYS DONE
IT THIS WAY...

PLAN AHEAD

AUTOMATE

USE REVIT TO DRIVE
DYNAMO GEOMETRY



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Make anything™

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