

# Revit and Dynamo For Landscape Architecture

## AR20475

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# Class summary

This class will demonstrate how you can use Revit software for landscape architecture with some assistance from Dynamo extension. Attendees will get an overview of how to use Revit software features such as families to provide typical symbols in plan while providing opportunities for visualization, scheduling to provide quantities, and tagging to annotate consistent information. Going beyond the basics, we'll use Dynamo extension to show advanced techniques to streamline the design process. This session features Revit and Dynamo Studio. AIA Approved

# Key learning objectives

At the end of this class, you will be able to:

- Learn how to use Revit for landscape architecture
- Learn how to utilize Dynamo to improve your typical Revit workflow
- Understand how a BIM database can streamline landscape-architecture design documentation
- Become comfortable using Revit

# About the Presenter

## William Carney

BIM Director at BSA LifeStructures



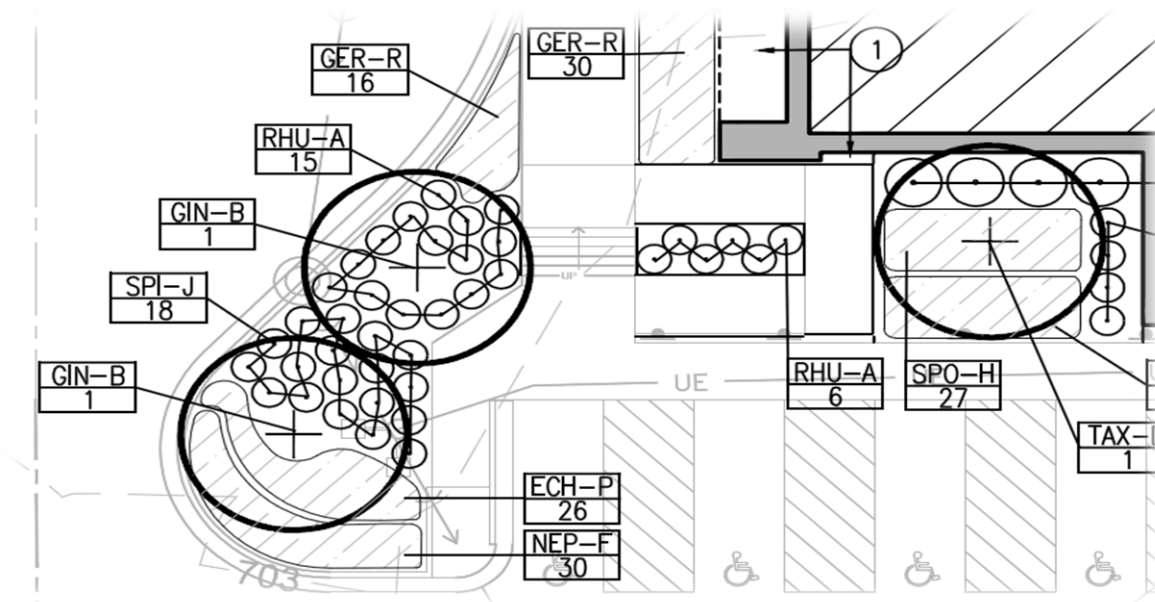
- Firm leader in adoption and implementation of design technology
- Not a Landscape Architect
- Early adopter of Revit 2004
- 10 years of Professional Architectural experience on a wide range of project types
- Committee member for the St. Louis Revit User Group
- Site moderator for the LinkedIn Group Revit Users
- Live St. Louis area with his wife Liz, son Hank, and Greyhound Helen

# Why am I presenting on this?

## Sketchup Visuals



## CAD Documents



## Photoshop Site

# How Can Revit Benefit A Landscape Architect?

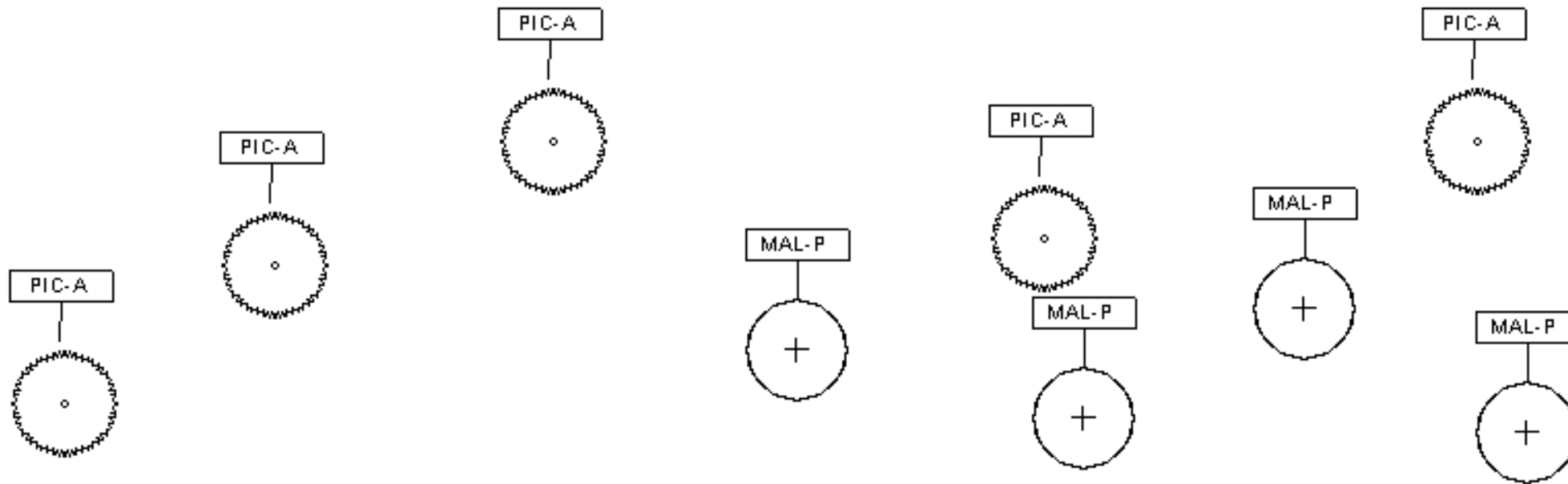
- The Database
- Families
- Visibility Graphics

# The Database



# The Database

Provides one source of truth for information.



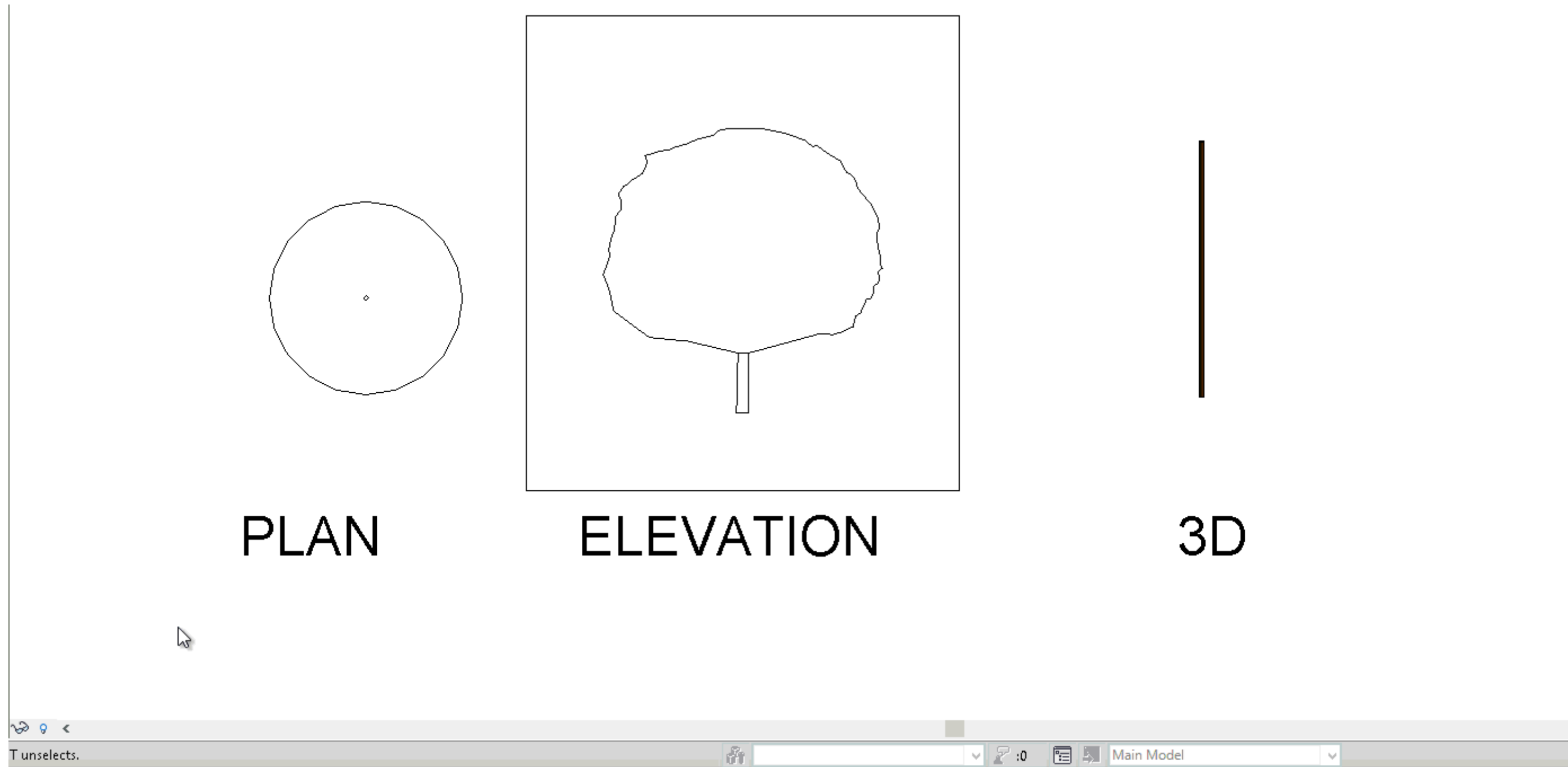
- Quantity
- Cost
- Data

PLANT LIST				
MARK	BOTANICAL NAME	COMMON NAME	COUNT	Cost
MAL-P	MALUS 'PRAIRIFIRE'	PRAIRIFIRE CRABAPPLE	4	\$1000.00
PIC-A	PICEA ABIES	NORWAY SPRUCE	5	\$1500.00
Grand total: 9				\$2500.00



# Families

A group of elements with a common set of properties called parameters...



# Visibility Graphics



**Object Styles**

Model Objects | Annotation Objects | Analytical Model Objects | Imported Objects

Filter list: <show all>

Category	Line Weight		Line Color	Line Pattern	Material
	Projection	Cut			
Air Terminals	5		Black	Solid	
Cable Tray Fittings	1		Black	Solid	
Cable Trays	1		Black	Solid	

**Visibility/Graphic Overrides for Floor Plan: OVERALL LANDSCAPE PLAN Fall Colors**

Model Categories | Annotation Categories | Analytical Model Categories | Imported Categories | Filters | Worksets | Revit Links | Design Options

Show model categories in this view

Filter list: <show all>

Visibility	Projection/Surface			Cut	Half-tone
	Lines	Patterns	Transparen...		
<input checked="" type="checkbox"/> Air Terminals					
<input checked="" type="checkbox"/> Areas					
<input checked="" type="checkbox"/> Cable Tray Fittings					
<input checked="" type="checkbox"/> Cable Trays					
<input type="checkbox"/> Casework					
<input type="checkbox"/> Ceilings					
<input checked="" type="checkbox"/> Columns					
<input checked="" type="checkbox"/> Communication De...					
<input checked="" type="checkbox"/> Conduit Fittings					
<input checked="" type="checkbox"/> Conduits					
<input checked="" type="checkbox"/> Curtain Panels					<input type="checkbox"/> By View
<input checked="" type="checkbox"/> Curtain Systems					<input type="checkbox"/> By View
<input checked="" type="checkbox"/> Curtain Wall Mullions					<input type="checkbox"/> By View
<input checked="" type="checkbox"/> Data Devices					<input type="checkbox"/> By View
<input checked="" type="checkbox"/> Detail Items					<input type="checkbox"/> By View

**View-Specific Element Graphics**

Visible  Half-tone

► Projection Lines

► Surface Patterns

► Surface Transparency

Reset OK Cancel Apply

**Visibility/Graphic Overrides for Floor Plan: OVERALL LANDSCAPE PLAN Fall Colors**

Model Categories | Annotation Categories | Analytical Model Categories | Imported Categories | Filters | Worksets | Revit Links | Design Options

Visibility	Projection/Surface			Cut		Half-tone
	Lines	Patterns	Transparen...	Lines	Patterns	
<input checked="" type="checkbox"/>						<input type="checkbox"/>

Line Style:

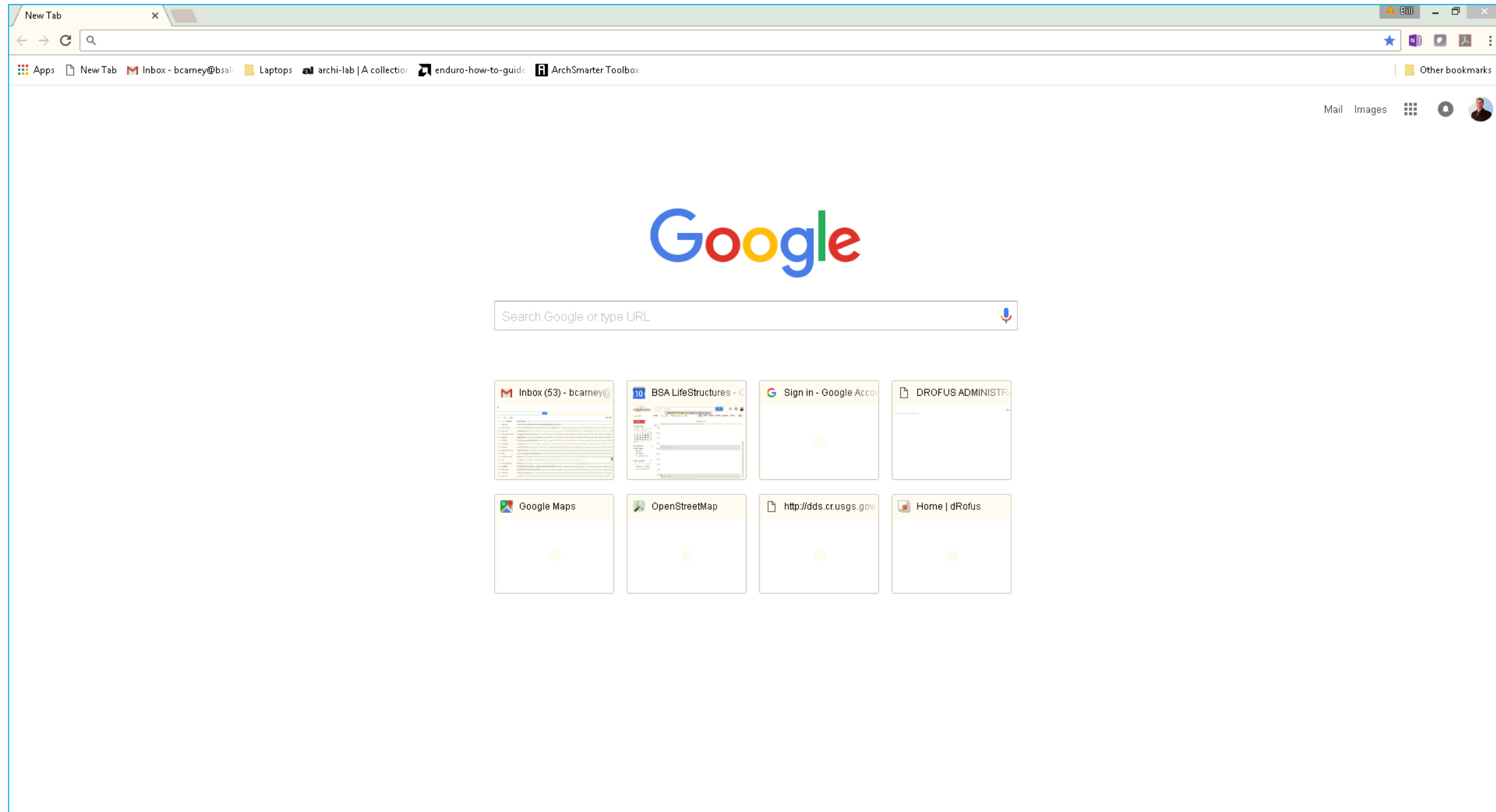
<By Category>

Line Style

# How can Dynamo Help a Landscape Architect?

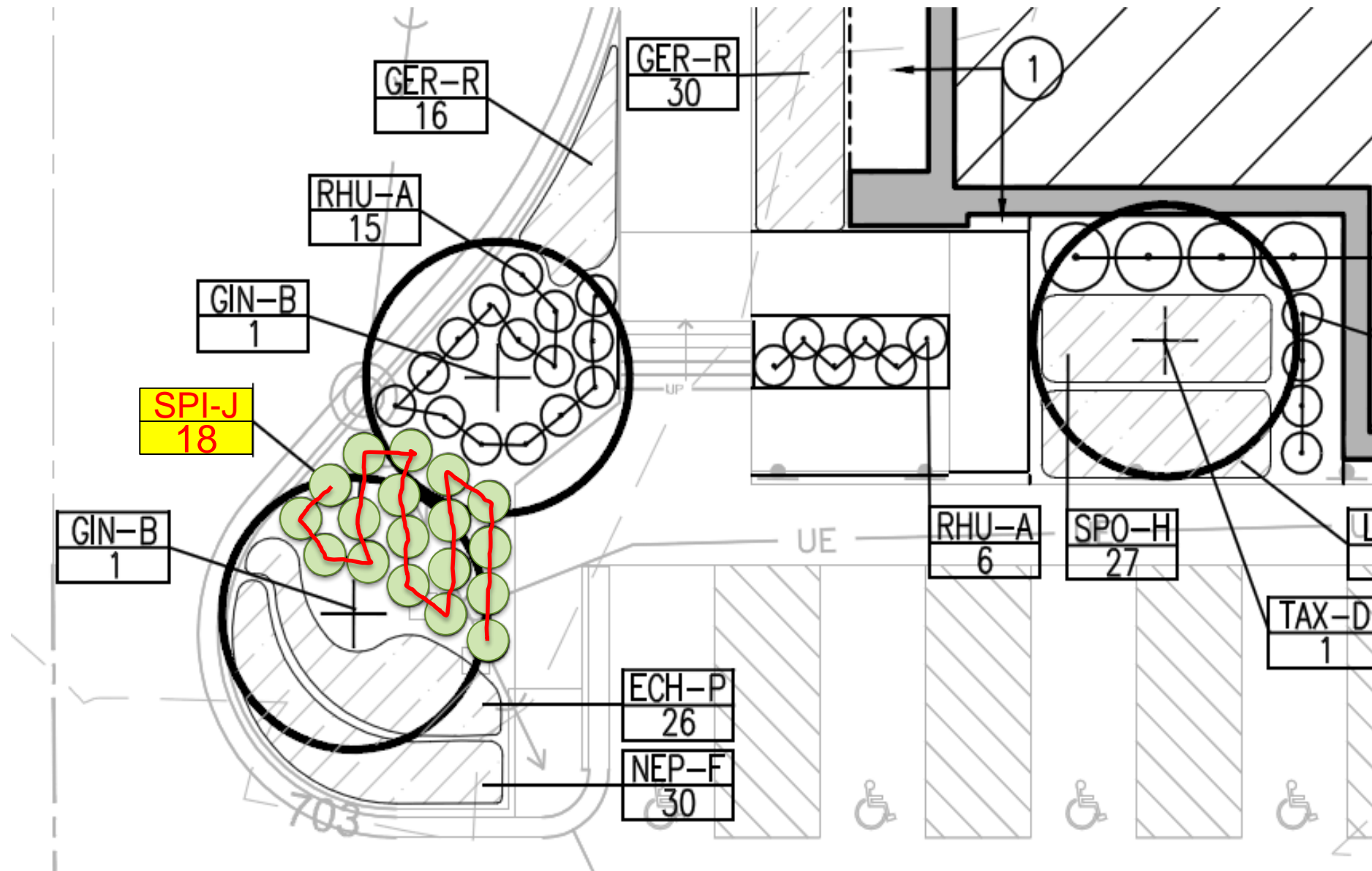
- Connect to external information
- Perform tedious tasks
- Perform actions based on calculations

# Connect to external information



For more info go to: <http://www.hksinc.com/hksline/2015/10/26/elk-mapping-plugin/>

# Perform tedious tasks



# Perform tedious tasks

The image shows a screenshot of the Autodesk Dynamo software interface. The window title is "Dynamo" and the file name is "Tag Trees.dyn". The interface includes a menu bar (File, Edit, View, Packages, Settings, Help), a toolbar, and a library panel on the left with a search bar and a list of categories such as ABT, Ampersand, Analyze, Archi-lab\_Grimshaw, Bakery, Berger, BlackBox, Builtin, CAAD\_RWTH, Clockwork, Core, Display, DME, Elk, Geometry, JBE, Landform, LSJ, LunchBox, Office, Operators, Revit, Rhythm, Slingshot, Springs, and SteamNodes. The main workspace contains a workflow graph with several nodes and connections. The graph is annotated with colored boxes and text labels: "Start Here!" (blue), "Sort by Type" (orange), "Find Location of families and sort them in a logical order" (yellow), "Create Lines and remove segments over a specified length" (yellow), "Find Line Points and Prune Duplicates" (grey), "Place Adaptive Component" (purple), "Add Count of Trees to Parameter" (orange), "Tag Items not in List (Single Trees)" (teal), and "Tag First item From List" (teal). The bottom status bar shows "Manual" and "Run" buttons, with a message "Run completed with warnings.".

# Perform Actions Based On Calculations

INTERIOR PARKING LOT: 15 SQ FEET GREEN SPACE PER PARKING STALL X 81 SPACES

REQ. SQ FT. 1,215

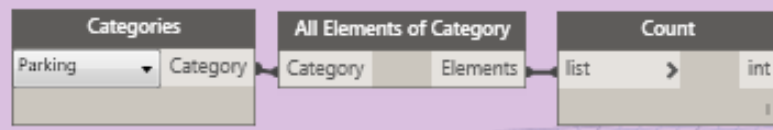
ACTUAL SQ FT 3,598

1 TREE PER EVERY 20 SPOTS

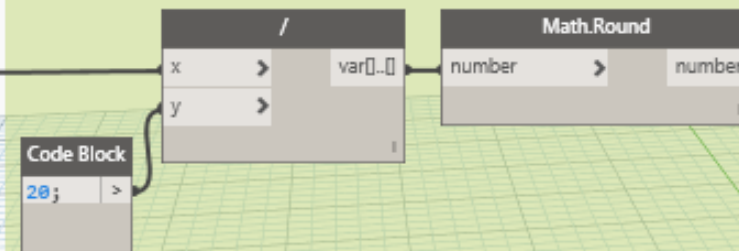
REQ. TREES 5

ACTUAL TREES 12

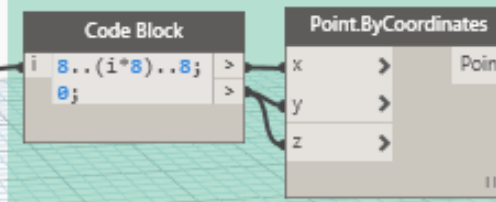
Get Parking Count



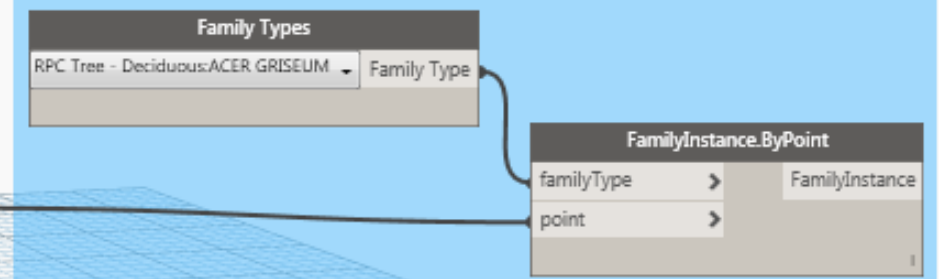
Get Required Number of Trees



Create a list of points based on number of families



Place Family at points



# Topography



# Determine the best method for your project

- Identify What is required as a deliverable
- Review the site conditions
- Determine the flow of information
- Pick the easiest method that fits your criteria

# Help guide your decision

## What Are Required Deliverables

- 1) Realistic Site / Exact Topography
- 2) Construction Documents & Imagery
- 3) No Requirement

## What is the Site Like

- i. Relatively Flat
- ii. Sloped
- iii. Varied

## What Do We Have

- A. 2D CAD
- B. 3D CAD/Civil 3D
- C. Pictures
- D. Nothing

## Who is updating site information

- a) Me
- b) Civil
- c) No Site Changes

# Possible Solutions

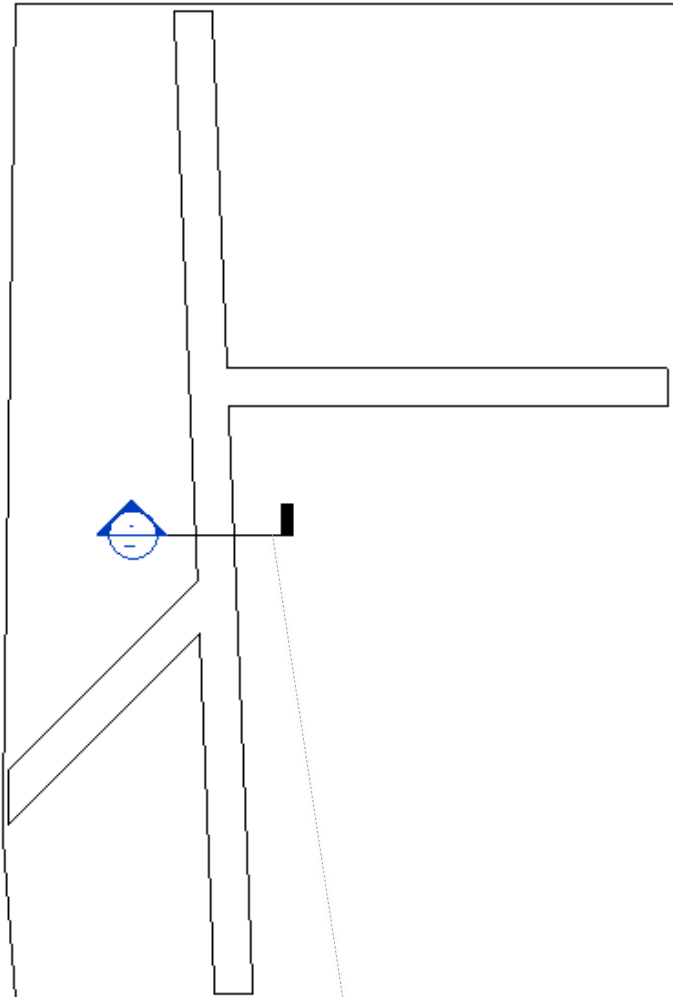
Flat Site	Sloped Site
<ul style="list-style-type: none"><li>• Floor slabs with offsets for thickness</li><li>• Flat topography with sub regions</li></ul>	<ul style="list-style-type: none"><li>• Topography with sub regions</li><li>• Floor slabs over topography</li></ul>

# Hardscape

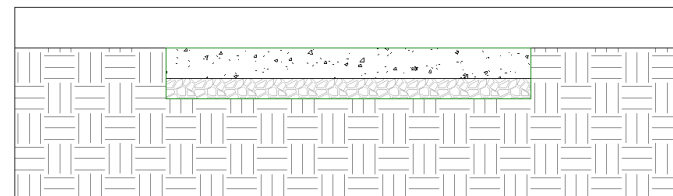
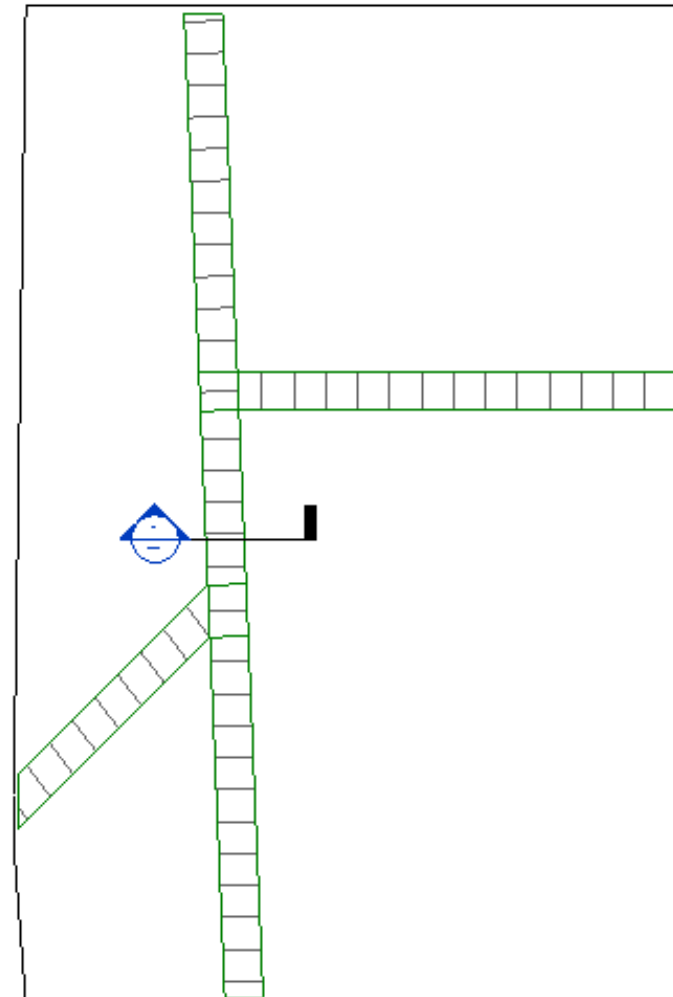
- Strategies
- Materials
- Curbs

# Hardscape Strategies

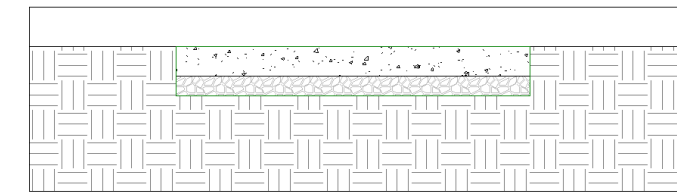
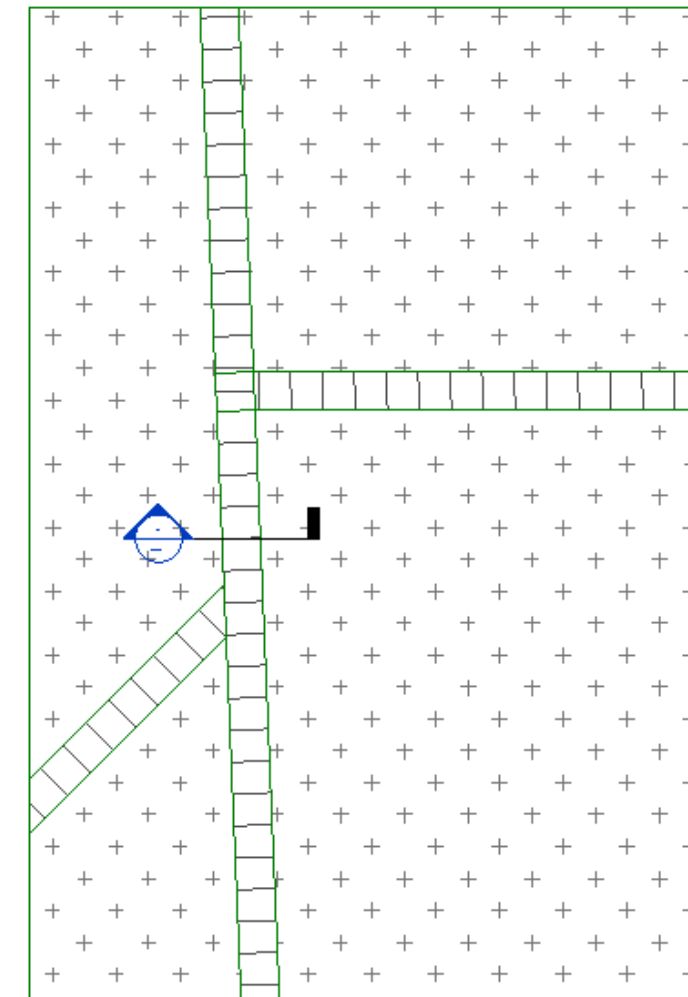
**Topography**



**Topography & Floors**

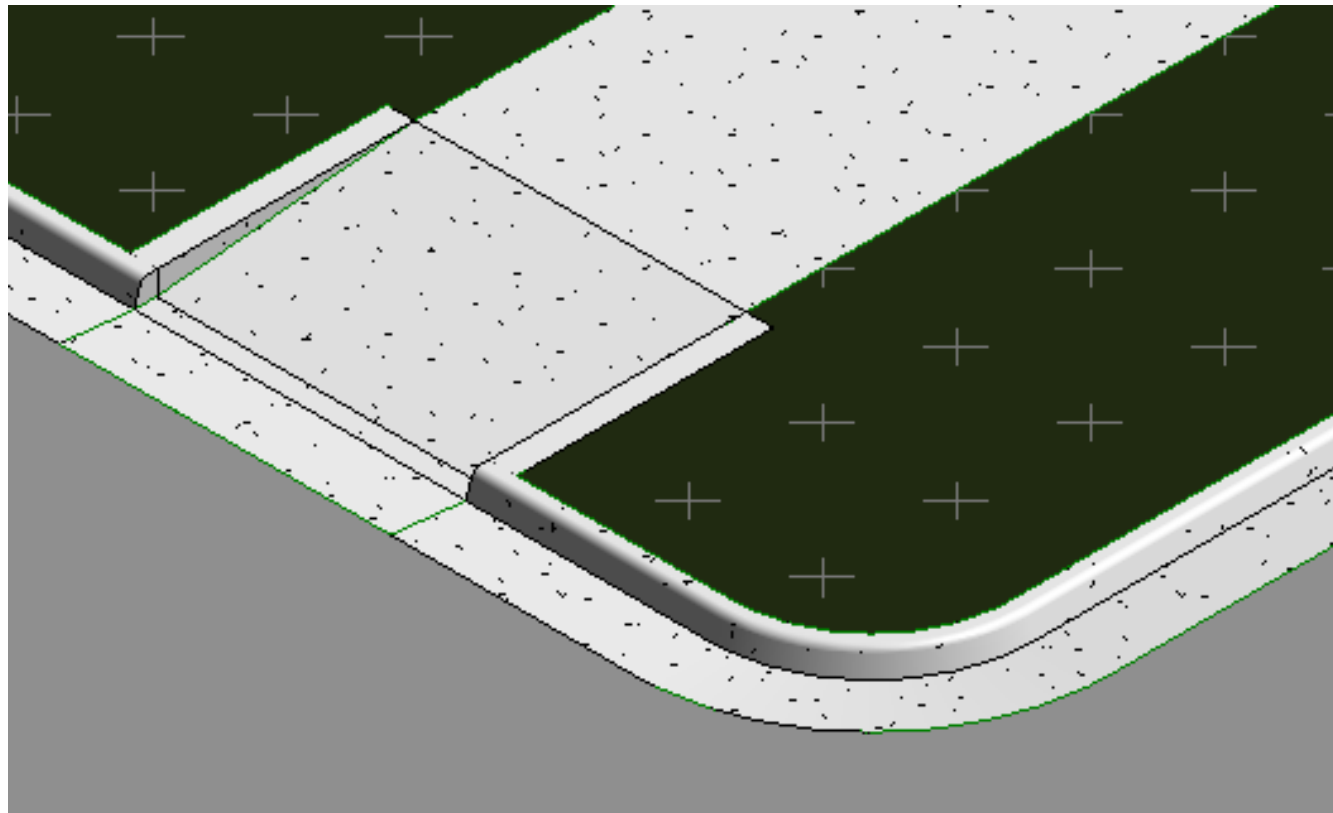


**Floors**

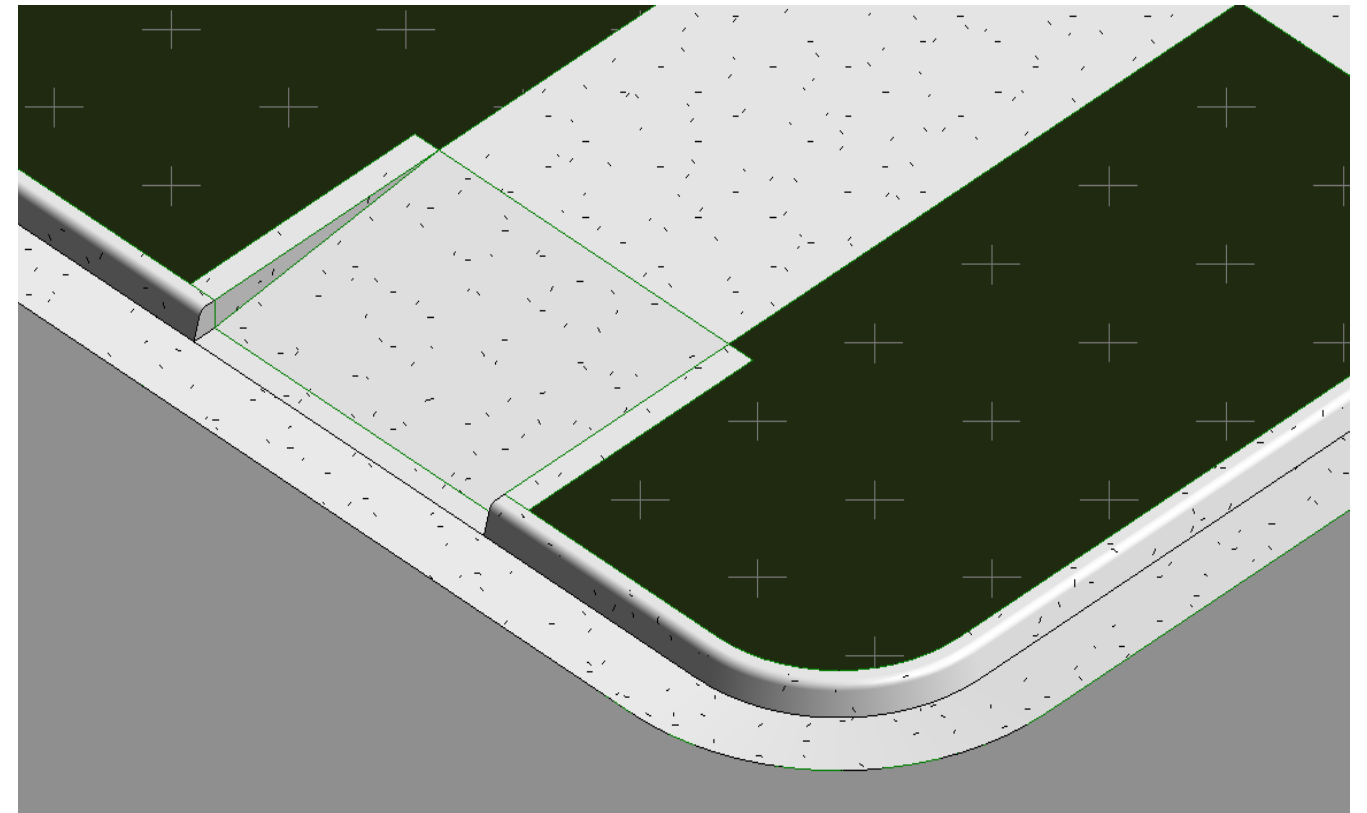


# Modeling Curbs

- Slab Edges
- Curb Cuts
- Shape Editing Tools

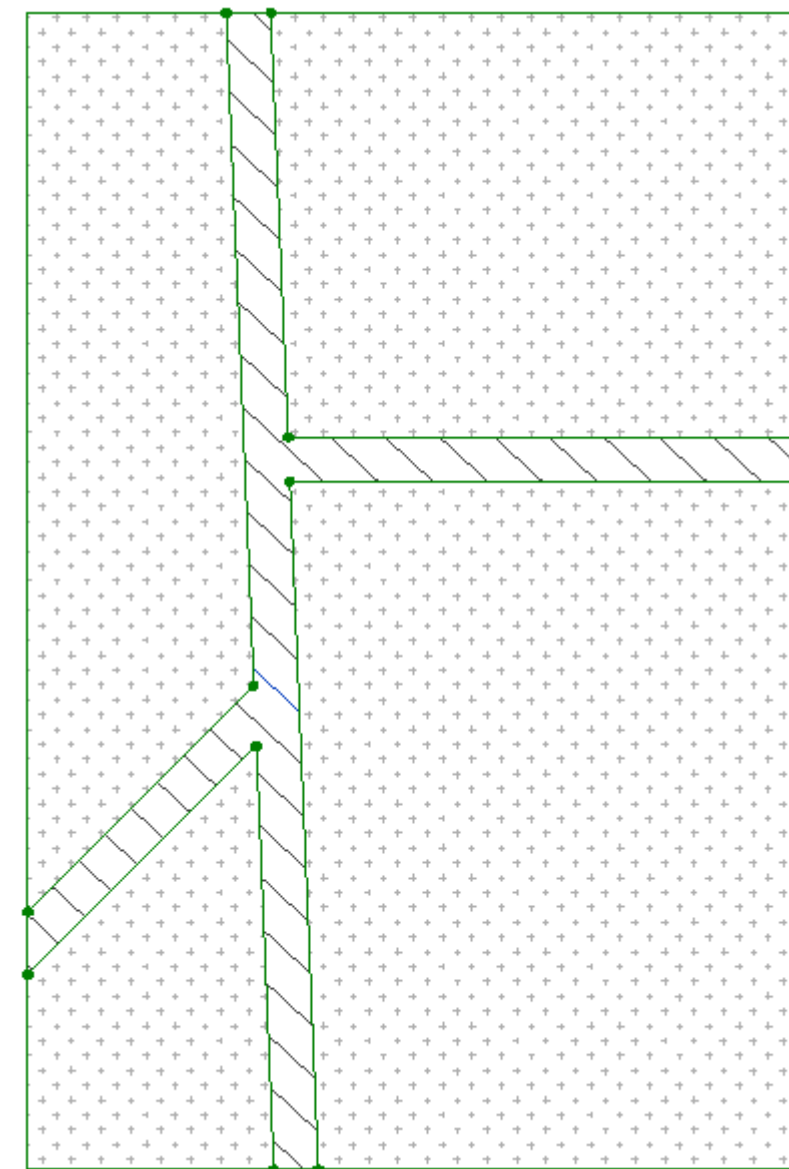
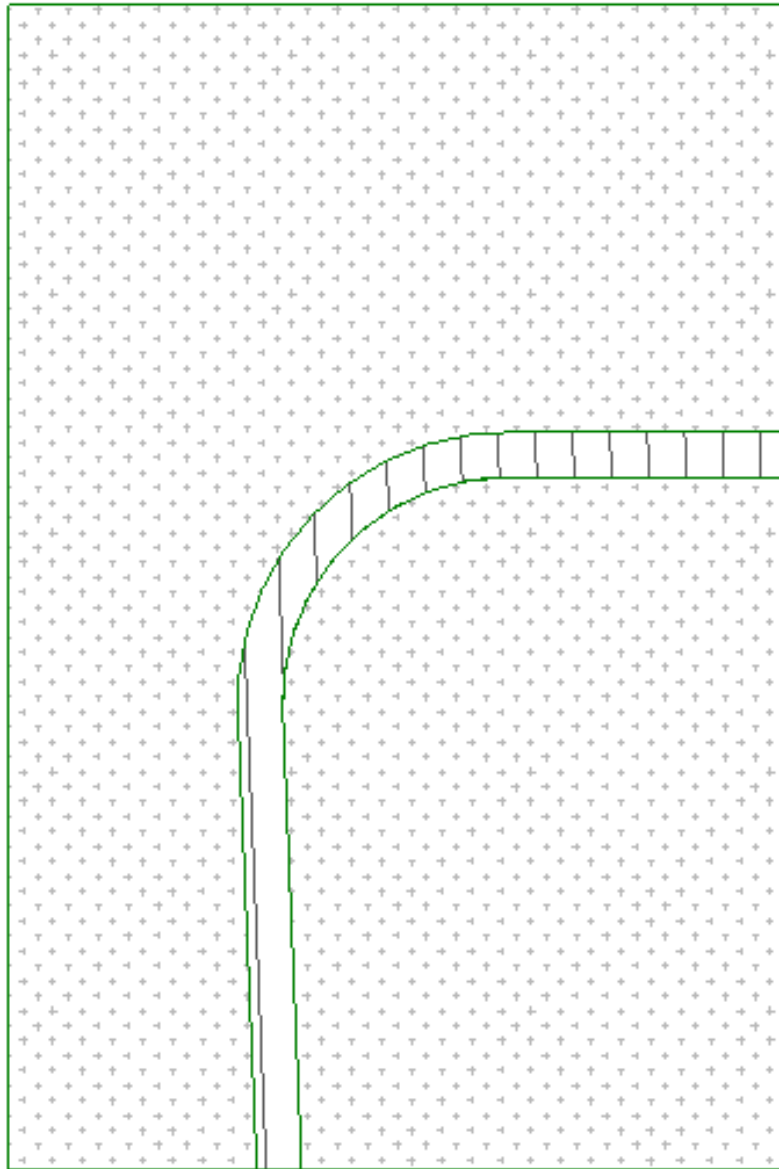


**Shape Editing Tools**



**Surface Hosted Family**

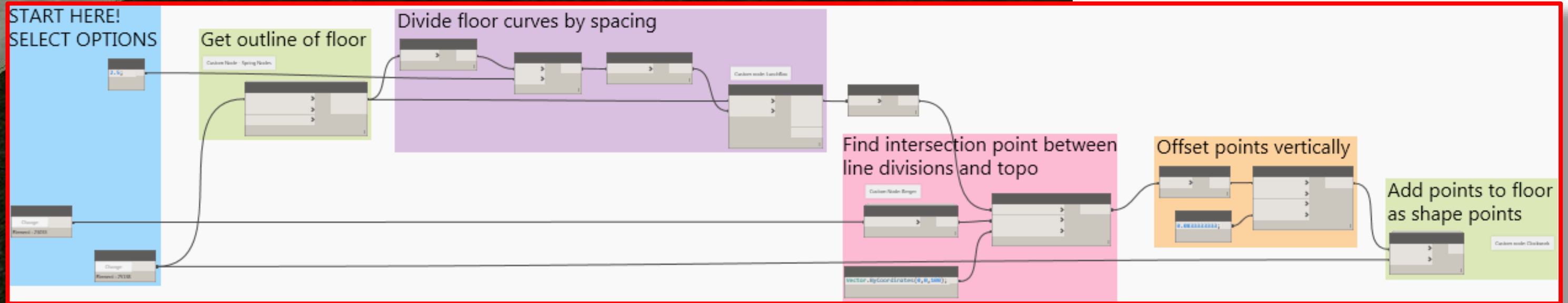
# Surface Patterns



# Hardscape Enhanced with Dynamo

Sloping Railing  
Following Floor

Sloping Floor  
Following Site

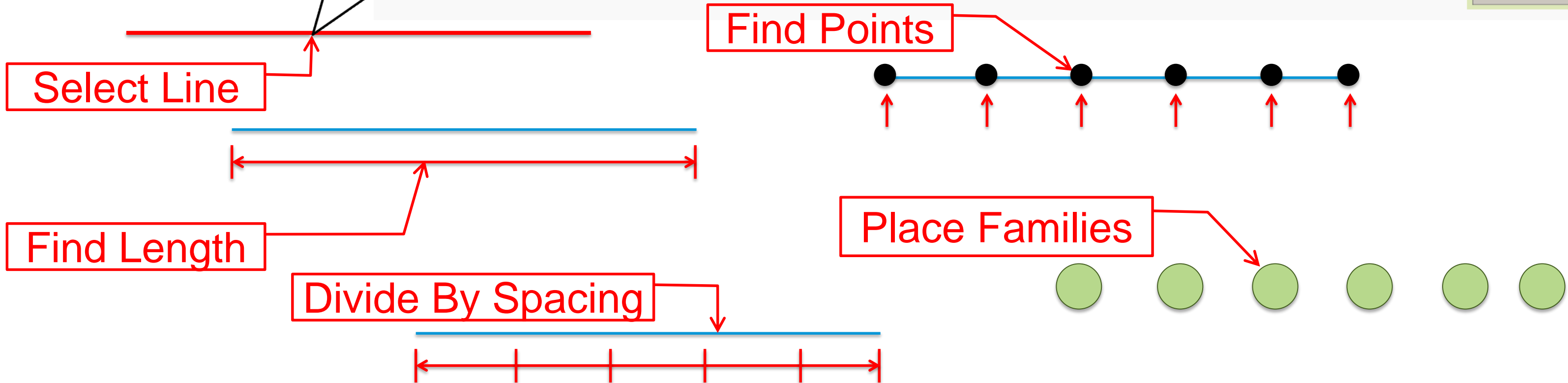
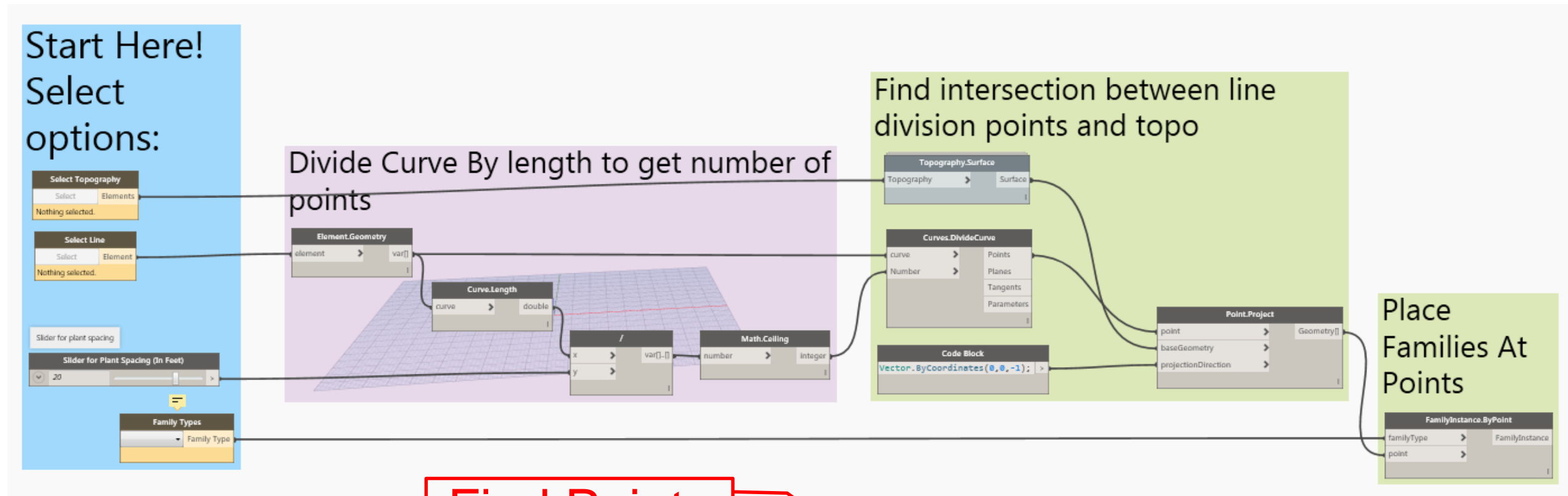




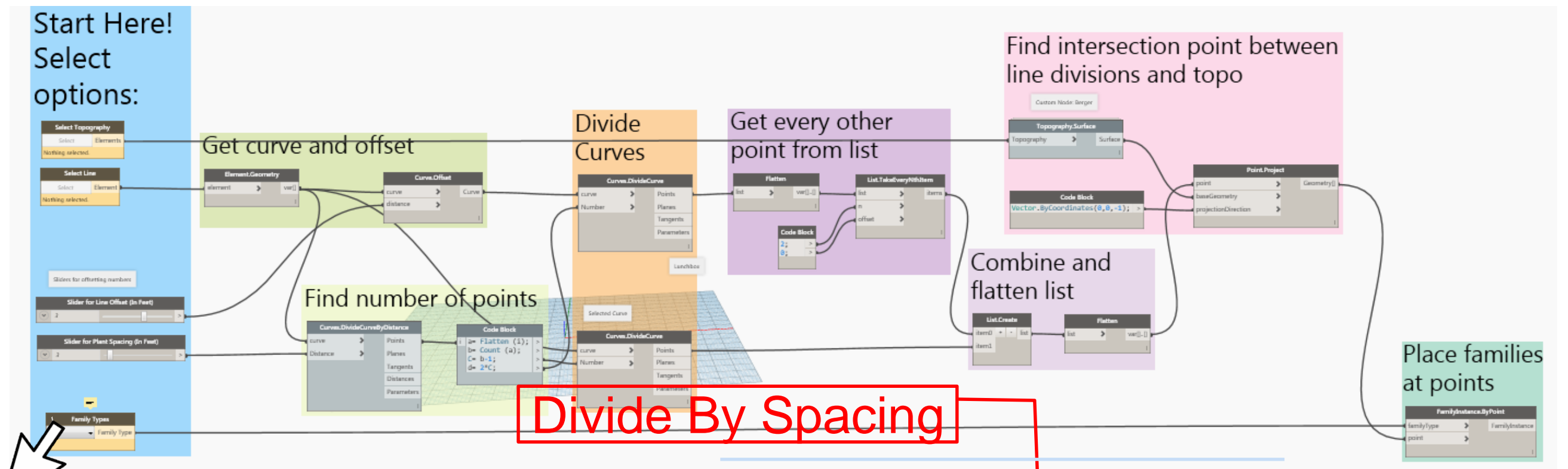
# Placing Families By Lines

- Single Line
- Offset
- Placing Patterns On A Line

# Placing Families in a line



# Offset Lines



Select Line

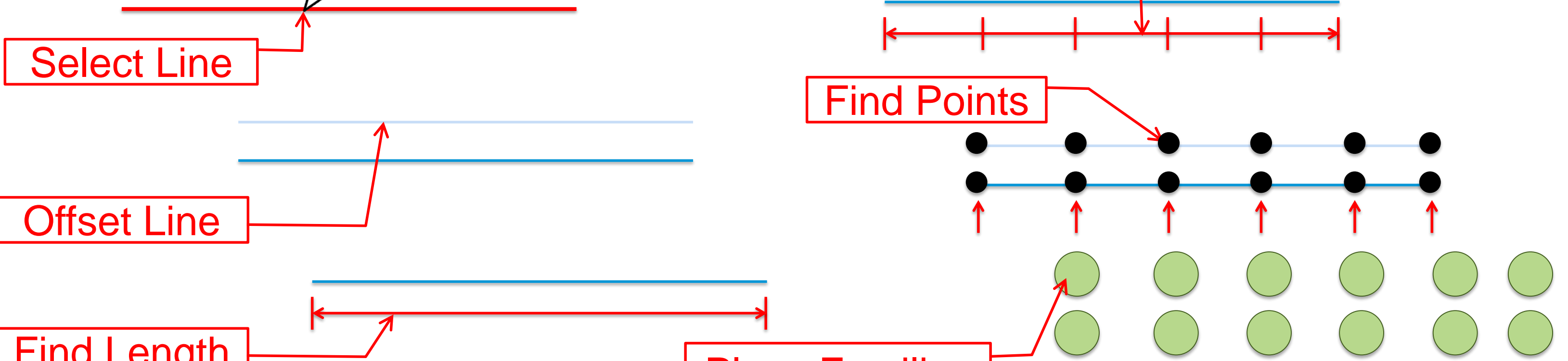
Offset Line

Find Length

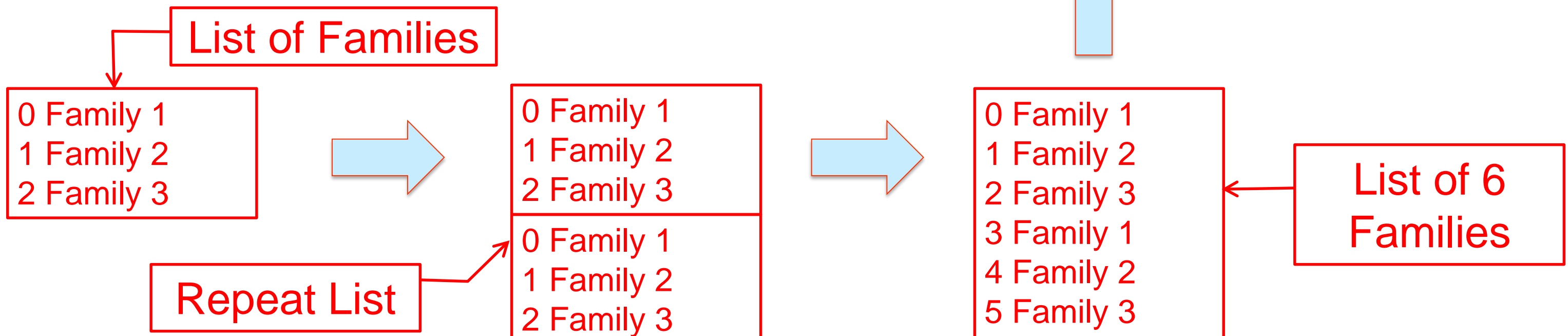
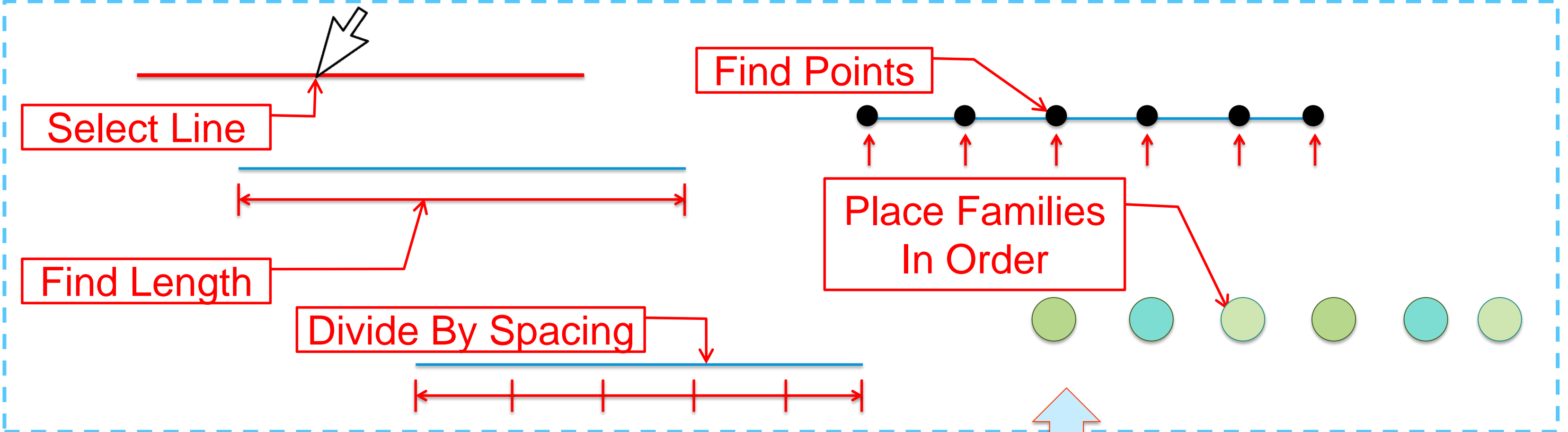
Divide By Spacing

Find Points

Place Families



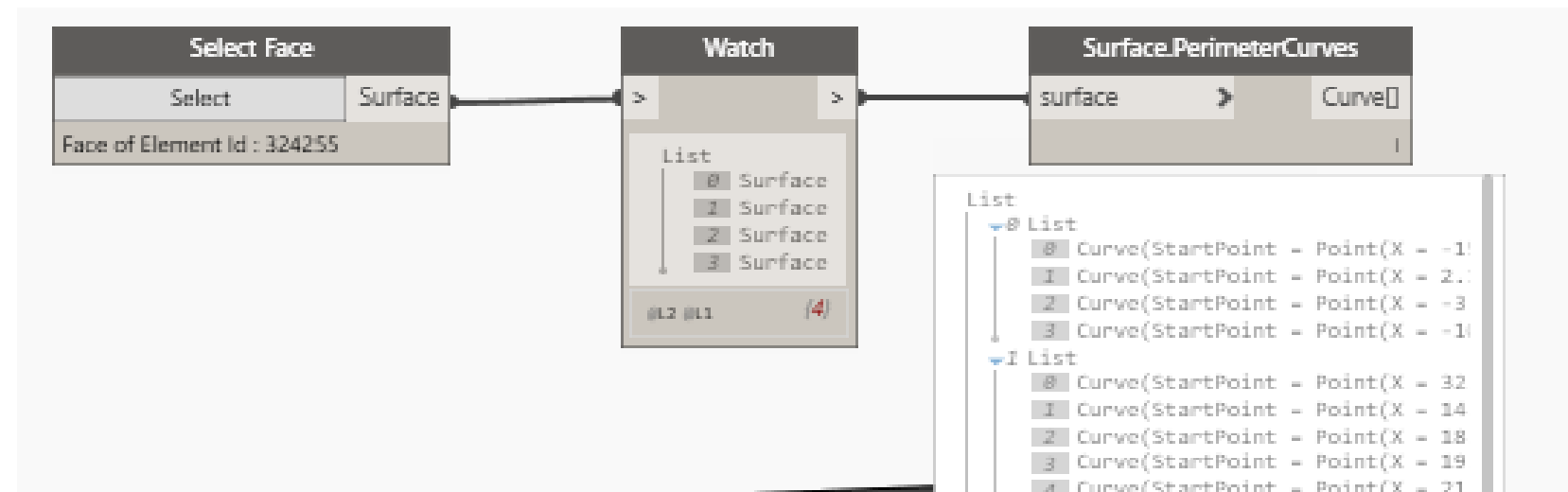
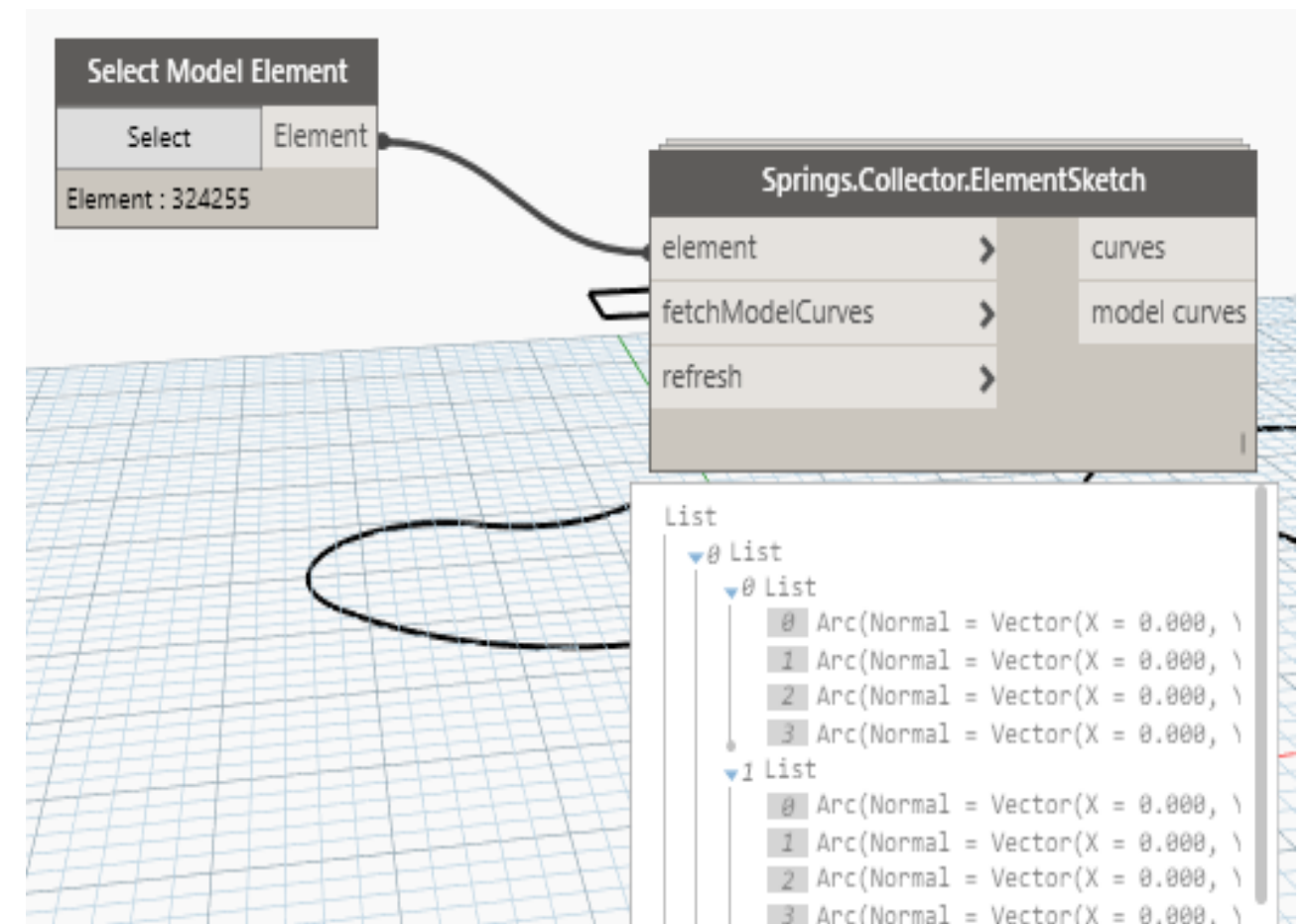
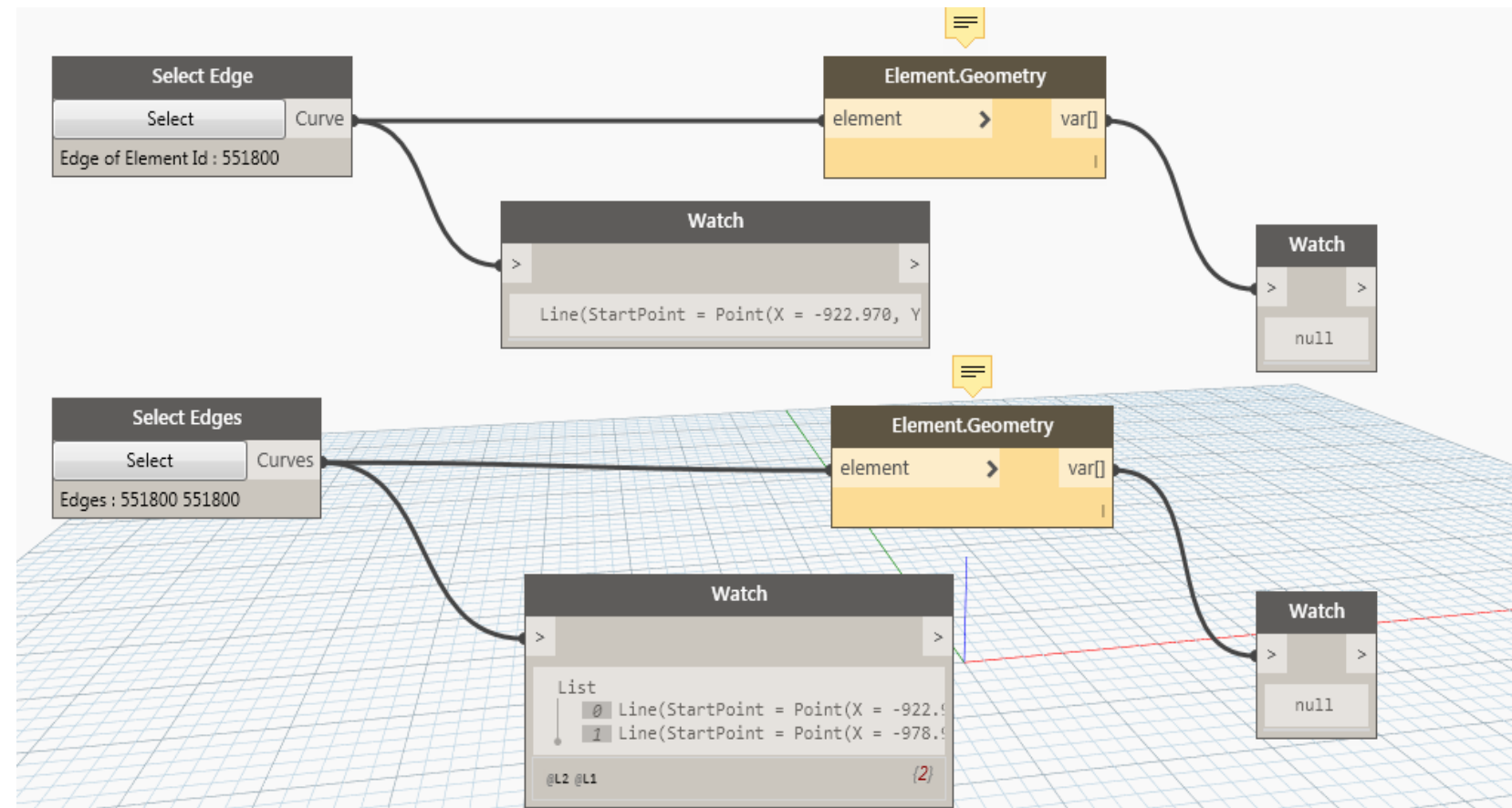
# Placing Patterns On A Line



# Collecting Lines From Geometry

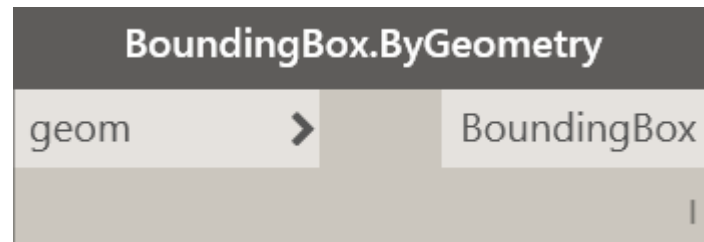
- Select Edges
- Collect Sketches
- Select Faces

# Collecting Lines From Geometry

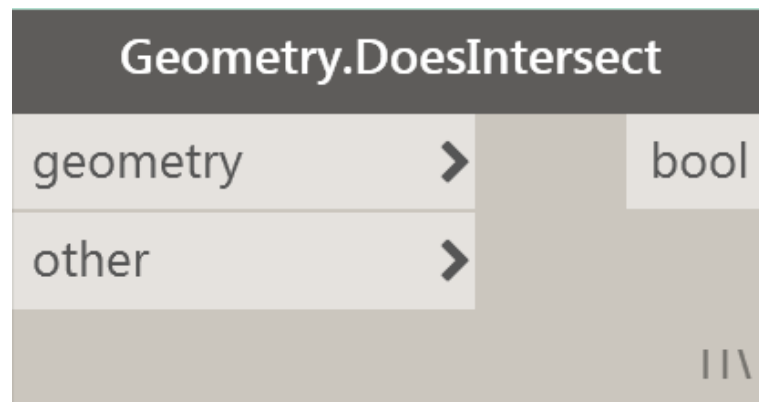


# Placing Families in Regions

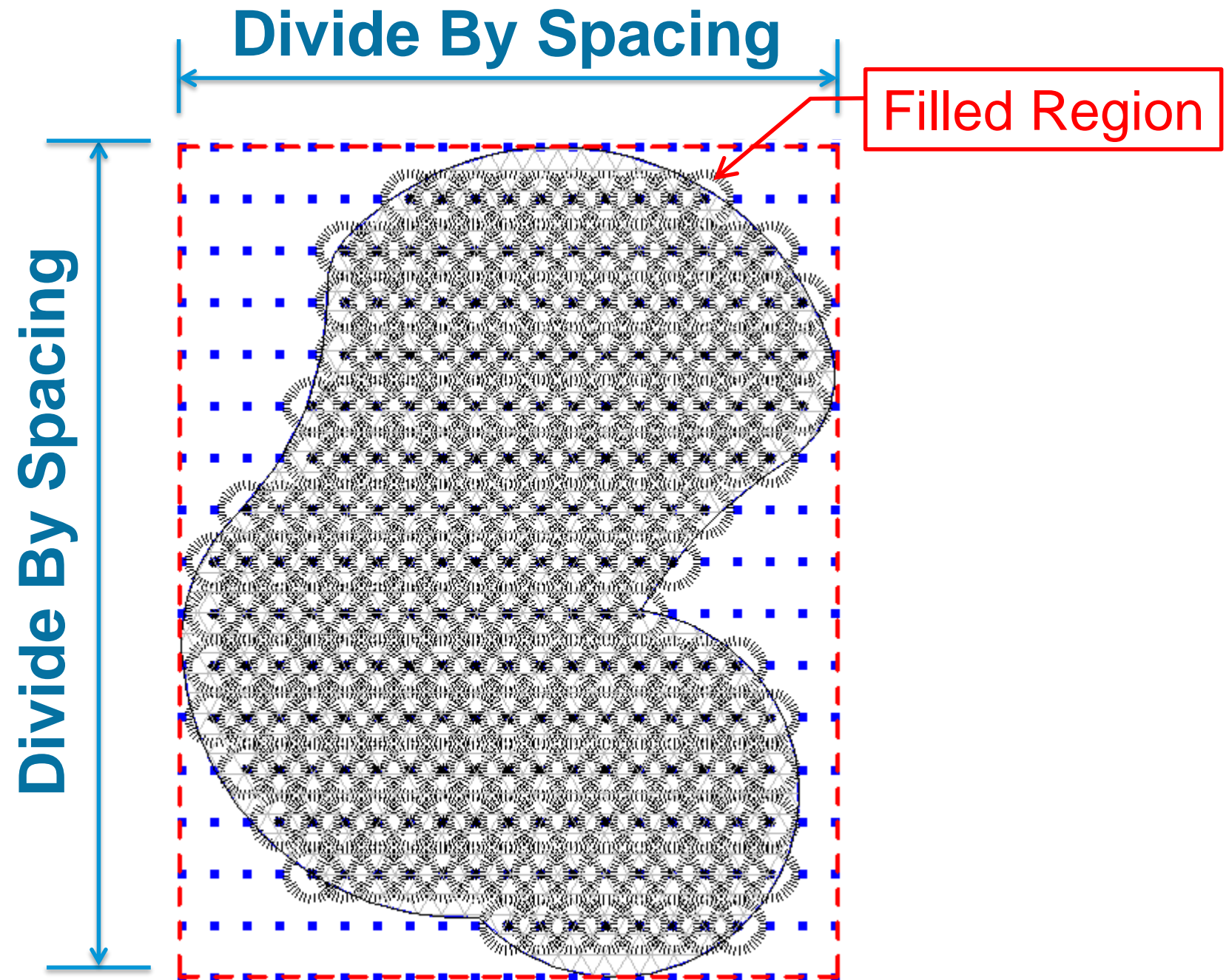
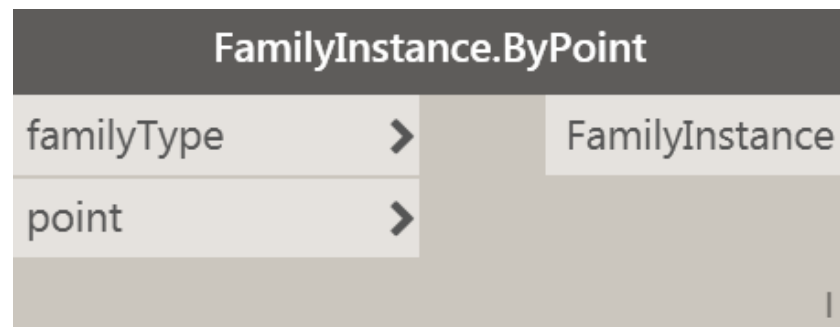
## Get Overall Length & Width



## Find Intersection Between Points and Region



## Place Families at Points

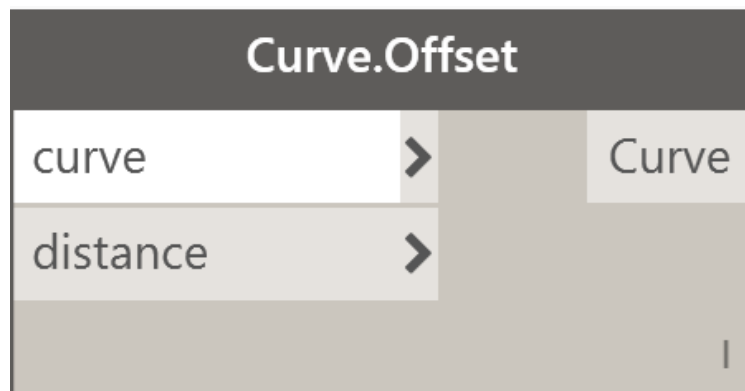


# Planter Beds

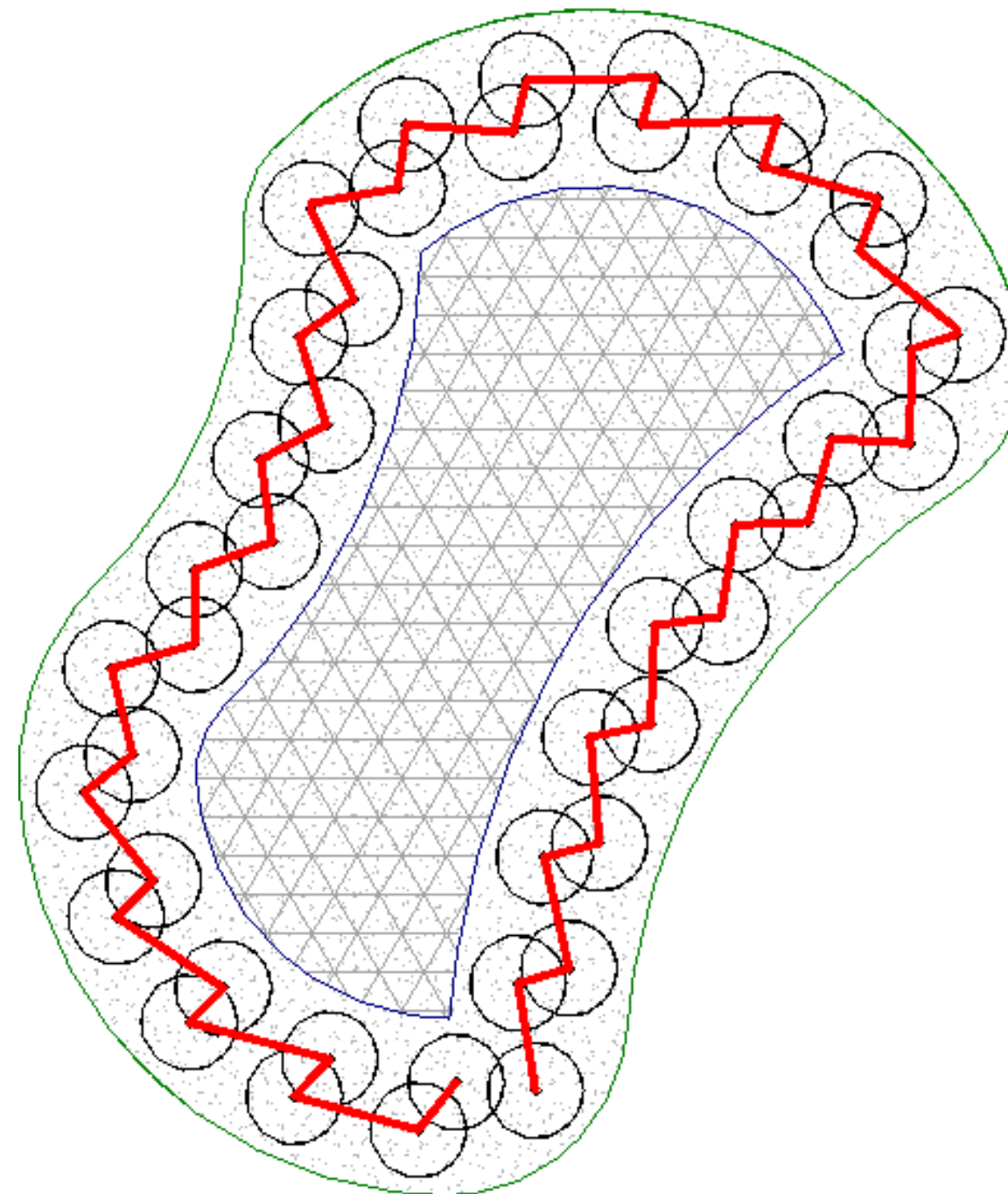
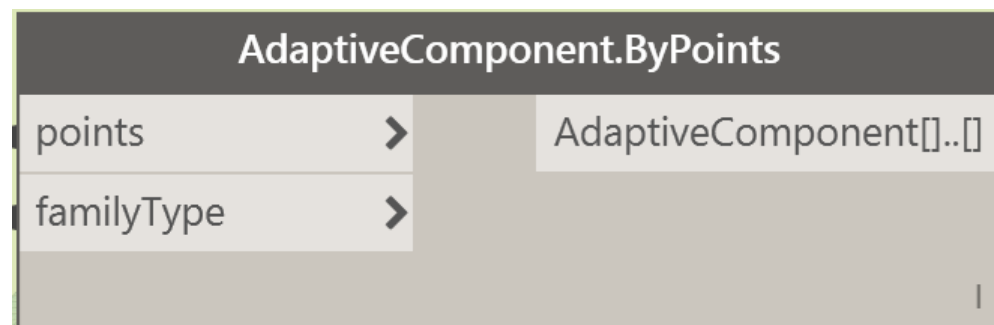
## Get Curves



## Offset Curves



## Annotate From Family Points



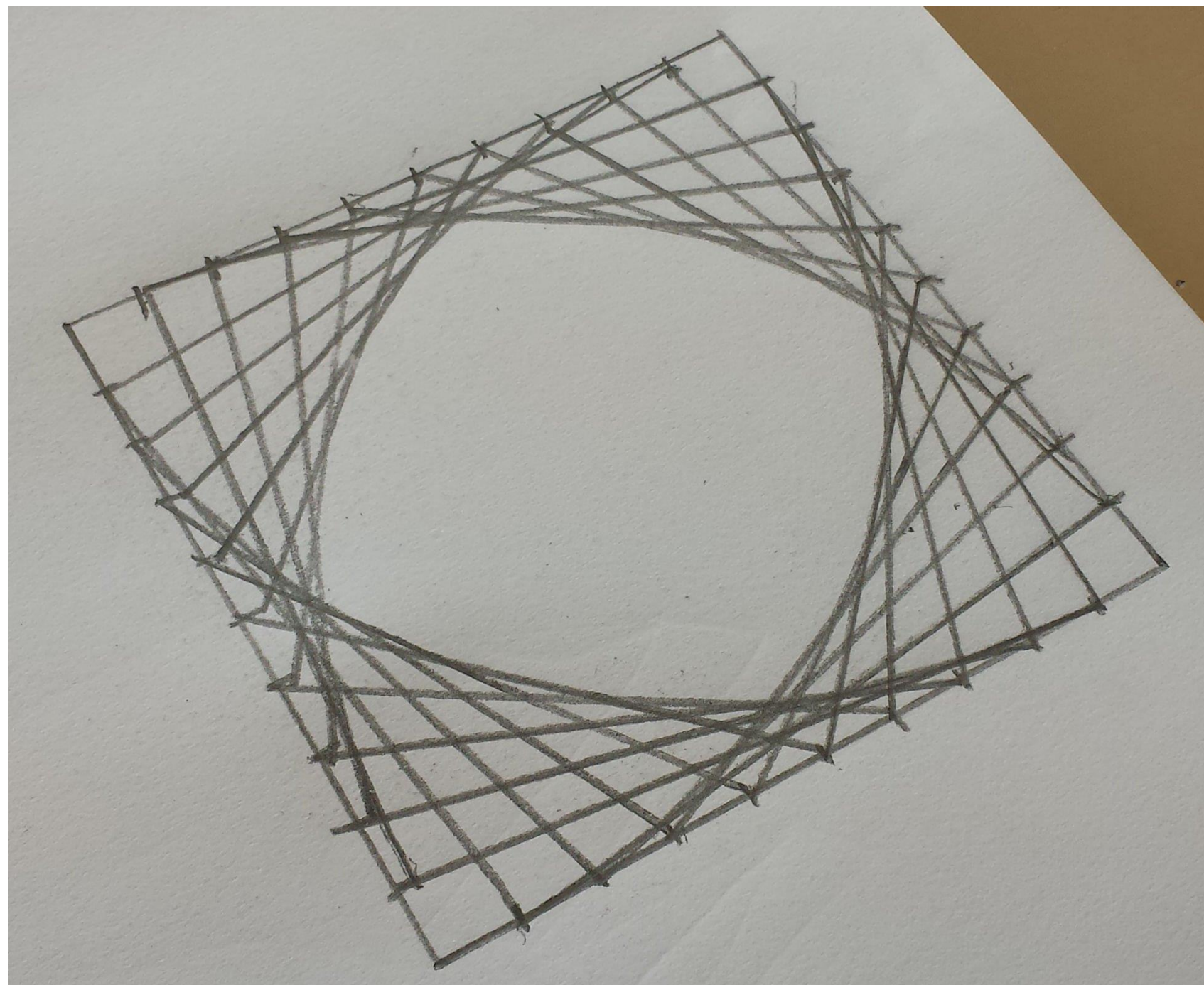
Rows of Plants

Annotation Line

Non-Linear Path

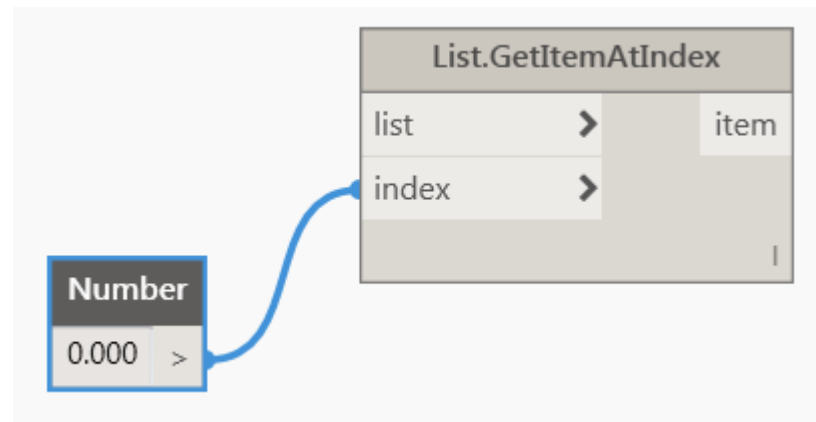
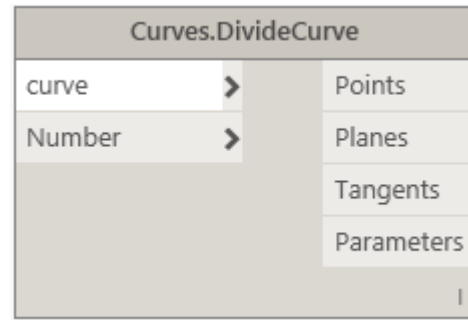


# Advanced Patterning

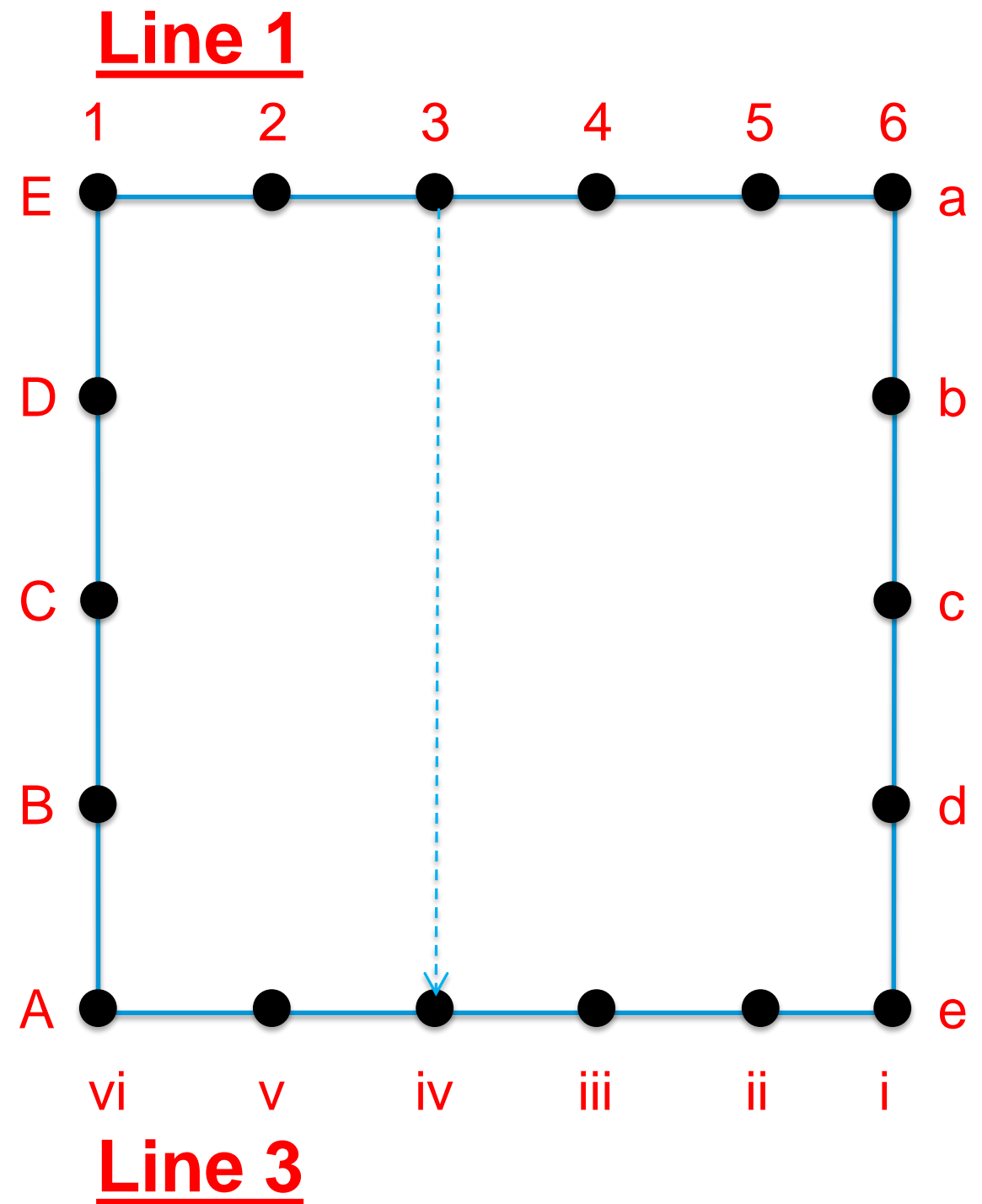


# Parabolic Line Diagrams...

- 0 Line 1
  - 0 **1**
  - 1 **2**
  - 2 **3**
  - 3 **4**
  - 4 **5**
  - 5 **6**
- 1 Line 2
  - 0 **a**
  - 1 **b**
  - 2 **c**
  - 3 **d**
  - 4 **e**
- 2 Line 3
  - 0 **i**
  - 1 **ii**
  - 2 **iii**
  - 3 **iv**
  - 4 **v**
  - 5 **vi**
- 3 Line 4
  - 0 **A**
  - 1 **B**
  - 2 **C**
  - 3 **D**
  - 4 **E**



Line 4



Line 2

# Parabolic Line Diagrams...

0 Line 1  
 1 **2**  
 2 **3**  
 3 **4**  
 4 **5**  
 5 **6**

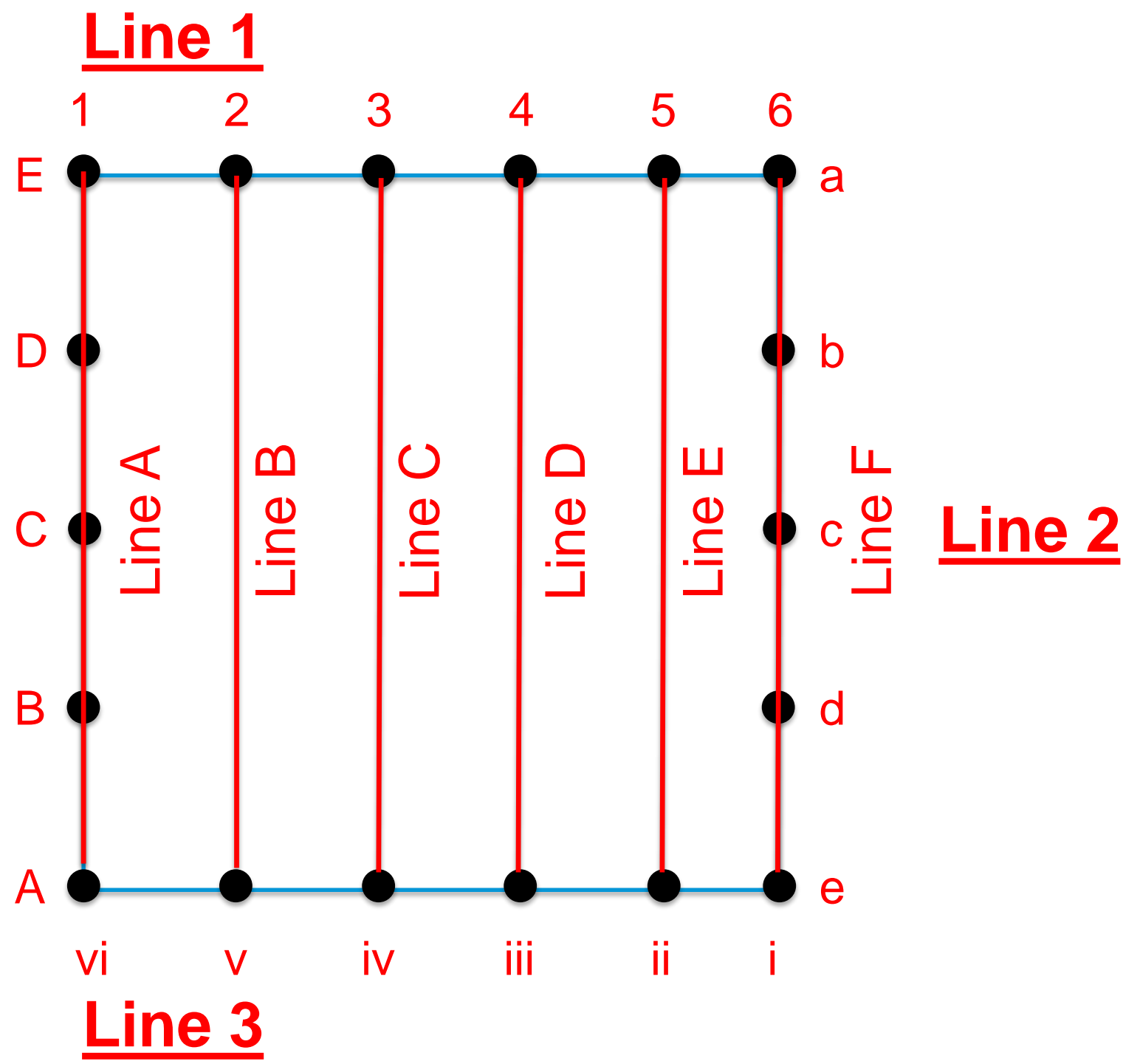
2 Line 3  
 0 **vi**  
 1 **v**  
 2 **iv**  
 3 **iii**  
 4 **ii**  
 5 **i**

```
List.Reverse
list > list
```

```
Line.ByStartPointEndPoint
startPoint > Line
endPoint >
```

0 List of Lines  
 0 **Line A**  
 1 **Line B**  
 2 **Line C**  
 3 **Line D**  
 4 **Line E**  
 5 **Line F**

Line 4



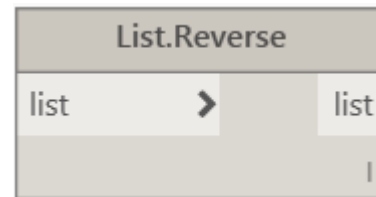
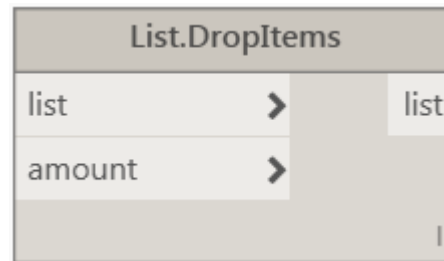
# Parabolic Line Diagrams...

0 Lines 1 & 2  
Drop First

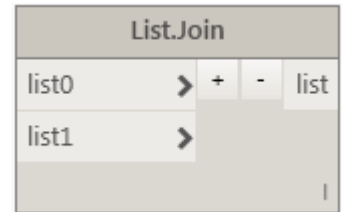
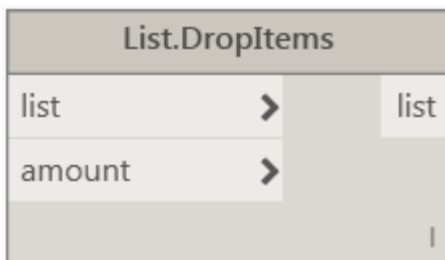
- 0 **2**
- 1 **3**
- 2 **4**
- 3 **5**
- 4 **6**
- 5 **b**
- 6 **c**
- 7 **d**

0 Lines 4 & 3  
Reverse

- Drop First
- 0 **D**
  - 1 **C**
  - 2 **B**
  - 3 **A**
  - 4 **v**
  - 5 **iv**
  - 6 **iii**
  - 7 **ii**

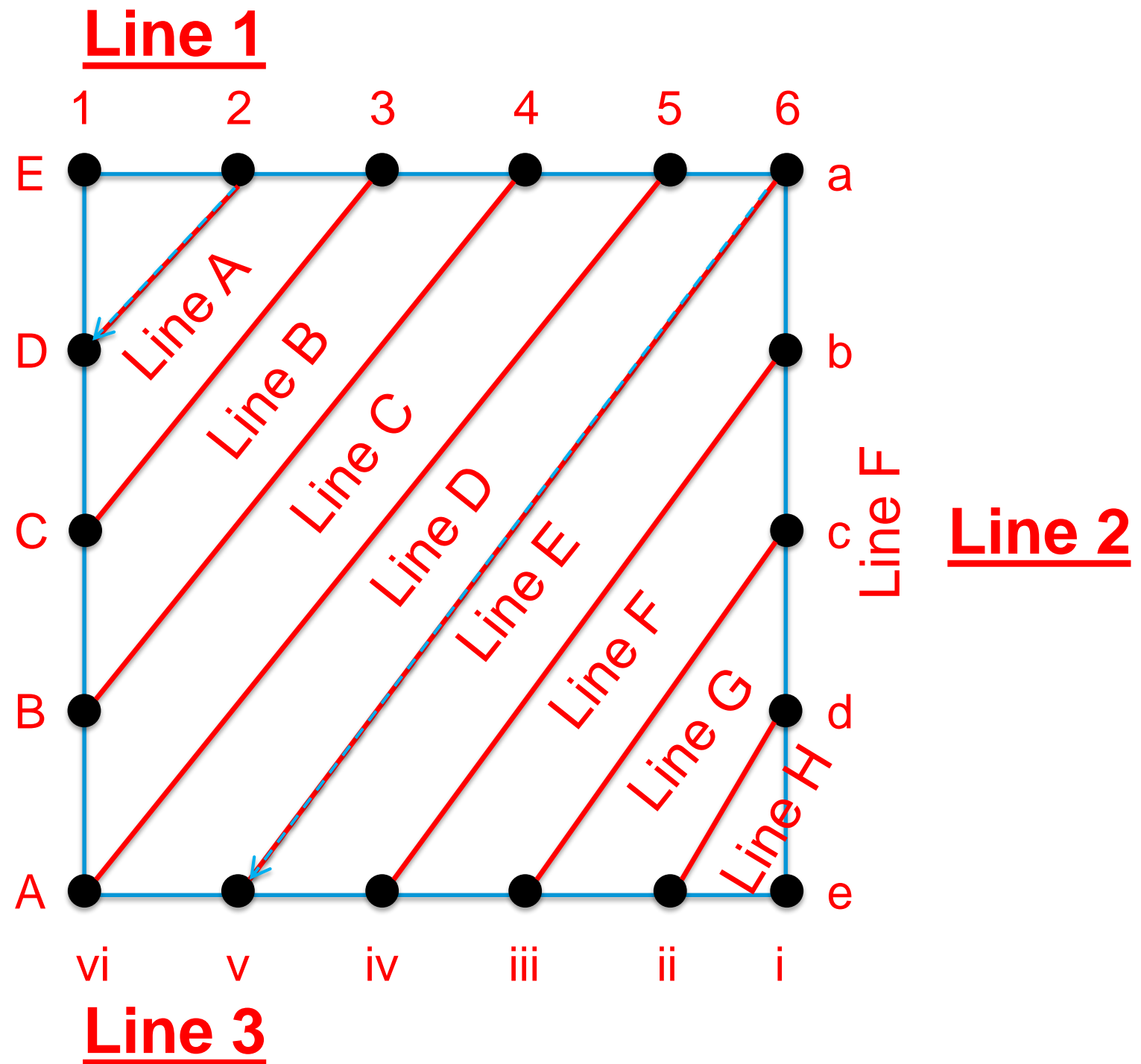
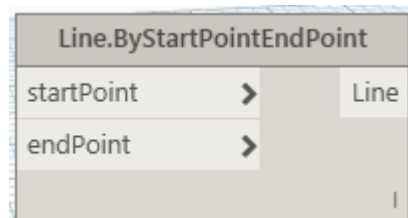


**Line 4**



0 List of Lines

- 0 **Line A**
- 1 **Line B**
- 2 **Line C**
- 3 **Line D**
- 4 **Line E**
- 5 **Line F**



# Final Thoughts

- Start Small
  - Convert Plant List to Families
- Link CAD Details
- Create Schedules
- Start Flat

# Questions?

# Thank you for attending!

- Please fill out your Speaker Survey
- Download the handout.
- Workspaces are included

