

# An MEP Engineer's Guide to Dynamo

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# Summary

People often associate Dynamo software with designing complex parametric geometry; but Dynamo software is not just a tool for creating funky shapes, it's a whiz at processing all kinds of data. This class will demonstrate various examples of how Dynamo software has been applied to common MEP (mechanical, electrical, and plumbing) engineering tasks to make them more efficient or more accurate. We will cover linking Revit Space naming utility information to Revit software families, using Dynamo software as an engine for MEP calculations, using Dynamo software to give you visual feedback on how hard equipment is being asked to work in your design, and using Microsoft Excel as a source of data for much of the above.



# A little info about me ...

- Joined Arup in 2011
- Senior Mechanical Engineer, based in London
- Experience on mission critical, healthcare, commercial and custodial projects.
- BIM Project of the Year for UK Government Project (HMYOI Cookham Wood)
- Specialised in implementation of BIM as a design tool for engineers.



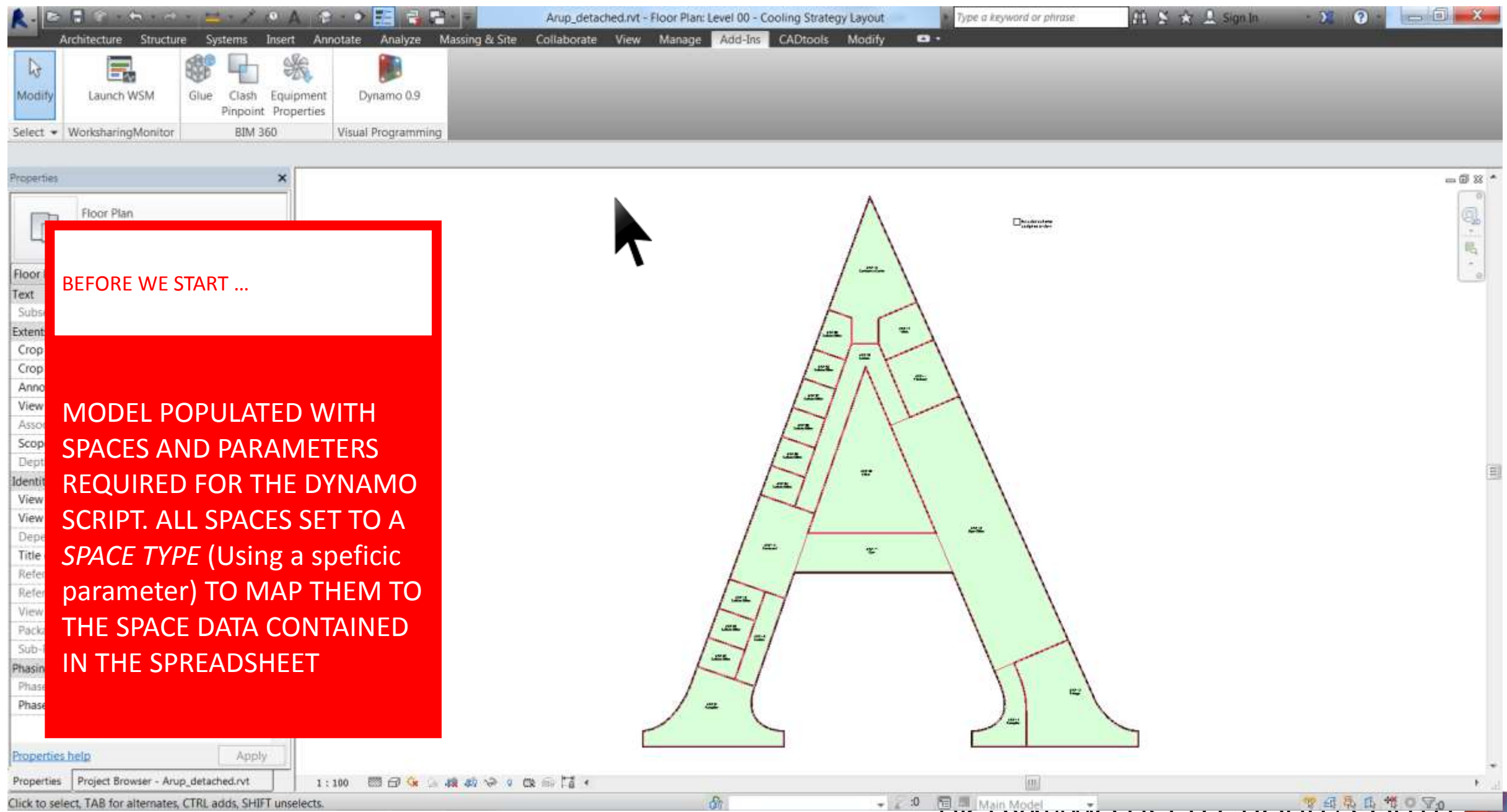




# Pushing Excel data into Revit *Spaces* using Dynamo

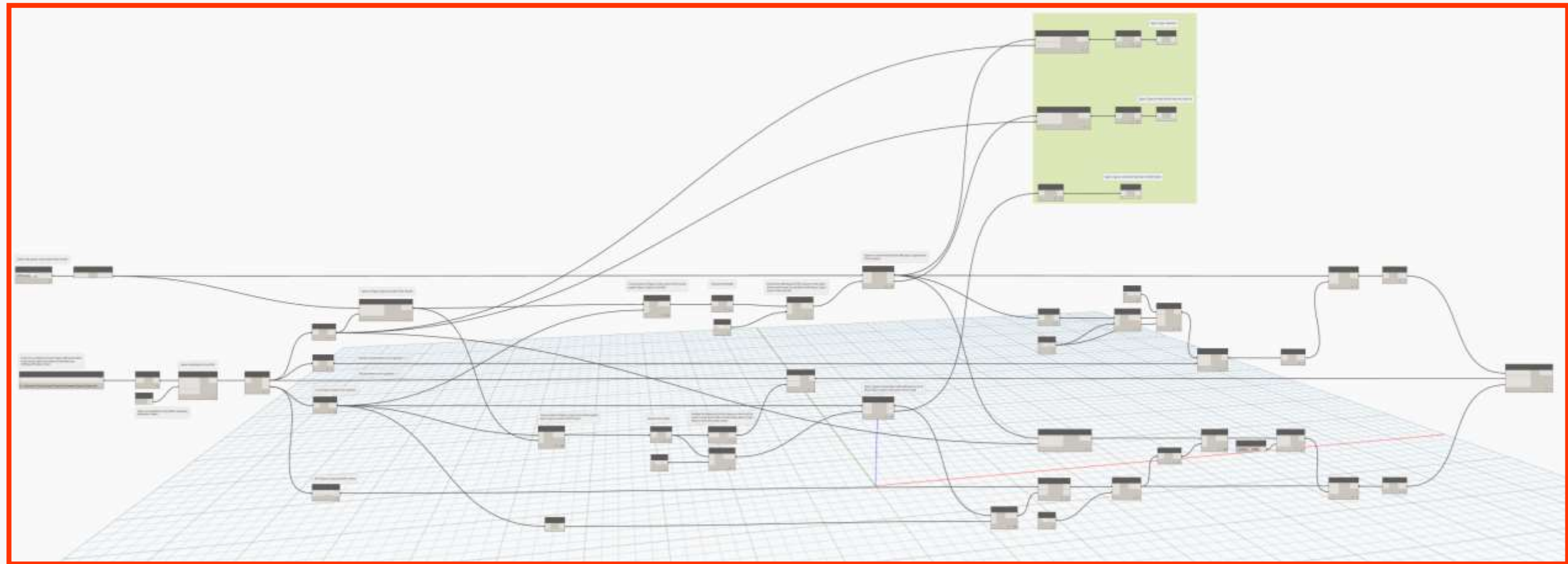






BEFORE WE START ...

MODEL POPULATED WITH SPACES AND PARAMETERS REQUIRED FOR THE DYNAMO SCRIPT. ALL SPACES SET TO A *SPACE TYPE* (Using a specific parameter) TO MAP THEM TO THE SPACE DATA CONTAINED IN THE SPREADSHEET



**Data passes through the WHOLE graph in LISTS...**



SELECT SPACES  
IN REVIT MODEL



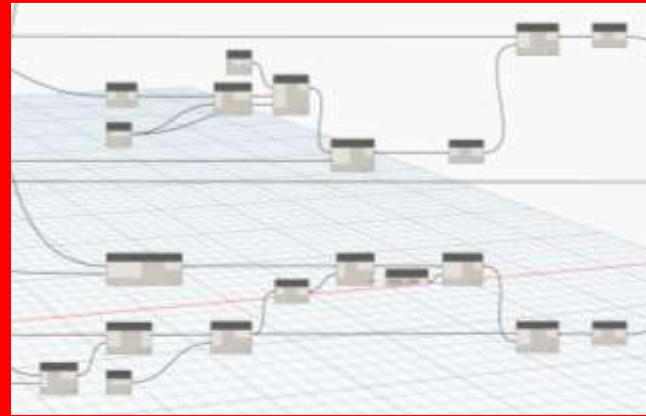
READ DATA  
FROM REVIT



COMPARE *SPACE TYPES* IN  
EXCEL AGAINST SPACE  
TYPES IN REVIT



FORMATS ALL OF THE DATA IN  
FOR SPACE TYPES FOUND TO BE  
PRESENT IN BOTH REVIT AND  
IN EXCEL INTO THE NECESSARY  
STRUCTURE TO UPDATE THE  
REVIT MODEL



SELECT  
SPREAD-  
SHEET AND  
READ DATA  
FROM EXCEL



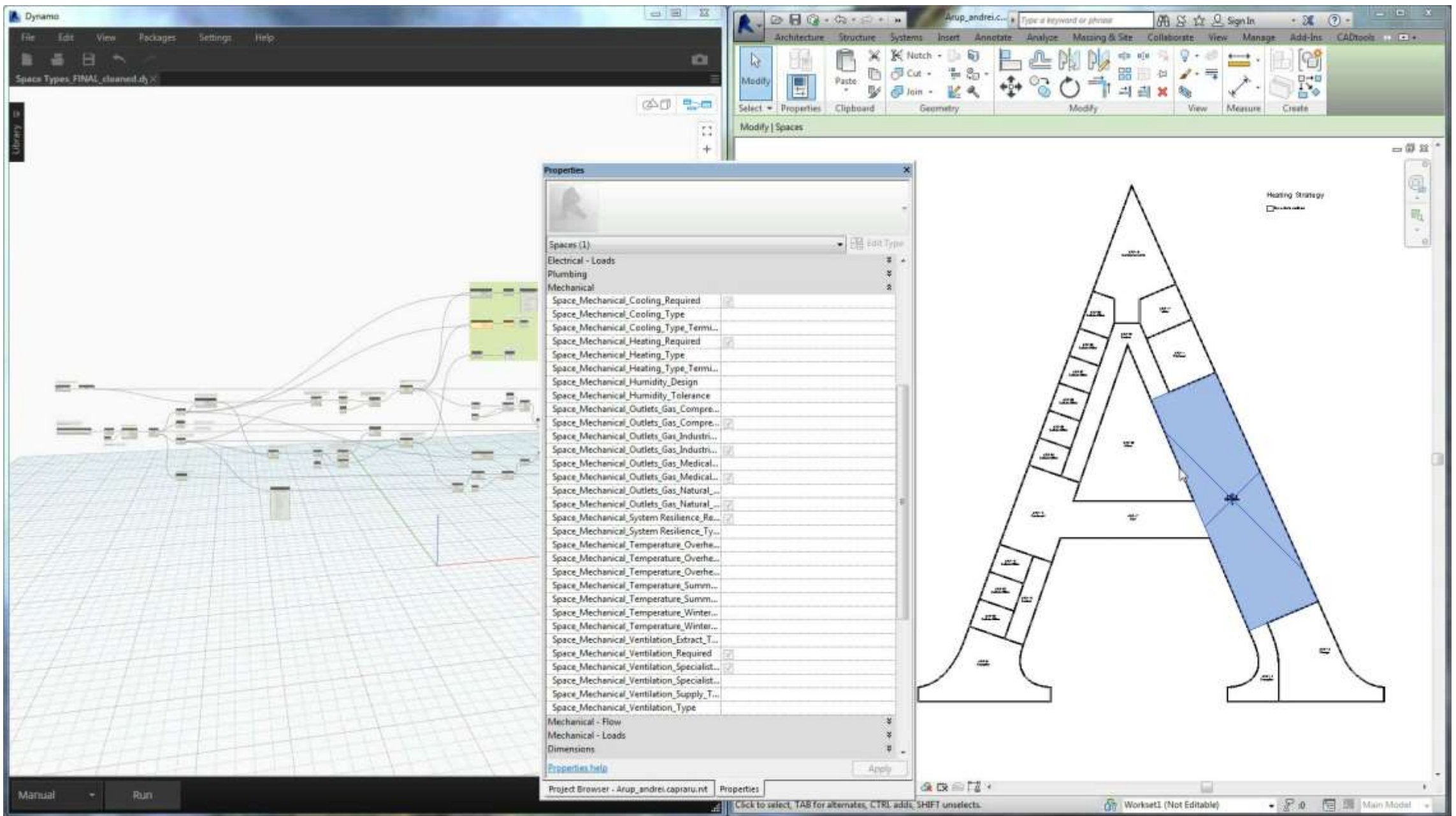
COMPARE *SPACE TYPES* IN  
EXCEL AGAINST SPACE  
TYPES IN REVIT

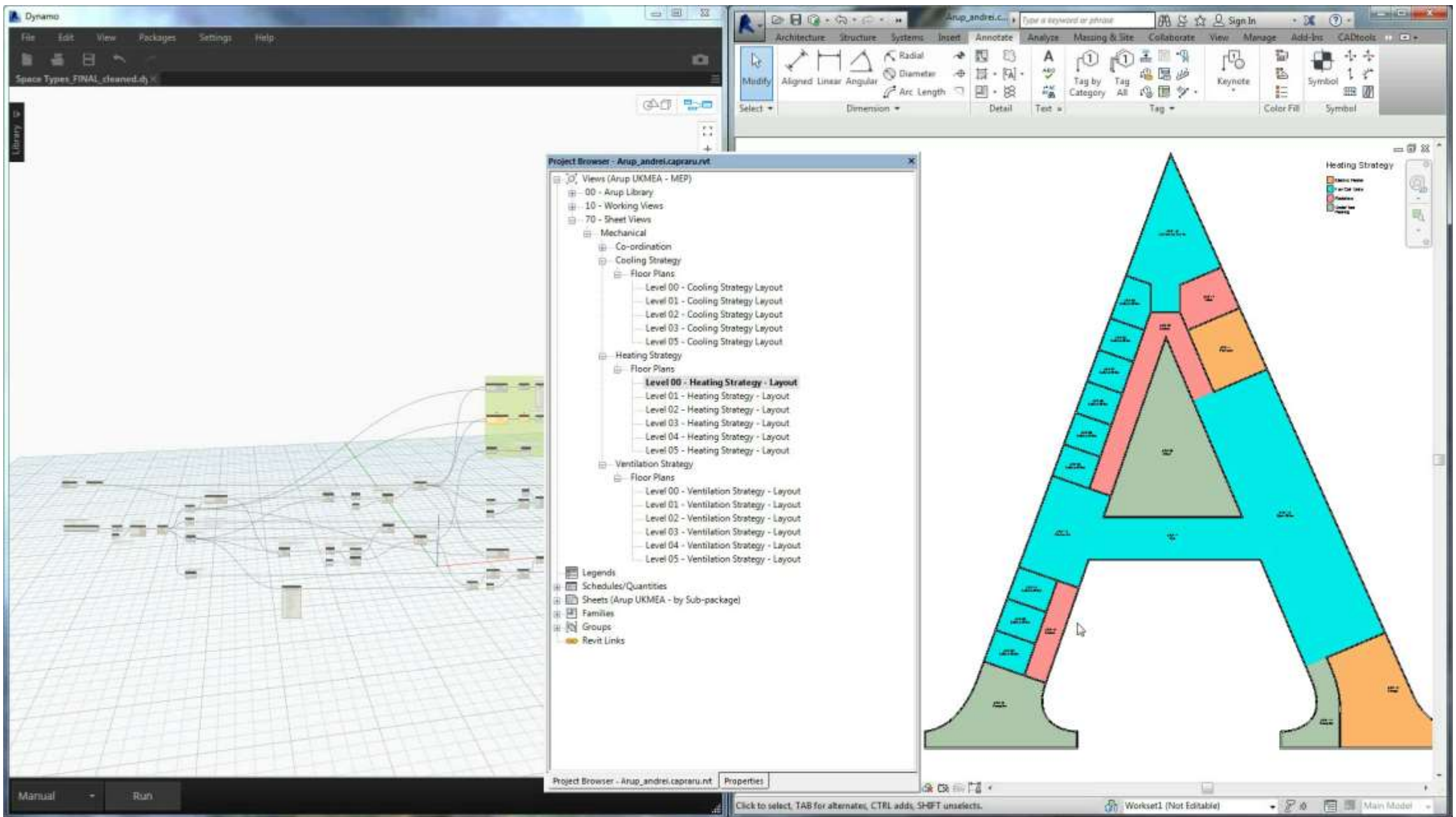


UPDATES  
THE SPACE  
PARAMS IN  
REVIT  
MODEL

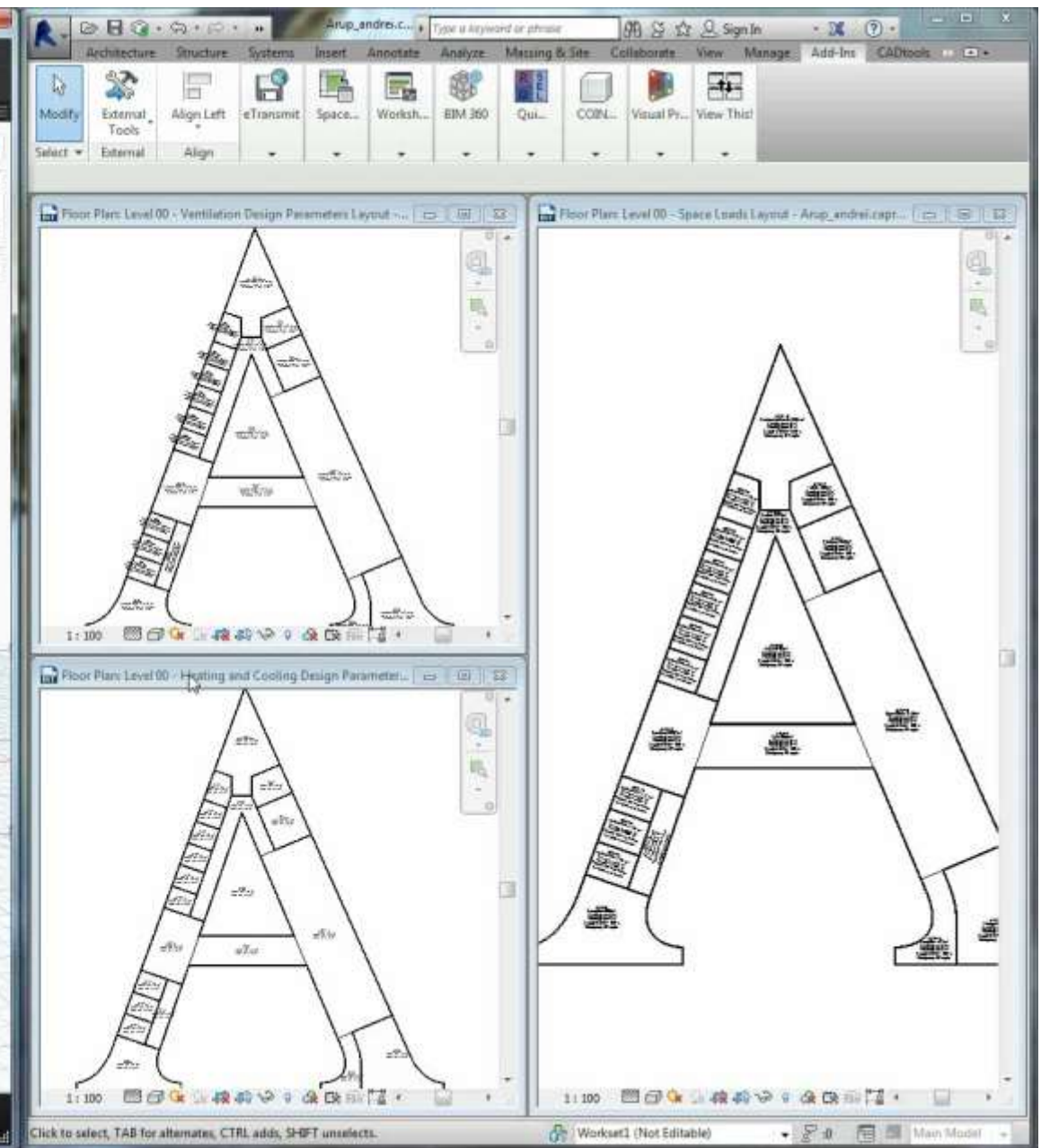
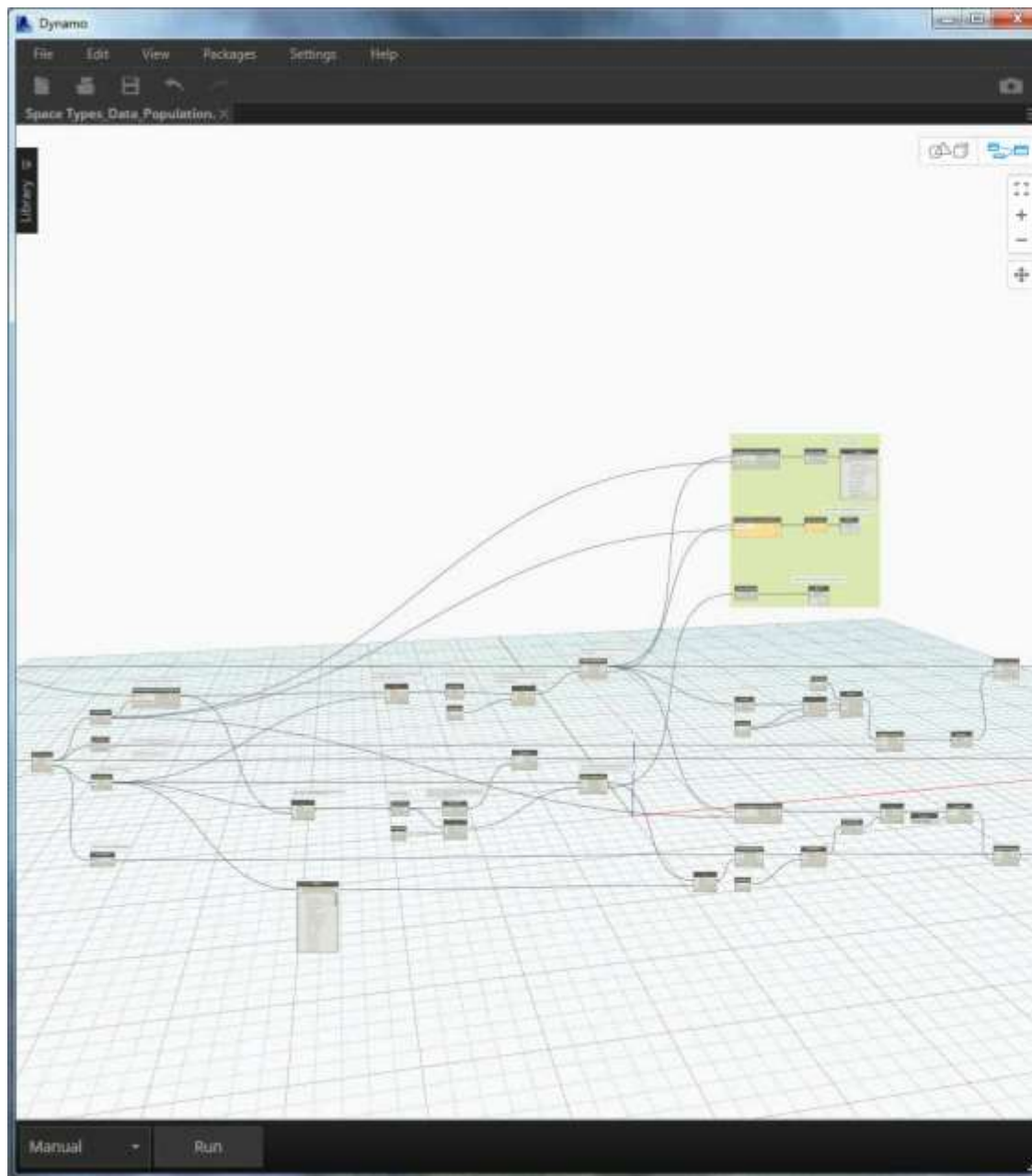












# Using *Space* parameters to inform calculations using Dynamo





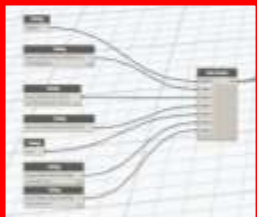
SELECT THE  
SPACES IN THE  
MODEL



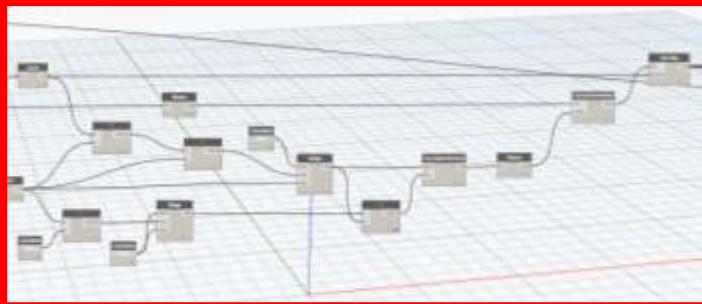
GET THE  
PARAMETER  
VALUES



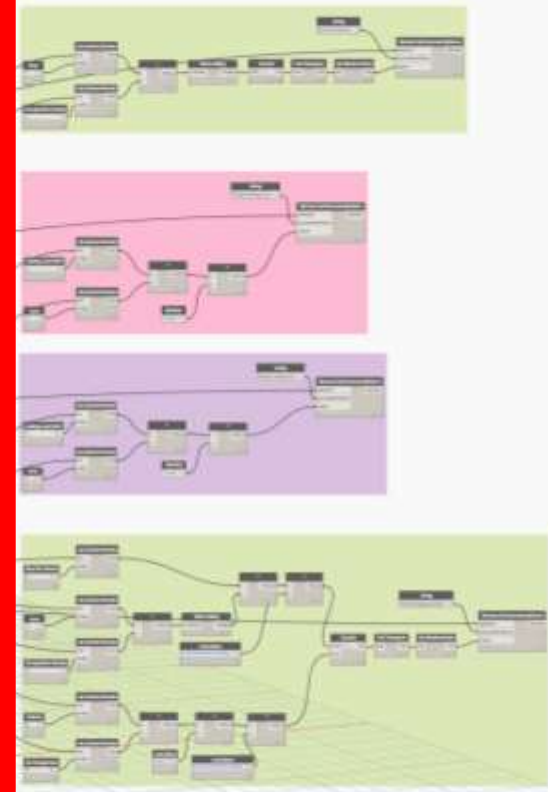
CREATE A LIST OF  
THE PARAMETERS  
WE WANT FROM  
THESE SPACES



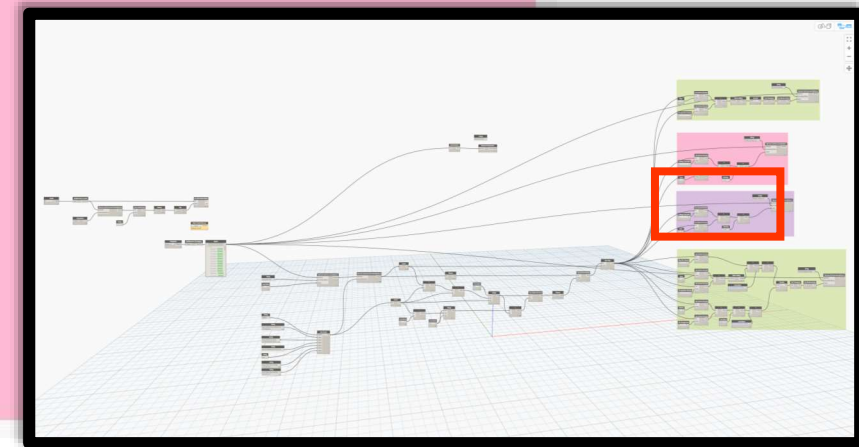
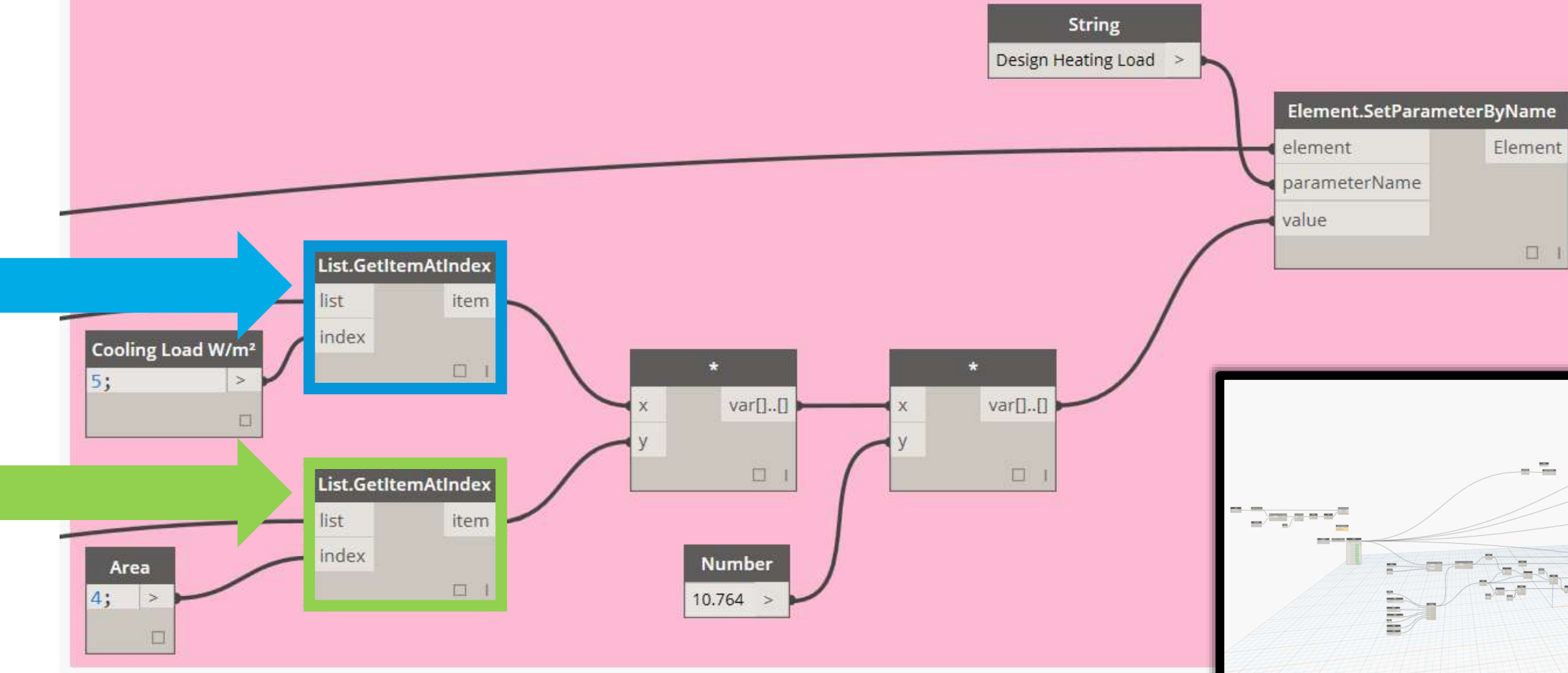
RE-ORDER THE LISTS  
CONTAINING THE PARAMETER  
VALUES FOR USE IN  
CALCULATIONS



USE PARAMETER  
VALUES FOR  
CALCULATIONS, AND  
SET NEW PARAMETER  
VALUES

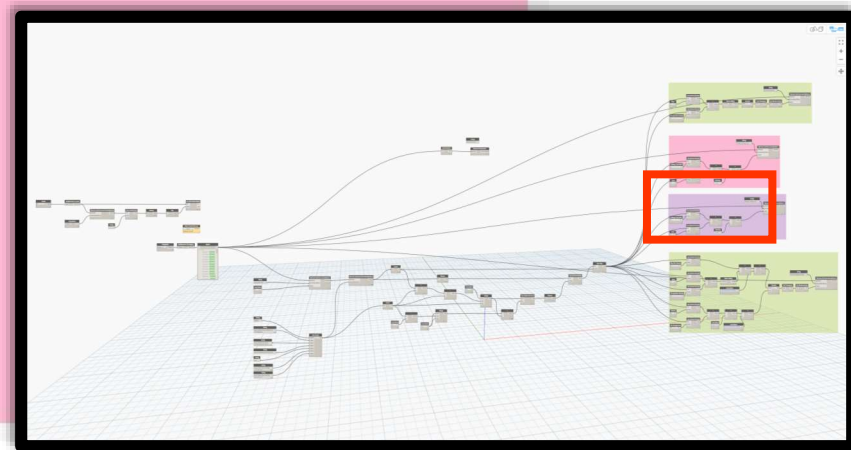
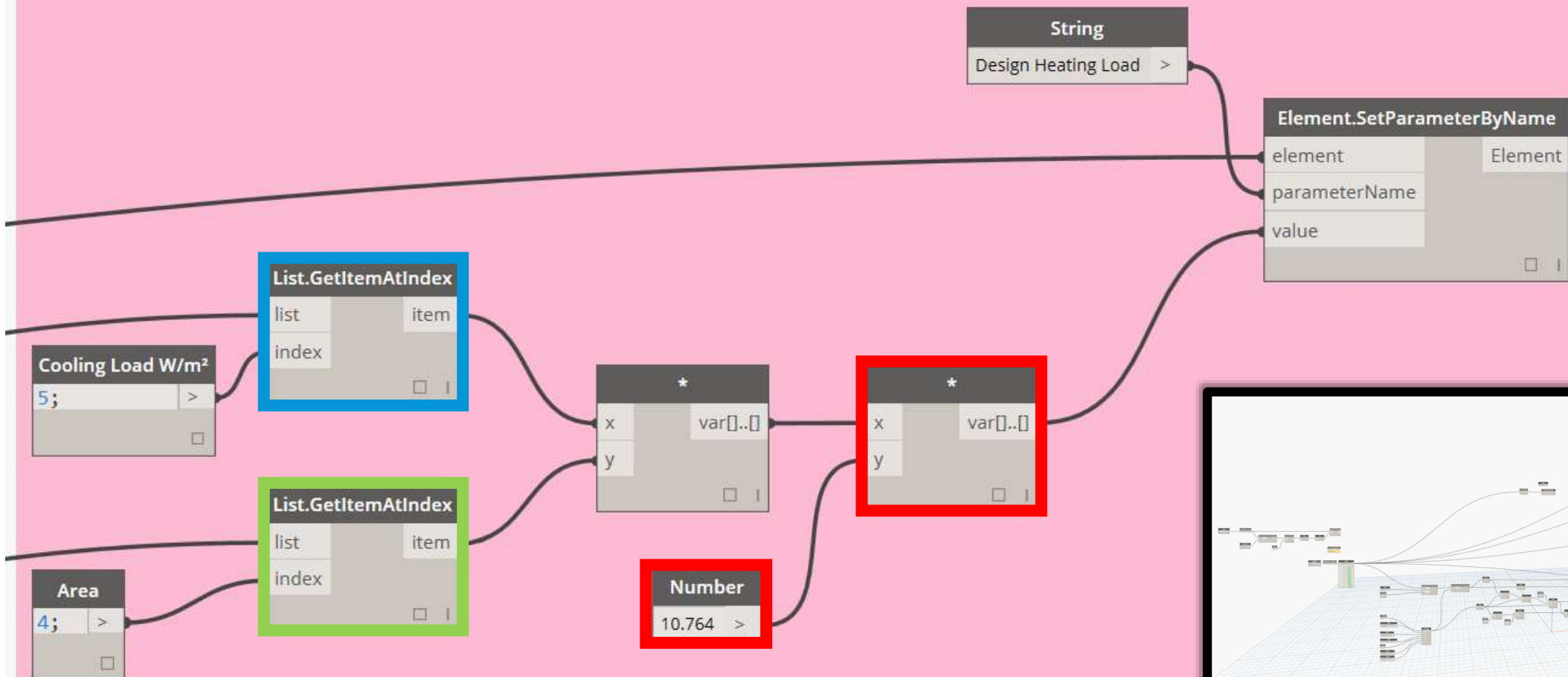


## HEATING CALCULATIONS



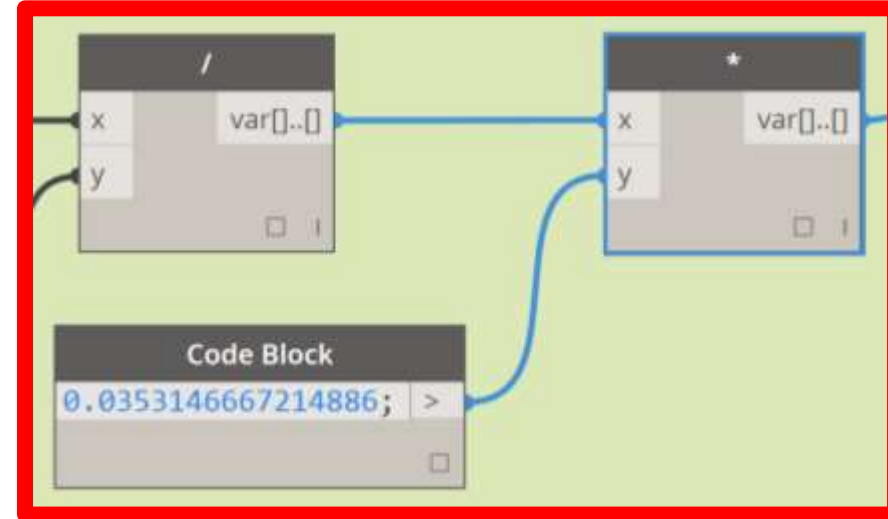
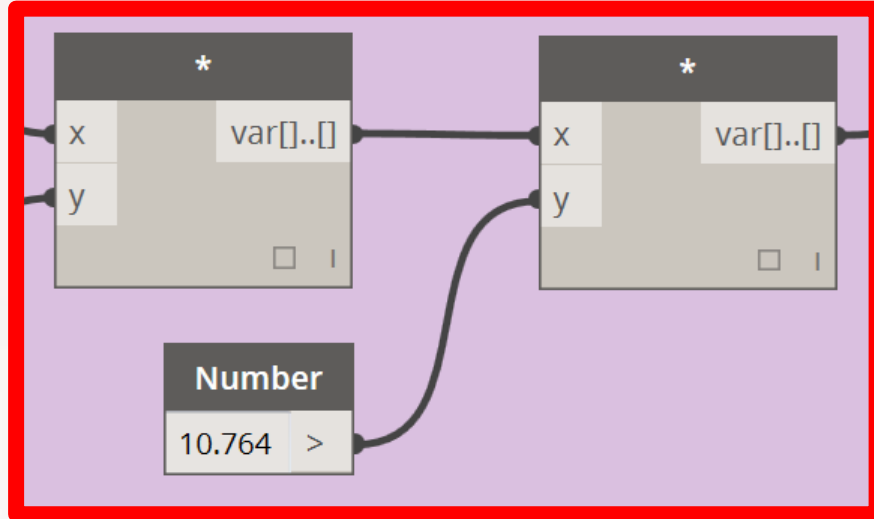
# Cooling Load $\text{W/m}^2$ x Area x 10.764?

HEATING CALCULATIONS

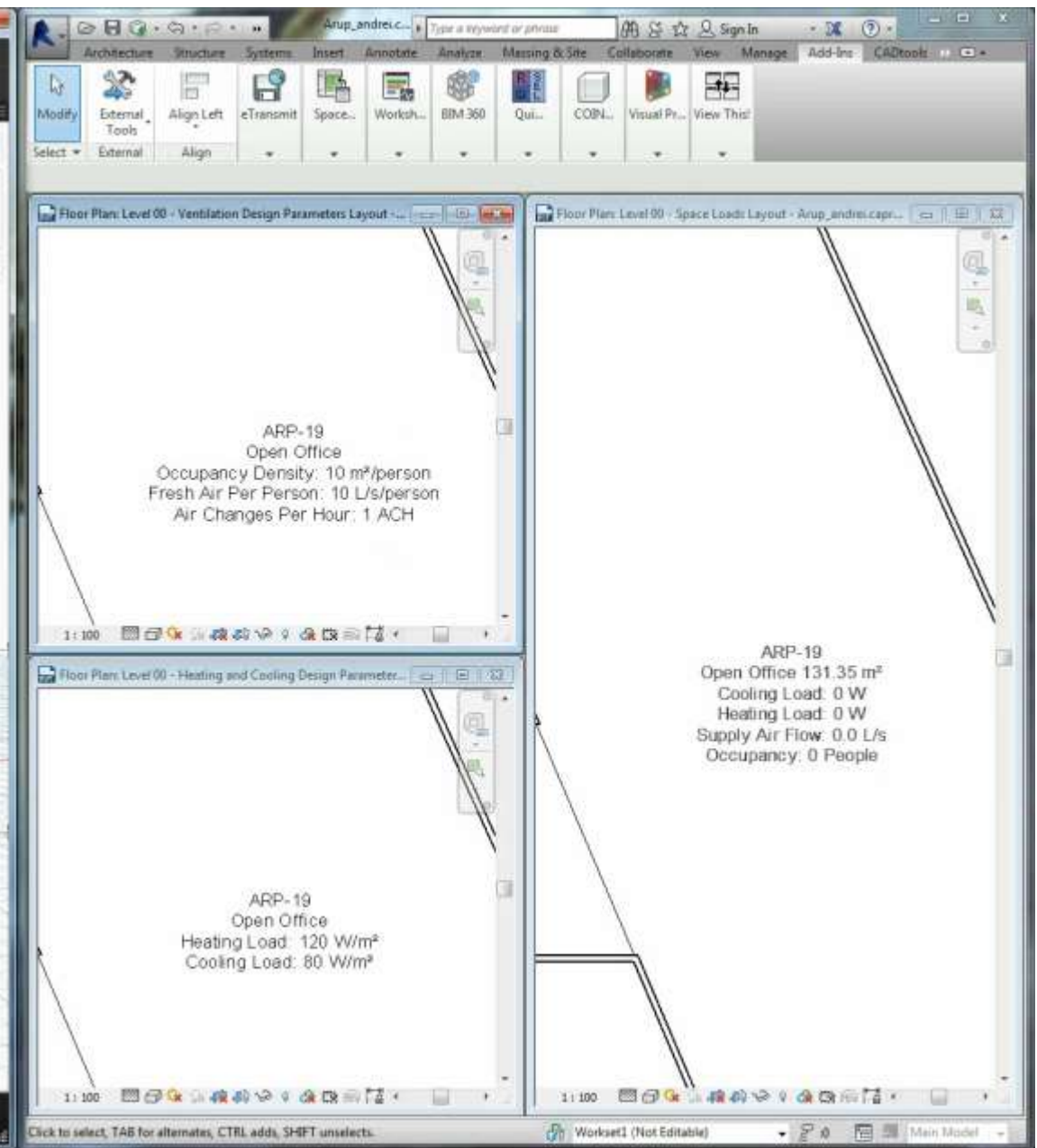
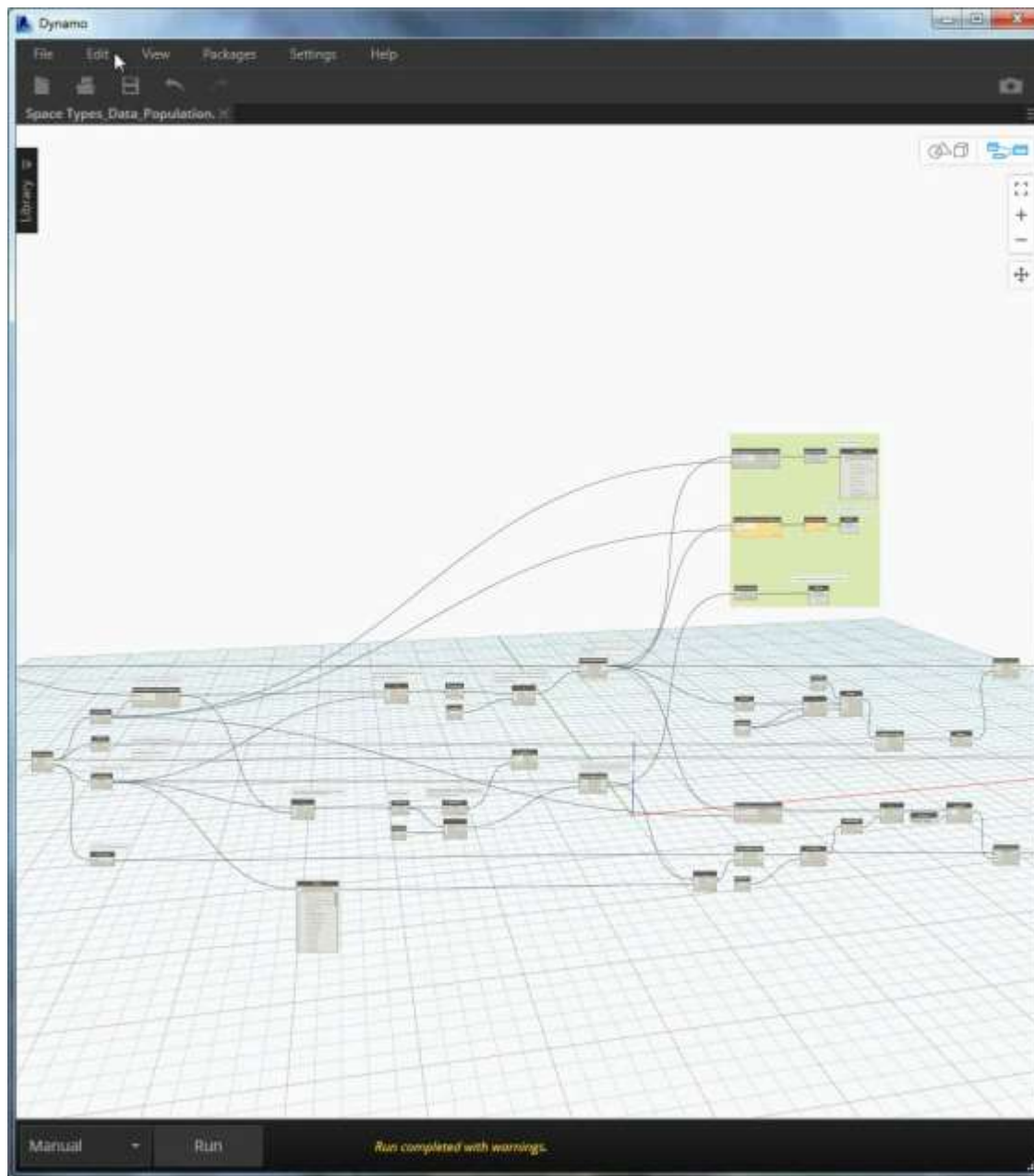


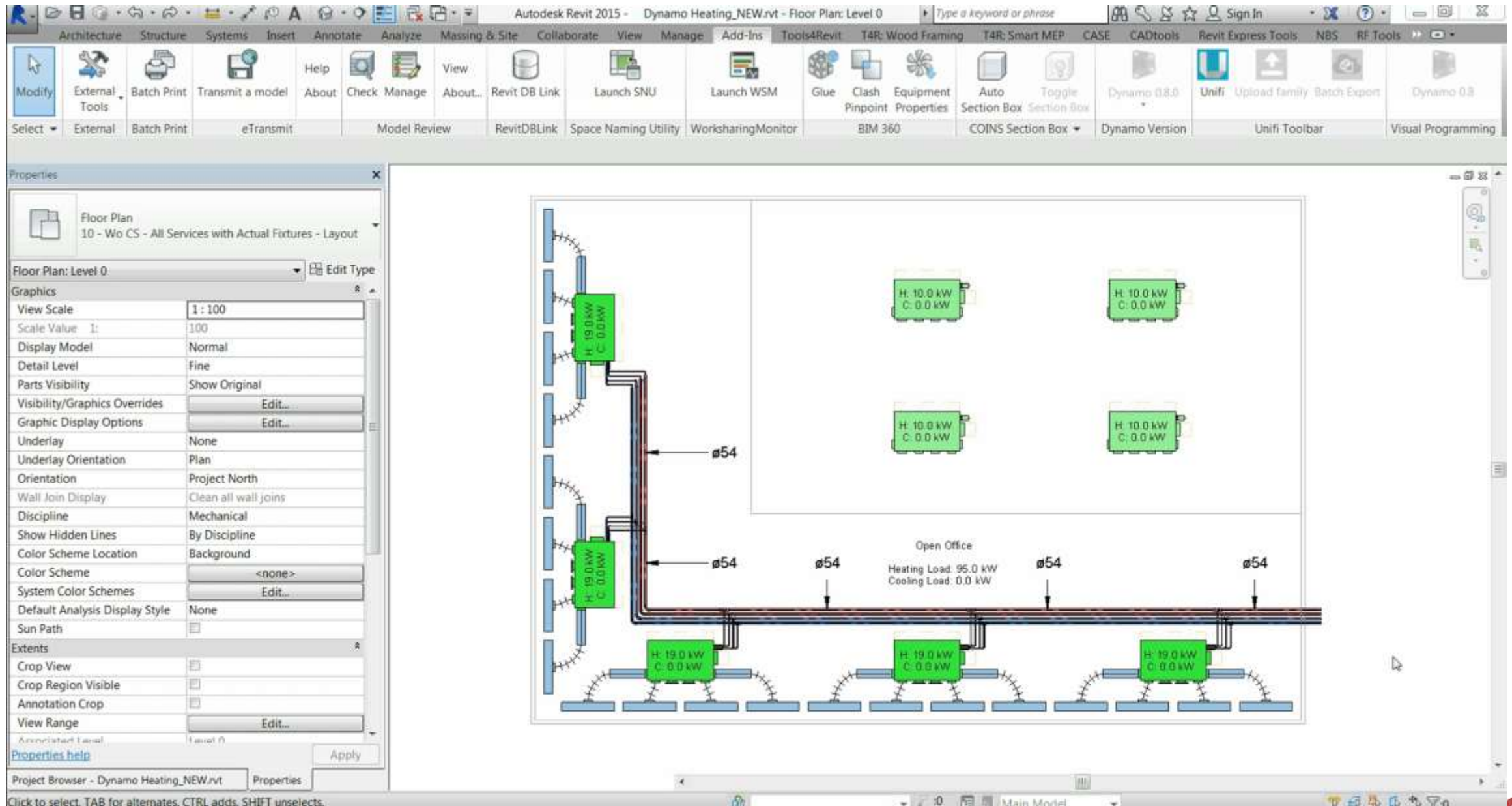
**TIP:**

**Use Code Block instead of Number for greater accuracy when required**



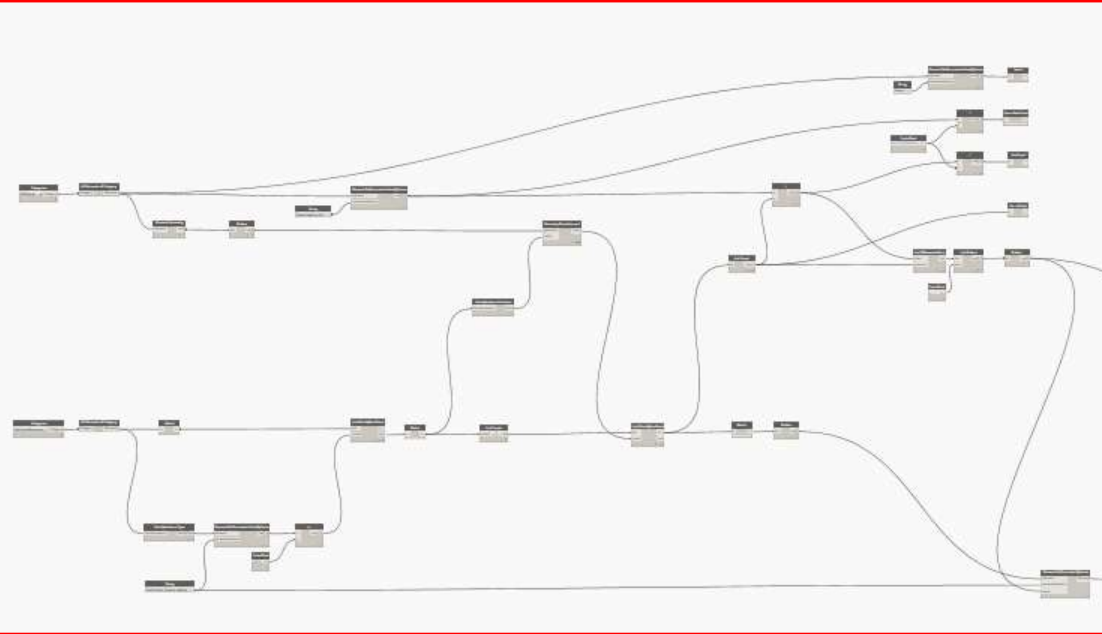






# Linking *Space* parameters to *Family* Parameters





DIVIDE THE HEATING LOAD OF A SPACE OVER THE NUMBER OF PIECES OF EQUIPMENT IN THAT SPACE ABLE TO PROVIDE HEATING

COLOURS IN THE HEATING EQUIPMENT BASED ON HOW HARD IT IS WORKING ACCORDING TO ITS MAXIMUM CAPACITY

