

# **BIM Aarhus Netværksmøde | Highlights Let's Rethink How We Do MEP Routings in Revit**

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# How do you plan your MEP routings in Revit

- Use “Heating and Cooling Loads” function in Revit?
- Excel Sheet for calculating airflow?
- Where does the data in the Excel Sheet come from?
- How do you choose the size of a duct?
- In the design process, how do you reserve space for shafts and routings?
- How do you explain to other project members how the routings are planned?

# The traditional way to plan MEP routings



Architect Model

- Print sheets from Revit
- Manual measure



Room	Area	Volume	Flow	Pressure	Velocity	Power	Cost	Notes
Room 1	10.0	30.0	1.0	1.0	1.0	1.0	1.0	1.0
Room 2	15.0	45.0	1.5	1.5	1.5	1.5	1.5	1.5
Room 3	20.0	60.0	2.0	2.0	2.0	2.0	2.0	2.0
Room 4	25.0	75.0	2.5	2.5	2.5	2.5	2.5	2.5
Room 5	30.0	90.0	3.0	3.0	3.0	3.0	3.0	3.0
Room 6	35.0	105.0	3.5	3.5	3.5	3.5	3.5	3.5
Room 7	40.0	120.0	4.0	4.0	4.0	4.0	4.0	4.0
Room 8	45.0	135.0	4.5	4.5	4.5	4.5	4.5	4.5
Room 9	50.0	150.0	5.0	5.0	5.0	5.0	5.0	5.0
Room 10	55.0	165.0	5.5	5.5	5.5	5.5	5.5	5.5
Room 11	60.0	180.0	6.0	6.0	6.0	6.0	6.0	6.0
Room 12	65.0	195.0	6.5	6.5	6.5	6.5	6.5	6.5
Room 13	70.0	210.0	7.0	7.0	7.0	7.0	7.0	7.0
Room 14	75.0	225.0	7.5	7.5	7.5	7.5	7.5	7.5
Room 15	80.0	240.0	8.0	8.0	8.0	8.0	8.0	8.0
Room 16	85.0	255.0	8.5	8.5	8.5	8.5	8.5	8.5
Room 17	90.0	270.0	9.0	9.0	9.0	9.0	9.0	9.0
Room 18	95.0	285.0	9.5	9.5	9.5	9.5	9.5	9.5
Room 19	100.0	300.0	10.0	10.0	10.0	10.0	10.0	10.0
Room 20	105.0	315.0	10.5	10.5	10.5	10.5	10.5	10.5
Room 21	110.0	330.0	11.0	11.0	11.0	11.0	11.0	11.0
Room 22	115.0	345.0	11.5	11.5	11.5	11.5	11.5	11.5
Room 23	120.0	360.0	12.0	12.0	12.0	12.0	12.0	12.0
Room 24	125.0	375.0	12.5	12.5	12.5	12.5	12.5	12.5
Room 25	130.0	390.0	13.0	13.0	13.0	13.0	13.0	13.0
Room 26	135.0	405.0	13.5	13.5	13.5	13.5	13.5	13.5
Room 27	140.0	420.0	14.0	14.0	14.0	14.0	14.0	14.0
Room 28	145.0	435.0	14.5	14.5	14.5	14.5	14.5	14.5
Room 29	150.0	450.0	15.0	15.0	15.0	15.0	15.0	15.0
Room 30	155.0	465.0	15.5	15.5	15.5	15.5	15.5	15.5
Room 31	160.0	480.0	16.0	16.0	16.0	16.0	16.0	16.0
Room 32	165.0	495.0	16.5	16.5	16.5	16.5	16.5	16.5
Room 33	170.0	510.0	17.0	17.0	17.0	17.0	17.0	17.0
Room 34	175.0	525.0	17.5	17.5	17.5	17.5	17.5	17.5
Room 35	180.0	540.0	18.0	18.0	18.0	18.0	18.0	18.0
Room 36	185.0	555.0	18.5	18.5	18.5	18.5	18.5	18.5
Room 37	190.0	570.0	19.0	19.0	19.0	19.0	19.0	19.0
Room 38	195.0	585.0	19.5	19.5	19.5	19.5	19.5	19.5
Room 39	200.0	600.0	20.0	20.0	20.0	20.0	20.0	20.0
Room 40	205.0	615.0	20.5	20.5	20.5	20.5	20.5	20.5
Room 41	210.0	630.0	21.0	21.0	21.0	21.0	21.0	21.0
Room 42	215.0	645.0	21.5	21.5	21.5	21.5	21.5	21.5
Room 43	220.0	660.0	22.0	22.0	22.0	22.0	22.0	22.0
Room 44	225.0	675.0	22.5	22.5	22.5	22.5	22.5	22.5
Room 45	230.0	690.0	23.0	23.0	23.0	23.0	23.0	23.0
Room 46	235.0	705.0	23.5	23.5	23.5	23.5	23.5	23.5
Room 47	240.0	720.0	24.0	24.0	24.0	24.0	24.0	24.0
Room 48	245.0	735.0	24.5	24.5	24.5	24.5	24.5	24.5
Room 49	250.0	750.0	25.0	25.0	25.0	25.0	25.0	25.0
Room 50	255.0	765.0	25.5	25.5	25.5	25.5	25.5	25.5
Room 51	260.0	780.0	26.0	26.0	26.0	26.0	26.0	26.0
Room 52	265.0	795.0	26.5	26.5	26.5	26.5	26.5	26.5
Room 53	270.0	810.0	27.0	27.0	27.0	27.0	27.0	27.0
Room 54	275.0	825.0	27.5	27.5	27.5	27.5	27.5	27.5
Room 55	280.0	840.0	28.0	28.0	28.0	28.0	28.0	28.0
Room 56	285.0	855.0	28.5	28.5	28.5	28.5	28.5	28.5
Room 57	290.0	870.0	29.0	29.0	29.0	29.0	29.0	29.0
Room 58	295.0	885.0	29.5	29.5	29.5	29.5	29.5	29.5
Room 59	300.0	900.0	30.0	30.0	30.0	30.0	30.0	30.0
Room 60	305.0	915.0	30.5	30.5	30.5	30.5	30.5	30.5
Room 61	310.0	930.0	31.0	31.0	31.0	31.0	31.0	31.0
Room 62	315.0	945.0	31.5	31.5	31.5	31.5	31.5	31.5
Room 63	320.0	960.0	32.0	32.0	32.0	32.0	32.0	32.0
Room 64	325.0	975.0	32.5	32.5	32.5	32.5	32.5	32.5
Room 65	330.0	990.0	33.0	33.0	33.0	33.0	33.0	33.0
Room 66	335.0	1005.0	33.5	33.5	33.5	33.5	33.5	33.5
Room 67	340.0	1020.0	34.0	34.0	34.0	34.0	34.0	34.0
Room 68	345.0	1035.0	34.5	34.5	34.5	34.5	34.5	34.5
Room 69	350.0	1050.0	35.0	35.0	35.0	35.0	35.0	35.0
Room 70	355.0	1065.0	35.5	35.5	35.5	35.5	35.5	35.5
Room 71	360.0	1080.0	36.0	36.0	36.0	36.0	36.0	36.0
Room 72	365.0	1095.0	36.5	36.5	36.5	36.5	36.5	36.5
Room 73	370.0	1110.0	37.0	37.0	37.0	37.0	37.0	37.0
Room 74	375.0	1125.0	37.5	37.5	37.5	37.5	37.5	37.5
Room 75	380.0	1140.0	38.0	38.0	38.0	38.0	38.0	38.0
Room 76	385.0	1155.0	38.5	38.5	38.5	38.5	38.5	38.5
Room 77	390.0	1170.0	39.0	39.0	39.0	39.0	39.0	39.0
Room 78	395.0	1185.0	39.5	39.5	39.5	39.5	39.5	39.5
Room 79	400.0	1200.0	40.0	40.0	40.0	40.0	40.0	40.0
Room 80	405.0	1215.0	40.5	40.5	40.5	40.5	40.5	40.5
Room 81	410.0	1230.0	41.0	41.0	41.0	41.0	41.0	41.0
Room 82	415.0	1245.0	41.5	41.5	41.5	41.5	41.5	41.5
Room 83	420.0	1260.0	42.0	42.0	42.0	42.0	42.0	42.0
Room 84	425.0	1275.0	42.5	42.5	42.5	42.5	42.5	42.5
Room 85	430.0	1290.0	43.0	43.0	43.0	43.0	43.0	43.0
Room 86	435.0	1305.0	43.5	43.5	43.5	43.5	43.5	43.5
Room 87	440.0	1320.0	44.0	44.0	44.0	44.0	44.0	44.0
Room 88	445.0	1335.0	44.5	44.5	44.5	44.5	44.5	44.5
Room 89	450.0	1350.0	45.0	45.0	45.0	45.0	45.0	45.0
Room 90	455.0	1365.0	45.5	45.5	45.5	45.5	45.5	45.5
Room 91	460.0	1380.0	46.0	46.0	46.0	46.0	46.0	46.0
Room 92	465.0	1395.0	46.5	46.5	46.5	46.5	46.5	46.5
Room 93	470.0	1410.0	47.0	47.0	47.0	47.0	47.0	47.0
Room 94	475.0	1425.0	47.5	47.5	47.5	47.5	47.5	47.5
Room 95	480.0	1440.0	48.0	48.0	48.0	48.0	48.0	48.0
Room 96	485.0	1455.0	48.5	48.5	48.5	48.5	48.5	48.5
Room 97	490.0	1470.0	49.0	49.0	49.0	49.0	49.0	49.0
Room 98	495.0	1485.0	49.5	49.5	49.5	49.5	49.5	49.5
Room 99	500.0	1500.0	50.0	50.0	50.0	50.0	50.0	50.0
Room 100	505.0	1515.0	50.5	50.5	50.5	50.5	50.5	50.5

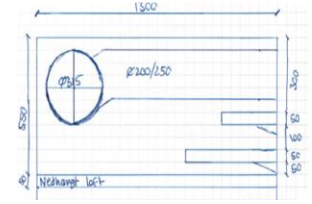
Excel Sheet

- Airflow calculation



Airflow to sheet

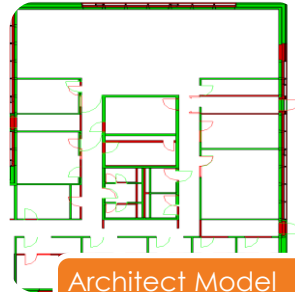
- Good overview
- Duct sizing



Sketches

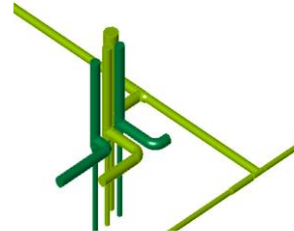


Scan and send



Architect Model

- Adjust the geometry
- Send updated model



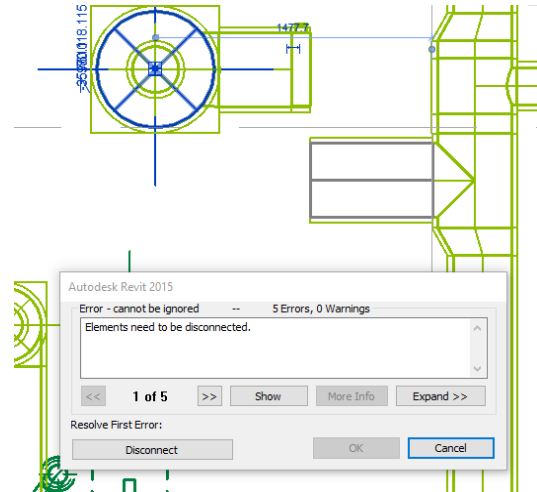
Ducts are drawn



Adjusting, Adjusting and Adjusting

# This is not a BIM process

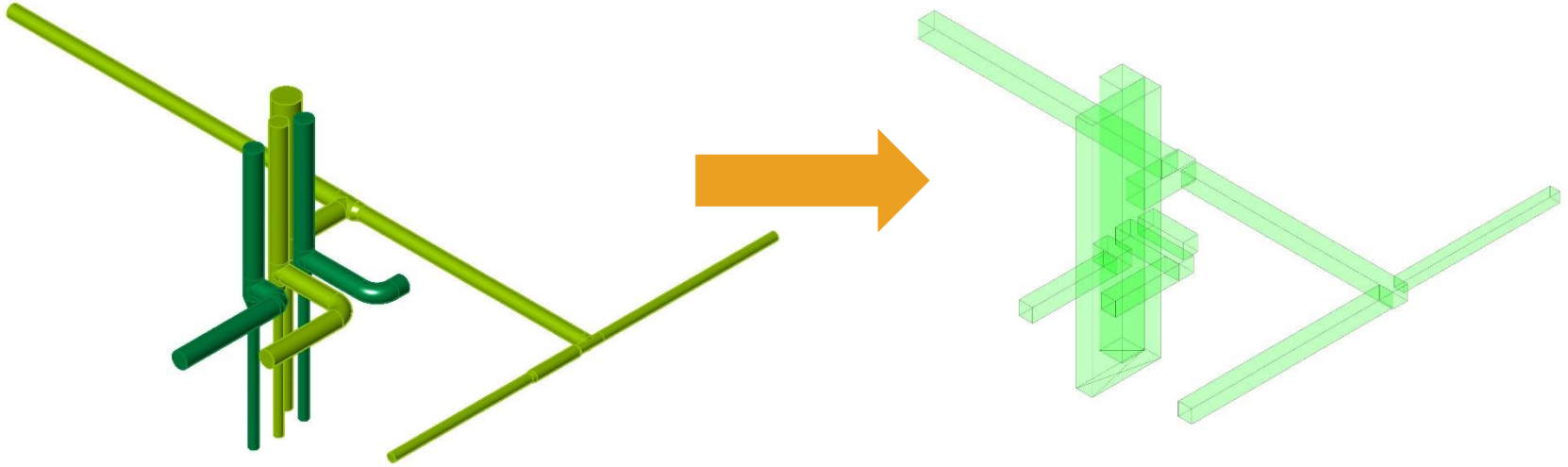
- Data in the model is not used
- Air flow not in Revit
- The sketches are not visible in the model
- Disconnection problems



# Generic Routing






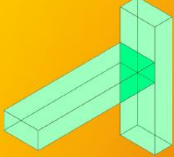
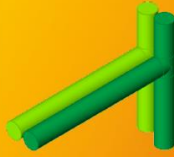
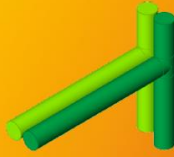

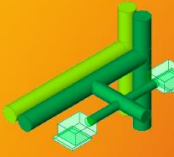
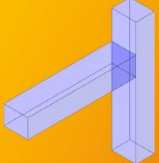




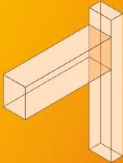
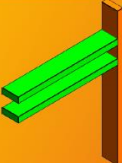
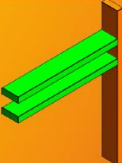
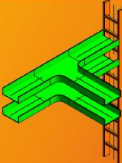
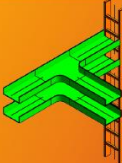
Ducts

Generic Routings

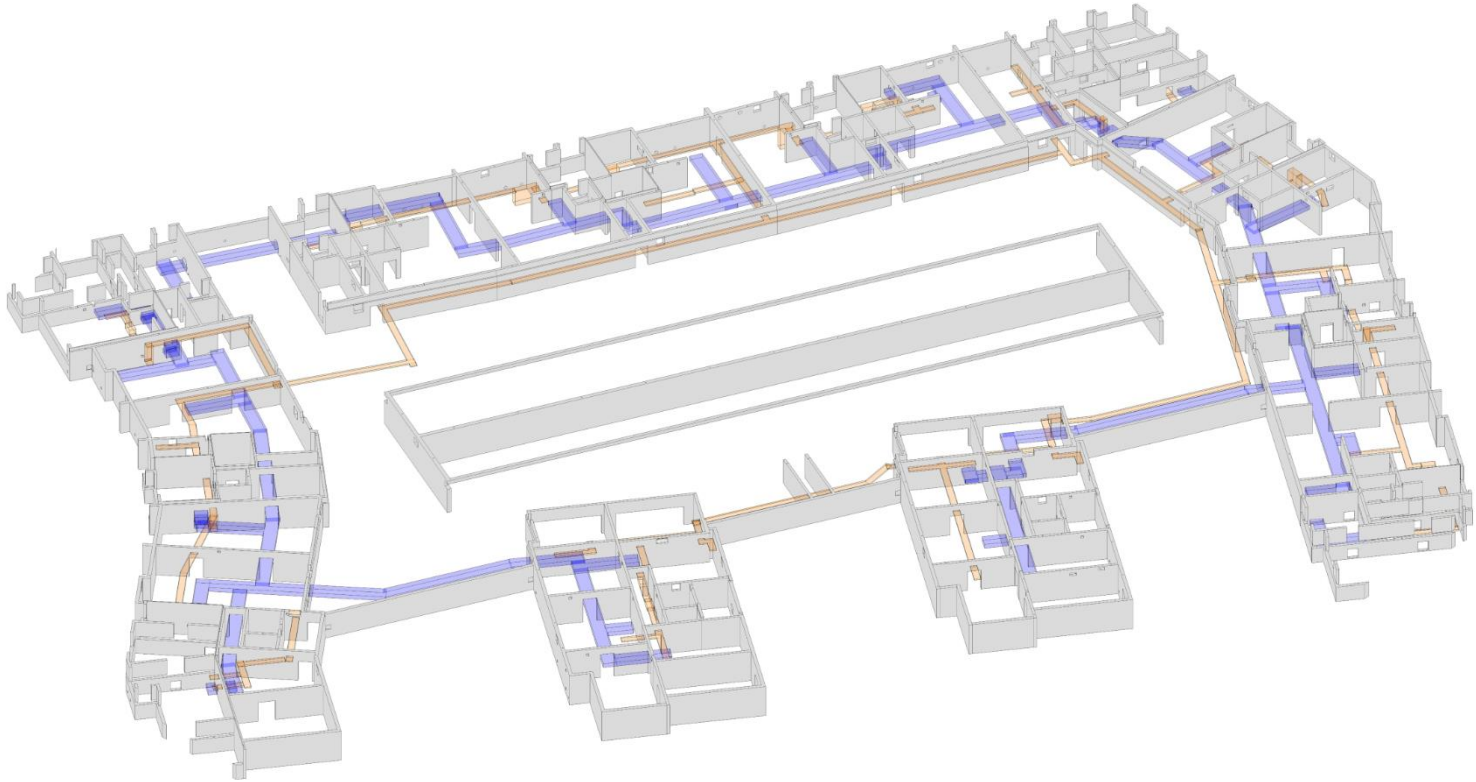


# Generic Routing

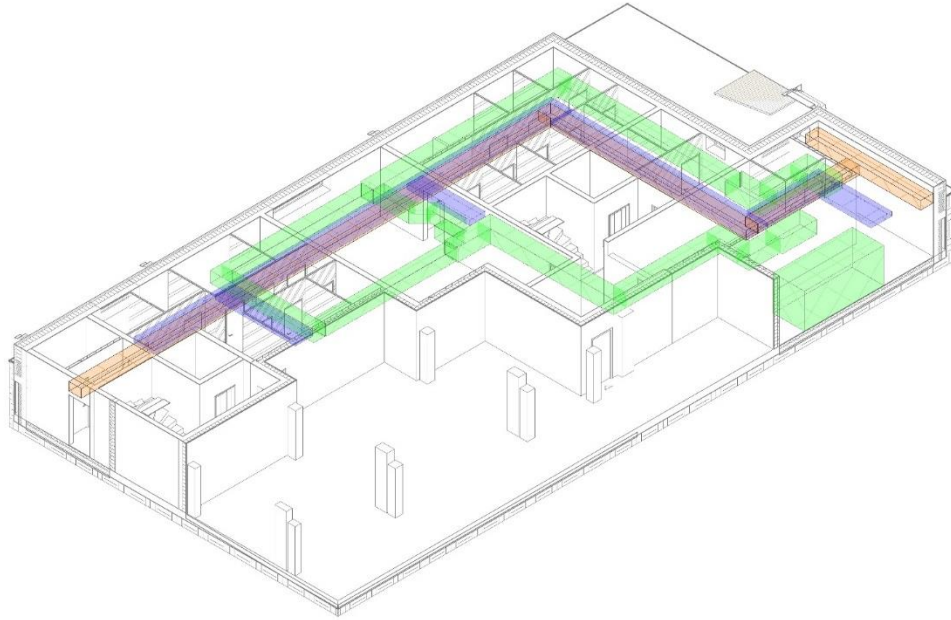
- Level of information and project phase

	Outline proposal Information level 3	Project proposal Information level 4	Preliminary project Information level 4	Main project Information level 5	Execution Information level 6
Concrete walls					
Ducts - Routings					
Pipe - Routings					
Cable trays - Routings					

# Generic Routing – Example

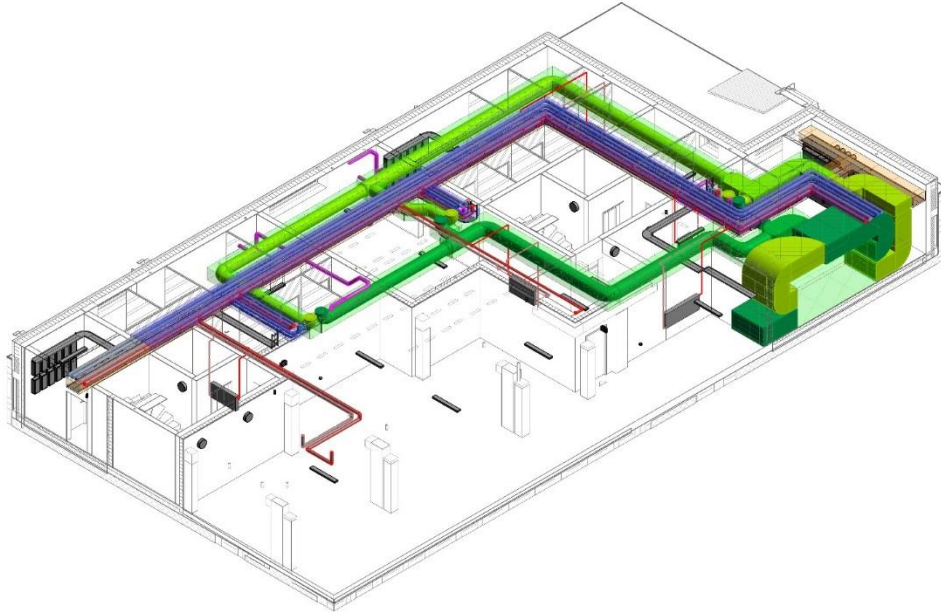


# Generic Routing - Example

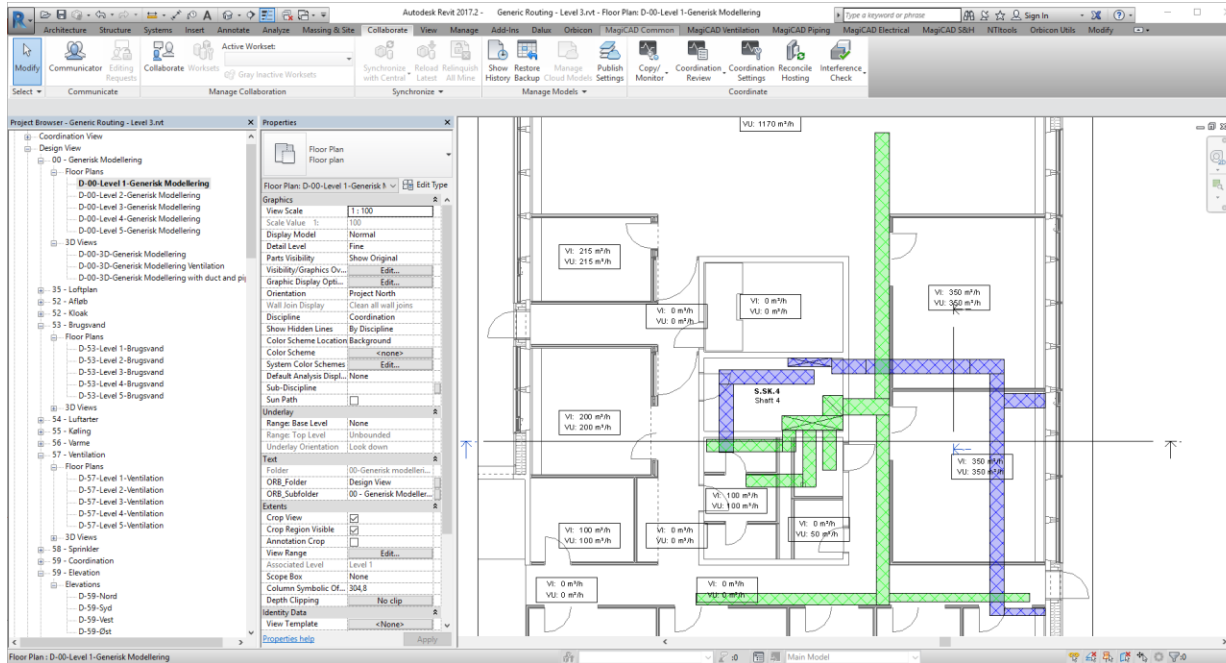




# Generic Routing - Example



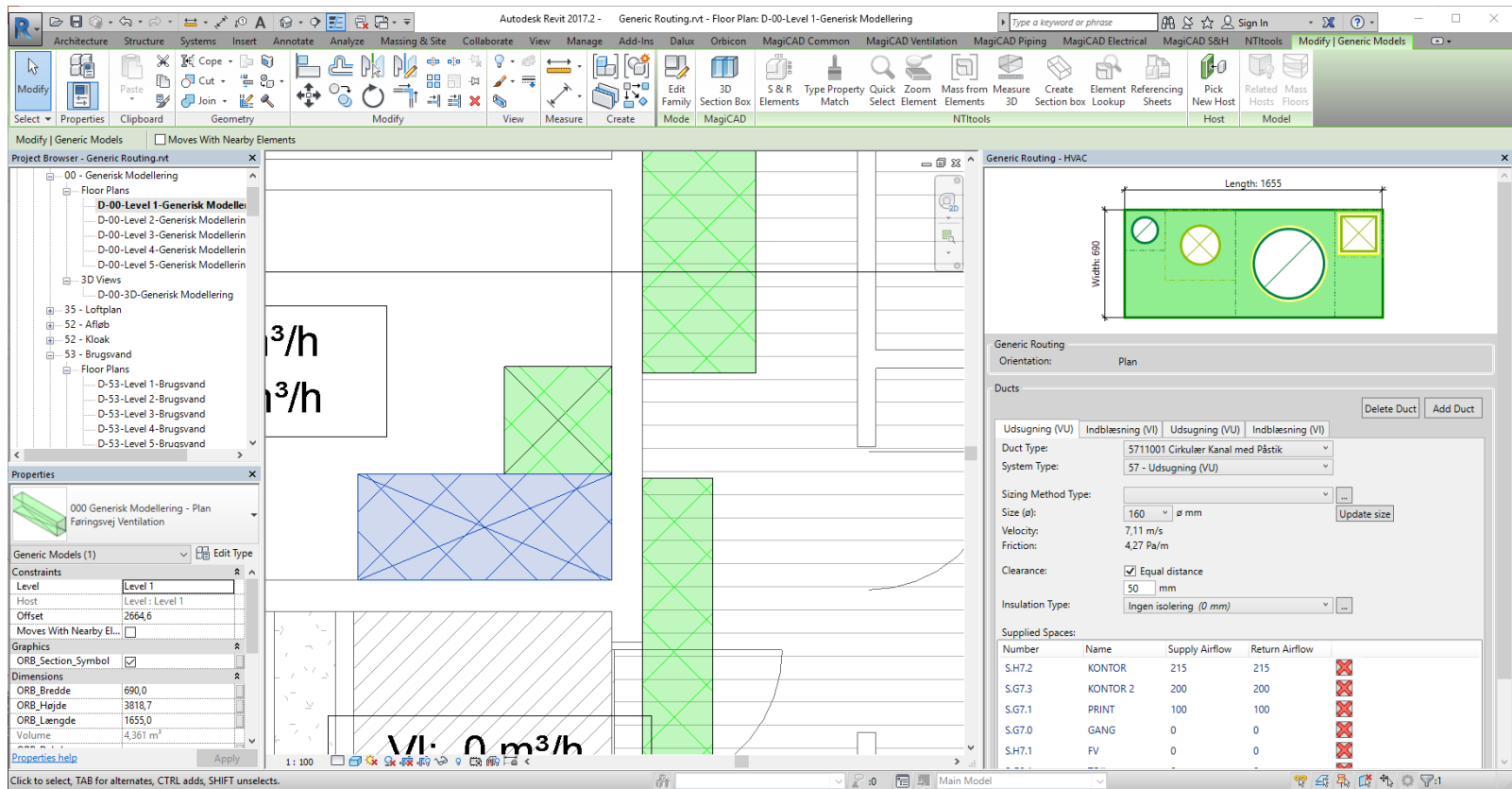
# Revit – Live demo



# Why I think this make sense

- Flexible in the early design phase, you want get disconnection errors.
- You can build in clearance around your duct, pipes and cable trays.
- You can do a Interference Check
- Easy for everyone to see the planned routings

# Generic Routing add-in for Revit



Autodesk Revit 2017.2 - Generic Routing.rvt - Floor Plan: D-00-Level 1-Generisk Modellering

Modify | Generic Models

Project Browser - Generic Routing.rvt

- 00 - Generisk Modellering
  - Floor Plans
    - D-00-Level 1-Generisk Modellering
    - D-00-Level 2-Generisk Modellering
    - D-00-Level 3-Generisk Modellering
    - D-00-Level 4-Generisk Modellering
    - D-00-Level 5-Generisk Modellering
  - 3D Views
    - D-00-3D-Generisk Modellering
  - 35 - Loftplan
  - 52 - Afløb
  - 52 - Kloak
  - 53 - Brugsvand
    - Floor Plans
      - D-53-Level 1-Brugsvand
      - D-53-Level 2-Brugsvand
      - D-53-Level 3-Brugsvand
      - D-53-Level 4-Brugsvand
      - D-53-Level 5-Brugsvand

Properties

000 Generisk Modellering - Plan  
Faringesvej Ventilation

Generic Models (1) Edit Type

Constraints

Level	Host	Offset
Level 1	Level : Level 1	2664,6

Moves With Nearby Elements

Graphics

ORB\_Section\_Symbol

Dimensions

Property	Value
ORB_Bredde	690,0
ORB_Højde	3818,7
ORB_Længde	1655,0
Volume	4,361 m <sup>3</sup>

Properties help

Click to select, TAB for alternates, CTRL adds, SHIFT unselects.

Generic Routing - HVAC

Orientation: Plan

Ducts

Udsugning (VU) Indblæsning (VI) Udsugning (VU) Indblæsning (VI)

Duct Type: 5711001 Cirkulær Kanal med Pæstik

System Type: 57 - Udsugning (VU)

Sizing Method Type:

Size (ø): 160 mm

Velocity: 7,11 m/s

Friction: 4,27 Pa/m

Clearance: ☒ Equal distance

Insulation Type: Ingen isolering (0 mm)

Supplied Spaces:

Number	Name	Supply Airflow	Return Airflow
S.H7.2	KONTOR	215	215
S.G7.3	KONTOR 2	200	200
S.G7.1	PRINT	100	100
S.G7.0	GANG	0	0
S.H7.1	FV	0	0

# Value to your BIM process?

- Do you think it make sense?
- Do you think this is the right way to go in the early project phases?