

# Plancal nova @ work

2D/3D HVAC CAD solution with integrated calculations

Step 1: Prepare the Building Model

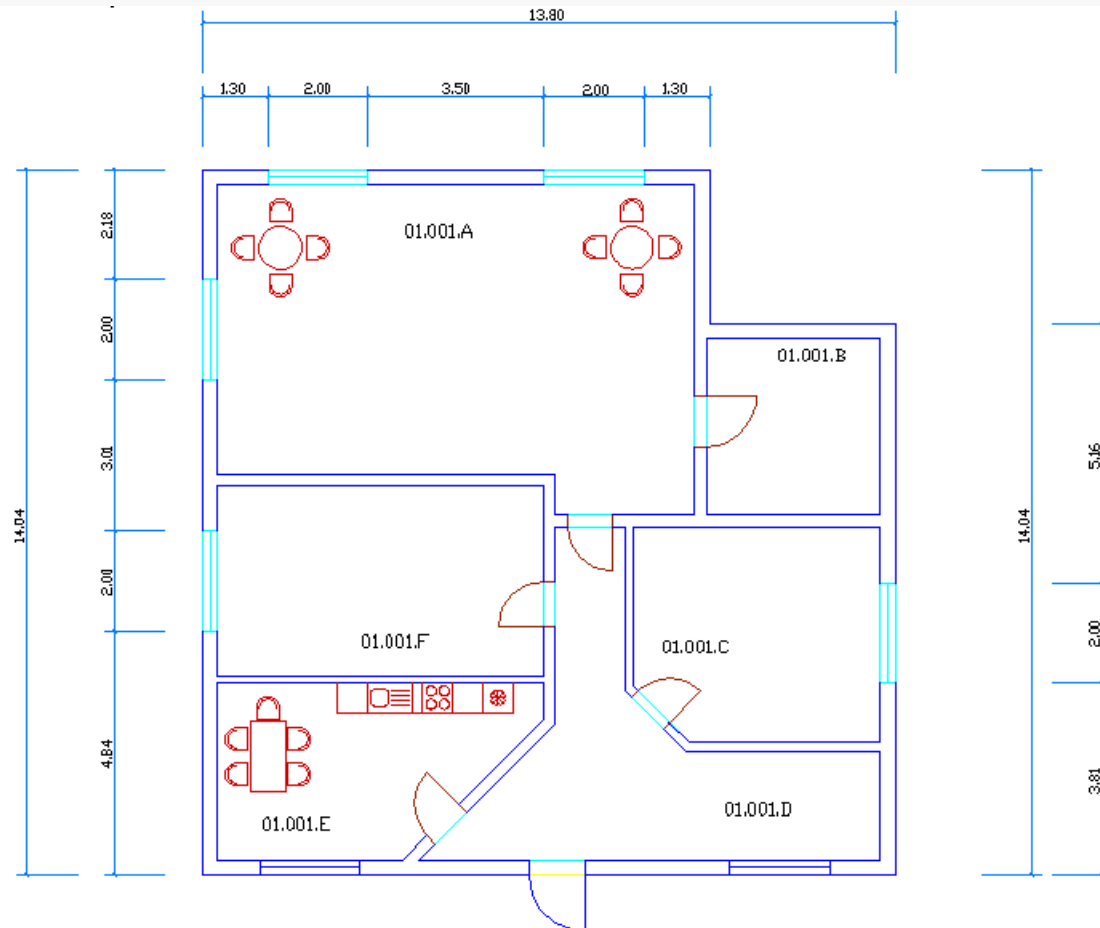
Step 2: Thermal Calculations

Step 3: Heating Installations

Step 4: Ventilation Installations

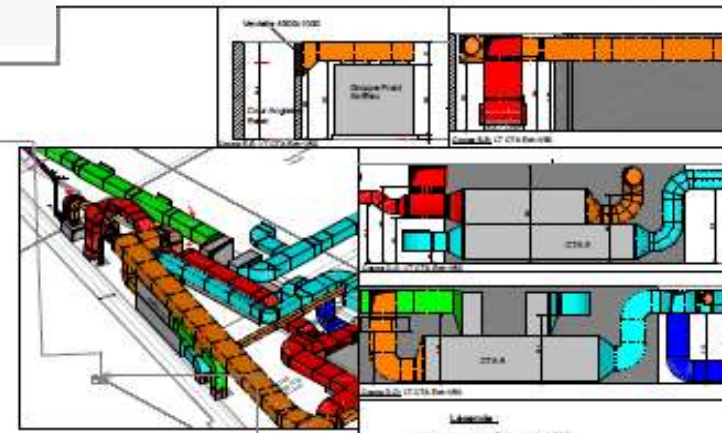
... more...

From 'THAT' ...



simple 2D architectural plan in dwg

... to 'THIS' ...



- Légende**
- Réseau de VMC
  - Réseau de Réfrigé
  - Réseau de Soufflage
  - Réseau d'air neuf de déaerification
  - Réseau de reprise de déaerification commun
  - Réseau de reprise
  - Réseau d'air neuf
  - Réseau d'air réfrig
  - Réseau d'eau glacée
  - Réseau d'eau chaude
  - Réseau de condensats
  - Réseau de gaz
  - Réseau de fluides frigorigènes

Les réseaux communs reprise et déaerification sont indiqués en dimension standard dans à leur premier tracé de pose en longueur, largeur et hauteur



**MUSEE DE LA MER**

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**BIARRITZ**

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PROJET DE PLAN

**NIVEAU 28.00NGF**

**CVCD**

Plan de base A2E-MEM-PRO-001-A-090115

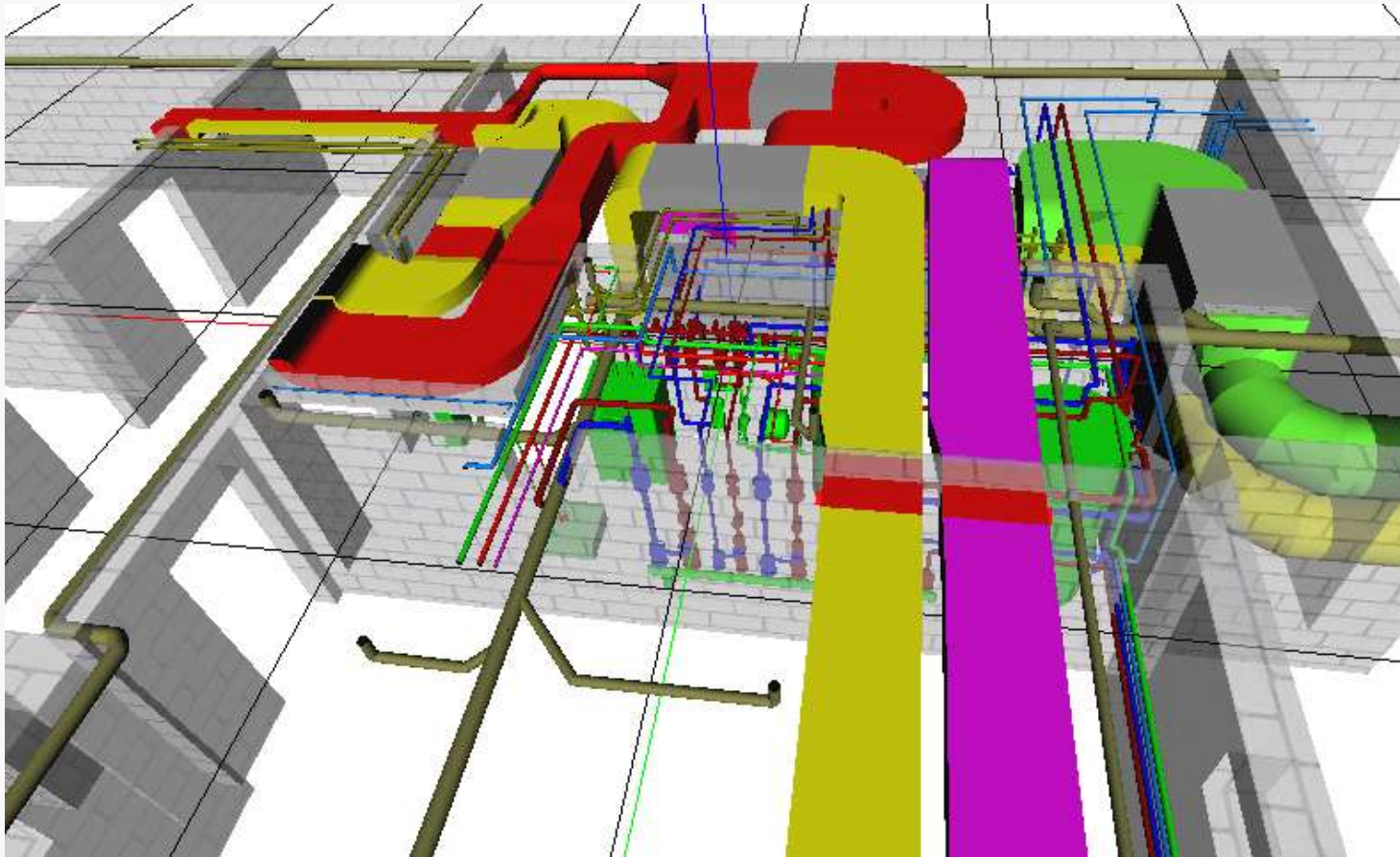
<b>Client</b>	MUSEE DE LA MER	<b>Projetant</b>	MUSEE DE LA MER
<b>Adresse</b>	MUSEE DE LA MER	<b>Client</b>	MUSEE DE LA MER
<b>Site</b>	MUSEE DE LA MER	<b>Projetant</b>	MUSEE DE LA MER
<b>Etat</b>	MUSEE DE LA MER	<b>Client</b>	MUSEE DE LA MER



Elth's

Item	Quantité	Unité	Volume	Surface	Longueur	Hauteur
1	1	m				
2	1	m				
3	1	m				
4	1	m				
5	1	m				
6	1	m				
7	1	m				
8	1	m				
9	1	m				
10	1	m				
11	1	m				
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94	1	m				
95	1	m				
96	1	m				
97	1	m				
98	1	m				
99	1	m				
100	1	m				

...or 'THIS'!



Mechanical Equipment room - Full 3D coordination drawing

## Step 1: Prepare the Building Model

### A) Import an IFC File

Plancal is member of



Compatibility with IFC

(Industry Foundation Class)

Import and export IFC based BIM (Building Information Modelling )

Communicate seamless with other IFC based software solutions

### B) Import a DWG/DXF File

Plancal nova ist member of

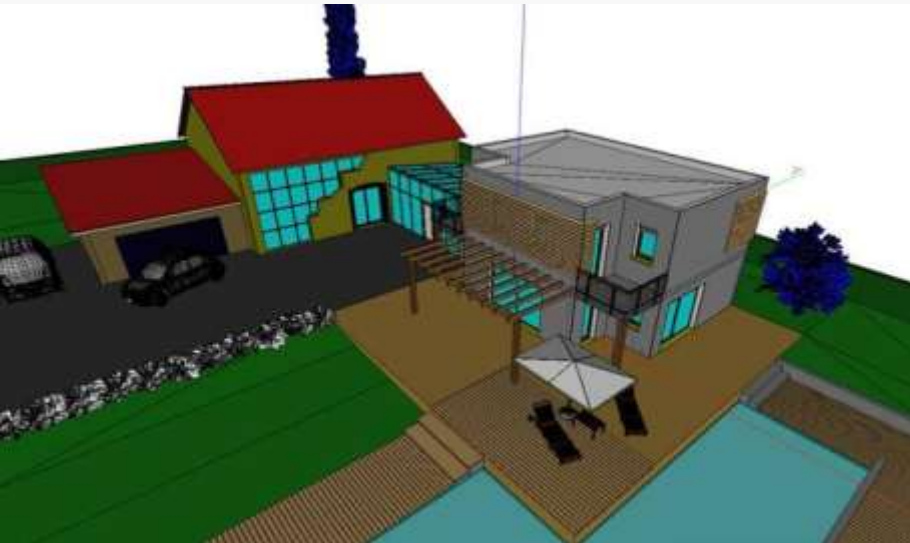


Full compatibility with DXF and DWG formats

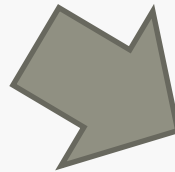
Import and export

2D or 3D drawings

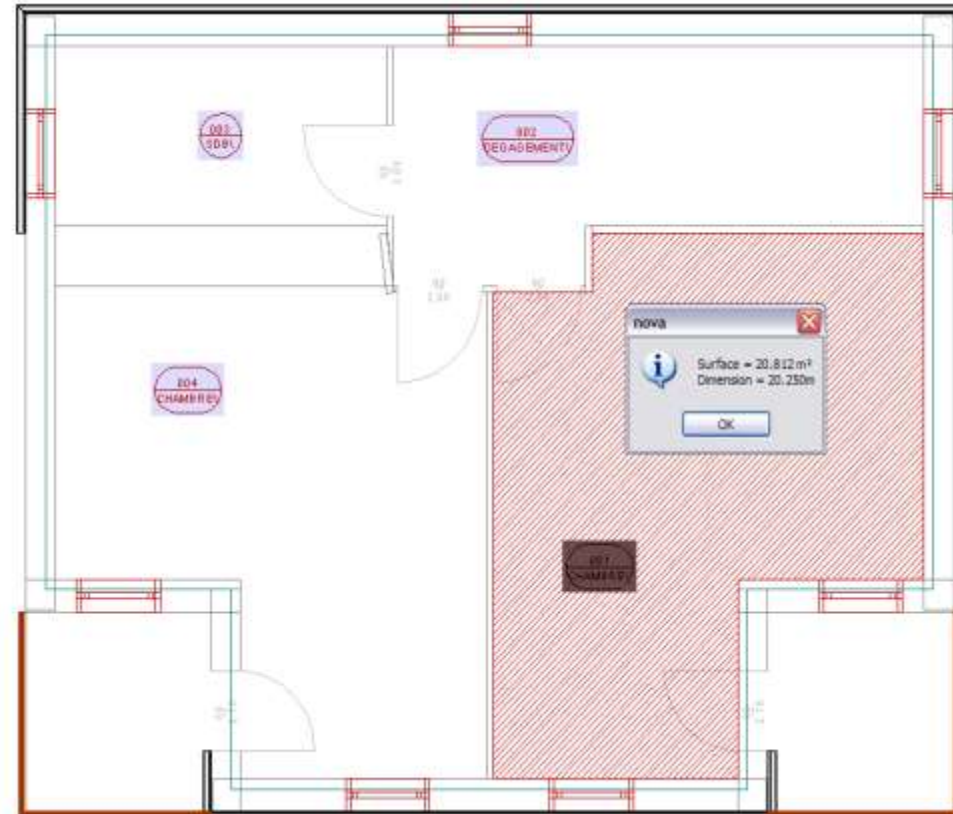
## 1A) Import or Export IFC



IFC compatible architectural  
Software  
(such as Allplan from Nemetschek)



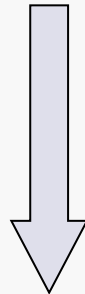
Direct and ,intelligent' BIM based import



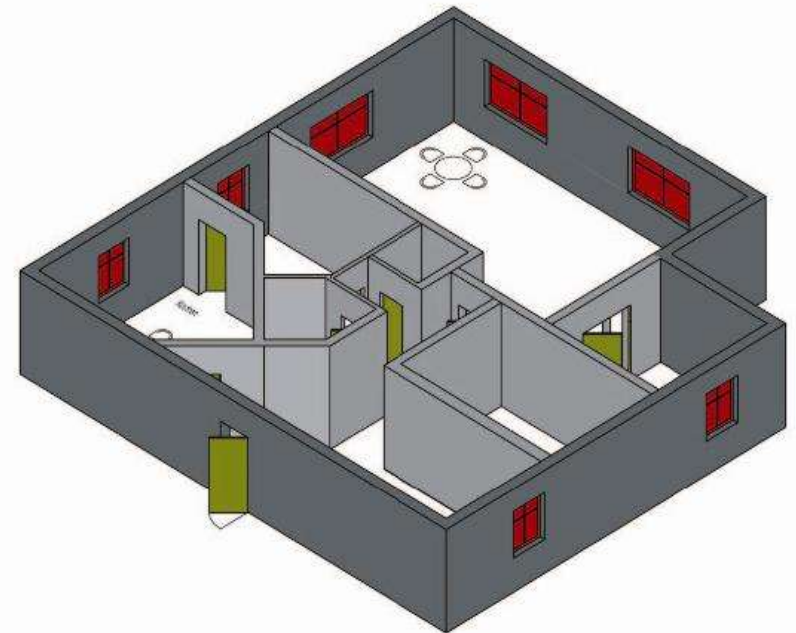
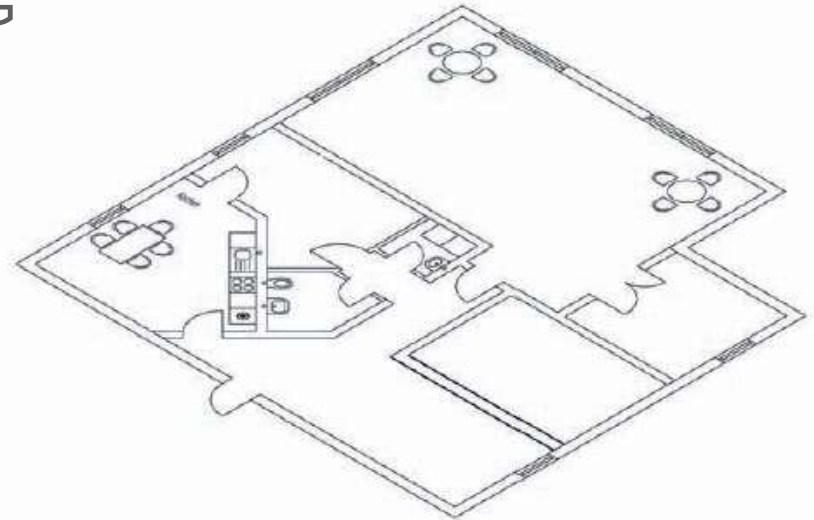
## 1B) Create Building Model from DWG



2D Plan



Building Model

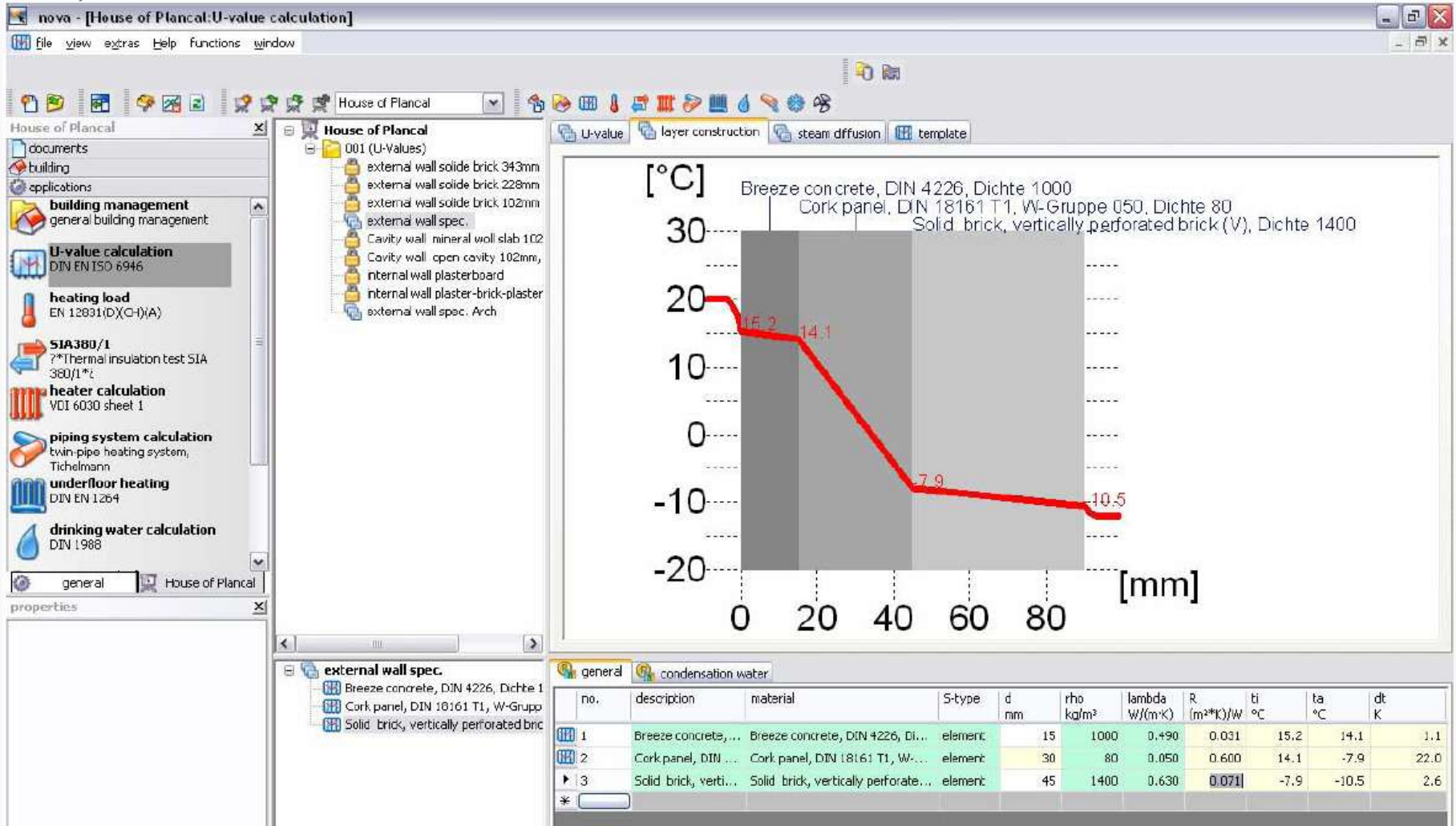


## Step 2: Thermal Calculations

- A) U-Value Calculation
- B) Static heat loss calculation according to EN 12831
- C) Dynamic cooling load calculation according to VD 2078

All directly integrated into graphic BIM

## 2A) U-Value Calculation



U-Values fix, layer construction and combined

## 2B) Heat loss calculation – directly on graphical BIM

nova - House of Plancal:heating load

file view extras Help functions window

House of Plancal

House of Plancal:heating load

House of Plancal:Mech\Inst. Heating.nvz

**ouse of Plancal**

- 001 (new building)
  - 1 (1. upper floor)
    - 0 (ground floor)
      - 001 (Meeting)
      - 002 (Entrance)
      - 003 (Office)
      - 004 (Bath)
      - 005 (Kitchen)
      - 006 (Technic-Room)

**room SIA 384.201**

no. 005 designation Kitchen

apartment

**geometry**

length 2.9 m  
width 6.5 m  
ground area 18.95 m<sup>2</sup>  
floor height 2.8 m  
ceiling thickness 0.2 m  
enclosing area 89.61 m<sup>2</sup>  
volumes 48.3 m<sup>3</sup>  
clear height 2.5 m

**data**

heated  
interior temperature 20 °C  
 interior  
dimensions medium  
minimum air change 0.3 1/h  
soil...  
heat-up capacity...

**infiltration**

air cl...  
heigl...  
heigl...  
faca...  
scre...  
coef

**transmission**

heat loss coefficient 47.63 W/K  
heat loss 1213 Watt  
...outwards 1290 Watt

**volumetric air flow / additional heating**

heat loss coefficient 4.68 W/K  
heat loss 126 Watt  
reheat factor  
reheating

**total**

spe...  
spe...  
net...  
star

**005 (Kitchen)**

- iw
- iw
- iw
- id
- ew
- VP
- ew
- gf
- enu

**area descriptions**

comp	s	n	adjoins	b m	l/h m	A <sub>gross</sub> m <sup>2</sup>	A <sub>n, gross</sub> m <sup>2</sup>	A <sub>net</sub> m <sup>2</sup>	θ <sub>u</sub> /θ <sub>e</sub> °C	u value	Φ <sub>T</sub> Watt
iw	N	1	003 (Office)	6.90	2.95	20...	20...	20...	22	1.91...	-78
iw	O	1	002 (Entrance)	0.83	2.95	2.46	2.46	2.46	20	0.47...	0
iw	S..	1	002 (Entrance)	3.90	2.95	11...	11...	9.74	20	0.47...	0
id	S..	1	002 (Entrance)	0.88	2.00	1.77	1.77	1.77	20	2	0
ew	S	1	external air	4.02	2.95	11...	11...	9.37	-7	1.64...	415
VP	S	1	external air	2.00	1.25	2.50	2.50	2.50	-7	1.7	115
ew	W	1	external air	3.89	2.95	11...	11...	11...	-7	1.64...	508
gf	H	1	soil	4.71	4.71	22...	22...	22...	-7	0.35	73
enu	H	1	external air	4.71	4.71	22...	22...	22...	-7	0.3	180

01.001.F Office

003 Office

005 Kitchen

01.001.E Kitchen

1.12  
2.00

## Heat Loss Reports

project number  
project designation House of Plancal

project number  
project designation House of Plancal

room heating load			SIA 384.201		
building	001	new building			
storey	0	ground floor			
room	001	Meeting	001.0.001		
<b>standard inner temperature</b>	$\theta_{int}$	20 °C	<b>inner room</b>		
<b>geometry</b>			<b>ventilation</b>		
width	$\phi_R$	9.5 m	minimum air change	$\eta_{min}$	0.3 h <sup>-1</sup>
length	$l_R$	6 m	air exchange rate	$\eta_{50}$	0 h <sup>-1</sup>
room ground area	$A_f$	56.97 m <sup>2</sup>	shielding coefficient	$E$	0.03 -
floor height	$h_G$	2.75 m	height above ground-level	$h_{Abs}$	0 m
ceiling thickness	$s_i$	0.2 m	height correction factor	$\epsilon$	1.00 -
clear room height	$H_N$	2.55 m	<b>supply air volumetric flow</b>	$V_{su}$	0 m <sup>3</sup> /h
room volume	$V_R$	145.26 m <sup>3</sup>	temperature	$\theta_{su}$	°C
<b>soil</b>			temp. reduction factor	$f_{v,su}$	-
depth of floor slab	$z$	0 m	<b>exhaust air volumetric</b>	$V_{ex}$	0 m <sup>3</sup> /h
perimetre of the floor slab	$P$	m	temperature	$\theta_{mech,inf}$	-7 °C
E-value <input type="checkbox"/> room by room	$E'$	6.75 m	temp. reduction factor	$f_{v,mech,inf}$	1.00 -
temperature reduction factor	$f_{g2}$	0.35 -			

transmission heat loss														
orientation	element	width	height	gross area	dial area	net area	adjoint	adjoint temp. diff.	correction factor	U-value	correction thermal	corrected U-value	caloric loss coefficient	transmission heat loss
S	component	b	h	A <sub>gross</sub>	A <sub>sub</sub>	A <sub>net</sub>	e <sub>U</sub>	$\theta_{U,2}$	$f_U$	U-value	$\Delta U_{WB}$	U <sub>corrected</sub>	H <sub>T</sub>	$\Phi_T$
		m	m	m <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>	g	°C		W/m <sup>2</sup> K	W/m <sup>2</sup> K	W/m <sup>2</sup> K	W/K	W
S	lw	6.66	2.95	19.66	2.5	19.65	Q	22	-0.07	0.47		0.47	-0.69	-19
W	ew	6.99	2.95	20.61	2.5	19.11	Q	-7	1.00	1.84		1.84	29.7	502
W	VP	2	1.25	2.5		2.5	Q	-7	1.00	1.70		1.7	4.25	115
N	ew	10.1	2.95	29.8	5	24.3	Q	-7	1.00	1.84		1.84	40.66	1090
N	VP	2	1.25	2.5		2.5	Q	-7	1.00	1.70		1.7	4.25	115
N	VP	2	1.25	2.5		2.5	Q	-7	1.00	1.70		1.7	4.25	115
O	ew	3.27	2.95	11.41		11.41	Q	-7	1.00	1.84		1.84	18.71	505
O	lw	3.63	2.95	10.71	2	8.71	Q	20	0.00	0.47		0.47	0	0
O	ld	1	2	2		2	Q	20	0.00	2.00		2	0	0
S	lw	1.34	2.95	3.95		3.95	Q	20	0.00	0.47		0.47	0	0
S	lw	1.5	2.95	4.44	1.8	2.67	Q	20	0.00	0.47		0.47	0	0
S	ld	0.88	2	1.77		1.77	Q	20	0.00	2.00		2	0	0
W	lw	0.57	2.95	1.68		1.68	Q	22	-0.07	0.47		0.47	-0.06	-2
H	gf	8.51	8.51	72.46		72.46	E	-7	0.38	0.35		0.22	8.87	239
H	enu	8.51	8.51	72.46		72.46	E	-7	1.00	0.30		0.3	21.74	587
<b>total transmission heat loss</b>													$\Phi_T$	3555

building composition			SIA 384.201		
<b>heat loss coefficient</b>					
heat loss coefficient	$\Sigma H_{T,e}$	359.9	W/K		
ventilation heat loss coefficient	$\Sigma H_V$	38.98	W/K		
<b>building heat loss coefficient</b>	$H_{bldg}$	<b>398.88</b>	<b>W/K</b>		

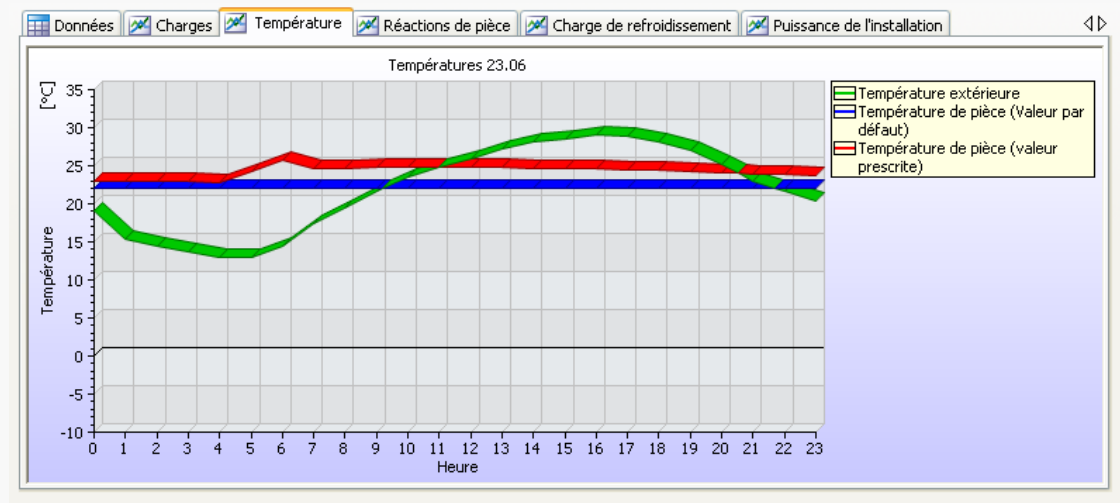
heat losses			
<b>transmission heat loss outwards</b>	$\Phi_{T,bldg}$	<b>9780</b>	W
minimum ventilation heat loss (rooms with natural ventilation)	$\Phi_{V,min,bldg}$	1065	W
ventilation heat loss through infiltration (rooms with natural ventilation)	$\Phi_{V,inf,bldg}$	0	W
ventilation heat loss through infiltration (rooms with mechanical ventilation)	$\Phi_{V,inf,MB}$	0	W
ventilation heat loss through mechanical supply air flow rate	$\Phi_{V,su,bldg}$	0	W
ventilation heat loss through exhaust air volumetric flow	$\Phi_{V,mech,inf}$	0	W
<b>ventilation heat loss</b>	$\Phi_{V,bldg}$	<b>852</b>	<b>W</b>

building heating load			
<b>net heat load</b>	$\Phi_{N,bldg}$	<b>10632</b>	W
<b>additional heating output</b>	$\Phi_{RH,bldg}$	<b>0</b>	W
<b>default building heating load</b>	$\Phi_{HL,bldg}$	<b>10632</b>	W

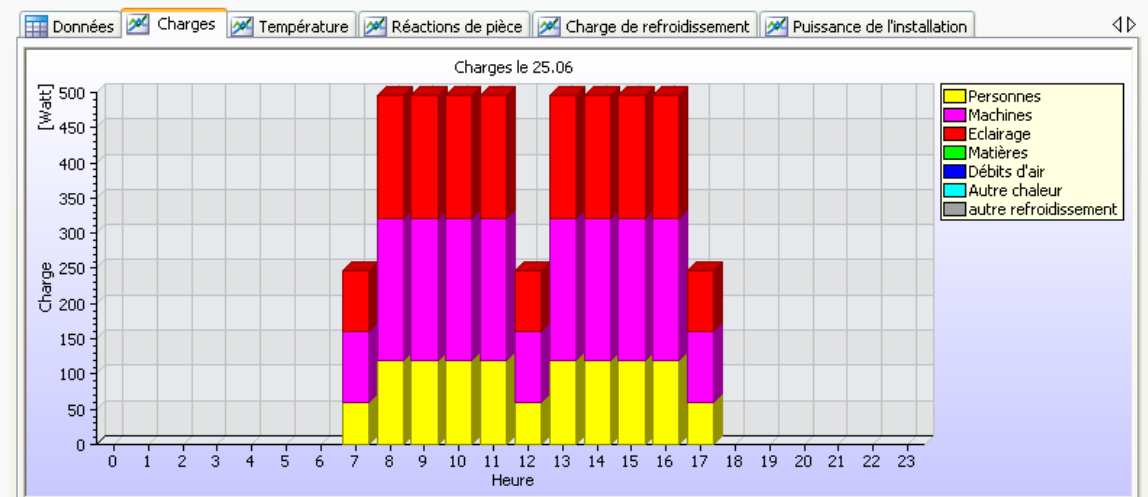
specific values			
heated building area	$A_{N,heated}$	157.8	m <sup>2</sup>
spec heating load per heated building area	$\Phi_{HL,bldg}/A$	67.37	W/m <sup>2</sup>
heated building volume	$V_{N,heated}$	402.4	m <sup>3</sup>
spec heating load per heated building volume	$\Phi_{HL,bldg}/V$	26.42	W/m <sup>3</sup>
heat transmitting enclosing area	$A_{U,heated}$	866.3	m <sup>2</sup>
<b>spec. transmission heat loss</b>	$H'_T$	<b>0.42</b>	<b>W/m<sup>2</sup>K</b>

## 2C) Dynamic cooling load calculation

External loads



Internal loads



## Step 3: Heating Installations

- A) Radiator sizing
- B) Underfloor heating sizing
- C) Pipe network sizing
  
- D) Drawing
  
- E) Material lists

## 3A) Integrated Radiator Sizing

nova - House of Plancal:heater calculation

file view extras Help functions window

House of Plancal

House of Plancal:heater calculation

House of Plancal:Mech\Inst. Heating.nvz

**House of Plancal**

- 001 (new building)
  - 1 (1. upper floor)
    - 0 (ground floor)
      - 001 (Meeting)
      - 002 (Entrance)
      - 003 (Office)
      - 004 (Bath)
      - 005 (Kitchen)
      - 006 (Technic-Ro)

**room data** heating load information template

general descriptions

no. 005  
description Kitchen

room data

length ( $l_R$ ) 2.9 m  
width ( $b_R$ ) 6.5 m  
room ground area ( $A_R$ ) 18.9  $\text{m}^2$   
floor height ( $h_G$ ) 2.8 m  
room volume ( $V_R$ ) 48.3 l  
room enclosing surface ( $A_U$ ) 89.61  $\text{m}^2$   
internal standard temperature ( $\theta_i$ ) 20  $^\circ\text{C}$

radiator specifications

maximum radiator length 1000 mm  
maximum radiator height 900 mm  
maximum radiator depth  
inlet temperature 70  $^\circ\text{C}$   
return temperature 55  $^\circ\text{C}$   
MIS 0 mm

thermal comfort

consider thermal comfort  
 optimise radiator inlet temperature  
cold surfaces standard height 1250 mm  
comfort rating 3

radiator outputs

default heating load ( $\Phi_N$ )  
heat output by auxiliary heating ( $Q_{out}$ )  
heat output by radiators ( $\Phi_{HC,R}$ )

profile specifications

radiator profile EN442 CARADON STELRAD 2005/04 COMPACT radiator

process radiators

calculate radiators delete radiators define no. of radiators distri

calculation defaults data default settings VDI 6030 new rating

no.	heater prc	$\Phi_{HC}$	RO	Q <sub>red</sub>	Q <sub>me</sub>	$\Phi_{HC}$	MIS	max	max	max	au	int	type of ra	leng	heigl	dept	$\Phi_{t,r}$	in	$\theta_i$	fixed
		Wat	%	Wat	Wat	Wat	mm	mm	mm	mm				mm	mm	mm	Wat	kg/h	$^\circ\text{C}$	
001	EN442...	1...		1...	2...	1...	0	1...	900				22	1...	600	100	1...	6...	5...	

01.001.F Office

003 Office

005 Kitchen

01.001.E Kitchen

9.65 / 2.55

## 3B) Underfloor heating

**Demo Heiztechnik**

- 001 (Haus 1)
  - 0 (ground floor)
    - 001 (Duschen)
    - 002 (Vorraum Duschen)
    - 003 (Flur)
    - 004 (Technikraum)
    - 005 (Büro)
    - 006 (Mehrzweckraum)
    - ?! (unlabeled)
  - 1 (1. basement)

room data | heating load information | heating circuit design specifications | template | template | template | template

internal standard temperature ( $\theta_i$ )	22 °C	heating circuit residual areas ( $A_{FR}$ )	0 m <sup>2</sup>
temperature below the room ( $\theta_{s,i}$ )	20 °C	thermal output of additional heating ( $Q_{out}$ )	0 Watt

profile specifications

underfloor heating profile:

floor covering:

insulation layer structure:

process underfloor heating circuits

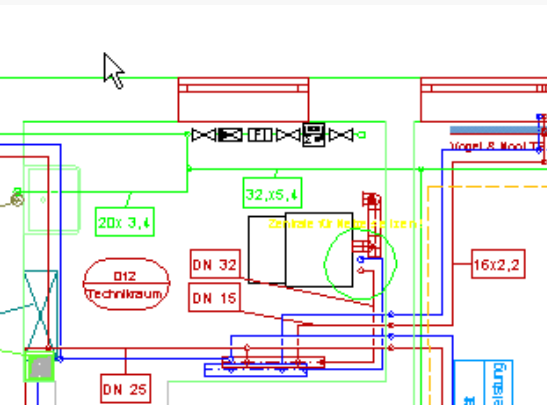
  

no.HC	type	V <sub>PA</sub> cm	V <sub>PA</sub> cm	L <sub>HC</sub> m	B <sub>HC</sub> m	A <sub>F</sub> m <sup>2</sup>	A <sub>F,PA</sub> m <sup>2</sup>	L <sub>R,Anb</sub> m	L <sub>R,HC</sub> m	L <sub>R,DI</sub> m	L <sub>R,total</sub> m	θ <sub>v</sub> °C	q <sub>HC</sub> K	θ <sub>p</sub> °C	Q <sub>H</sub> Watt	Q <sub>F</sub> Watt	θ <sub>F,PA</sub> °C	θ <sub>F,PA</sub> °C	HCD
1	RA		30.0			8.74		5.0	0.0	0.0	10.0	50.0			622				

Demo Heiztechnik: Haus 1 \ Erdgeschoss \ Ausführung EG.nvz.nvz

## 3C) Sizing / Pressure Loss Calculation



- network
  - mark
  - sub-net
  - verify
  - export
  - quick view
- change course
- expose manually
- parallel
- reverse direction

The screenshot shows the PLANCAL software interface for a drinking water calculation. The main window displays a tree view of the distribution network, including:
 

- sanktion riser
- Copper pipe EN 1057
- T-piece
- y-pipe
- sec
- bathtub
- shower basin
- washstand
- Distribution 1
- sanktion riser
- Distribution 2
- sanktion riser
- Distribution 3

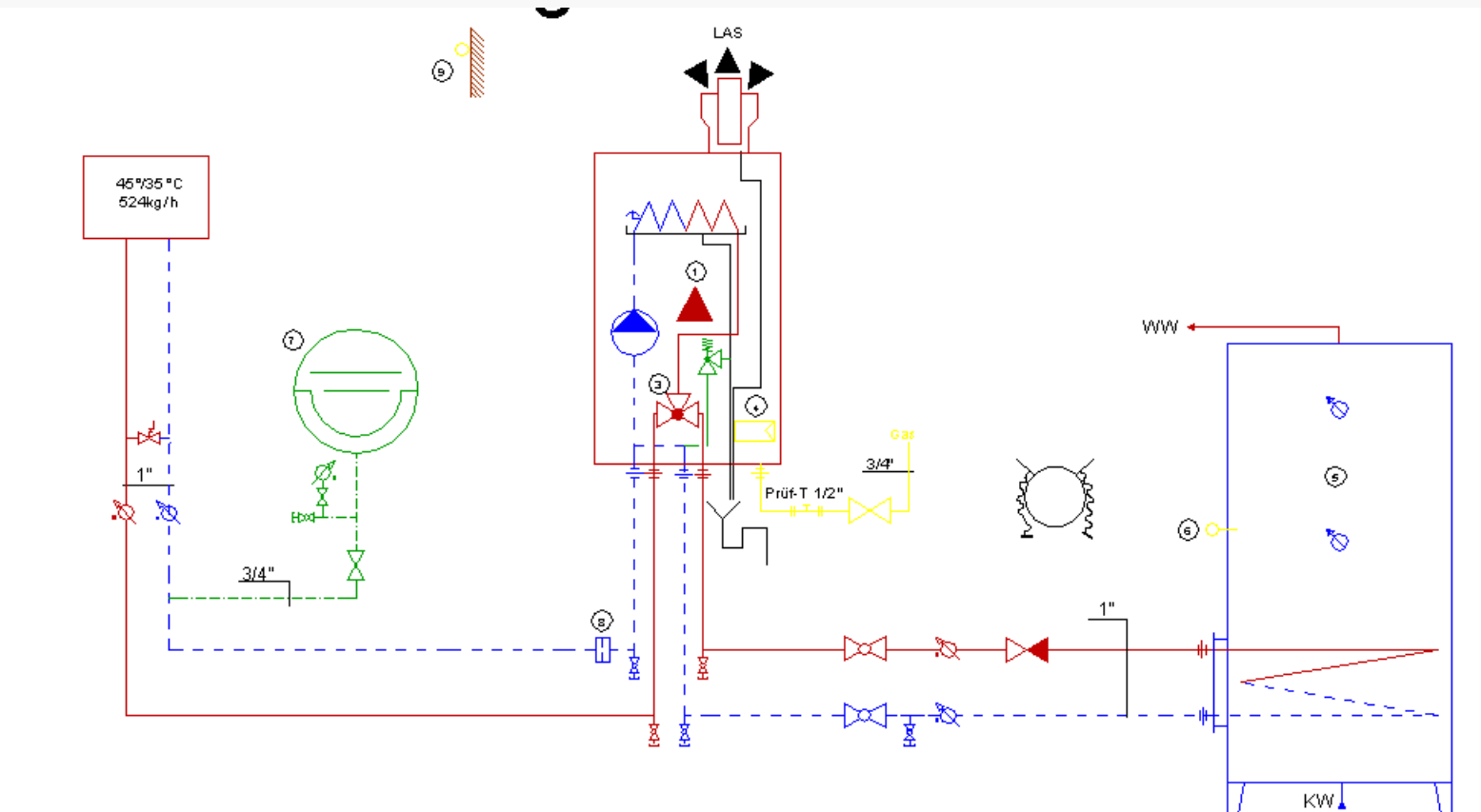
The right-hand side of the interface shows a component palette with various plumbing elements:
 

- cold water control centre
- hot water control centre
- circulation control centre
- section
- T-piece
- distributor
- mixed distributors
- drinking water heater con...
- drinking water heater with circulation connection
- drinking water heater
- circulation T-piece
- washstand
- bathtub
- double washstand
- drain basin

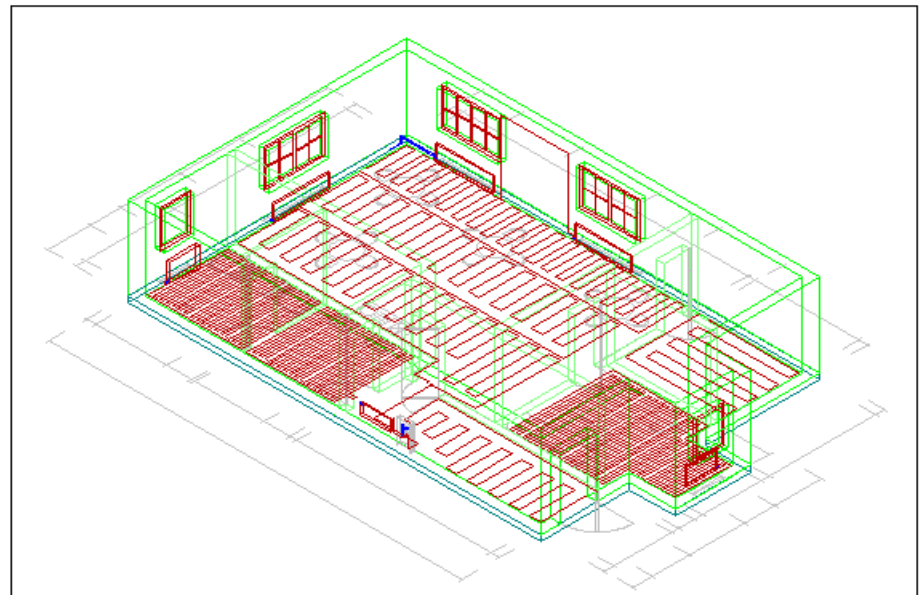
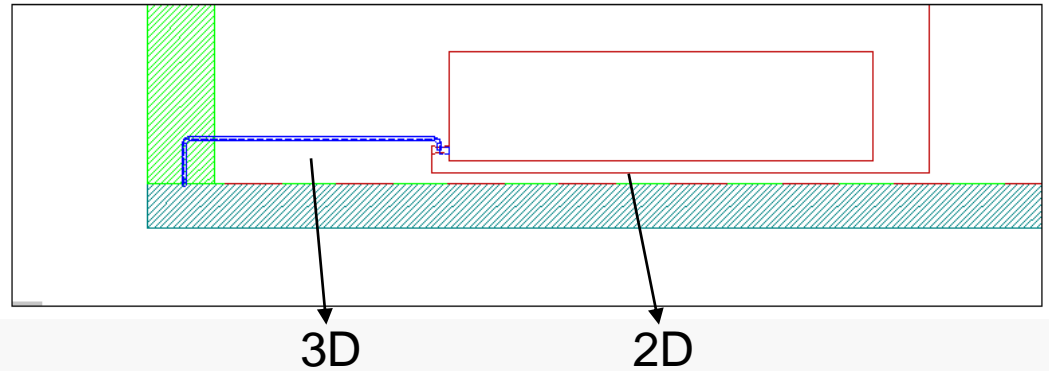
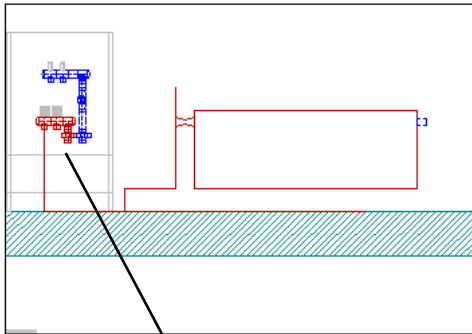
The bottom right corner displays a detailed table for the selected component:

element description	
length being calulad	1.6 m
dGeohheight	
part section number	
<b>default</b>	
pipe material	Copper pipe EN 1057
<b>insulation</b>	
peak volumetric flow VR	0.98 l/s
total volumetric flow VR	1.07 l/s
DN	20
velocity	1.74 m/s
R	33.41 mBar/m
pipe pressure loss	51.20 mBar
section pressure loss	31.03 mBar
calculate	

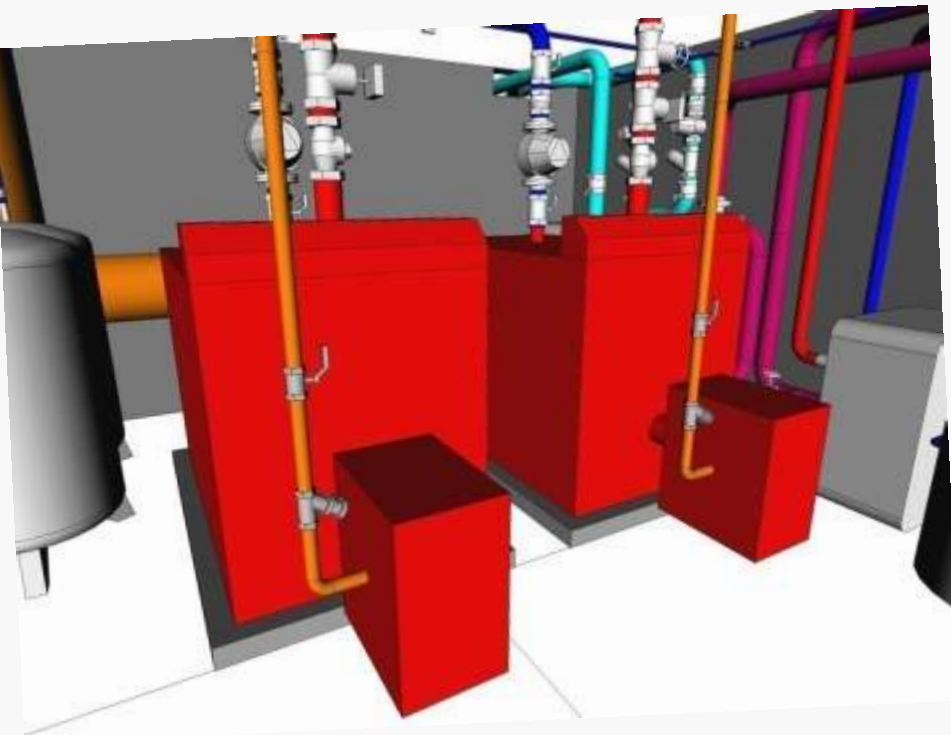
## 3D) Heating Drawing: Heating Scheme



## Heating Drawing: 2D, 3D, sections



Heating Drawing: 2D, 3D, sections



„online shading“ in nova



Real installation

## 3E) Material lists

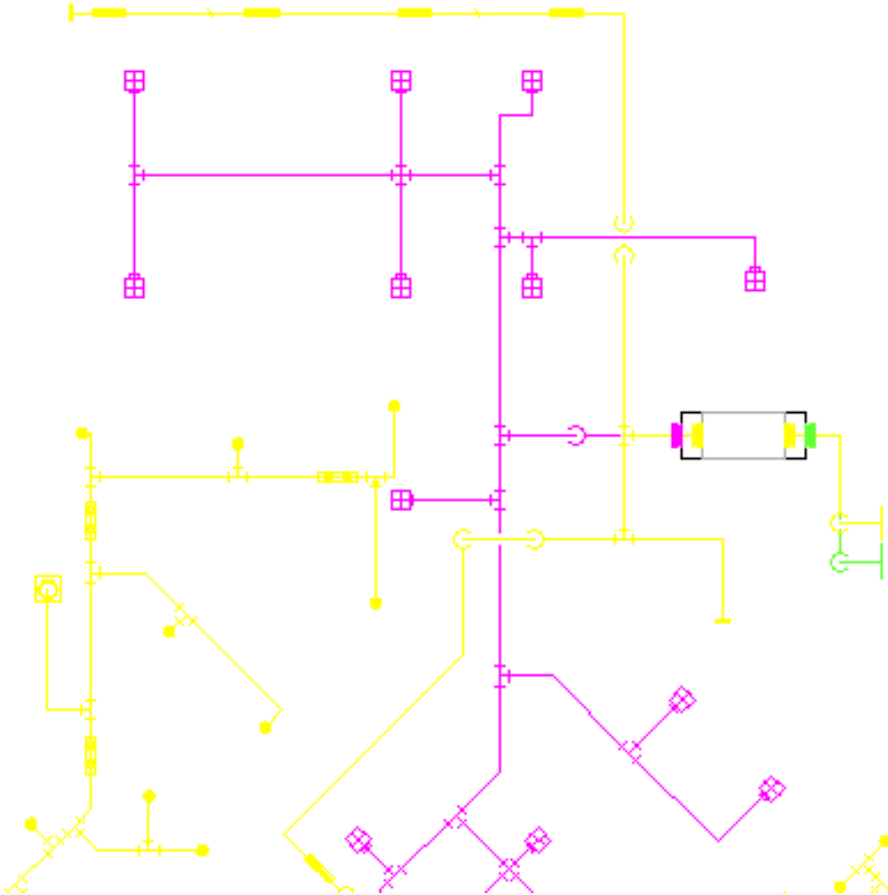
Prj.Nr.  
Projekt  
Formteile

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		1	SR	Stutzen rund	13	F1				100			100													1	1.00					
		1	BS	Bogen symmetrisch	20	F1	200	450			50	50		90	100								S 20	S 20		1.25	1.25			Abluft		
		1	BS	Bogen symmetrisch	20	F1	450	450			50	50		90	100								S 20	S 20		1.74	1.74			Abluft		
		1	LT	Luftleitungsteil	12	F1	450	200					400										S 20	S 20		1	1.00			Abluft		
		1	LT	Luftleitungsteil	12	F1	450	300					400										S 20	S 20		1	1.00			Abluft		
		1	LT	Luftleitungsteil	12	F1	450	450					150										S 20	S 20		1	1.00			Abluft		
		1	LT	Luftleitungsteil	12	F1	450	450					300										S 20	S 20		1	1.00			Abluft		
		1	LT	Luftleitungsteil	12	F1	450	450					400										S 20	S 20		1	1.00			Abluft		
		1	LT	Luftleitungsteil	12	F1	450	450					500										S 20	S 20		1	1.00			Abluft		
		2	SR	Stutzen rund	13	F1				125			50													0.02	0.04			Abluft		
		1	TG	T-Stück oben gerade	70	F1	300	450		450			750		100		450	150	150	50	50	S 20	S 20	S 20		1.35	1.35			Abluft		
		1	TG	T-Stück oben gerade	70	F1	450	450		450			750		100		450	150	150	50	50	S 20	S 20	S 20		1.62	1.62			Abluft		
		1	UA	Übergang asymmetrisch	41	F1	800	200	450	200	125	-175	500								50	50	S 30	S 20		1.06	1.06			Abluft		
		5	UA	Übergang asymmetrisch	41	F1	800	200	450	450	250	-175	500								50	50	S 30	S 20		1.12	5.59			Abluft		
		1	UA	Übergang asymmetrisch	41	F1	800	200	450	300	175	-175	500								50	50	S 30	S 20		1.06	1.06			Abluft		
		1	US	Übergang symmetrisch	40	F1	300	450	200	450			500								50	50	S 20	S 20		1	1.00			Abluft		
		1	US	Übergang symmetrisch	40	F1	450	450	300	450			500								50	50	S 20	S 20		1	1.00			Abluft		
		7	BO	Boden	1	F2	200	800			10											S 30			1	7.00			Abluft			
		1	TG	T-Stück oben gerade	70	F2	450	550		450			750		100		450	250	150	50	50	S 20	S 20	S 20		1.95	1.95			Abluft		
		1	TG	T-Stück oben gerade	70	F2	450	700		550			750		100		450	300	150	50	50	S 20	S 20	S 20		2.27	2.27			Abluft		
		1	TG	T-Stück oben gerade	70	F2	450	850		700			750		100		450	300	150	50	50	S 30	S 20	S 20		2.49	2.49			Abluft		
		1	TG	T-Stück oben gerade	70	F2	450	850		450			1250		100		950	550	150	50	50	S 30	S 20	S 30		4.79	4.79			Abluft		
		1	UA	Übergang asymmetrisch	41	F2	450	950	600	850	0	75	500								50	50	S 30	S 20		1.48	1.48			Abluft		
		1	UA	Übergang asymmetrisch	41	F2	855	550	850	600	65	-3	500									50	50	S 30	S 30		1.46	1.46			Abluft	
		1	UA	Übergang asymmetrisch	41	F2	1500	300	950	450	190	-275	500									50	50	S 30	S 30		2.05	2.05			Abluft	
		36																								46.20						

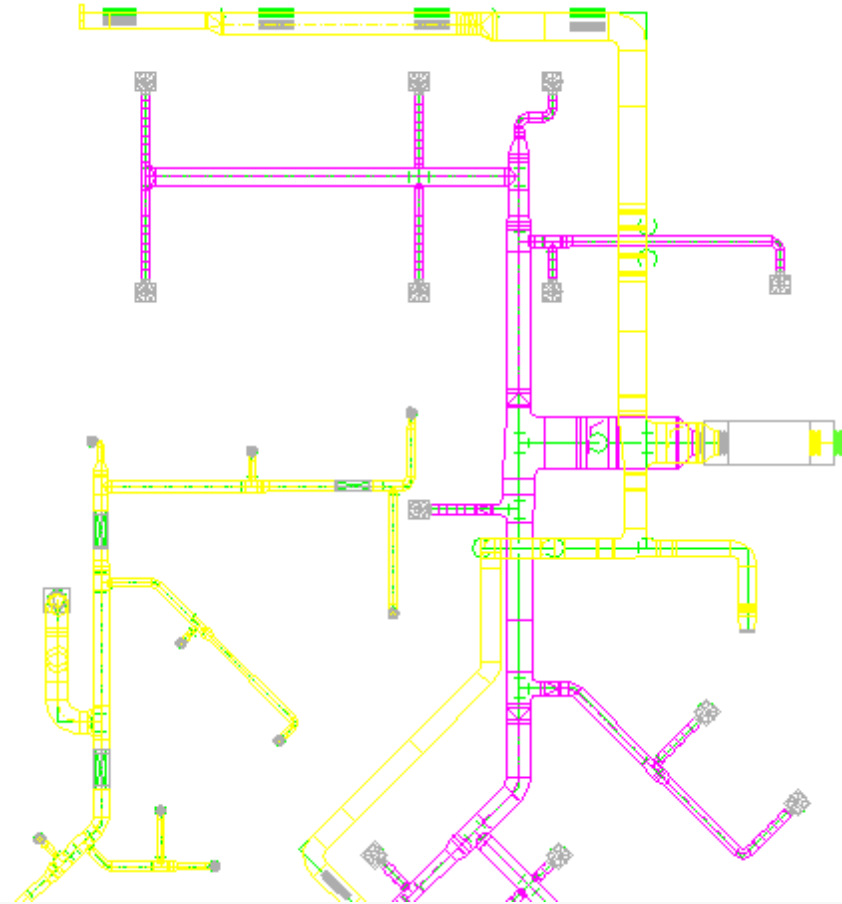
## Step 4: Ventilation Installations

- A) Duct sizing and 2/D3D production
- B) Libraries
- C) Drawing
- D) Material lists

## 4A) Duct sizing and 2D/3D conversion

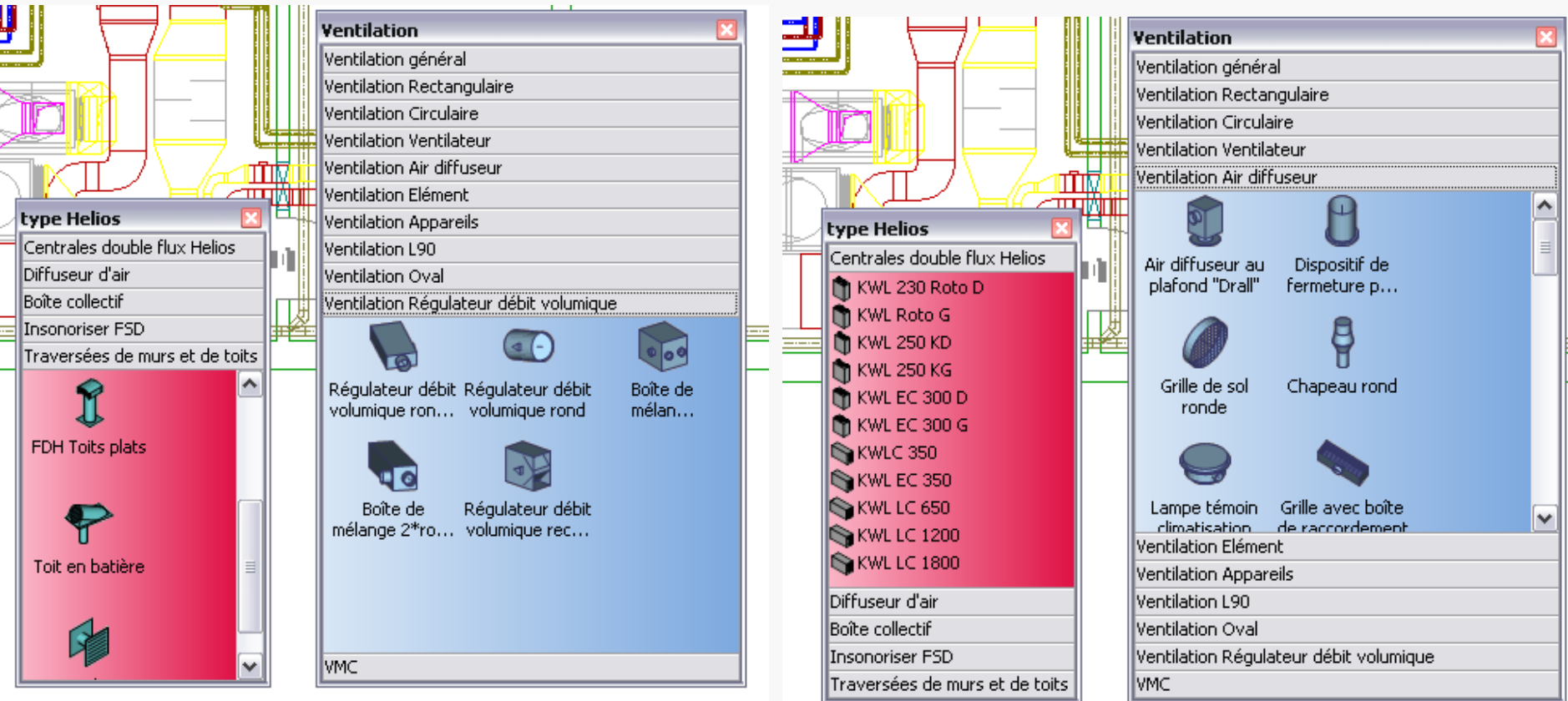


Use single line drawing for fast duct sizing



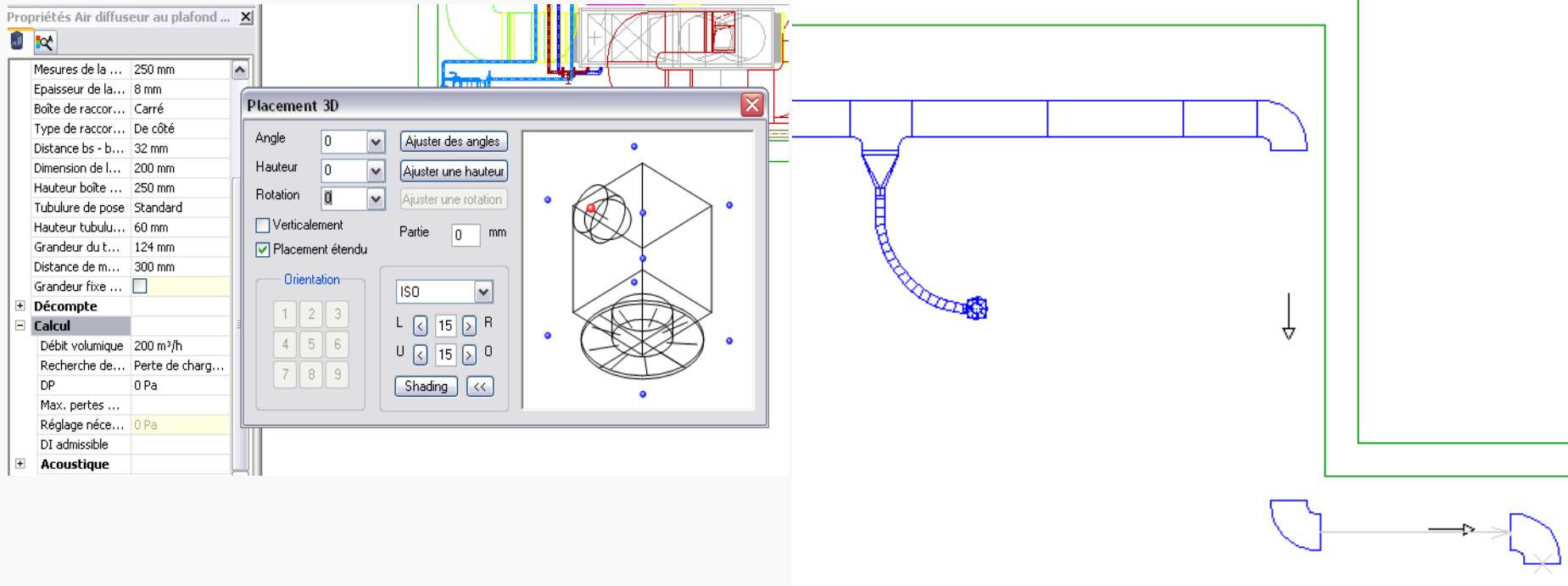
Convert into 2D/3D drawing automatically

## 2D/3D drawing - libraries



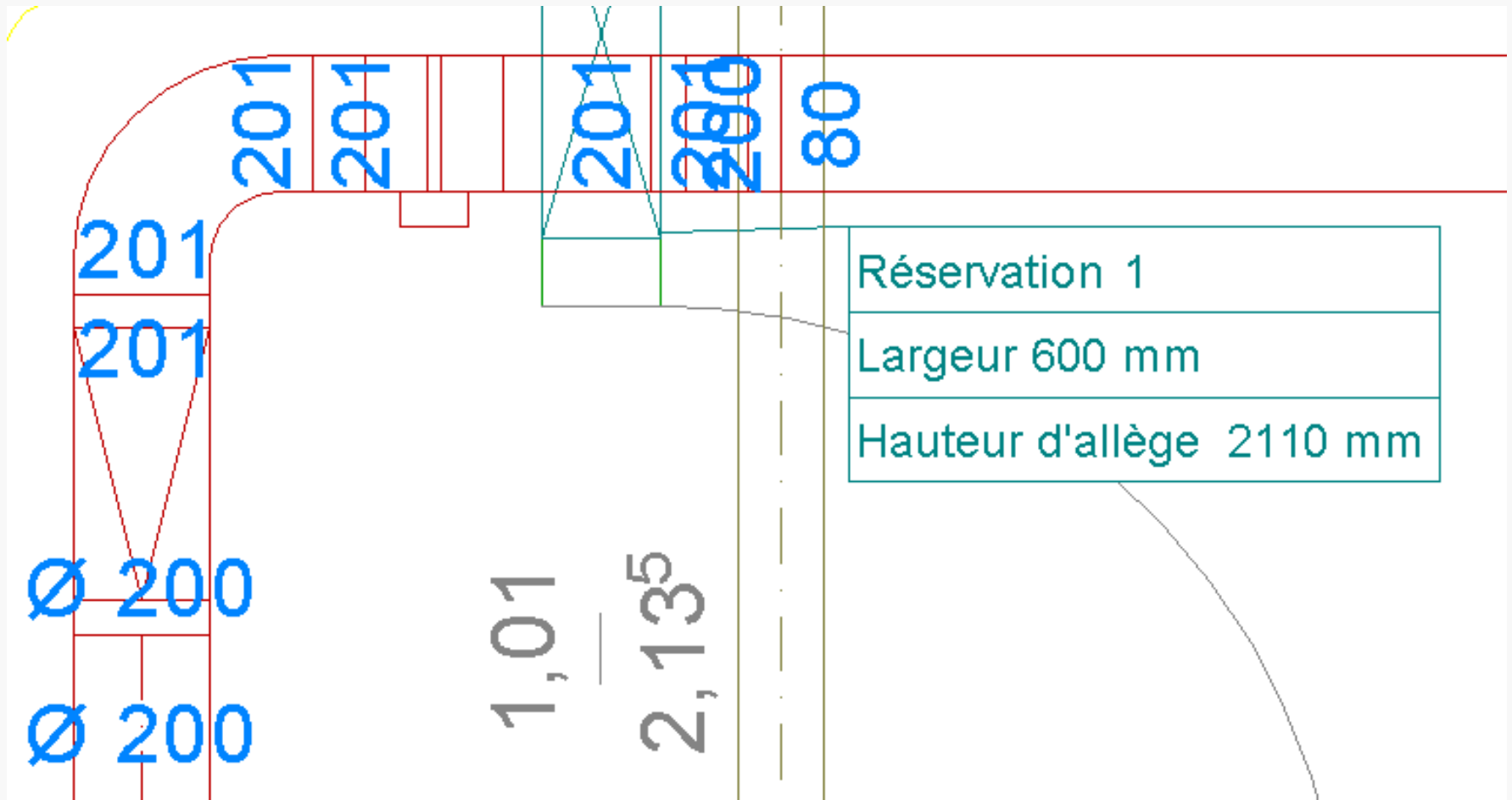
Dynamic objetct for schematic, single line and 2D/3D drawings

## Construction in 2D and 3D



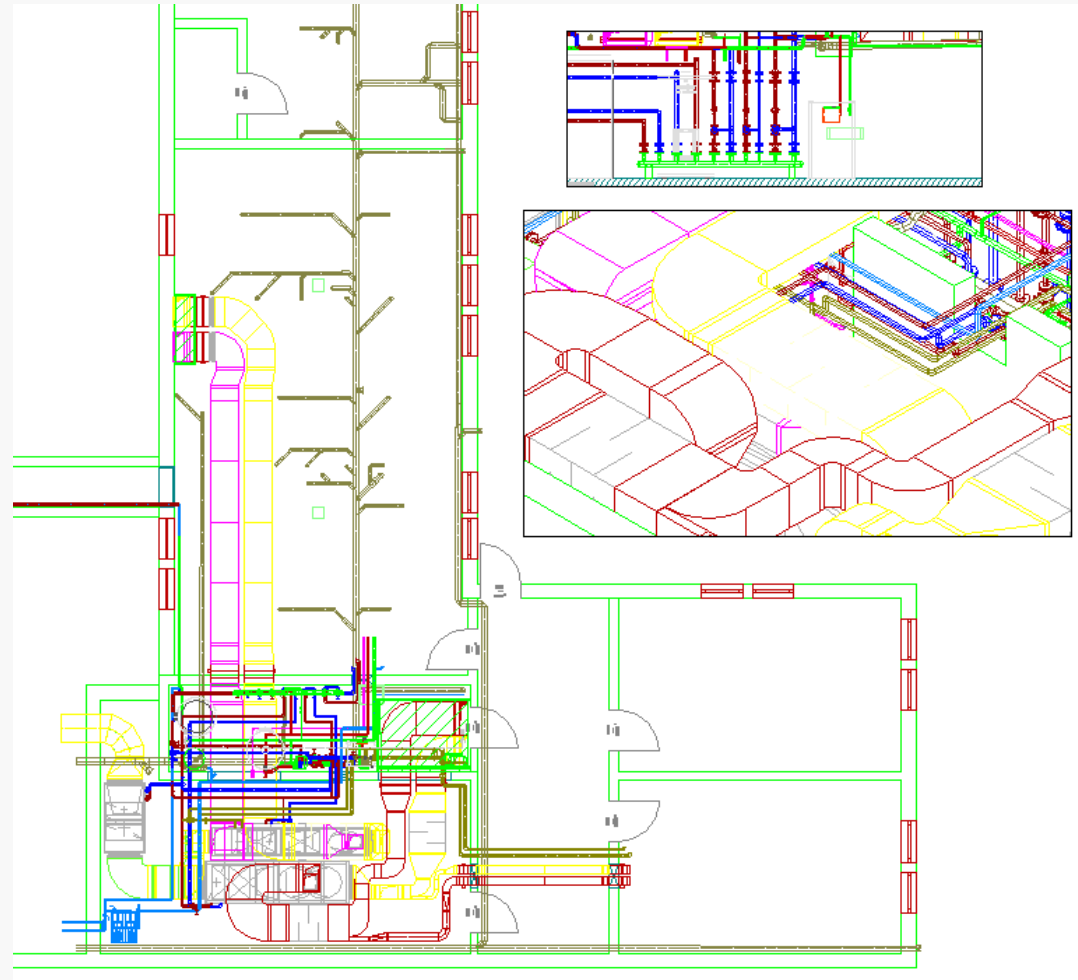
Specific functions for 2D/3D plans

## Tables



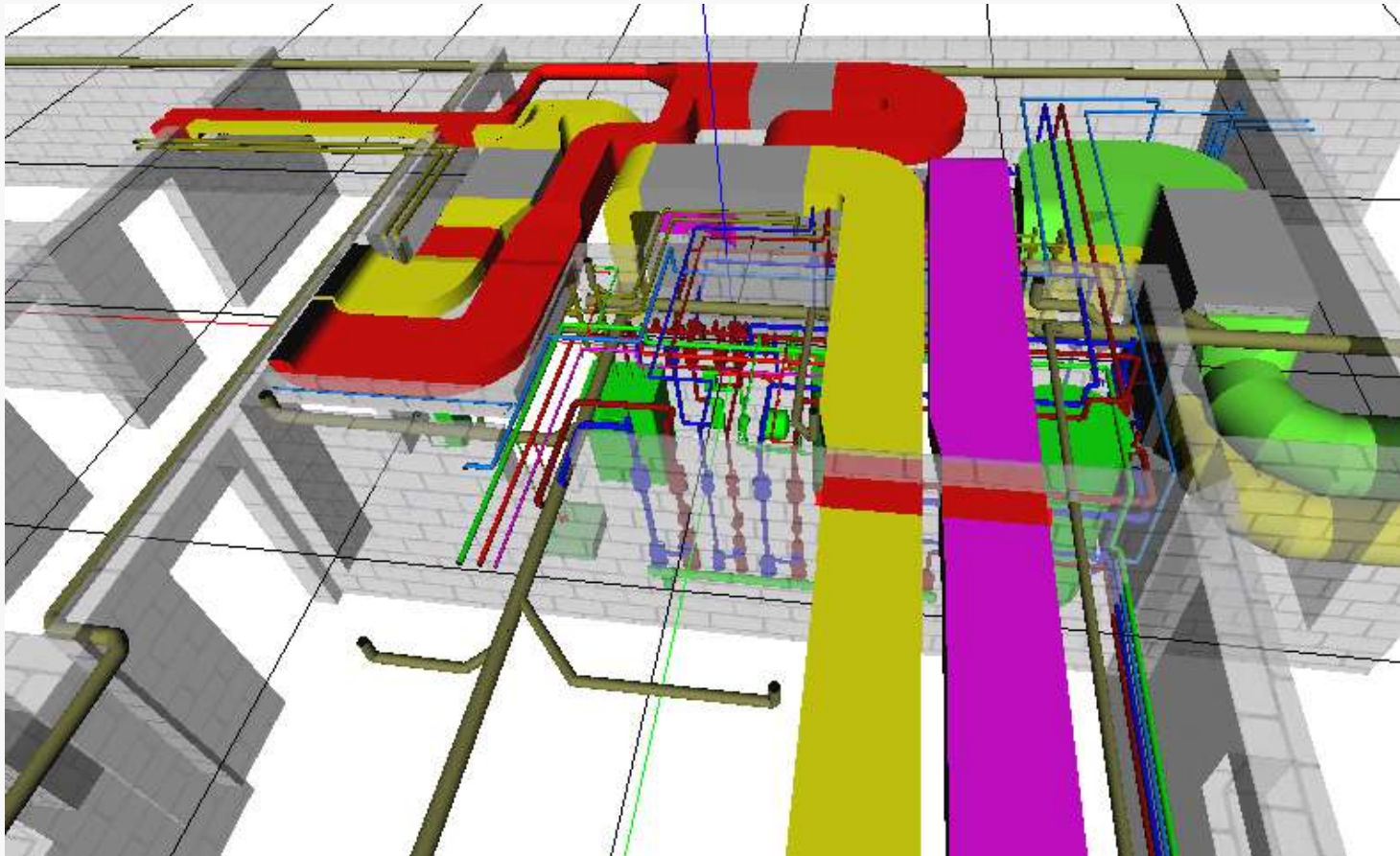
Automatic labling function, collision testing and break throughs

## Views



Unlimited views – plan, sections, iso views – dynamically related

## Online Shading



Virtual « visit » of you rinstallations

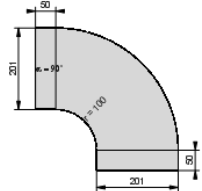
mercredi, 19. novembre 2008

Téléphone

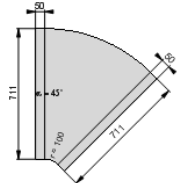
Téléfax:

E-Mail:

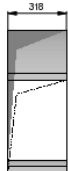
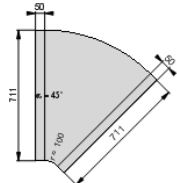
Code synétique (BS)



Code synétique (BS)



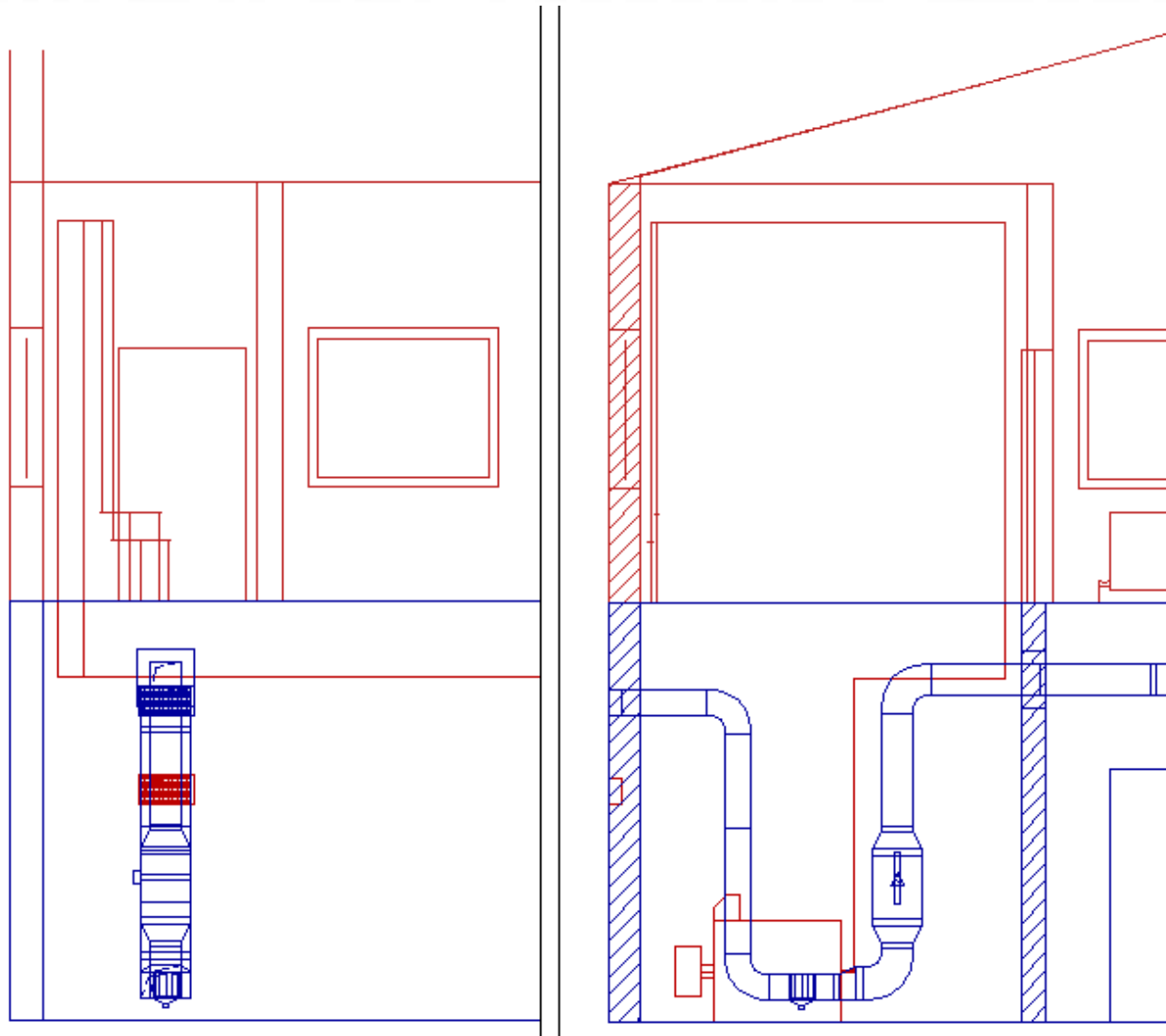
Code synétique (BS)



2		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)		1015			
3		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)		1015			
4		1 Socle pour appareil de climatisation		Type et mesures (organes d'arrêt, passages d'air)		1015			
5		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)		1015			
6		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)		1015			
7		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)		1015			
8		1 Tubulure manchette en toile		Type et mesures (organes d'arrêt, passages d'air)	855	855			
9		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)		1015			
10		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)		1015			
11		1 Tubulure manchette en toile		Type et mesures (organes d'arrêt, passages d'air)	855	855			
12		1 Coude à segment 4 parties	BSE	Pièce préfabriquée (ronde)					
13		1 Tubulure manchette en toile		Type et mesures (organes d'arrêt, passages d'air)	855	855			
14		1 Tubulure manchette en toile		Type et mesures (organes d'arrêt, passages d'air)	855	855			
15		1 Pièce intermédiaire asymétrique	RA	51 Surface m <sup>2</sup>	F2	855	855	700	-197
16		1 Tuyau métallique agraphé	R-R	Cote en longueur (m)				700	
17		1 Tuyau métallique agraphé	R-R	Cote en longueur (m)				700	
18		1 Coude à segment 4 parties	BSE	Pièce préfabriquée (ronde)					
19		1 Pièce intermédiaire asymétrique	RA	51 Surface m <sup>2</sup>	F2	855	855	700	-197
20		1 Socle pour appareil de climatisation		Type et mesures (organes d'arrêt, passages d'air)			710		
21		1 Socle pour appareil de climatisation		Type et mesures (organes d'arrêt, passages d'air)			1015		
22		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)			710		
23		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)			710		
24		1 Composants appareil d'aération		Type et mesures (organes d'arrêt, passages d'air)			710		

Material lists – various printable reports – export to Excel or eKlimax

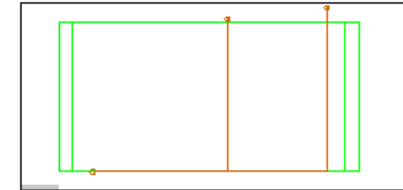
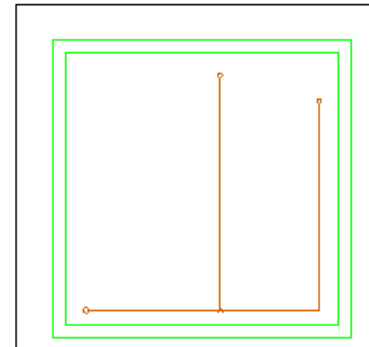
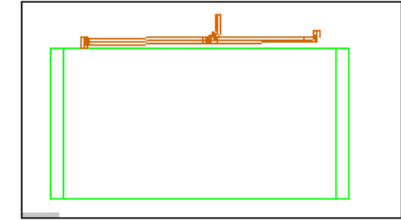
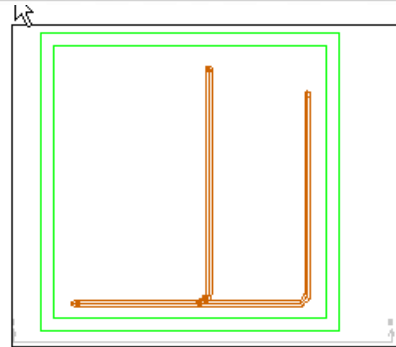
and more ....



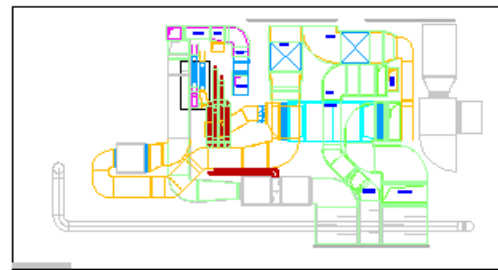
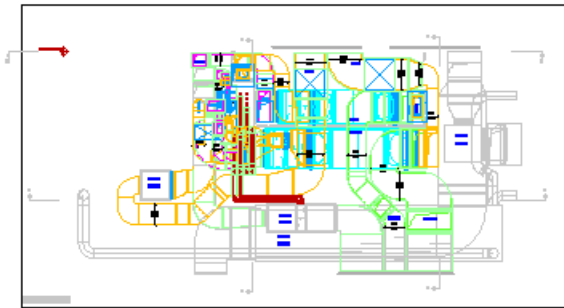
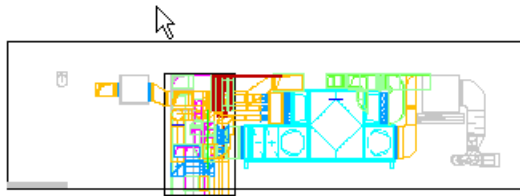
Multiple level views

**Sanitary Sewage  
water can be done in  
2D.**

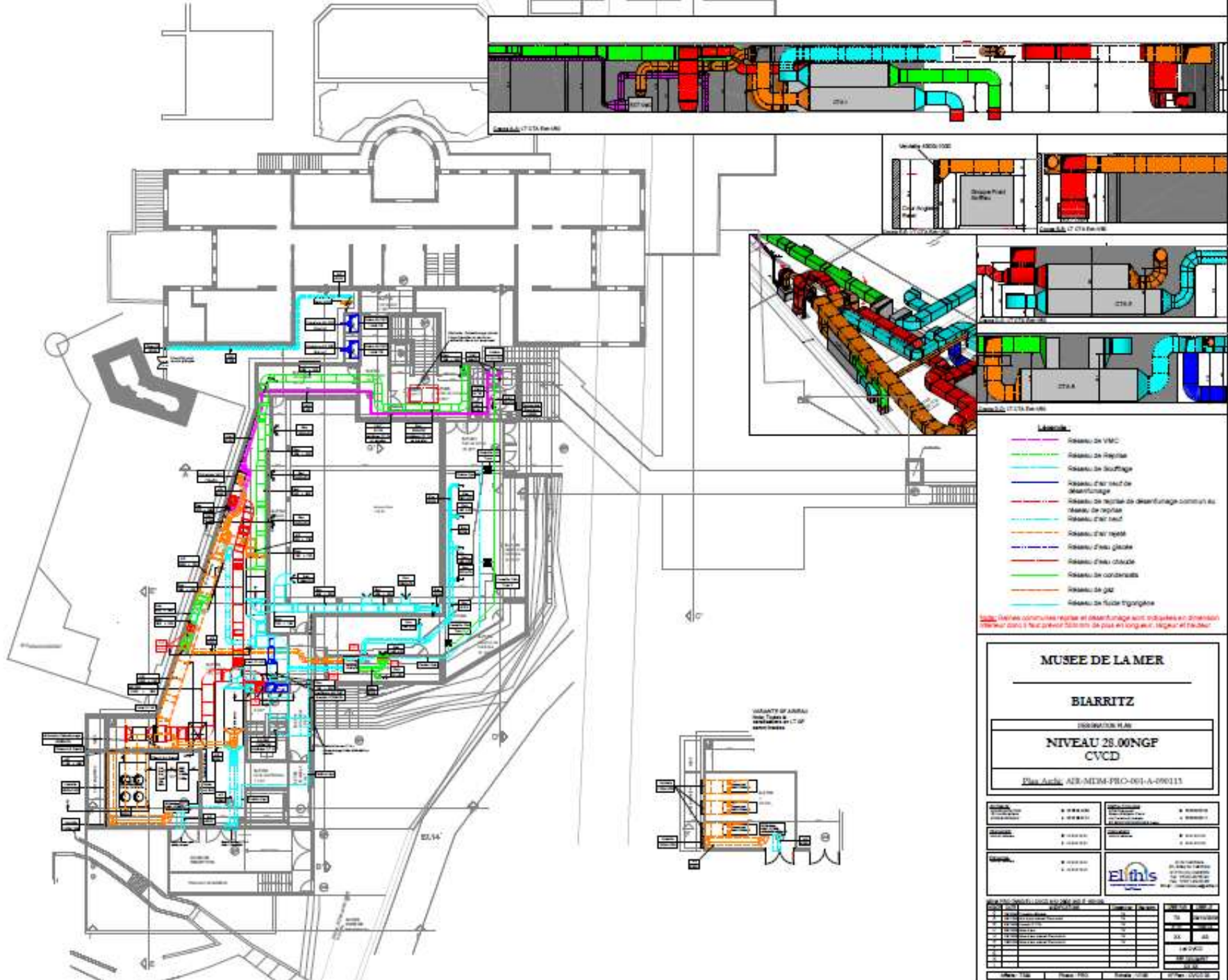
**Nova does the  
interpretation of 3D  
with the correct  
hides**











- Légende**
- Réseaux de VMC
  - Réseaux de Réception
  - Réseaux de Chauffage
  - Réseaux d'air neuf de distribution
  - Réseaux de travail de désenfumage communs au
  - Réseaux d'air neuf
  - Réseaux d'air repris
  - Réseaux d'eau glacée
  - Réseaux d'eau chaude
  - Réseaux de condensats
  - Réseaux de gaz
  - Réseaux de fluides frigorigènes

Les Réseaux de travail de désenfumage sont indiqués en orange dans le plan pour faciliter la pose en longeur, largeur et hauteur.

**MUSEE DE LA MER**

**BIARRITZ**

PROJET N° 10  
**NIVEAU 28.00NGF  
 CVCD**

Plan Aériel AIR-MEM-PRO-001-A-090113

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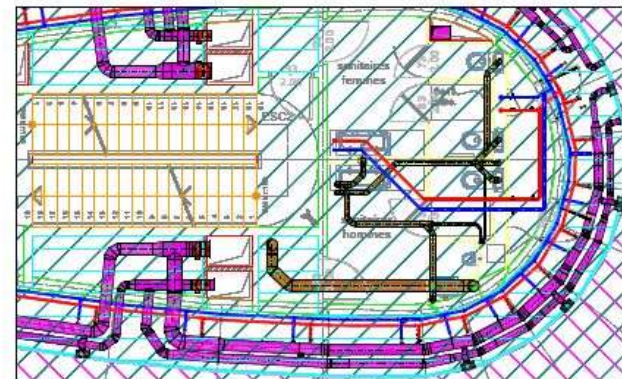
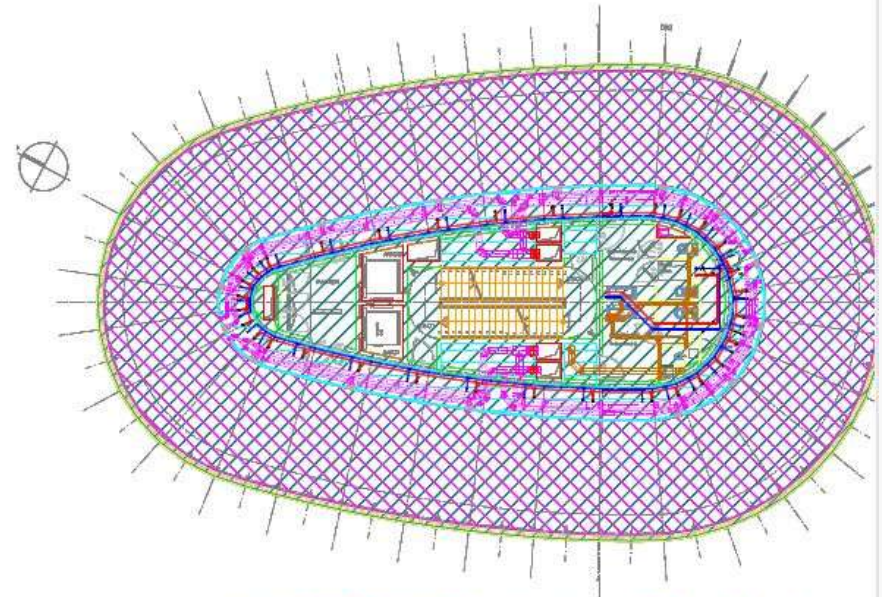
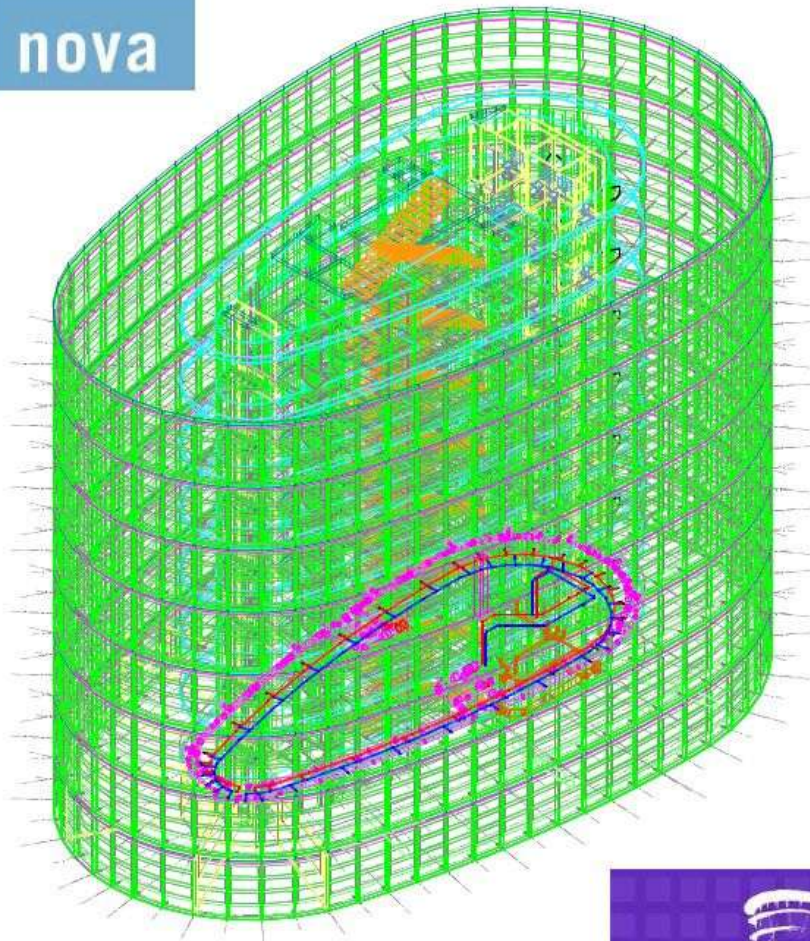
**Elthys**

CONSEIL EN SERVICES TECHNIQUES  
 ET EN PROJECTION DE PROJET

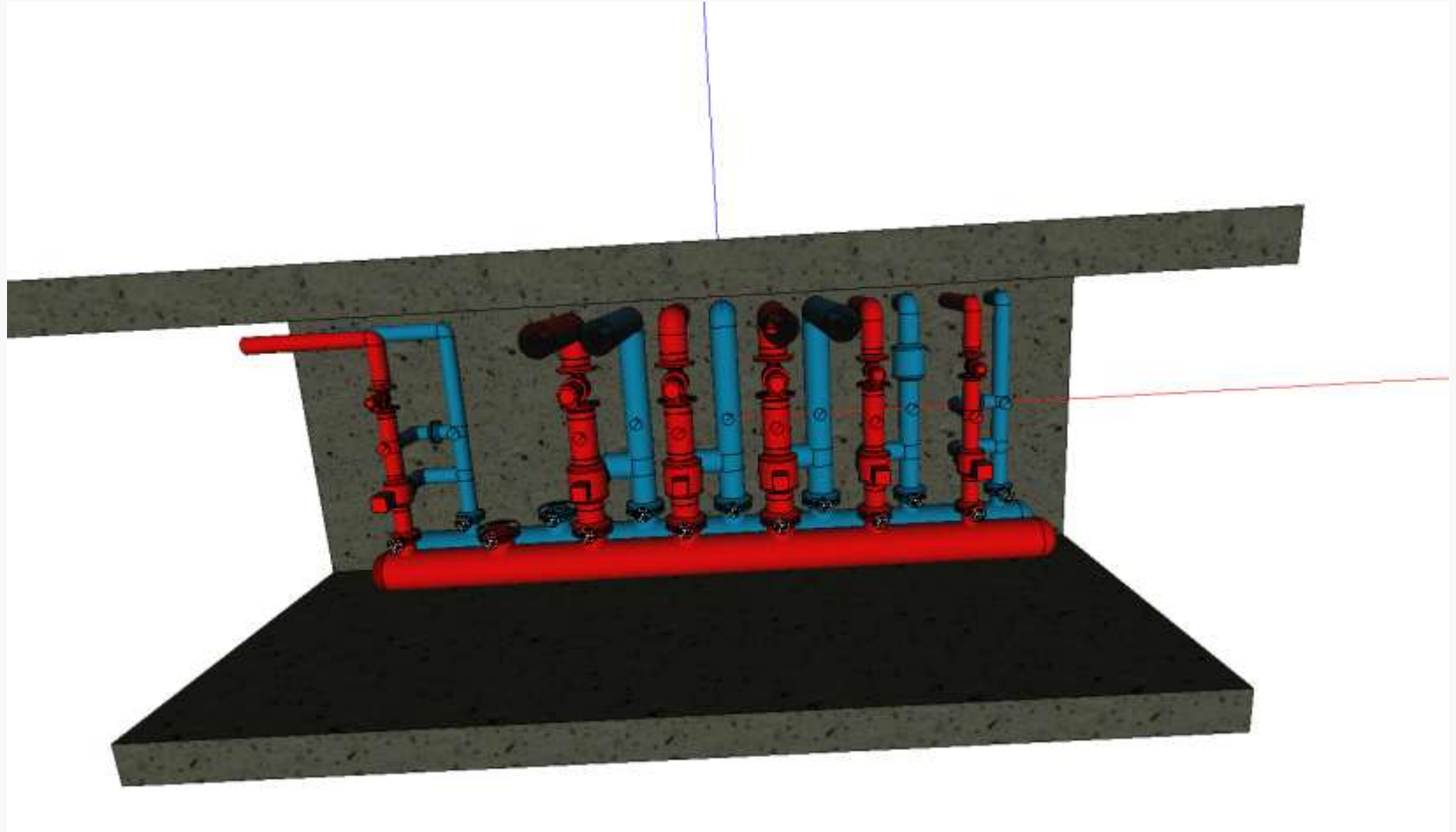
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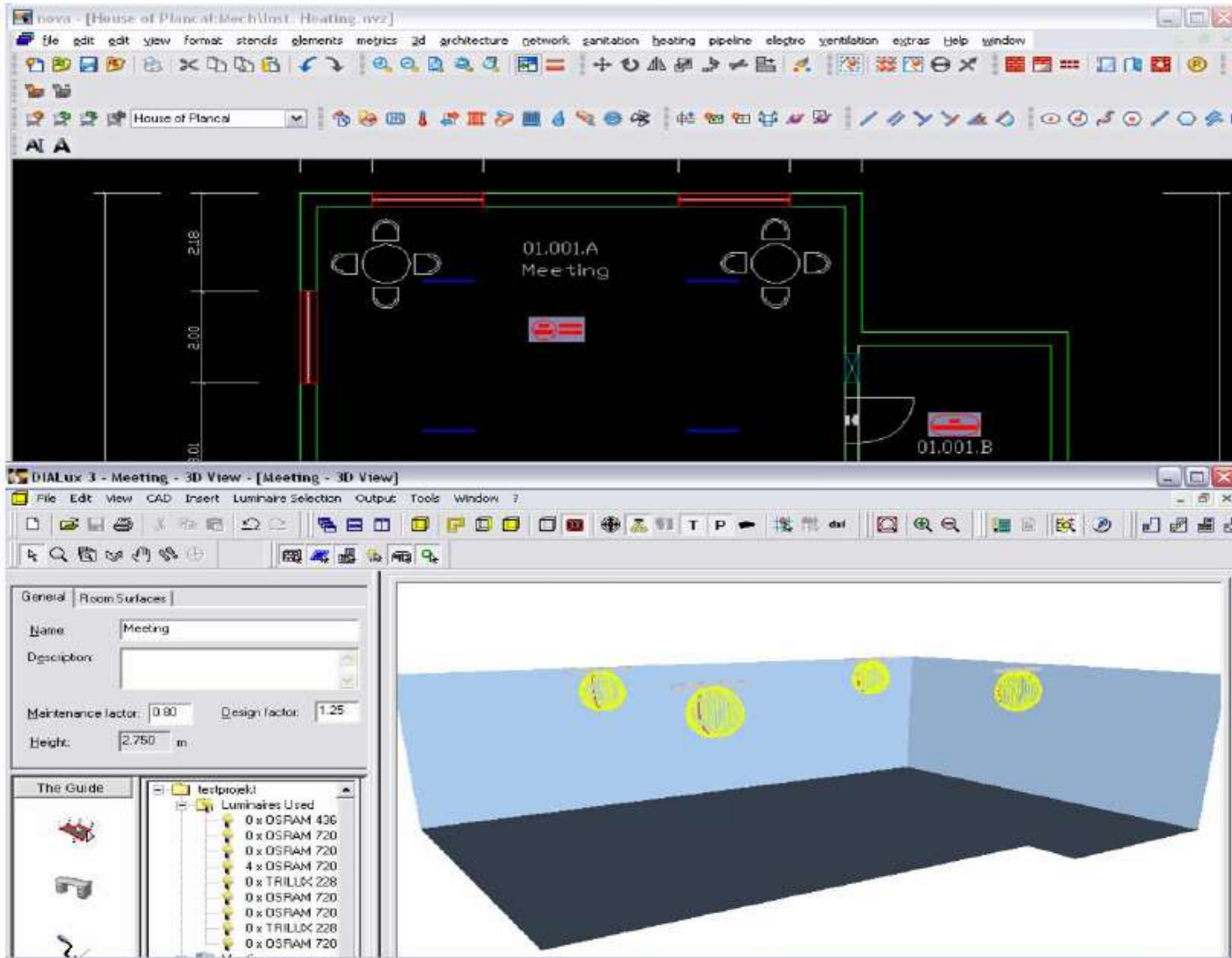
# PLANCAL

nova



# Detailing in 3D Onlineshading





# YOUR SOLUTION - NOVA

# PLANCAL

The image displays a comprehensive set of architectural and engineering drawings, including floor plans, 3D models, and data tables, illustrating the PLANCAL software solution. The drawings are arranged in a grid-like fashion, showcasing various views and data outputs. A central logo for PLANCAL is prominently displayed, along with the website address [www.plancal.ch](http://www.plancal.ch).

The drawings include:

- Architectural floor plans with overlaid colored lines representing infrastructure.
- 3D perspective views of building structures with embedded infrastructure.
- Technical diagrams and data tables, likely representing system specifications or performance metrics.
- Software interface screenshots showing data entry and visualization.
- 3D models of infrastructure components like pipes and conduits.
- Technical drawings of electrical or mechanical systems.
- Photographs of physical infrastructure installations.

The PLANCAL logo is centered in a grey box with the text "PLANCAL" in bold, black, sans-serif font. Below it, the website address "www.plancal.ch" is written in a smaller font. The overall layout is a collage of various technical and architectural drawings, illustrating the software's capabilities in infrastructure planning and visualization.