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Vergleich PHTG Erweiterung – Gebäude M / P
31.03.17

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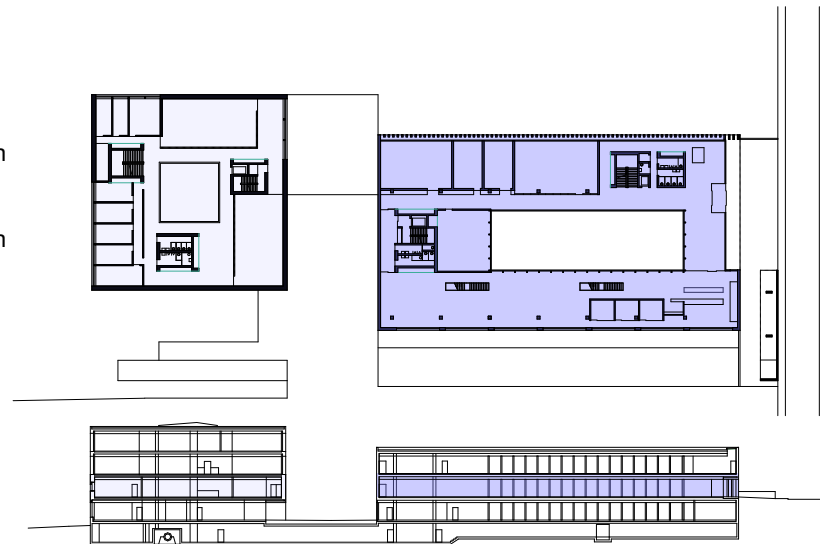
BKP Positionen		Gebäude M/P			Erweiterungsbau		
		Bauabrechnung 06.11.09			Botschaft 10.01.17 / KV 03.11.16		
		Fr.	Fr.	%	Fr.	Fr.	%
0	Grundstückskosten		0	0.0%		2'290'000	8.5%
1	Vorbereitungsarbeiten		132'349	0.4%		1'880'000	7.0%
10	Bestandsaufnahmen, Baugrunduntersuchungen	5'059		0.0%	20'000		0.1%
11	Räumungen, Terrainvorbereitungen	0		0.0%	45'000		0.2%
12	Sicherungen, Provisorien	6'532		0.0%	5'000		0.0%
13	Gemeinsame Baustelleneinrichtung	96'937		0.3%	70'000		0.3%
15	Anpassungen an bestehende Erschliessungsleitungen	4'276		0.0%	400'000		1.5%
17	Spezielle Foundationen, Baugrubensicherungen, Grundwasserabdichtung	0		0.0%	1'320'000		4.9%
19	Honorare	19'545		0.1%	20'000		0.1%
2	Gebäudekosten		29'466'103	96.1%		19'790'000	73.6%
20	Baugrube	750'373		2.4%	1'340'000		5.0%
21	Rohbau 1	11'336'266		37.0%	4'380'000		16.3%
22	Rohbau 2	623'795		2.0%	3'080'000		11.5%
23	Elektroanlagen	2'833'325		9.2%	1'790'000		6.7%
24	Heizungs– und Lüftungsanlagen	3'302'335		10.8%	1'730'000		6.4%
25	Sanitäranlagen	989'690		3.2%	450'000		1.7%
26	Transportanlagen (Aufzüge)	181'915		0.6%	130'000		0.5%
27	Ausbau 1	3'909'839		12.7%	2'840'000		10.6%
28	Ausbau 2	2'592'754		8.5%	1'580'000		5.9%
29	Honorare	2'925'811		9.5%	2'470'000		9.2%
3	Betriebseinrichtungen		0	0.0%		470'000	1.7%
33	Elektroanlagen (Händetrockner, Zimmerbelegungsanzeigen, Mediensteuerung, Monitore Besucherinfo)				115'000		0.4%
34	Heizungs– und Lüftungsanlagen (Luft/Klimatisierung Schulküche)				107'000		0.4%
35	Sanitäranlagen (Kücheneinrichtung Schulküche)				226'900		0.8%
39	Ausbau 2 (Festinstalliertes Mobiliar, z.B. Papierkörbe)				20'000		0.1%
4	Umgebung		443'035	1.4%		920'000	3.4%
40	Terraingestaltung	0		0.0%	55'800		0.2%
41	Roh– und Ausbauarbeiten	0		0.0%	237'800		0.9%
42	Gartenanlagen	412'407		1.3%	252'900		0.9%
44	Installationen	0		0.0%	3'200		0.0%
46	Kleinere Trassenbauten	0		0.0%	297'900		1.1%
49	Honorare	30'628		0.1%	70'000		0.3%
5	Baunebenkosten		527'319	1.7%		460'000	1.7%
6	Reserve		0	0.0%		870'000	3.2%
9	Ausstattung (Kunst am Bau)		120'494	0.4%		200'000	0.7%
Total, inkl. 8% MwSt.			30'669'301	100.0%		26'880'000	100.0%

Kennwert		Gebäude M/P				Erweiterungsbau			
		Bauabrechnung 06.11.09				Botschaft 10.01.17 / KV 03.11.16			
GV	Gebäudevolumen SIA 116	m3	47'316			m3	23'628		
GV	Gebäudevolumen SIA 416	m3	45'285			m2	4'878	100.0%	
GF	Geschossfläche	m2	10'790	100.0%		m2	2'355	48.3%	
HNF	Hauptnutzfläche	m2	4'881	45.2%		m2	610	12.5%	
NNF	Nebennutzfläche	m2	1'552	14.4%		m2	1'215	24.9%	
VF	Verkehrsfläche	m2	3'062	28.4%					
				88.0%				85.7%	
Verhältnis GV / GF			4.19				4.84	115.5%	
Teuerung April 2009 bis 2016			3%						
Kosten pro m3 GV in BKP 2			650						
Kosten pro m3 GV in BKP 2, aufindexiert auf 2016		Fr.	670			Fr.	840		
Minderkosten für Ausführung in Minergie statt Minergie – P, Annahme 4%						Fr.	-35		
Minderkosten für Wegfall schwieriger Baugrund, Annahme Fr. 700'000.- in BKP 20						Fr.	-30		
Effizienzverluste im kubischen Verhältnis GV / GF ggü. Bestandsgebäuden (10 bis 15%)						Fr.	-125		
Vergleichskosten pro m3 GV in BKP2 Erweiterungsbau unter vergleichbaren Bedingungen zu M/P						Fr.	650		

Vergleichsobjekte									
Gebäudekosten BKP 2 + 3						Fr. 20'220'000			
Gebäudekosten pro m3 GV in BKP 2 + 3						Fr.	857		
Erweiterung FH für Technik, Rapperswil (2015) – Minergie	GV/GF	4.80	m3	31'295		Fr.	884	103.2%	
Neubau Hochschule für Gestaltung HKG Dreispitz, Basel (2015) – Minergie-P Eco	GV/GF	5.19	m3	61'915		Fr.	826	96.4%	
Neubau Hörsäle und Mediothek PH Graubünden, Chur (2010) – Minergie	GV/GF	6.21	m3	6'279		Fr.	850	99.2%	

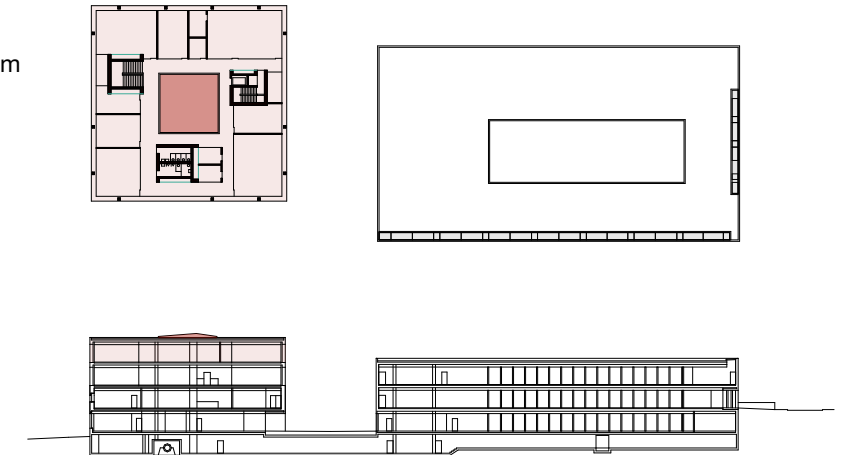
Ebene +1

	GF	= 1'129 m2	Höhe = 3.95m
	GV	= 4'460 m3	
	GF	= 1'701 m2	Höhe = 4.00m
	GV	= 6'804 m3	

$$GV_{\text{Total}} = 11'264 \text{ m}^3$$


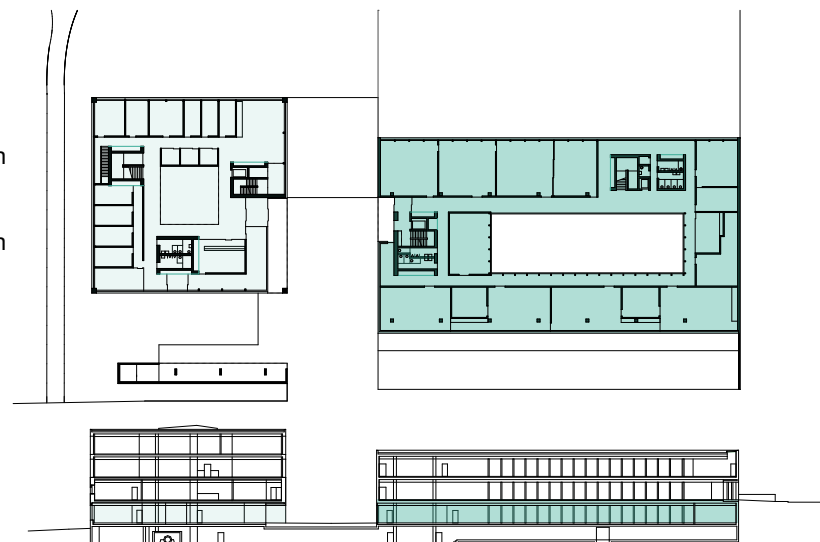
Ebene +3

	GF	= 1'129 m ²	Höhe = 4.01m
	GV	= 4'527 m ³	
	Aufbau Oblichter		
	GV	= 117 m ³	

$$GV_{\text{Total}} = 4'644 \text{ m}^3$$


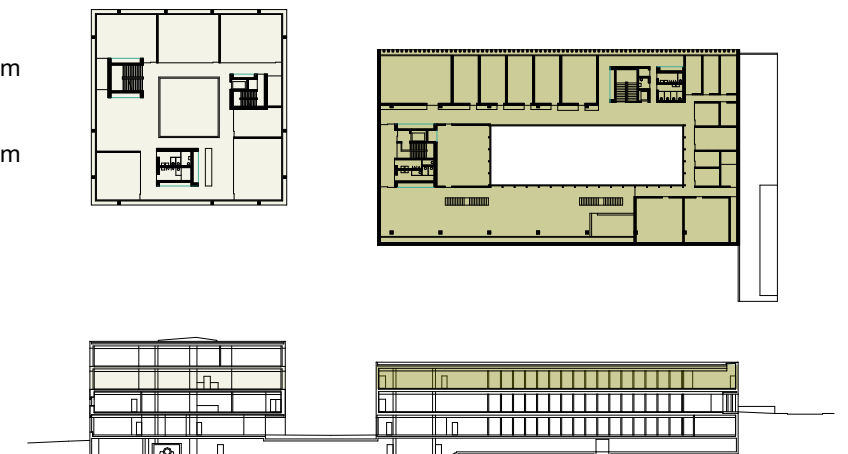
Ebene ± 0

	GF	= 1'075 m2	Höhe = 3.95m
	GV	= 4'426 m3	
	GF	= 1'737 m2	Höhe = 4.00m
	GV	= 6'948 m3	

$$GV_{\text{Total}} = 11'194 \text{ m}^3$$


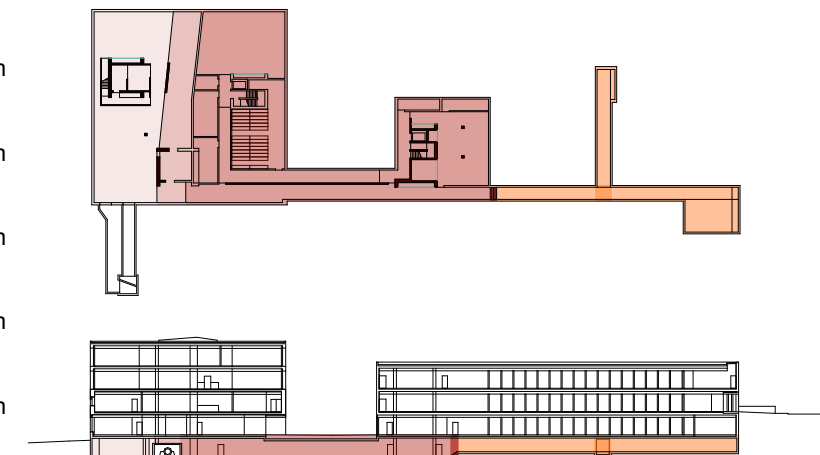
Ebene +2

	GF	= 1'129 m2	Höhe = 3.95m
	GV	= 4'460 m3	
	GF	= 1'758 m2	Höhe = 4.07m
	GV	= 7'155 m3	

$$GV_{\text{Total}} = 11'615 \text{ m}^3$$


Ebene -1

	GF	= 415 m2	Höhe = 4.11m
	GV	= 1'706 m3	
	GF	= 180 m2	Höhe = 1.47m
	GV	= 265 m3	
	GF	= 931 m2	Höhe = 4.11m
	GV	= 3'826 m3	
	GF	= 3 m2	Höhe = 3.69m
	GV	= 11 m3	
	GF	= 224 m2	Höhe = 3.26m
	GV	= 730 m3	
	GF	= 8 m2	Höhe = 3.76m
	GV	= 30 m3	

$$GV_{\text{Total}} = 6'568 \text{ m}^3$$
**Total GF**

GF _{Total} Ebene -1	=	1'761 m3
GF _{Total} Ebene 0	=	2'812 m3
GF _{Total} Ebene +1	=	2'830 m3
GF _{Total} Ebene +2	=	2'887 m3
GF _{Total} Ebene +3	=	1'129 m3

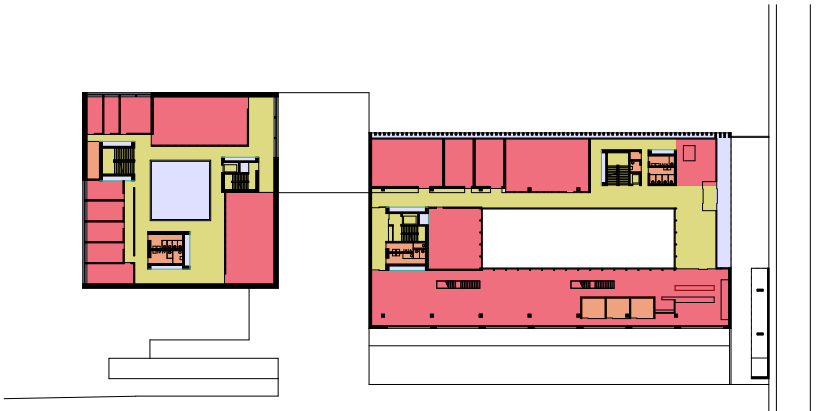
$$GF_{Total} = 10'790 \text{ m}^3$$
Total GV

GV_{Total} Ebene -1	=	6'568 m3
GV_{Total} Ebene 0	=	11'194 m3
GV_{Total} Ebene +1	=	11'264 m3
GV_{Total} Ebene +2	=	11'615 m3
GV_{Total} Ebene +3	=	4'644 m3

$$GV_{\text{Total}} = 45'285 \text{ m}^3$$

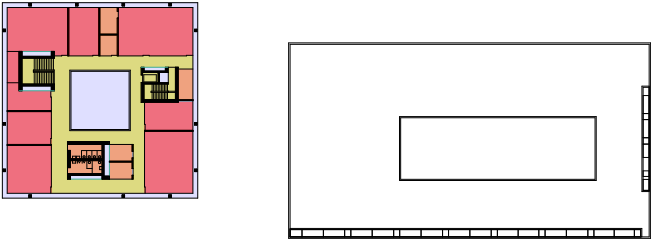
Ebene +1 (Gebäude P / M)

GF	=	1'129 / 1'701	m2
HNF	=	449 / 1'005	m2
NNF	=	41 / 90	m2
VF	=	363 / 396	m2



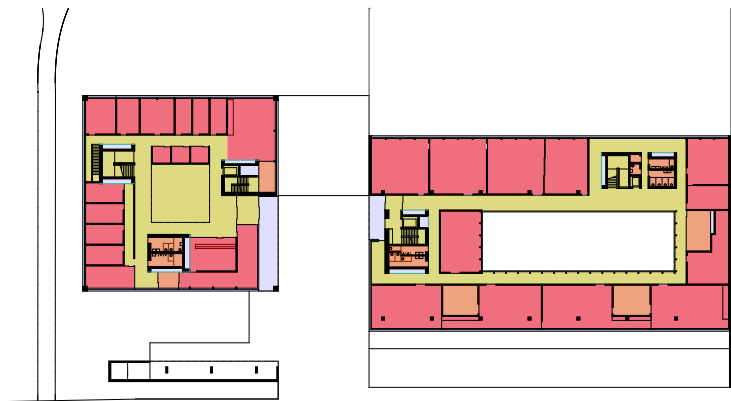
Ebene +3 (Gebäude P)

GF	=	1'129	m2
HNF	=	504	m2
NNF	=	86	m2
VF	=	247	m2



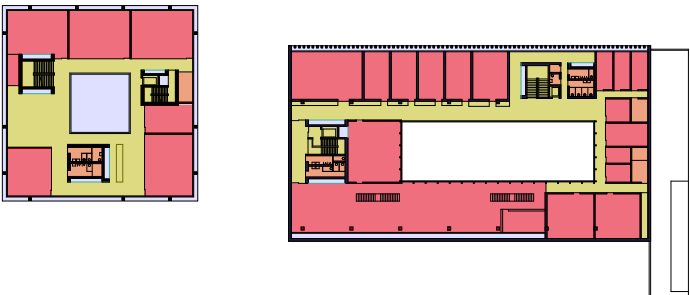
Ebene ±0 (Gebäude P / M)

GF	=	1'075 / 1'737	m2
HNF	=	490 / 957	m2
NNF	=	52 / 143	m2
VF	=	376 / 447	m2



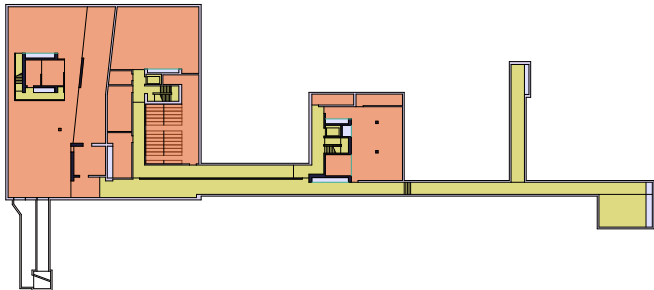
Ebene +2 (Gebäude P / M)

GF	=	1'129 / 1'758	m2
HNF	=	457 / 1'019	m2
NNF	=	40 / 77	m2
VF	=	354 / 384	m2



Ebene -1 (Gebäude P + M)

GF	=	1761	m2
HNF	=	-	m2
NNF	=	1'023	m2
VF	=	495	m2



Total HNF

HNF _{Total} Ebene -1	=	0 m2
HNF _{Total} Ebene 0	=	1'447 m2
HNF _{Total} Ebene +1	=	1'454 m2
HNF _{Total} Ebene +2	=	1'476 m2
HNF _{Total} Ebene +3	=	504 m2

HNF _{Total}	=	4'881 m2
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Total NNF

NNF _{Total} Ebene -1	=	1'023 m2
NNF _{Total} Ebene 0	=	195 m2
NNF _{Total} Ebene +1	=	131 m2
NNF _{Total} Ebene +2	=	117 m2
NNF _{Total} Ebene +3	=	86 m2

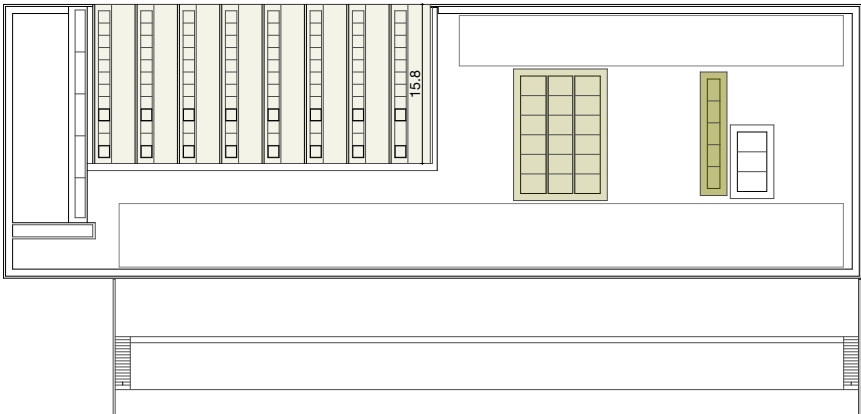
NNF _{Total}	=	1'552 m2
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Total VF

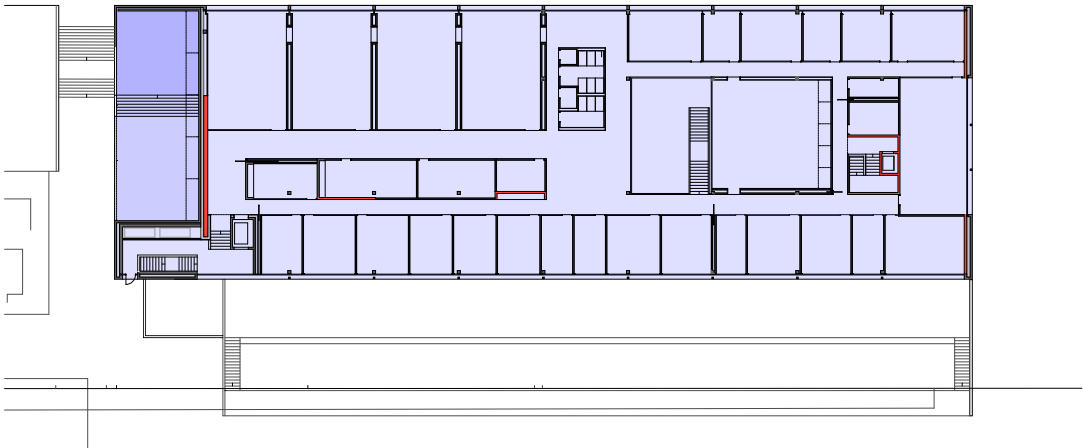
VF _{Total} Ebene -1	=	495 m2
VF _{Total} Ebene 0	=	823 m2
VF _{Total} Ebene +1	=	759 m2
VF _{Total} Ebene +2	=	738 m2
VF _{Total} Ebene +3	=	247 m2

VF _{Total}	=	3'062 m2
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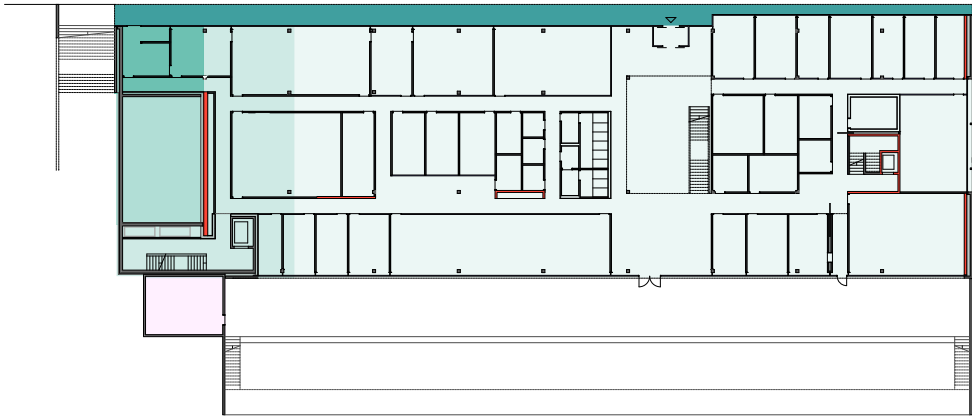
Dach			
GV Shed	= 55m2 x 15.8m	=	869 m3
GV Oblichter	= 153m2 x 0.30m	=	46 m3
GV Total Dach		=	915 m3



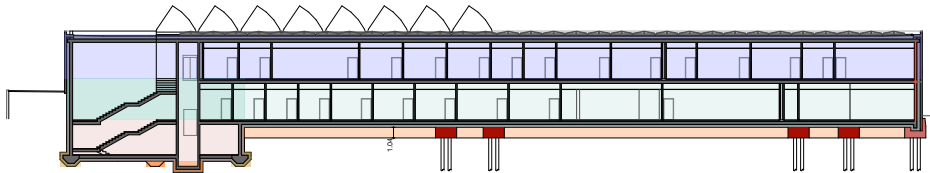
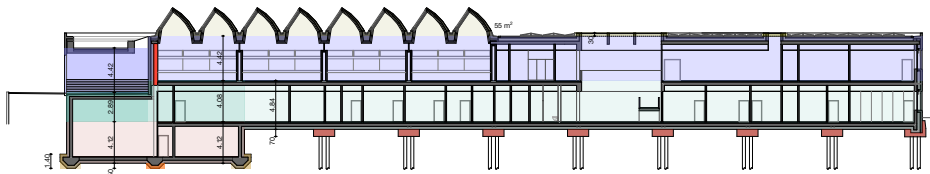
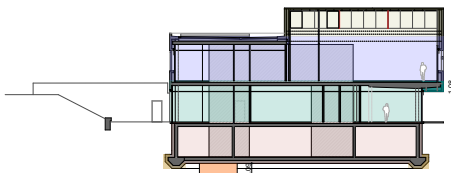
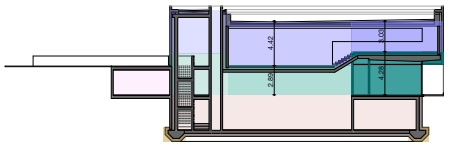
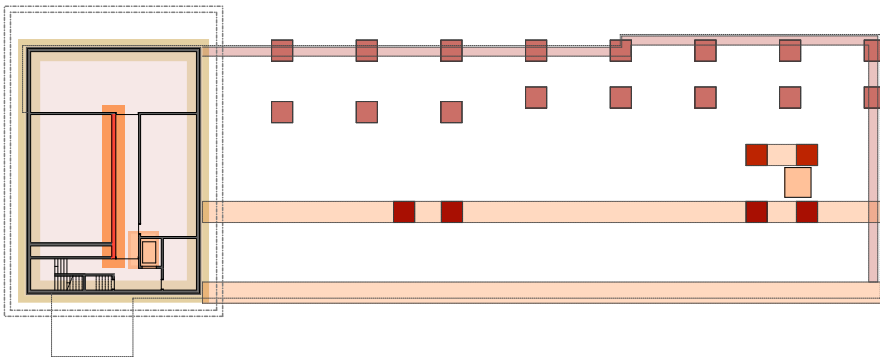
Ebene +1			
GV Pausenhalle Vorne	= 104m2 x 4.42m	=	460 m3
GV Pausenhalle Hinten	= 69m2 x 3.03m	=	209 m3
GV Ebene+1	= 2'142m2 x 4.42m	=	9'468 m3
GV Total Ebene +1		=	10'137 m3



Ebene 0			
GV Auskragung	= 150m2 x 1.08m	=	113 m3
GV Pausenhalle tief	= 102m2 x 2.89m	=	295 m3
GV Pausenhalle hoch	= 58m2 x 4.28m	=	248 m3
GV Aussengeräte	= 49m2 x 3.21m	=	157 m3
GV E±0 Unterkellert	= 271m2 x 4.08m	=	1'106 m3
GV E±0 Nicht Unterkell.	= 1'713m2 x 4.84m	=	8'291 m3
GV Total Ebene ±0		=	10'210 m3

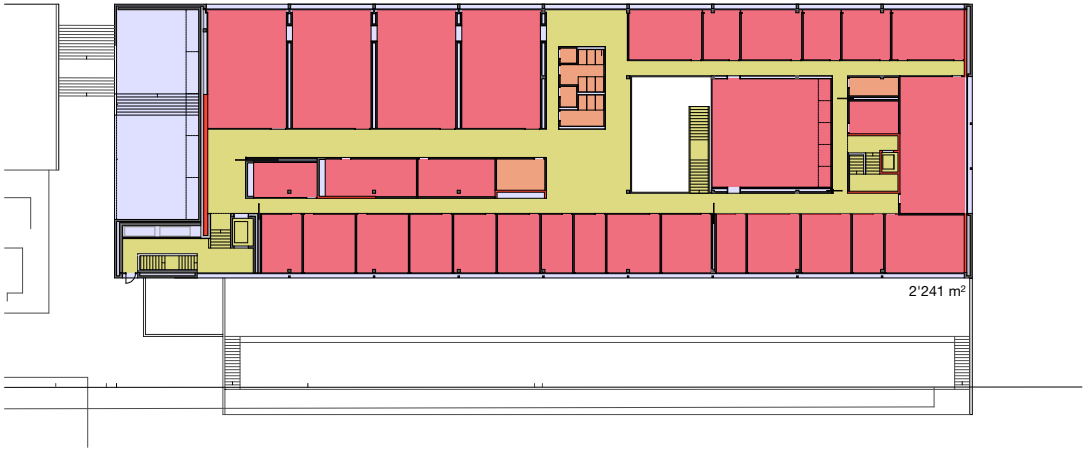


Ebene -1			
GV Ebene-1	= 431m2 x 4.12m	=	1'776 m3
GV Fund. Stützen	= 16 x 4m2 x 0.70m	=	45 m3
GV Streifenf. unter E0	= 299 m2 x 1.04m	=	311 m3
GV Streifenf. unter E1	= 35 m2 x 0.5m	=	18 m3
GV Streifenf. unter E1	= 96 m2 x 1.4m	=	134 m3
GV Streifenf. unter E1	= 122 m2 x 0.5m	=	61 m3
GV Lift West	= 11 m2 x 1.09m	=	12 m3
GV Lift Ost	= 8 m2 x 1.09m	=	9 m3
GV Total Ebene -1		=	2'366 m3



Total GV			
GV Total Ebene -1	=	2'366 m3	
GV Total Ebene 0	=	10'210 m3	
GV Total Ebene +1	=	10'137 m3	
GV Total Dach	=	915 m3	
GV Total	=	23'628 m3	

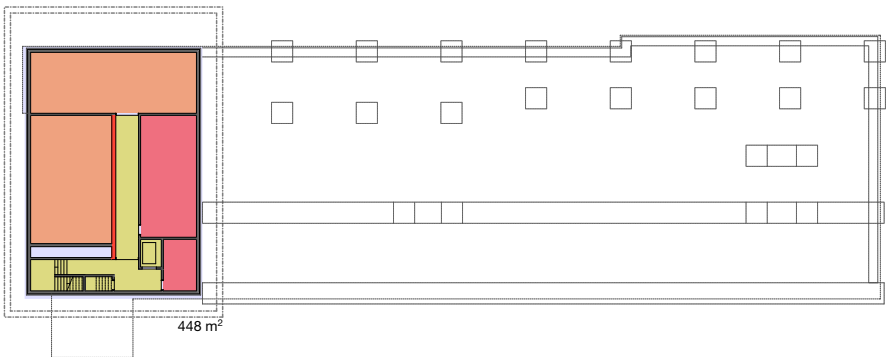
Ebene +1			
	GF	=	2'241 m2
	HNF	=	1'235 m2
	NNF	=	54 m2
	VF	=	529 m2



Ebene 0			
	GF	=	2'189 m2
	HNF	=	1'036 m2
	NNF	=	357 m2
	VF	=	610 m2



Ebene -1			
	GF	=	448 m2
	HNF	=	84 m2
	NNF	=	199 m2
	VF	=	76 m2



Total Kennwerte			
	GF	=	4'878 m2
	HNF	=	2'355 m2
	NNF	=	610 m2
	VF	=	1'215 m2