

IMPACT OF THE 3 HOURS SHADOW ZONE ON THE TYPICAL FLOOR LEVELS, per tower and program type

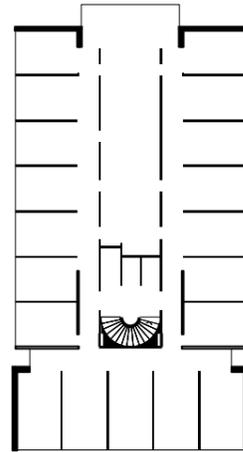
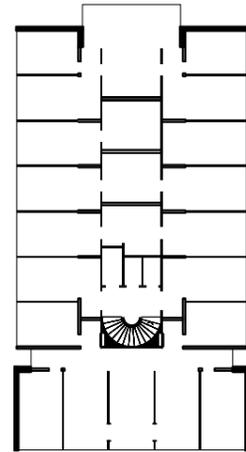
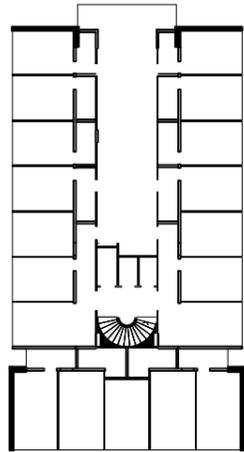
HOTEL

APARTMENTS

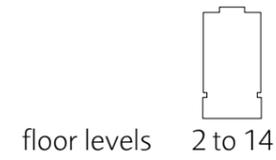
OFFICES / WORKSHOPS

non residential program, not concerned by the 3-hour shadow zone

TOWER A



all facades are outside the 3 hours shadow zone
all programs possible at all levels

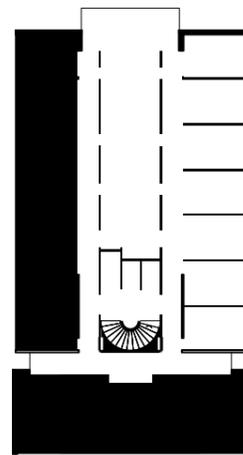
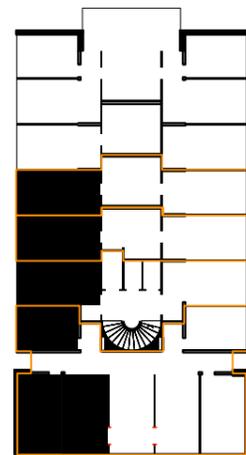
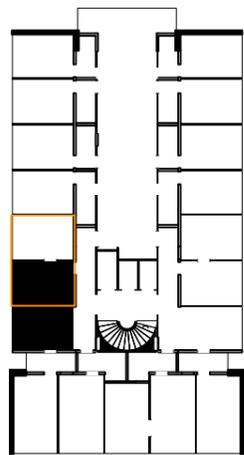


worst accepted case
floor level 13

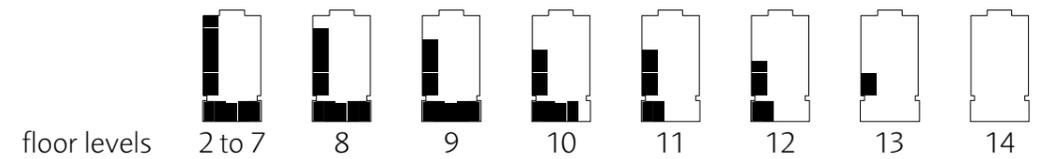
worst accepted case
floor level 11

worst accepted case
floor levels 2 to 7

TOWER B



west and south facades affected by the 3-hour shadow zone
hotel program possible from level 13
apartment program possible from level 11
office program possible at all levels

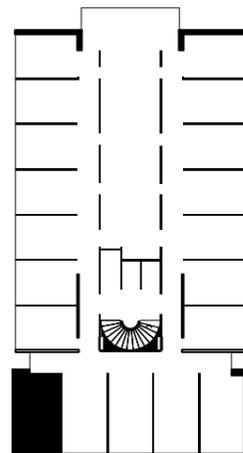
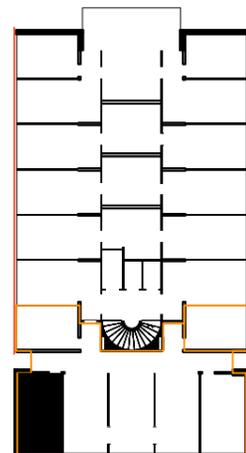
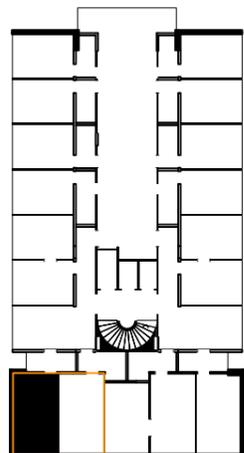


worst accepted case
floor levels 2 to 10

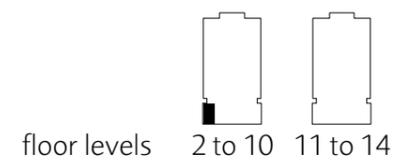
worst accepted case
floor levels 2 to 10

worst accepted case
floor levels 2 to 10

TOWER C



one cell at south facade affected by the 3-hour shadow zone
hotel program possible at all level
apartment program possible at all level
office program possible at all levels



studio facade
affected at 50%

apartment facade
affected at 15%

FLOOR AREAS CALCULATION, TYPICAL FLOORS

one type of program per tower, which is equivalent to an even mix of the three programs for each tower
 excluding ground floor and roof levels

PROGRAM TYPE
ACCOMODATION TYPE
orientation
west / east / north / south
floor area m2 net
level 14
level 13
level 12
level 11
level 10
level 9
level 8
level 7
level 6
level 5
level 4
level 3
level 2
AMOUNT PER TYPE
TOTAL M2 NET PER TYPE

HOTEL					
HOTEL ROOM with bathroom		STUDIO (with bath. + kitchen)		SHARED AREA	
west or east	south	west or east	west or east	north	west / east
17m2	22m2	26m2	38m2	75m2	60m2
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
8	3	2	1	1	1
104	39	26	13	13	13
1768	858	676	494	975	780

APARTMENTS							
2 ROOMS	3 ROOMS	3.5 ROOMS	4 ROOMS	5 ROOMS	7 ROOMS	SHARED AREA	
west / east	west / east	west / south or east / south	west / north / east	west / north / east	west / south / east	west / east	exterior walkway
50m2	65m2	70m2	85m2	100m2	135m2	50m2	60m2
3	/	/	/	1	1	1	1
2	1	j	1	/	/	1	1
3	/	/	/	1	1	1	1
2	1	2	1	/	/	1	1
3	/	/	/	1	1	1	1
2	1	2	1	/	/	1	1
3	/	/	/	1	1	1	1
2	1	2	1	/	/	1	1
3	/	/	/	1	1	1	1
2	1	2	1	/	/	1	1
3	/	/	/	1	1	1	1
33	6	10	6	7	7	13	13
1650	390	700	510	700	945	650	780

OFFICES / WORKSHOPS			
1 CELL	1 CELL	SHARED AREA	
west or east	south	north	west / east
18m2	22m2	80m2	80m2
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
10	5	1	1
130	65	13	13
2340	1430	1040	1040

m2 gross per tower
total m2 net per tower

6669
5 551

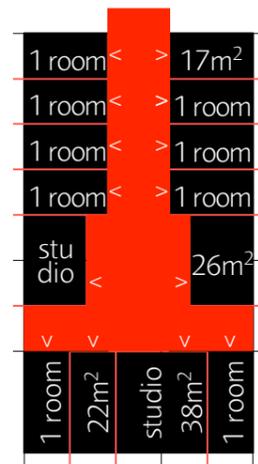
6669
5 545

6669
5 850

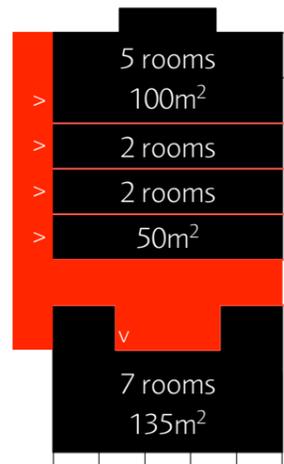
TOTAL M2 GROSS 3 TOWERS
TOTAL M2 NET 3 TOWERS

20007
16 946

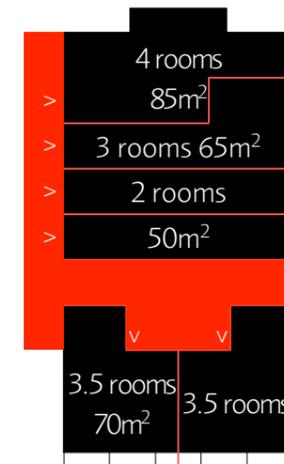
- living unit division
- private floor area
- shared floor area



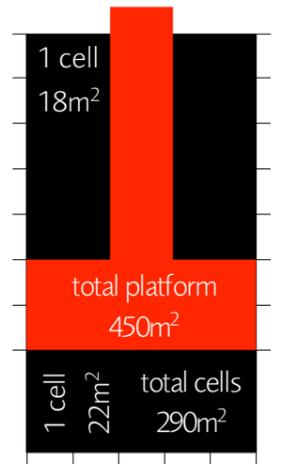
HOTEL
typical floor plan



APARTMENTS
typical floor plan 1



APARTMENTS
typical floor plan 2



OFFICES / WORKSHOPS
typical floor plan

schematic floor plans showing areas repartition

PROJECT COST ESTIMATION
for one type of program per tower
excluding ground floor and roof levels

		DESCRIPTION	PRICE PER UNIT
REMOVAL	facade	removal of windows	CHF 160
		removal of prefabricated concrete panels	CHF 200
		removal of prefabricated concrete stairs (per flight)	CHF 2 500
	interior walls	removal of sanitary partitions walls	CHF 60
		removal of non-load-bearing brick partitions	CHF 100
		removal of interior doors	CHF 150
	equipment	removal of false ceilings	CHF 45
		removal of sanitary equipment	CHF 140
		new door openings in reinforced concrete bearing walls	CHF 3 000
	openings	demolition of non bearing concrete walls (shaft)	CHF 200

ADDITIONS		DESCRIPTION	PRICE PER UNIT
facade	Double glazed bay window	external insulation with coating	CHF 300
		exterior walkway (steel structure)	CHF 2 400
		guardrails walkway	CHF 1 100
		partition walls with acoustic insulation and ducts / drains	CHF 215
	interior walls	slabs filling stair wells	CHF 500
		sanitary equipment (per unit)	CHF 5 000
	equipment	bathroom / kitchen ventilation	CHF 80
		interior partitions walls / cladding	CHF 150
		interior doors	CHF 750
		entrance doors	CHF 2 400
		wall painting	CHF 30
		ceiling paint	CHF 35
apartment floors		CHF 120	
bathrooms floors		CHF 120	
floor common areas and offices		CHF 100	
fire proofs doors		CHF 2 400	
sprinklers		CHF 120	
Electricity appartments		panel + power supply + lighting + PC	CHF 250
Electricity common areas	main switchboard + power supply + lighting + emergency light.	CHF 300	

BUILDING SITE	construction lift	CHF 75 000
	building site installation	5% of the total cost

TOTAL COST PER TOWER	
TOTAL COST PER TOWER (incl. hazards)	15% of the total cost

TOTAL COST 3 TOWERS	
TOTAL COST 3 TOWERS (incl. hazards)	

HOTEL			
U	PER FLOOR	PER TOWER	TOTAL PRICE
m²	45	595	CHF 95 200
m²		840	CHF 168 000
U	1	15	CHF 37 500
m²	47	611	CHF 36 660
m²	68	884	CHF 88 400
U	27	351	CHF 52 650
m²	133	1729	CHF 77 805
U	15	195	CHF 27 300
U	6	78	CHF 234 000
m²	19	247	CHF 49 400
m²	200	3145	CHF 3 931 250
m²	55	915	CHF 274 500
m²	0	0	CHF 0
ml	0	0	CHF 0
m²	54	702	CHF 150 930
m²	5	65	CHF 32 500
U	31	403	CHF 2 015 000
m²	315	4095	CHF 327 600
m²	130	1690	CHF 253 500
U	14	182	CHF 136 500
U	0	0	CHF 0
m²	1000	13000	CHF 390 000
m²	480	6240	CHF 218 400
m²	260	3380	CHF 405 600
m²	40	520	CHF 62 400
m²	135	1755	CHF 175 500
m²	2	26	CHF 62 400
m²	480	6240	CHF 748 800
m²		3800	CHF 950 000
m²		1760	CHF 528 000
U		1	CHF 75 000
U			CHF 576 490

CHF 12 181 285
CHF 14 008 477

APPARTMENTS			
U	PER FLOOR	PER TOWER	TOTAL PRICE
m²	45	595	CHF 95 200
m²		840	CHF 168 000
U	1	15	CHF 37 500
m²	47	611	CHF 36 660
m²	158	2054	CHF 205 400
U	33	429	CHF 64 350
m²	405	5265	CHF 236 925
U	24	312	CHF 43 680
U	3	39	CHF 117 000
m²	19	247	CHF 49 400
m²	200	3145	CHF 3 931 250
m²	55	915	CHF 274 500
m²	60	780	CHF 1 872 000
ml	30	390	CHF 429 000
m²	72	936	CHF 201 240
m²	5	65	CHF 32 500
U	23	299	CHF 1 495 000
m²	390	5070	CHF 405 600
m²	135	1755	CHF 263 250
U	3	39	CHF 29 250
U	7	91	CHF 218 400
m²	900	11700	CHF 351 000
m²	480	6240	CHF 218 400
m²	350	4550	CHF 546 000
m²	40	520	CHF 62 400
m²	50	650	CHF 65 000
m²	2	26	CHF 62 400
m²	480	6240	CHF 748 800
m²		4900	CHF 1 225 000
m²		1430	CHF 429 000
U		1	CHF 75 000
U			CHF 695 705

CHF 14 684 810
CHF 16 887 532

OFFICES / WORKSHOPS			
U	PER FLOOR	PER TOWER	TOTAL PRICE
m²	45	595	CHF 95 200
m²		840	CHF 168 000
U	1	15	CHF 37 500
m²	47	611	CHF 36 660
m²	164	2132	CHF 213 200
U	39	507	CHF 76 050
m²	405	5265	CHF 236 925
U	30	390	CHF 54 600
U	0	0	CHF 0
m²	19	247	CHF 49 400
m²	200	3145	CHF 3 931 250
m²	55	915	CHF 274 500
m²	0	0	CHF 0
ml	0	0	CHF 0
m²	0	0	CHF 0
m²	5	65	CHF 32 500
U	14	182	CHF 910 000
m²	50	650	CHF 52 000
m²	170	2210	CHF 331 500
U	7	91	CHF 68 250
U	0	0	CHF 0
m²	800	10400	CHF 312 000
m²	480	6240	CHF 218 400
m²	0	0	CHF 0
m²	40	520	CHF 62 400
m²	120	1560	CHF 156 000
m²	2	26	CHF 62 400
m²	480	6240	CHF 748 800
m²		0	CHF 0
m²		5850	CHF 1 755 000
U		1	CHF 75 000
U			CHF 494 127

CHF 10 451 662
CHF 12 019 411

CHF 37 317 757
CHF 42 915 420

COST COMPARISON

between one tower's transformation project and an hypothetical new construction

OPTION 1, TRANSFORMATION PROJECT for one existing tower, with new residential program (walk-through apartments)
partial removals + full renovation

construction cost for one tower with residential program (apartments program, see HAO_FM 3/4)	RESIDENTIAL
floor area per level	16 887 532 CHF
total m3 (m2 floor x total height typical floors = 35m)	515 m2
	18025 m3
project construction cost per m3, including removal costs	940 CHF

OPTION 2, NEW CONSTRUCTION HYPOTHESIS floor area as per option 1, with residential program (apartments)
full demolition + new construction

total m3 (as per option 1)	RESIDENTIAL
estimated cost new construction for residential project in Switzerland	18025 m3
estimated cost for the full demolition of the towers	1 000 CHF
estimated cost for the full demolition of 1 tower	14 900 000 CHF
estimated demolition cost per m3	4 966 667 CHF
	276 CHF
new construction cost per m3, including estimated cost for tower demolition	1 280 CHF