

## 2. Six Urban Typologies

### Assessing energy performances

# SIX URBAN TYPOLOGIES IN BASEL. OVERVIEW

## Historical Compact City SCHIFFLÄNDE, BASEL

Inhabitants (2011)	2 033
Area	372 000 m <sup>2</sup>
Density	271 p/10 000 m <sup>2</sup>
Residential arae/inhabitant	59 m <sup>2</sup>
Average stories	4
Average height	16 m
Buildings number	788
Foot print area	198 930 m <sup>2</sup>
GFA (gross floor area)	795 720 m <sup>2</sup>
Roof surface	278 369 m <sup>2</sup>
Building volume	608 038 m <sup>3</sup>



Figure-ground plan, 1: 20 000

## Figure groundplan



Figure groundplan, 1: 6 000

## The Urban Block (1860's) GUNDELDINGEN, BASEL

Inhabitants (2011)	18 471
Area	1 017 966 m <sup>2</sup>
Density	181 p/10 000 m <sup>2</sup>
Residential arae/inhabitant	39 m <sup>2</sup>
Average stories	4.5
Average height	18 m
Buildings number	2 022
Foot print area	384 593 m <sup>2</sup>
GFA (gross floor area)	1 953 834 m <sup>2</sup>
Roof surface	492 279 m <sup>2</sup>
Building volume	6 922 674 m <sup>3</sup>



Figure-ground plan, 1: 30 000



Figure groundplan, 1: 6 000

## Row Houses (20's/30's) GENOSSENSCHAFT 'IM LANGEN LOH', BASEL

Inhabitants (2011)	5 837
Focus area	479 561 m <sup>2</sup>
Density	151 p/10 000 m <sup>2</sup>
Residential arae/inhabitant	49.6 m <sup>2</sup>
Average stories	3
Average height	9 m
Buildings number	248
Foot print area	124 725 m <sup>2</sup>
GFA (gross floor area)	374 100 m <sup>2</sup>
Roof surface	192 000 m <sup>2</sup>
Building volume	1 122 500 m <sup>3</sup>

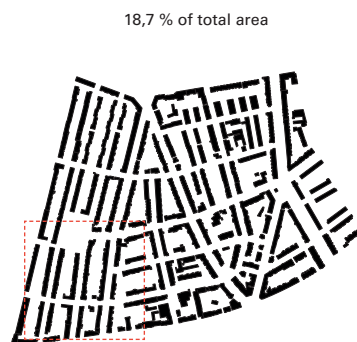


Figure-ground plan, 1: 20 000



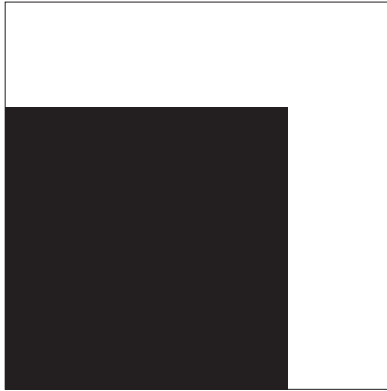
Figure groundplan, 1: 6 000

### Aerial picture



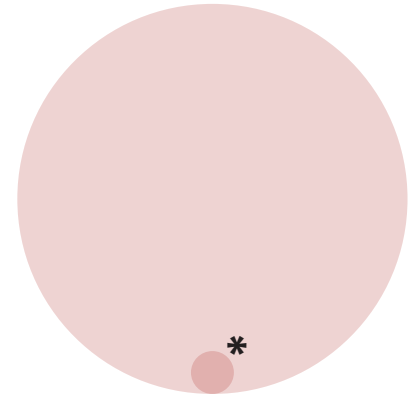
Aerial picture, 1: 6 000

### Built to unbuilt area



Built to unbuilt area, 1: 6 000

### Density



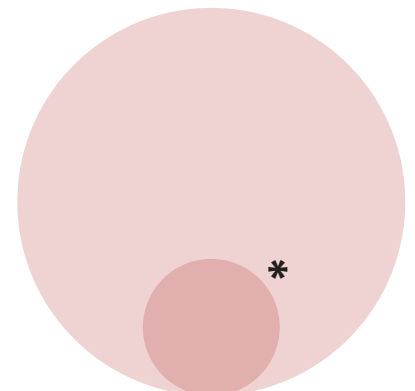
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



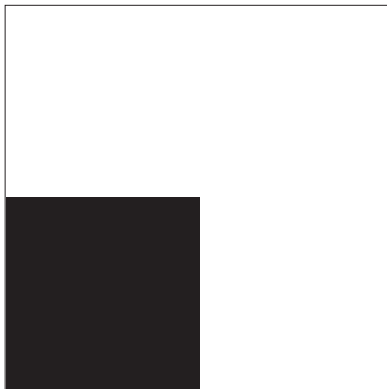
Built to unbuilt area, 1: 6 000



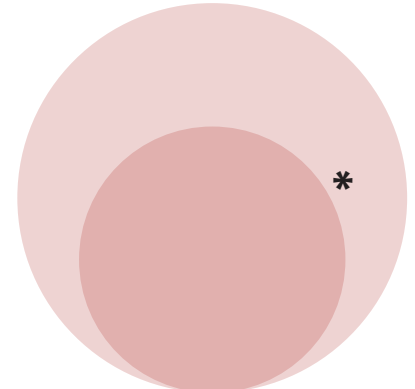
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



Built to unbuilt area, 1: 6 000



Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20

**Modern Housing Development (1960's)  
DE BARY, BASEL**

Inhabitants (2011)	2 019
Area	378 600 m <sup>2</sup>
Density	53 p/10 000 m <sup>2</sup>
Residential arae/inhabitant	44 m <sup>2</sup>
Average stories	11
Average height	12 m
Buildings number	91
Foot print area	8140 m <sup>2</sup>
GFA (gross floor area)	89 546 m <sup>2</sup>
Roof surface	10 256 m <sup>2</sup>
Building volume	250 712 m <sup>3</sup>

23.7 % of total area



Figure-ground plan, 1: 20 000

**Figure groundplan**

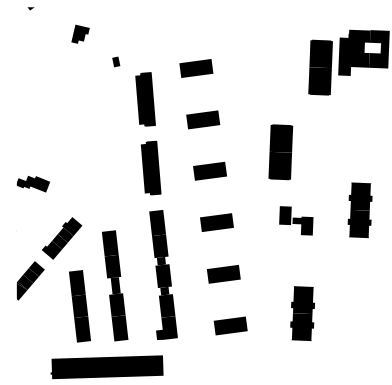


Figure groundplan, 1: 6 000

**Single Family House Suburbia  
REINACH, BASEL**

Inhabitants (2011)	1 684
Area	640 008 m <sup>2</sup>
Density	29 p/10 000 m <sup>2</sup>
Residential arae/inhabitant	104 m <sup>2</sup>
Average stories	2.5
Average height	8 m
Buildings number	734
Foot print area	80 089 m <sup>2</sup>
GFA (gross floor area)	200 222 m <sup>2</sup>
Roof surface	112 614 m <sup>2</sup>
Building volume	520 577 m <sup>3</sup>

14.06 % of total area

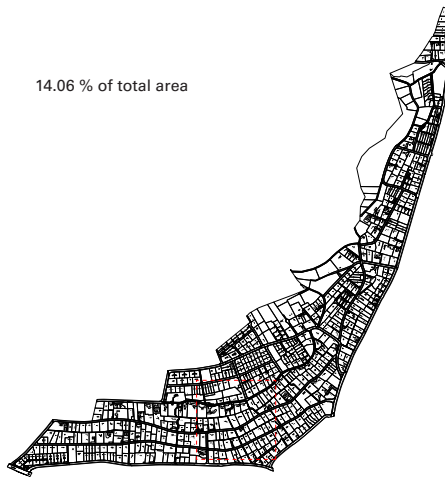


Figure-ground plan, 1: 30 000



Figure groundplan, 1: 6 000

**Contemporary Large Scale Block  
ERLENMATT, BASEL**

Inhabitants (2011)	2 733
Focus area	205 696 m <sup>2</sup>
Density	133 p/10 000 m <sup>2</sup>
Residential arae/inhabitant	66 m <sup>2</sup>
Average stories	5.5
Average height	20 m
Buildings number	16
Foot print area	56 000 m <sup>2</sup>
GFA (gross floor area)	294 802 m <sup>2</sup>
Roof surface	57 995 m <sup>2</sup>
Building volume	1 022 128 m <sup>3</sup>

43,7 % of the total area

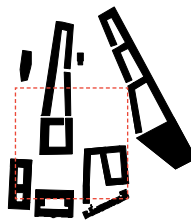


Figure-ground plan, 1: 20 000

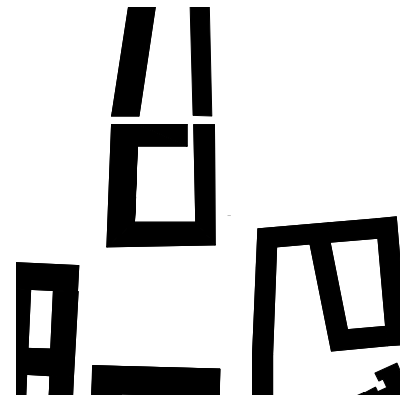
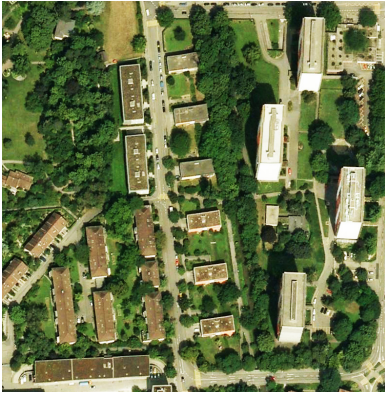


Figure groundplan, 1: 6 000

### Aerial picture



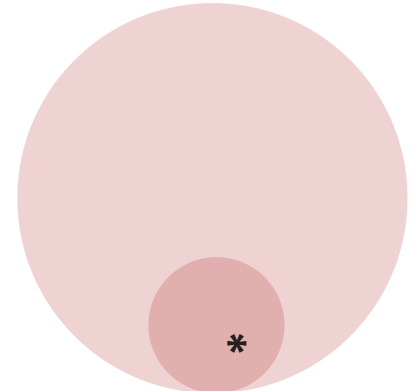
Aerial picture, 1: 6 000

### Built to unbuilt area

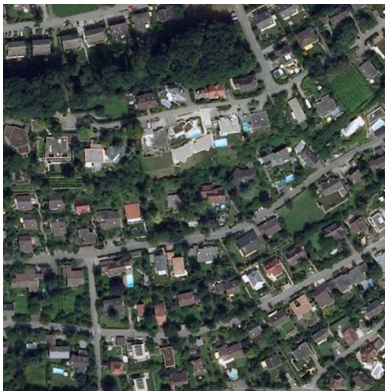


Built to unbuilt area, 1: 6 000

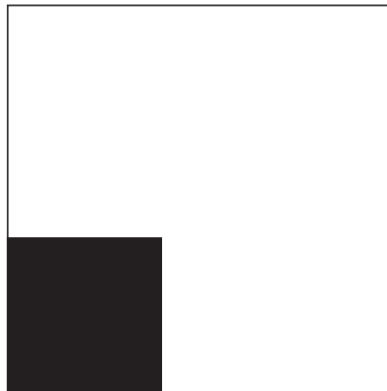
### Density



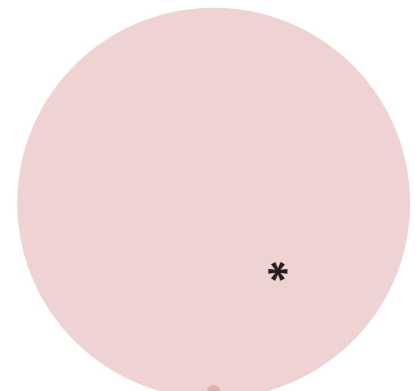
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



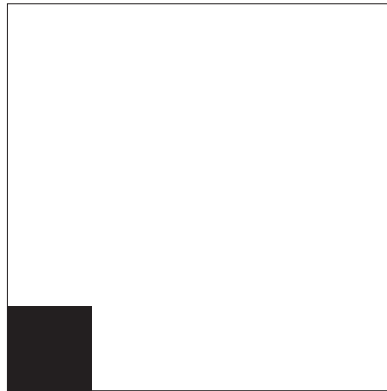
Built to unbuilt area, 1: 6 000



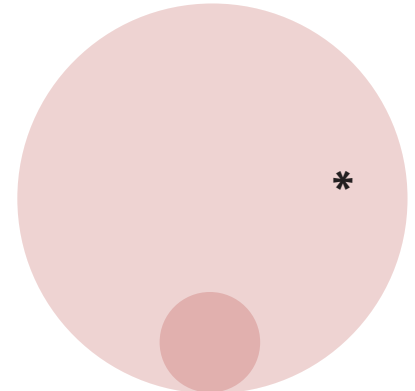
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



Built to unbuilt area, 1: 6 000



Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20

# SIX URBAN TYPOLOGIES: REFERENCES

SCHIFFLÄNDE, BASEL. Historical Compact City

## Schiff lände, Basel

Inhabitants	2 033	
Density		271 p/10 000 m <sup>2</sup>
Residential area/inhab.	59 m <sup>2</sup>	
Average stories		4
Average height		16 m

### Figure groundplan



Figure groundplan, 1: 6 000

## Regensburg, Germany

Inhabitants	2 033	
Density		271 p/10 000 m <sup>2</sup>
Residential area/inhab.	59 m <sup>2</sup>	
Average stories		4
Average height		16 m



Figure groundplan, 1: 6 000

## Venice, Italy

Inhabitants	2 033	
Density		271 p/10 000 m <sup>2</sup>
Residential area/inhab.	59 m <sup>2</sup>	
Average stories		4
Average height		16 m

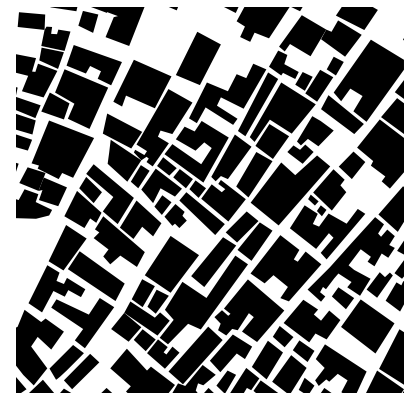


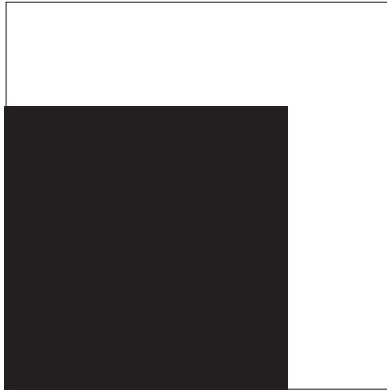
Figure groundplan, 1: 6 000

### Aerial picture



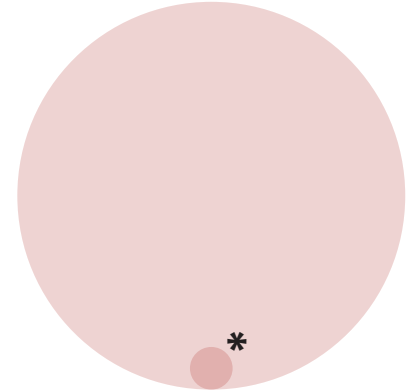
Aerial picture, 1: 6 000

### Built to unbuilt area



Built to unbuilt area, 1: 6 000

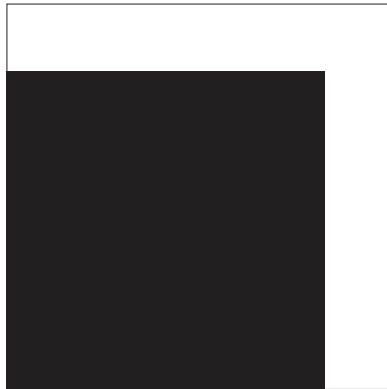
### Density



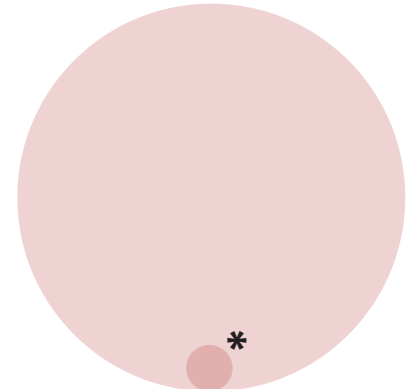
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



Built to unbuilt area, 1: 6 000



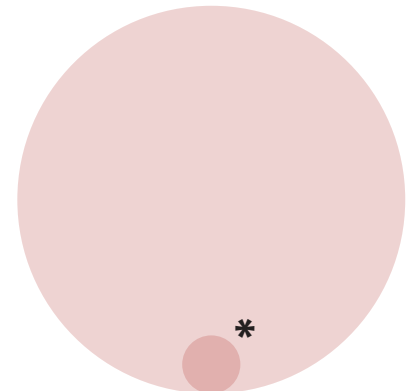
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



Built to unbuilt area, 1: 6 000



Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20

# SIX URBAN TYPOLOGIES: REFERENCES

## GUNDELDINGEN, BASEL. The Urban Block (1860's)

### Gundeldingen, Basel

Inhabitants	18 471	
Density		181 p/10 000 m <sup>2</sup>
Residential area/inhab.	39 m <sup>2</sup>	
Average stories		4.5
Average height		16 m

### Figure groundplan



Figure groundplan, 1: 6 000

### EL Carmen, Valencia, Spain

Inhabitants	1 944	
Density		60 p/10 000 m <sup>2</sup>
Residential area/inhab.	60 m <sup>2</sup>	
Average stories		4.5
Average height		13.5 m



Figure groundplan, 1: 6 000

### Kreuzberg, Berlin, Germany

Inhabitants	276 049	
Density		13 693/10 000 m <sup>2</sup>
Residential area/inhab.	59 m <sup>2</sup>	
Average stories		4.5
Average height		18 m

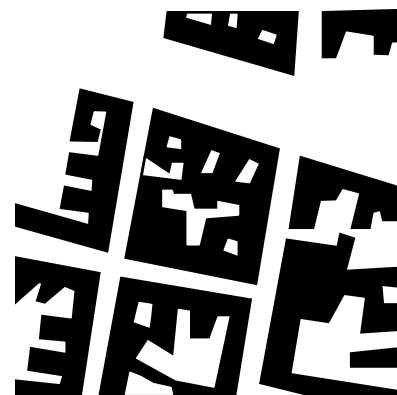


Figure groundplan, 1: 6 000

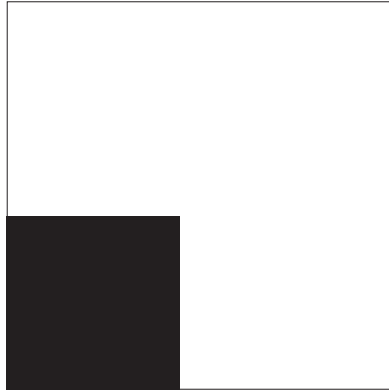


### Aerial picture



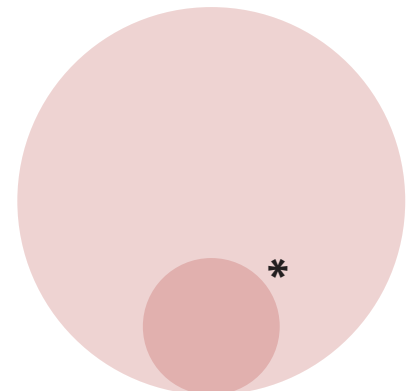
Aerial picture, 1: 6 000

### Built to unbuilt area



Built to unbuilt area, 1: 6 000

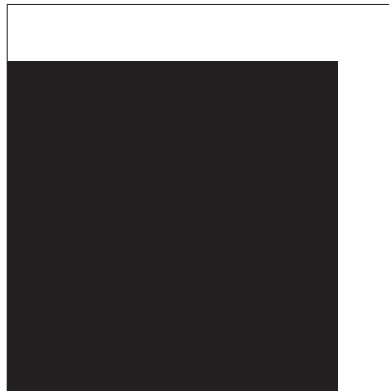
### Density



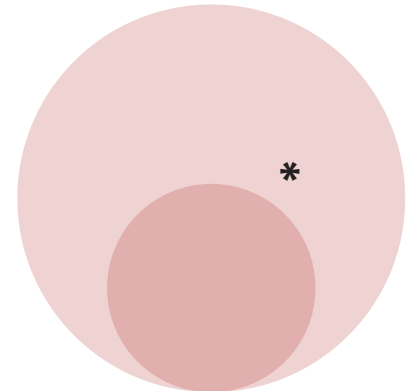
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



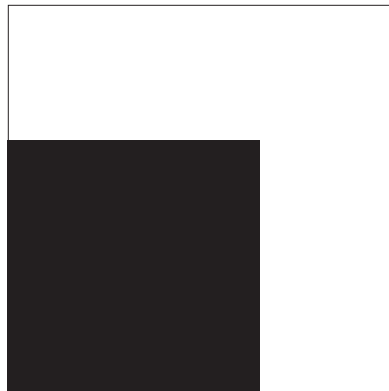
Built to unbuilt area, 1: 6 000



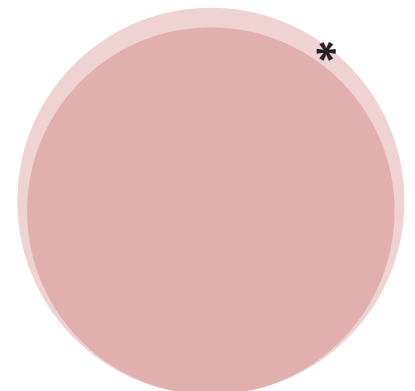
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



Built to unbuilt area, 1: 6 000



Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20

## SIX URBAN TYPOLOGIES: REFERENCES

GENOSSENSCHAFT 'IM LANGEN LOH', BASEL. Row Houses (20's/30's)

### Genossenschaft „im Langen Loh“, Basel

Inhabitants	5 837	
Density		271 p/10 000 m <sup>2</sup>
Residential area/inhab.	59 m <sup>2</sup>	
Average stories		4
Average height		16 m

Figure groundplan



Figure groundplan, 1: 6 000

### Schiedam, Mathenesserlaan, the Netherlands

Inhabitants	410	
Density		37 p/10 000 m <sup>2</sup>
Residential area/inhab.	xx m <sup>2</sup>	
Average stories		2
Average height		9 m



Figure groundplan, 1: 6 000

### Kobenhavn, Store Kongensgade, Denmark

Inhabitants	560	
Density		64 p/10 000 m <sup>2</sup>
Residential area/inhab.	xx m <sup>2</sup>	
Average stories		2
Average height		8 m



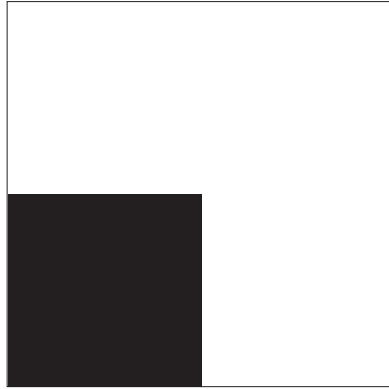
Figure groundplan, 1: 6 000

### Aerial picture



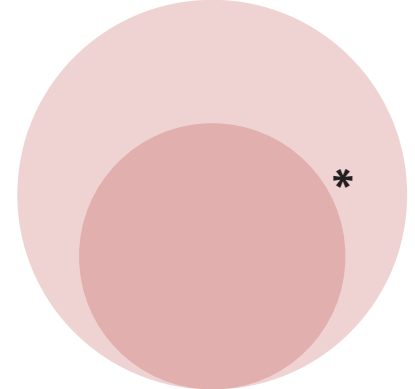
Aerial picture, 1: 6 000

### Built to unbuilt area

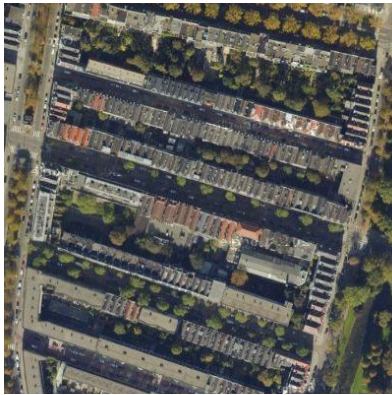


Built to unbuilt area, 1: 6 000

### Density



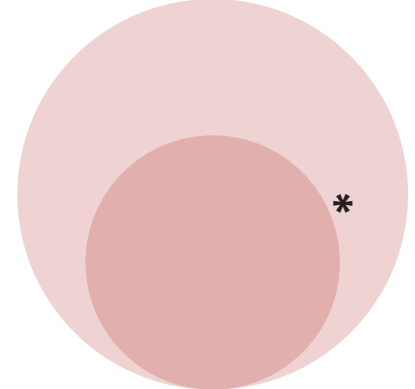
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



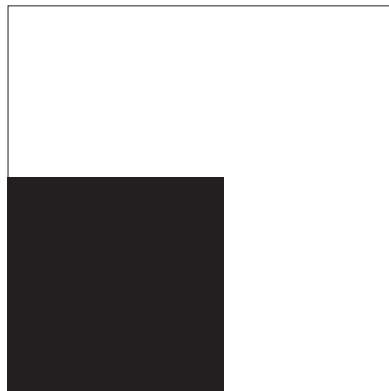
Built to unbuilt area, 1: 6 000



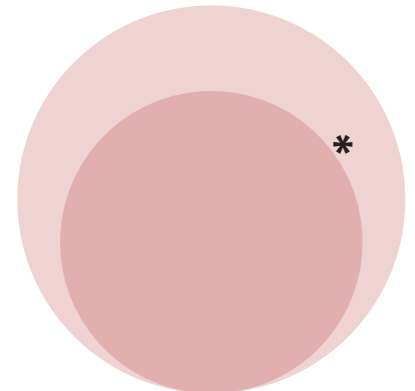
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



Built to unbuilt area, 1: 6 000



Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20

# SIX URBAN TYPOLOGIES: REFERENCES

DE BARY, BASEL. Modern Housing Development (1960's)

## De Bary, Basel

Inhabitants	2 019	
Density		53 p/10 000 m <sup>2</sup>
Residential area/inhab.	44 m <sup>2</sup>	
Average stories		11
Average height		12 m

### Figure groundplan

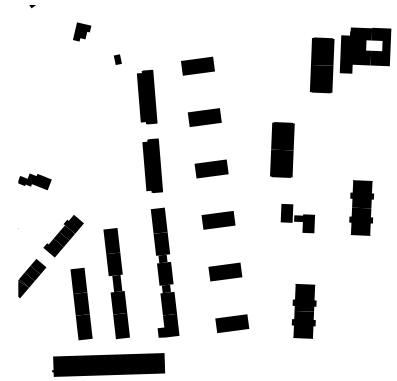


Figure groundplan, 1: 6 000

## Hardau, Zürich

Inhabitants	2 747	
Density		72 p/10 000 m <sup>2</sup>
Residential area/inhab.	45 m <sup>2</sup>	
Average stories		16
Average height		32 m

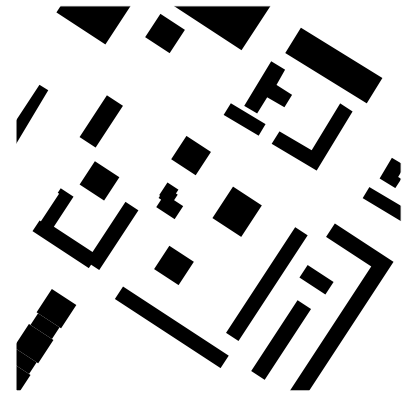


Figure groundplan, 1: 6 000

## Lafayette Park, Detroit, USA

Inhabitants	1 077	
Density		28 p/10 000 m <sup>2</sup>
Residential area/inhab.	43 m <sup>2</sup>	
Average stories		15
Average height		31 m

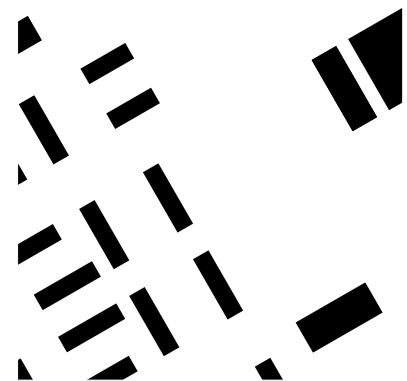
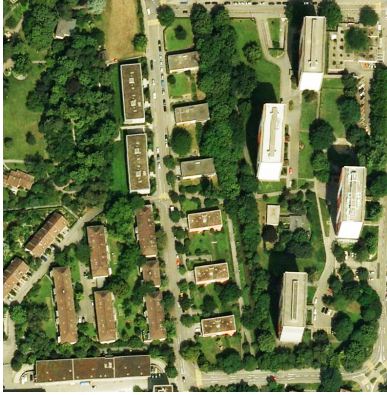


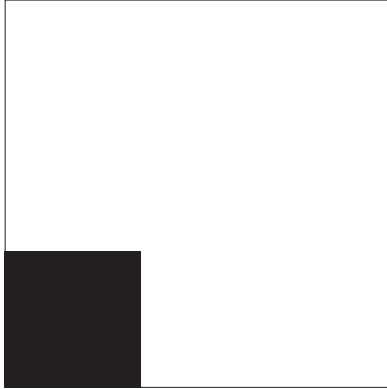
Figure groundplan, 1: 6 000

### Aerial picture



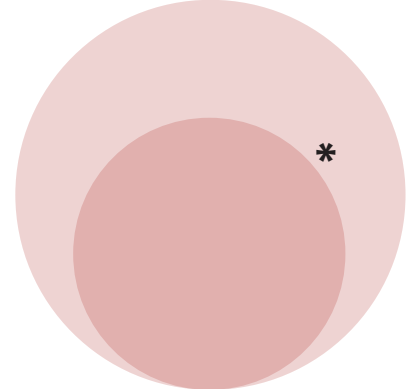
Aerial picture, 1: 6 000

### Built to unbuilt area



Built to unbuilt area, 1: 6 000

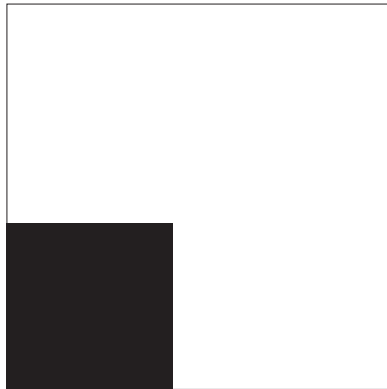
### Density



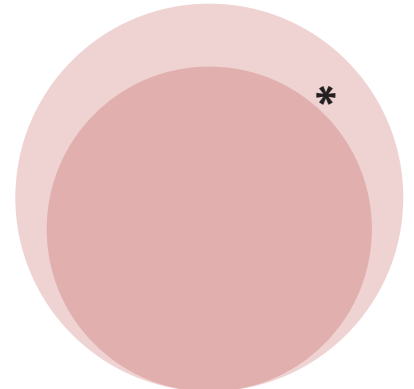
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



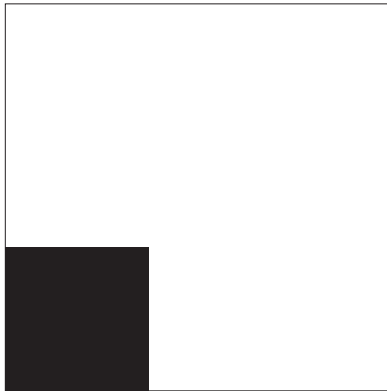
Built to unbuilt area, 1: 6 000



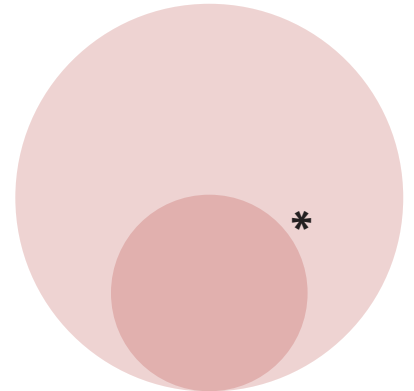
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



Built to unbuilt area, 1: 6 000



Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20

# SIX URBAN TYPOLOGIES: REFERENCES

REINACH, BASEL. Single Family House Suburbia

## Reinach, Baselland

Inhabitants	18 752	
Density		29 p/10 000 m <sup>2</sup>
Residential area/inhab.	104 m <sup>2</sup>	
Average stories		2.5
Average height		8 m

Figure groundplan



Figure groundplan, 1: 6 000

## Hampstead Garden Suburb, Greater London

Inhabitants	22 273	
Density		38 p/10 000 m <sup>2</sup>
Residential area/inhab.	94 m <sup>2</sup>	
Average stories		2.5
Average height		2.5 m

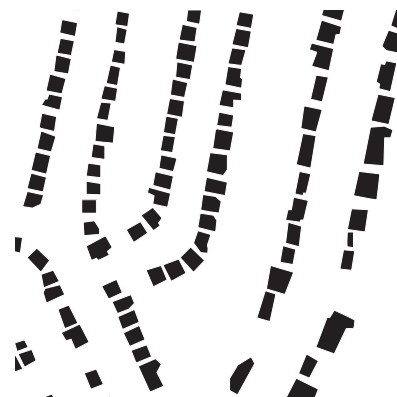


Figure groundplan, 1: 6 000

## Levittown, NY

Inhabitants	51 881	
Density		29 p/10 000 m <sup>2</sup>
Residential area/inhab.	89 m <sup>2</sup>	
Average stories		2.5
Average height		2 m

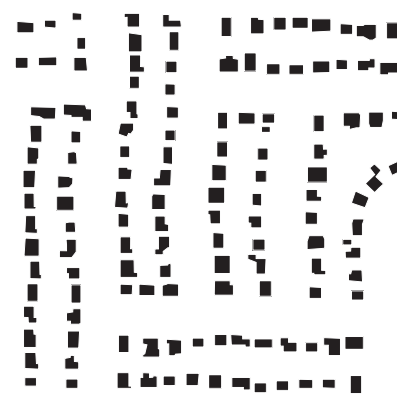


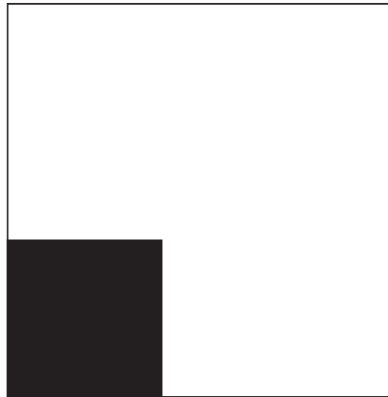
Figure groundplan, 1: 6 000

### Aerial picture



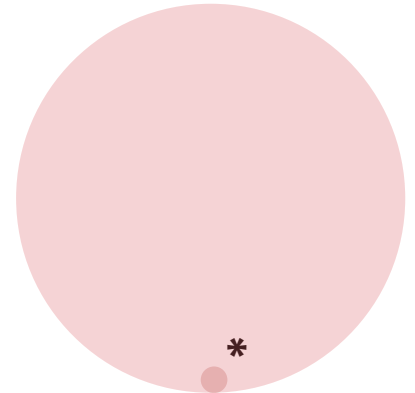
Aerial picture, 1: 6 000

### Built to unbuilt area

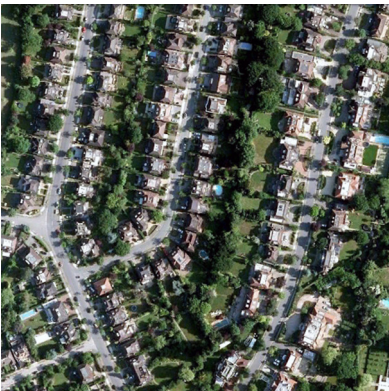


Built to unbuilt area, 1: 6 000

### Density



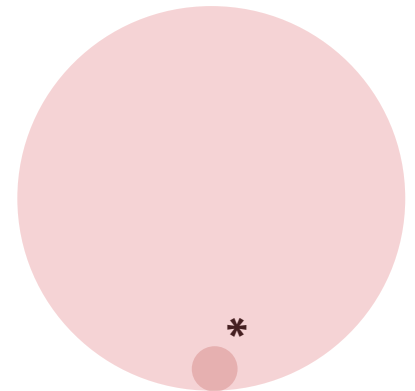
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



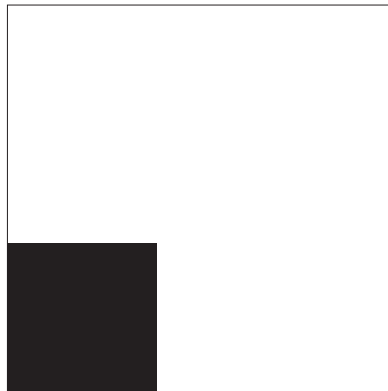
Built to unbuilt area, 1: 6 000



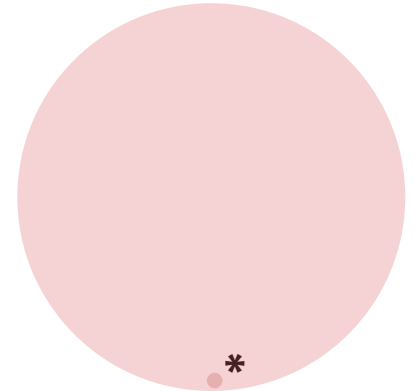
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



Built to unbuilt area, 1: 6 000



Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20

# SIX URBAN TYPOLOGIES: REFERENCES

ERLENMATT, BASEL. Contemporary Large Scale Block

## Erlenmatt, Basel

Inhabitants	2 736	
Density		133 p/10 000 m <sup>2</sup>
Residential area/inhab.	66 m <sup>2</sup>	
Average stories		5.5
Average height		20 m

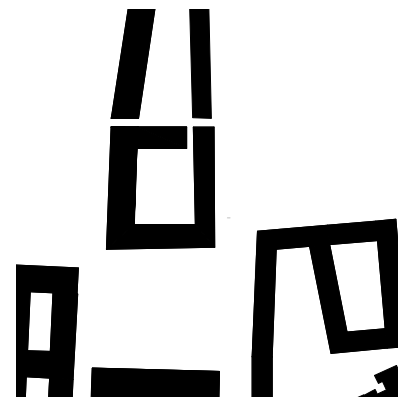


Figure groundplan, 1: 6 000

## Berlin, Marzahn, Landsberger Tor

Inhabitants	103 963	
Density		53 p/10 000 m <sup>2</sup>
Residential area/inhab.	38 m <sup>2</sup>	
Average stories		5
Average height		20 m

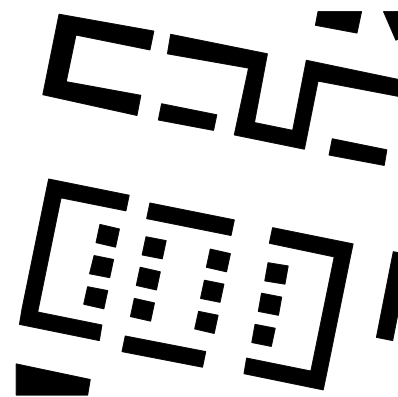


Figure groundplan, 1: 6 000

## Washington-Hof, Wien

Inhabitants	89 172	
Density		109 p/10 000 m <sup>2</sup>
Residential area/inhab.	35 m <sup>2</sup>	
Average stories		4.5
Average height		18 m

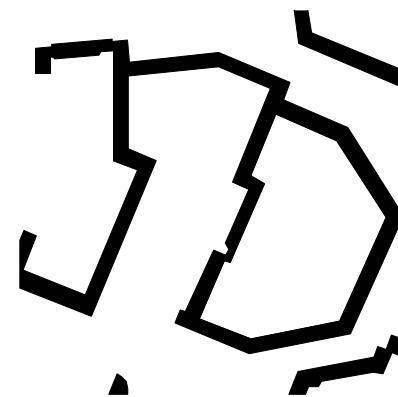


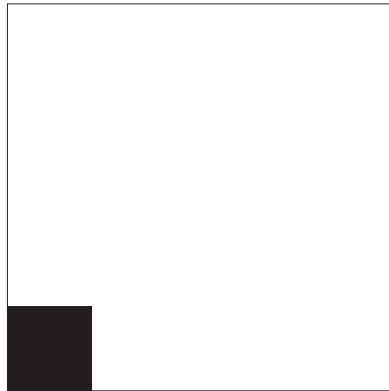
Figure groundplan, 1: 6 000





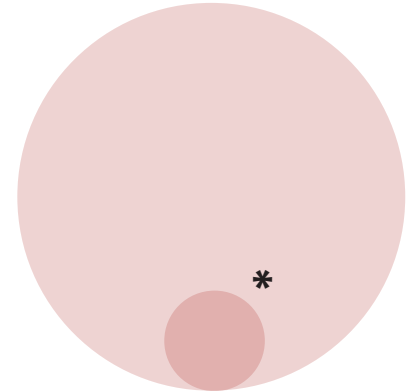
Aerial picture, 1: 6 000

**Built to unbuilt area**

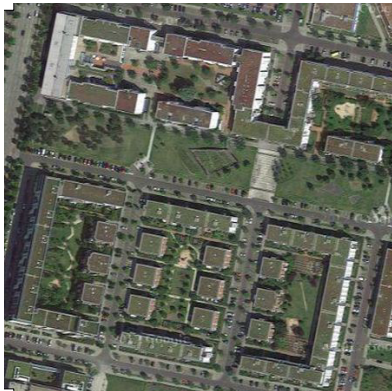


Built to unbuilt area, 1: 6 000

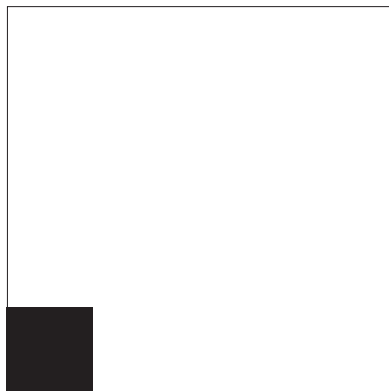
**Density**



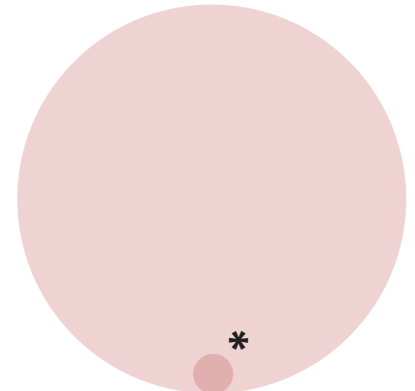
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000



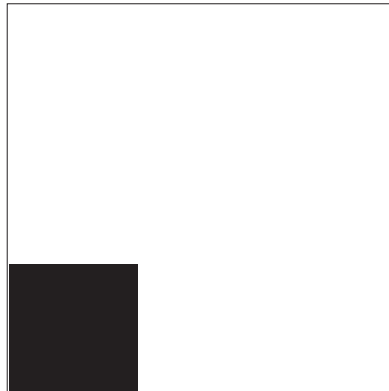
Built to unbuilt area, 1: 6 000



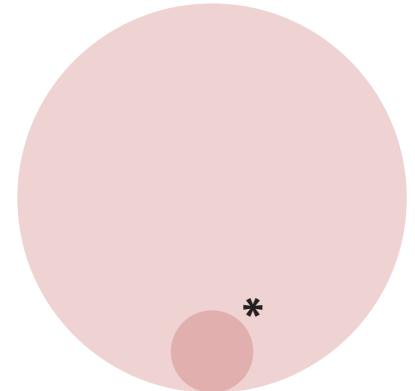
Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20



Aerial picture, 1: 6 000

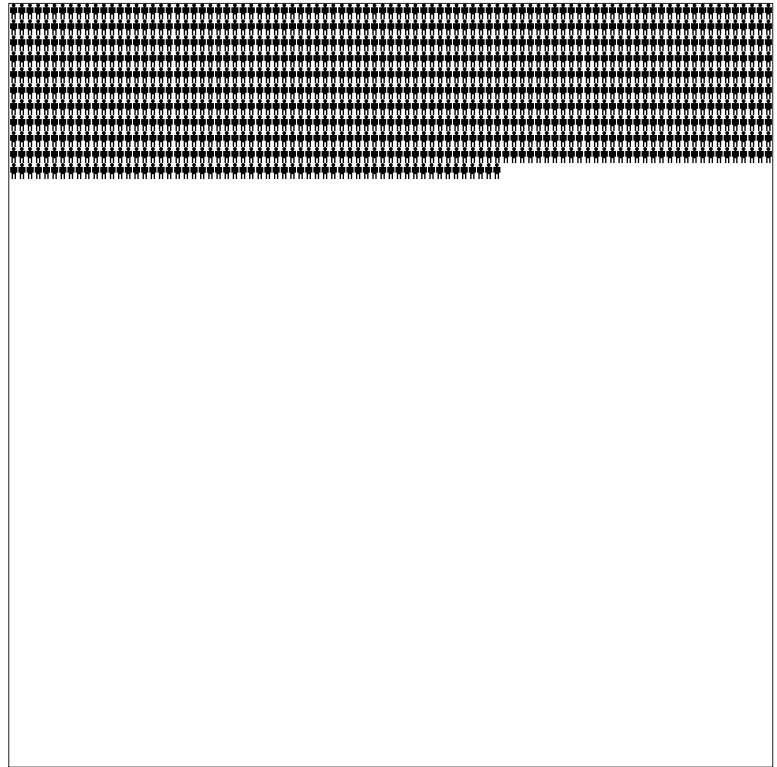
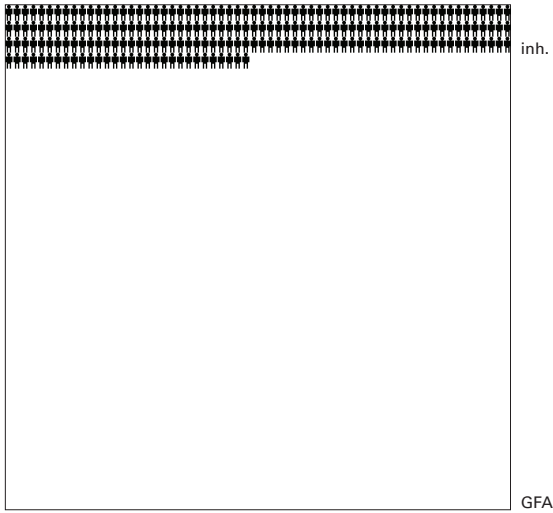


Built to unbuilt area, 1: 6 000



Density (inhabitants/ 10 000m<sup>2</sup>  
\* inhab x 20

# DENSITIES OF POPULATIONS



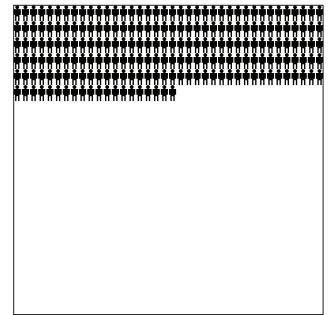
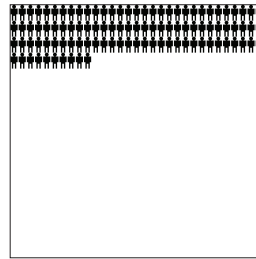
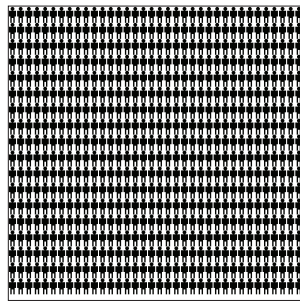
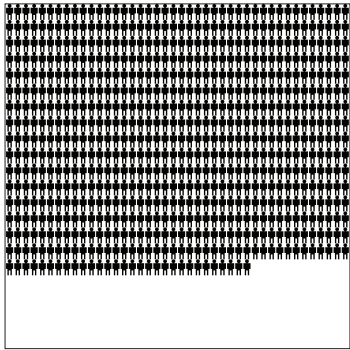
SCHIFFFLÄNDE

GFA	795 720 sqm
Inhabitants	2033
Density	391 inhab/sqm



GUNDELDINGEN

GFA	1 953 834 sqm
Inhabitants	18 471
Density	105 inhab/sqm



IM LANGEN LOH

GFA	374 100 sqm
Inhabitants	5837
Density	64 inhab/sqm



DE BARY

GFA	89 546 sqm
Inhabitants	2 019
Density	53 inhab/sqm



REINACH

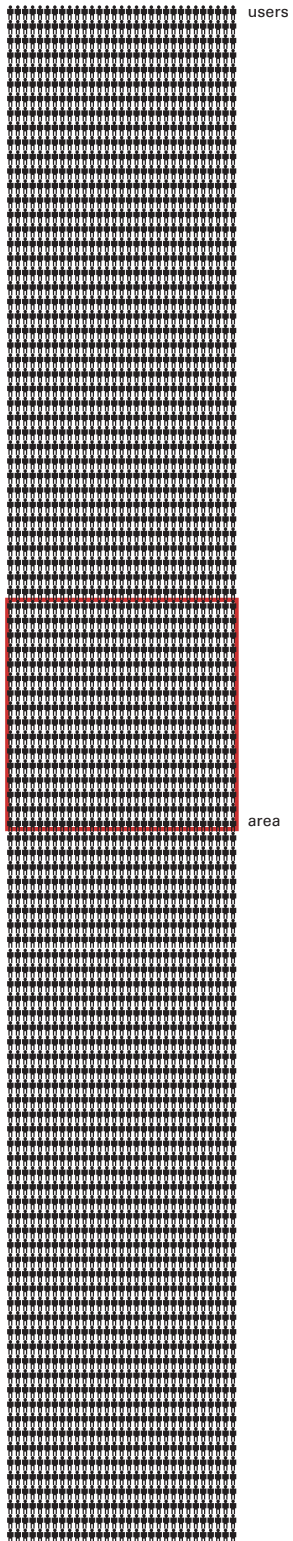
GFA	220 222 sqm
Inhabitants	1684
Density	130 inhab/sqm



ERLENMATT

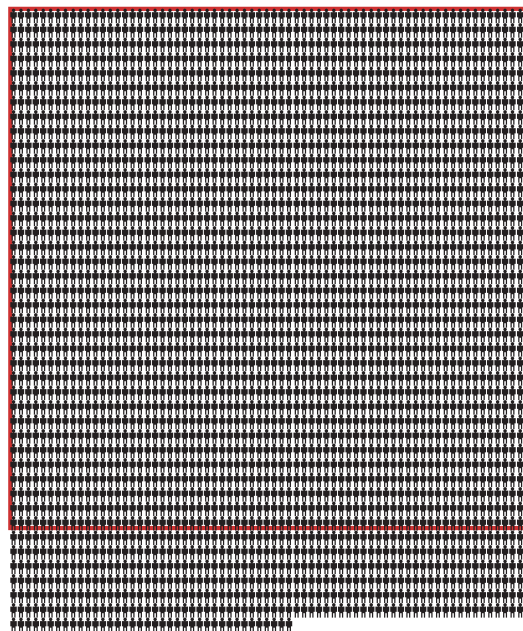
GFA	56 000 sqm
Inhabitants	2733
Density	66 inhab/sqm

# DENSITY OF USERS



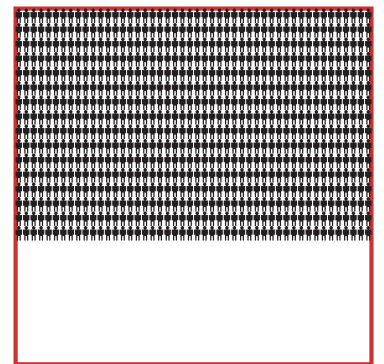
SCHIFFLÄNDE

Area 372 000 sqm  
Users 33 507



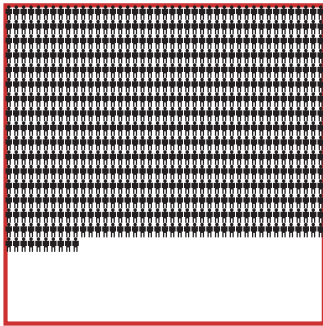
GUNDELDINGEN

Area 1 017 966 sqm  
Users 25 068



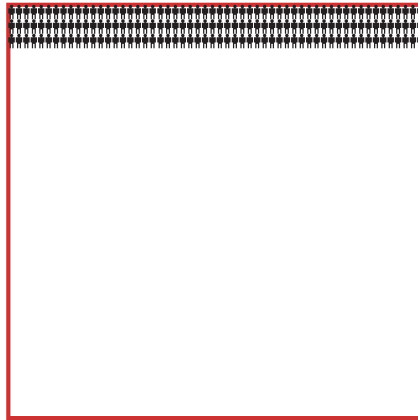
IM LANGEN LOH

Area 479 561 sqm  
Users 8228



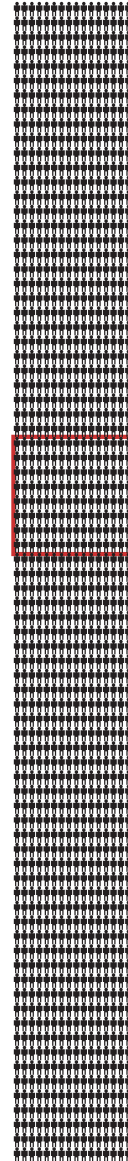
DE BARY

Area 378 600 sqm  
Users 220



REINACH

Area 640 008 sqm  
Users 1684

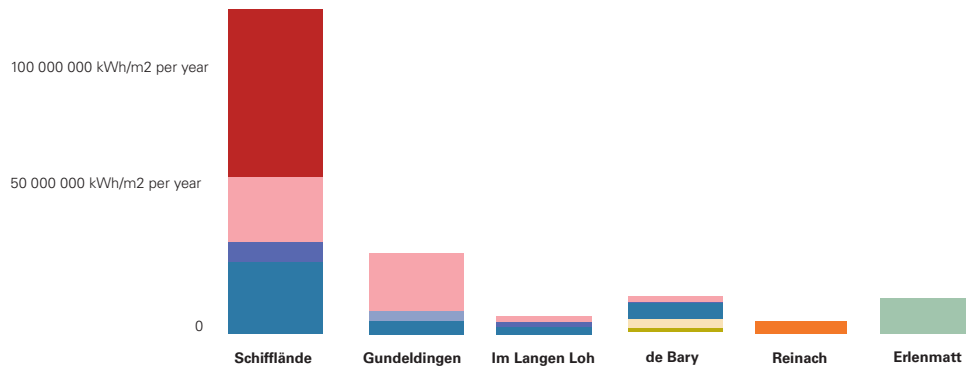


ERLEMMATT

Area 205 696 sqm  
Users 13 645



# ENERGY CONSUMPTION



Total energy consumption per year per building type  
(www.2000-watt.bs.ch)

- pre-industrial/ old city
- buildings turn of 19th century
- villas turn of 19th century
- pre-war welfare housing < 1938
- housing around 1950s
- residential buildings 1960s-1980s
- residential buildings since 1990s
- single family homes
- highrises
- new buildings since 1990s

# ENERGY CONSUMPTION BY BUILDING TYPE

Figure groundplan, 1: 6 000

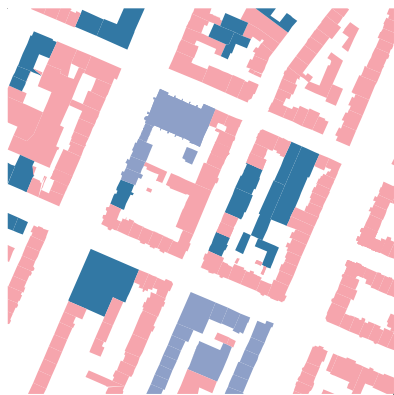
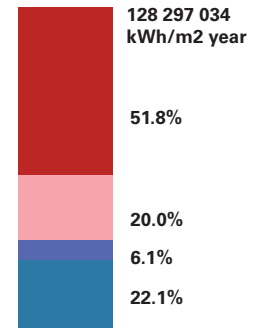
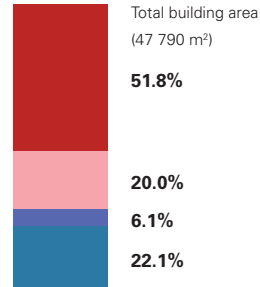
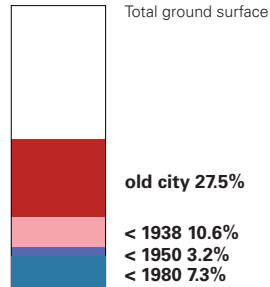
Area of building type/  
total ground surface

Area of building type/ total build-  
ing area

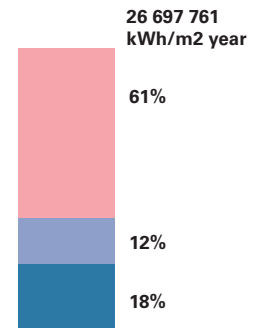
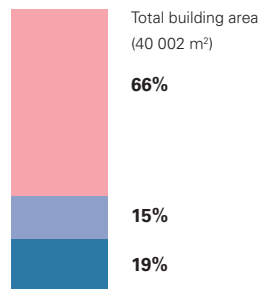
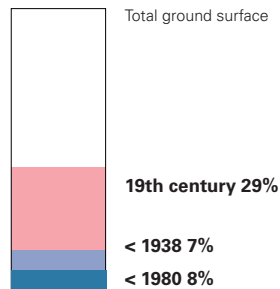
Total energy consumption per year  
per building type



SCHIFFPLÄNDE, BASEL  
Historical Compact City



GUNDELDINGEN, BASEL  
The Urban Block (1860's)



GENOSSENSCHAFT 'IM LANGEN LOH', BASEL  
Row Houses (20's/30's)

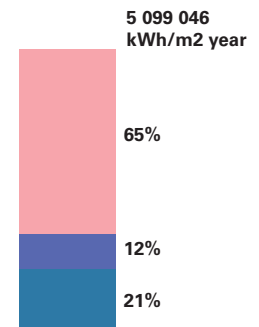
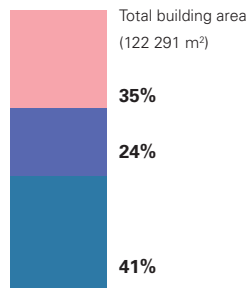
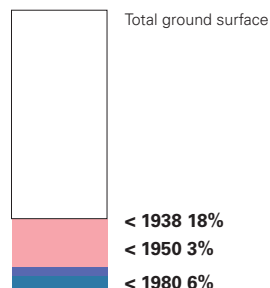
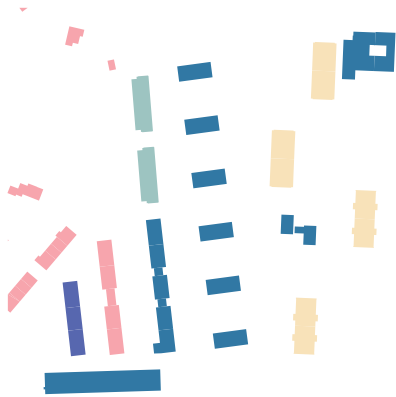


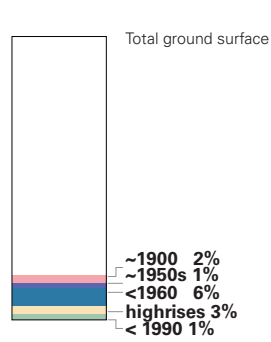


Figure groundplan, 1: 6 000

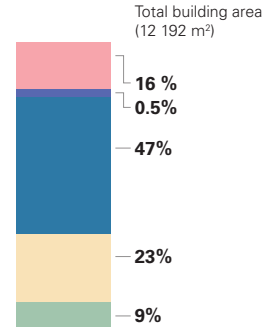


DE BARY, BASEL  
Modern Housing Development (1960's)

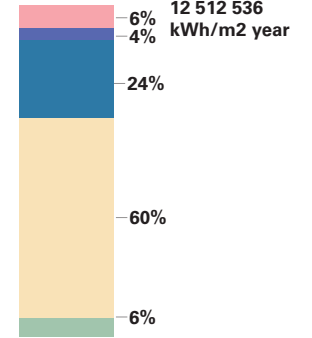
Area of building type/  
total ground surface



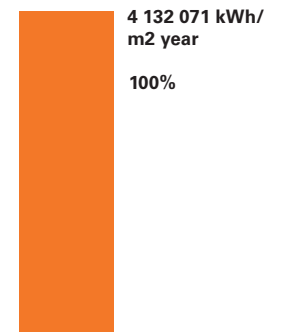
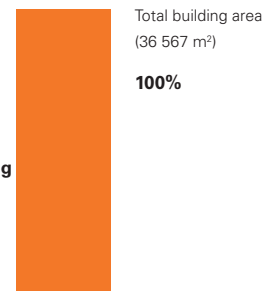
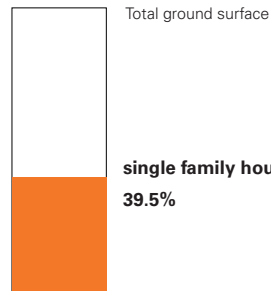
Area of building type/ total build-  
ing area



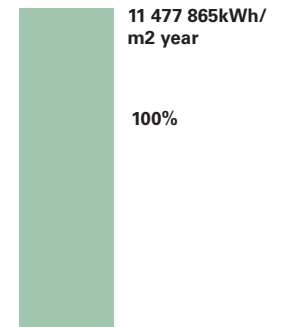
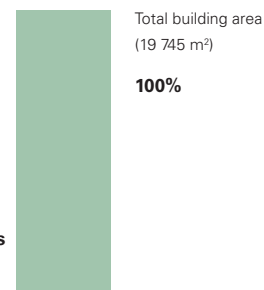
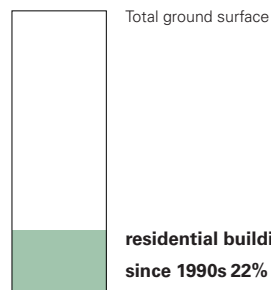
Total energy consumption per year  
per building type



REINACH, BASEL  
Single Family House Suburbia



ERLEMATT, BASEL  
Contemporary Large Scale Block

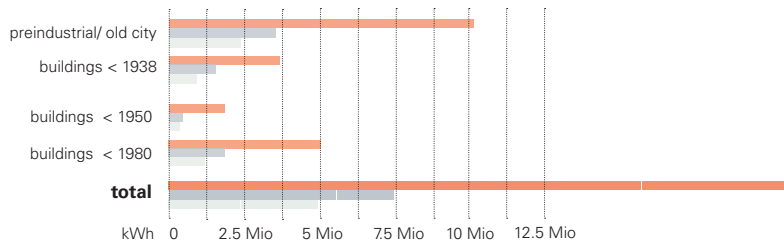


# ENERGY CONSUMPTION BY BUILDING TYPE

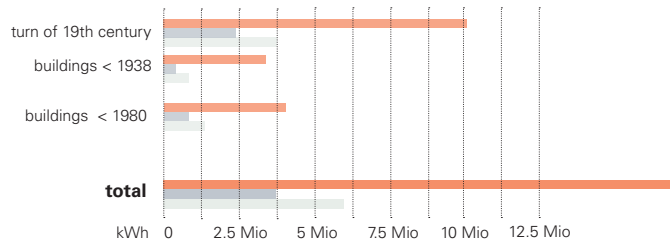
## Energy consumption for heating, electricity and warm water

(www.2000-watt.bs.ch)

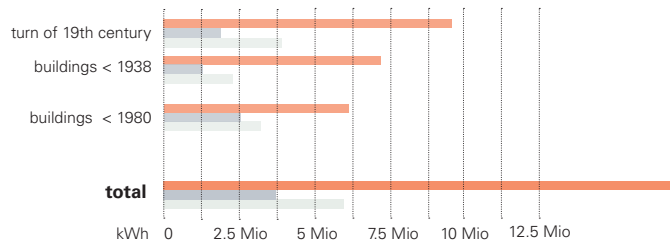
	Heating	Water	Electricity	Sum of all kWh/m2*a	GFA	Total kWh/m2*a	Percentage
pre-industrial / old city	95	20	31	146	111370.5	16'260'093	50%
residential buildings turn of 19th century	86	20	31	137	43114.5	5'906'687	18%
villas turn of 19th century	106	20	31	157	0	0	0%
pre-war welfare housing < 1938	106	20	31	157	0	0	0%
housing around 1950s	111	20	31	162	14610	2'366'820	7%
residential buildings 1960s-1980s	97	20	31	148	52690	7'798'120	24%
residential buildings since 1990s	54	20	31	105	0	0	0%
single family homes	69	13	31	113	0	0	0%
highrises	104	20	31	155	0	0	0%
new buildings since 1990s	63	20	31	114	0	0	0%
<b>Total</b>					<b>221785</b>	<b>32'331'720</b>	<b>100%</b>



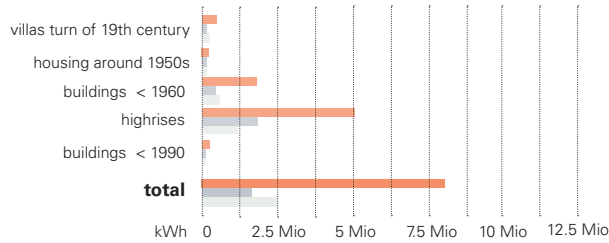
	Heating	Water	Electricity	Sum of all kWh/m2*a	GFA	Total kWh/m2*a	Percentage
pre-industrial / old city	95	20	31	146	0	0	0%
residential buildings turn of 19th century	86	20	31	137	118633	16'252'721	61%
villas turn of 19th century	106	20	31	157	0	0	0%
pre-war welfare housing < 1938	106	20	31	157	27505	4'318'285	16%
housing around 1950s	111	20	31	162	0	0	0%
residential buildings 1960s-1980s	97	20	31	148	41398	6'126'904	23%
residential buildings since 1990s	54	20	31	105	0	0	0%
single family homes	69	13	31	113	0	0	0%
highrises	104	20	31	155	0	0	0%
new buildings since 1990s	63	20	31	114	0	0	0%
<b>Total</b>					<b>187536</b>	<b>26'697'910</b>	<b>100%</b>



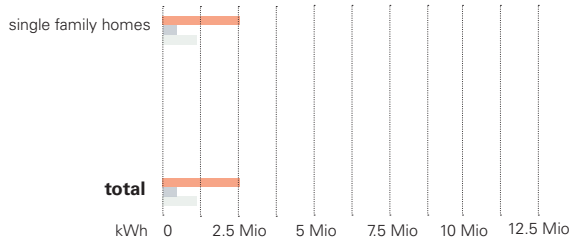
	Heating	Water	Electricity	Sum of all kWh/m2*a	GFA	Total kWh/m2*a	Percentage
pre-industrial / old city	95	20	31	146	0	0	0%
residential buildings turn of 19th century	86	20	31	137	107004,6	14 659 634	33%
villas turn of 19th century	106	20	31	157	0	0	0%
pre-war welfare housing < 1938	106	20	31	157	0	0	0%
housing around 1950s	111	20	31	162	73374,6	11 886 685	26%
residential buildings 1960s-1980s	97	20	31	148	125348,3	18 551 545	41%
residential buildings since 1990s	54	20	31	105	0	0	0%
single family homes	69	13	31	113	0	0	0%
highrises	104	20	31	155	0	0	0%
new buildings since 1990s	63	20	31	114	0	0	0%
<b>Total</b>					<b>305727,5</b>	<b>45 097 864</b>	<b>100%</b>



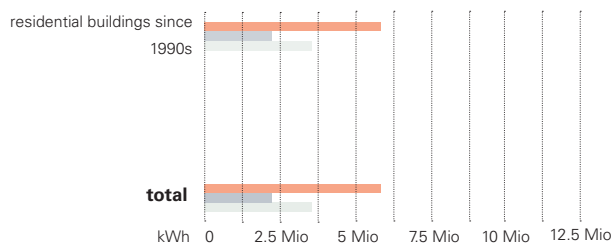
	Heating	Water	Electricity	GFA	Total kWh/m2*a	Percentage	
pre-industrial / old city	95	95.20	20	311	146	0	0%
residential buildings turn of 19th century	86	20	31		5910	809.670	6%
villas turn of 19th century	106	20	31		0	0	0%
pre-war welfare housing < 1938	106	20	31		0	0	0%
housing around 1950s	111	20	31		3050	494.100	4%
residential buildings 1960s-1980s	97	20	31		19939,5	2.951.046	24%
residential buildings since 1990s	54	20	31		0	0	0%
single family homes	69	13	31		0	0	0%
highrises	104	20	31		48620	7.536.100	60%
new buildings since 1990s	63	20	31		6330	721.620	6%
<b>Total</b>					<b>83849,5</b>	<b>12.512.536</b>	<b>100%</b>



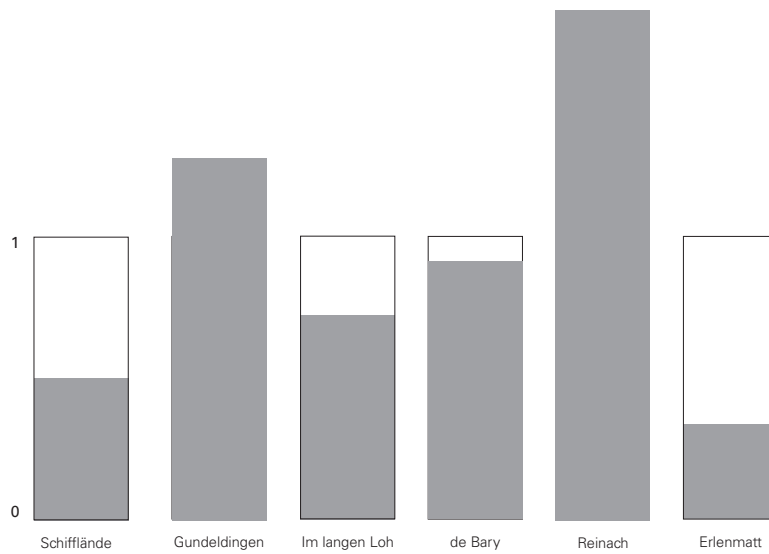
	Heating	Water	Electricity	Sum of all kWh/m2*a	FfA	Total kWh/m2*a	Percentage
pre-industrial / old city	95	20	31	146	0	0	0%
residential buildings turn of 19th century	86	20	31	137	0	0	0%
villas turn of 19th century	106	20	31	157	0	0	0%
pre-war welfare housing < 1938	106	20	31	157	0	0	0%
housing around 1950s	111	20	31	162	0	0	0%
residential buildings 1960s-1980s	97	20	31	148	0	0	0%
residential buildings since 1990s	54	20	31	105	0	0	0%
single family homes	69	13	31	113	36565	4 131 845	100%
highrises	104	20	31	155	0	0	0%
new buildings since 1990s	63	20	31	114	0	0	0%
<b>Total</b>				<b>36565</b>	<b>4 131 845</b>	<b>100%</b>	



	Heating	Water	Electricity	Sum of all kWh/m2*a	GFA	Total kWh/m2*a	Percentage
pre-industrial / old city	95	20	31	146	0	0	0%
residential buildings turn of 19th century	86	20	31	137	0	0	0%
villas turn of 19th century	106	20	31	157	0	0	0%
pre-war welfare housing < 1938	106	20	31	157	0	0	0%
housing around 1950s	111	20	31	162	0	0	0%
residential buildings 1960s-1980s	97	20	31	148	0	0	0%
residential buildings since 1990s	54	20	31	105	109313	11'477'865	100%
single family homes	69	13	31	113	0	0	0%
highrises	104	20	31	155	0	0	0%
new buildings since 1990s	63	20	31	114	0	0	0%
<b>Total</b>				<b>109313</b>	<b>11'477'865</b>	<b>100%</b>	

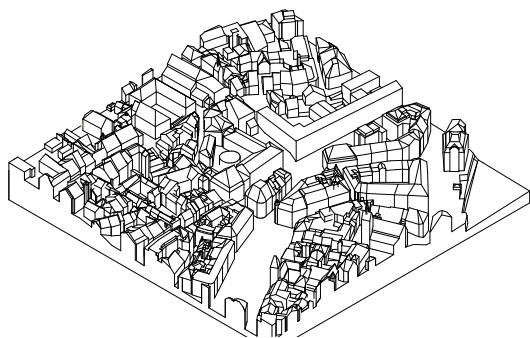






Total building envelope/GFA

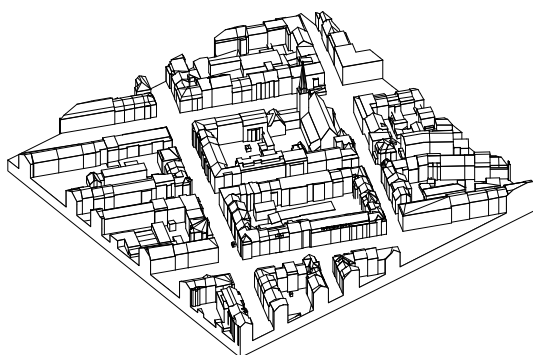
# BUILDING ENVELOPE



SCHIFFLÄNDE, BASEL  
Historical Compact City

Total building envelope	108 368 m <sup>2</sup>
GFA	215 055 m <sup>2</sup>
<b>Building envelope/ GFA</b>	<b>0.504</b>

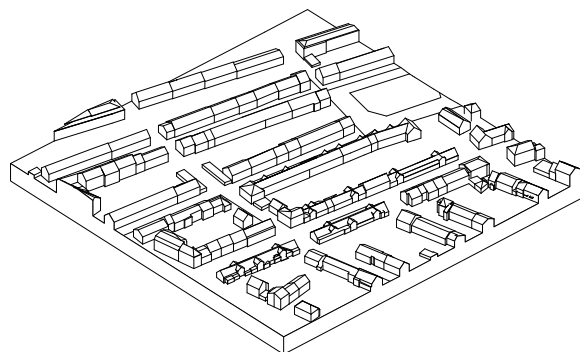
Entire district	
Total building envelope	450 714 m <sup>2</sup>
GFA	795 720 m <sup>2</sup>
Building envelope/ GFA	0.566



GUNDELDINGEN, BASEL  
The Urban Block (1860's)

Total building envelope	209 170 m <sup>2</sup>
GFA	187 536 m <sup>2</sup>
<b>Building envelope/ GFA</b>	<b>1.1</b>

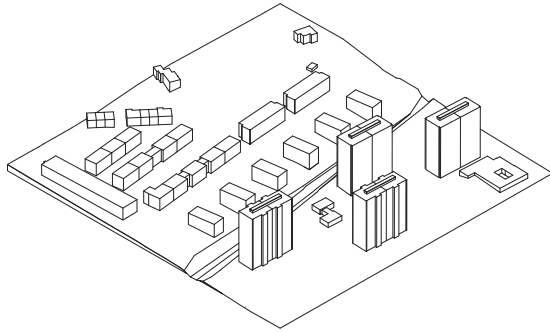
Entire district	
Total building envelope	5 192 000 m <sup>2</sup>
GFA	1 953 834 m <sup>2</sup>
Building envelope/ GFA	265%



GENOSSENSCHAFT 'IM LANGEN LOH', BASEL  
Row Houses (20's/30's)

Total building envelope	40 808 m <sup>2</sup>
GFA	374 100 m <sup>2</sup>
<b>Building envelope/ GFA</b>	<b>0.72</b>

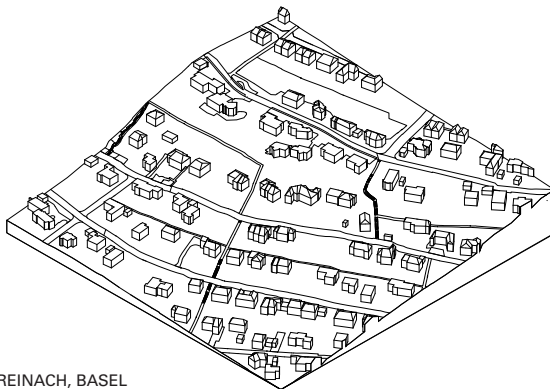
Entire district	
Total building envelope	281 500m <sup>2</sup>
GFA	374 175m <sup>2</sup>
Building envelope/ GFA	0.75



DE BARY, BASEL  
Modern Housing Development (1960's)

Total building envelope	76 136 m <sup>2</sup>
GFA	89 546 m <sup>2</sup>
<b>Building envelope/ GFA</b>	<b>0.85</b>

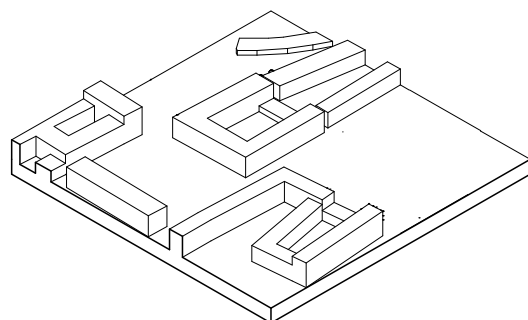
Entire district	
Total building envelope	274 678 m <sup>2</sup>
GFA	290 857 m <sup>2</sup>
Building envelope/ GFA	0.94



REINACH, BASEL  
Single Family House Suburbia

Total building envelope	64 111 m <sup>2</sup>
GFA	35 565 m <sup>2</sup>
<b>Building envelope/ GFA</b>	<b>1.82</b>

Entire district	
Total building envelope	344 382 m <sup>2</sup>
GFA	200 222 m <sup>2</sup>
Building envelope/ GFA	1.72



ERLENMATT, BASEL  
Contemporary Large Scale Block

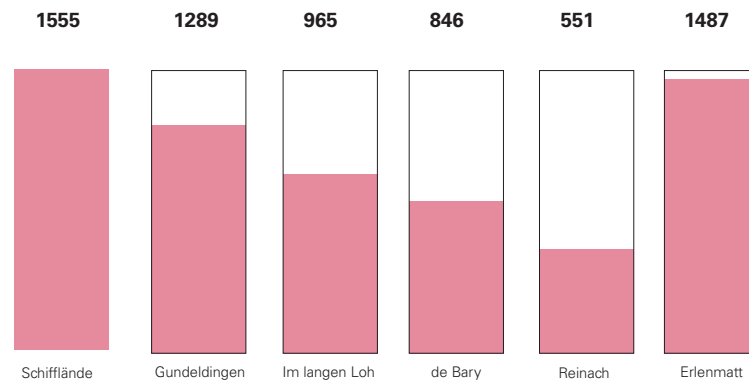
Total building envelope	47 694 m <sup>2</sup>
GFA	145 326 m <sup>2</sup>
<b>Building envelope/ GFA</b>	<b>0.335</b>

Entire district	
Total building envelope	133 488 m <sup>2</sup>
GFA	289 674 m <sup>2</sup>
Building envelope/ GFA	0.461





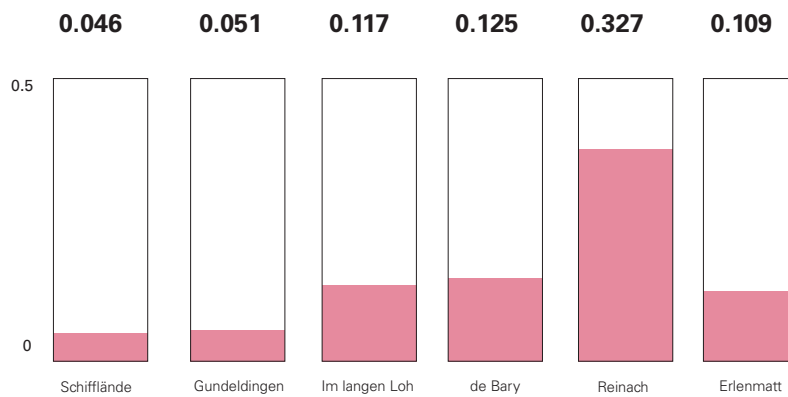
# EMBODIED ENERGY PER SURFACE



Embodied Energy per sqm  
([www.bauteilkatalog.ch/ch/de/Bauteilkatalog.asp](http://www.bauteilkatalog.ch/ch/de/Bauteilkatalog.asp))



# EMBODIED ENERGY EFFICIENCY

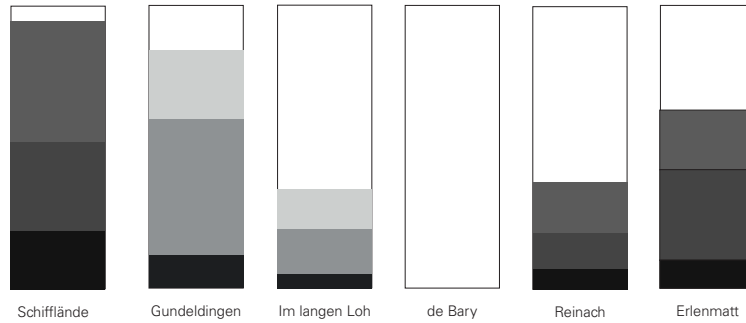


Embodied energy per user  
([www.bauteilkatalog.ch/ch/de/Bauteilkatalog.asp](http://www.bauteilkatalog.ch/ch/de/Bauteilkatalog.asp))





Total unbuilt area



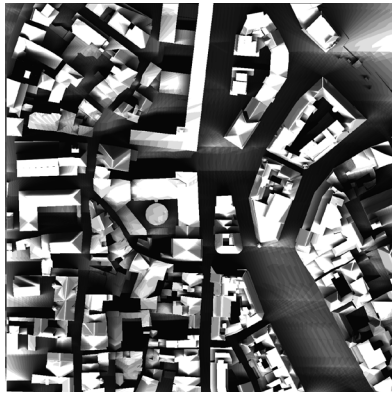
Percentage of surface in shade



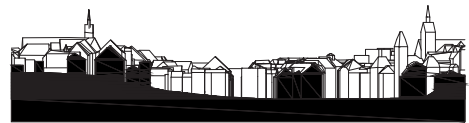
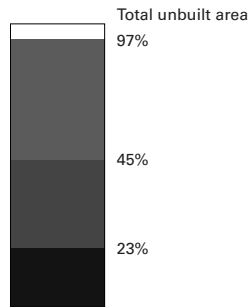
# SHADOW

(for 21th of September in Basel, source: <http://www.stadtplan.bs.ch/geoviewer/>)

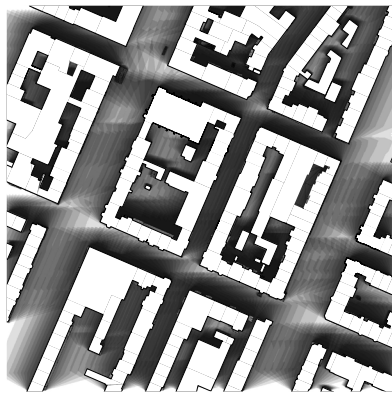
- 3 h shadowed
- 6 h shadowed
- 9 h shadowed
- no shadow



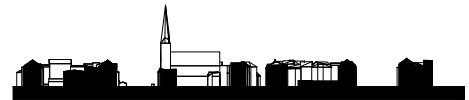
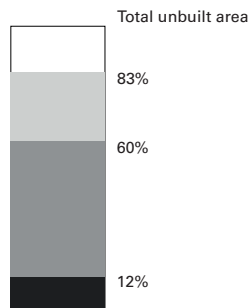
SCHIFFLÄNDE, BASEL  
Historical Compact City



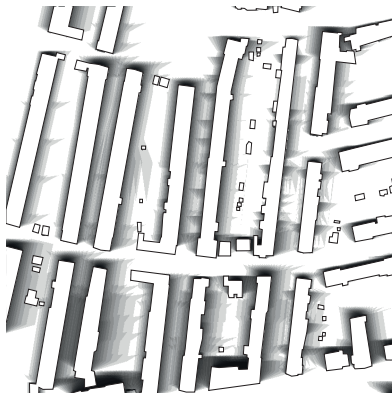
Section, 1: 2 500



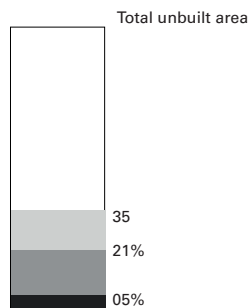
GUNDELDINGEN, BASEL  
The Urban Block (1860's)



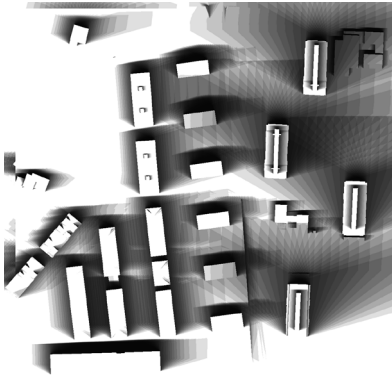
Section, 1: 2 500



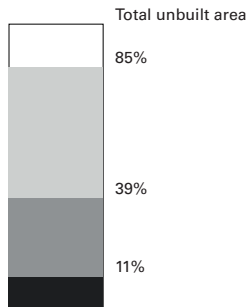
GENOSSENSCHAFT 'IM LANGEN LOH', BASEL  
Row Houses (20's/30's)



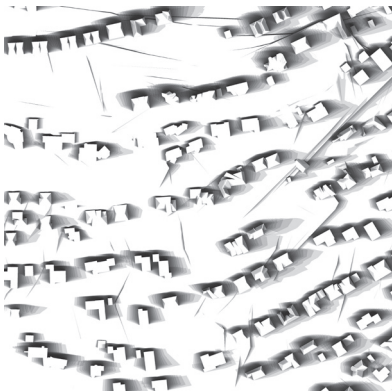
Section, 1: 2 500



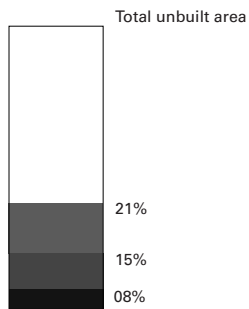
DE BARY, BASEL  
Modern Housing Development (1960's)



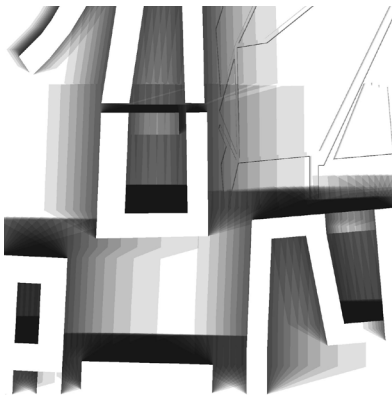
Section, 1: 2 500



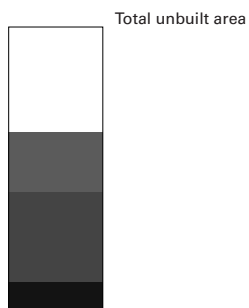
REINACH, BASEL  
Single Family House Suburbia



Section, 1: 2 500



ERLENMATT, BASEL  
Contemporary Large Scale Block

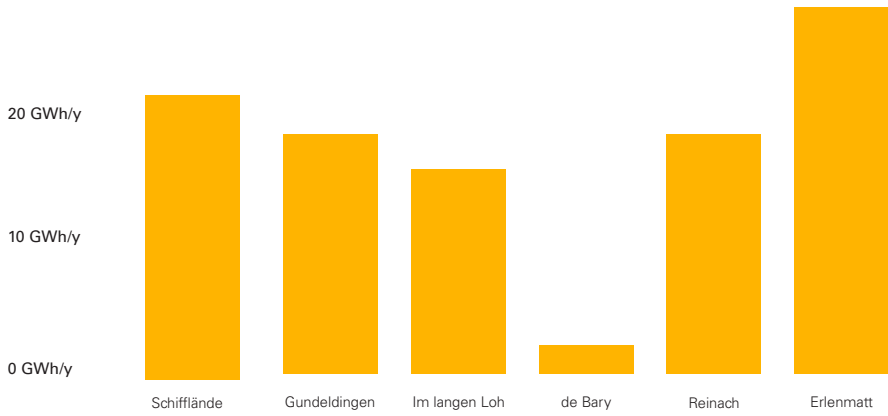


Section, 1: 2 500





# POTENTIAL FOR RENEWABLE SOLAR ENERGY



Total solar energy per year

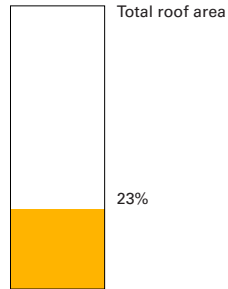
# POTENTIALS FOR RENEWABLE SOLAR ENERGY

SOLAR POWER - PHOTOVOLTAIC source: <http://www.stadtplan.bs.ch/geoviewer/>

- Potential surface for photovoltaic
- Roof surface 100%



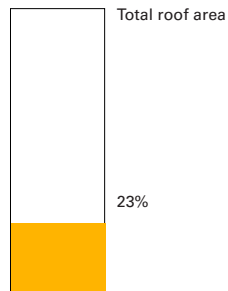
SCHIFFFLÄNDE, BASEL  
Historical Compact Cityw



Potential area (pv)	19 198 m <sup>2</sup>
Total roof surface	68 377 m <sup>2</sup>
Solar potential	28,1 %
Total solar power	1279 kW
Maximum potential*	1.2 kW/ inha
Total solar energy	21.86 GWh/y
Maximum potential*	10800 kWh/y inhab
* 130W/m <sup>2</sup>	



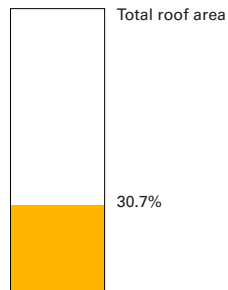
GUNDELDINGEN, BASEL  
The Urban Block (1860's)



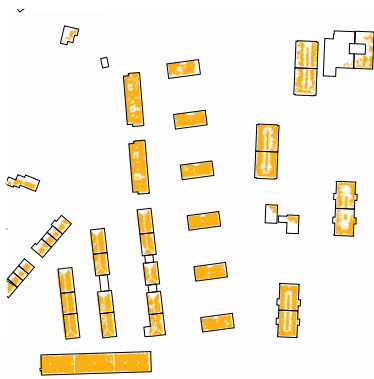
Potential area (pv)	12 600 m <sup>2</sup>
Total roof surface	51 700 m <sup>2</sup>
Solar potential	24.3%
Total solar power	1638 kW
Maximum potential*	0.376 kW/ inha
Total solar energy	14.3 MWh/y
Maximum potential*	3.29 kWh/y inhab
* 130W/m <sup>2</sup>	



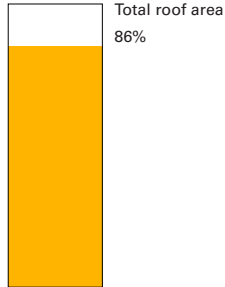
GENOSSENSCHAFT 'IM LANGEN LOH', BASEL  
Row Houses (20's/30's)



Potential area (pv)	9640 m <sup>2</sup>
Total roof surface	32 065m <sup>2</sup>
Solar potential	30.7 %
Total solar power	1253 kW
Maximum potential*	972 kW/ inha
Total solar energy	11.2 GWh/y
Maximum potential*	1.42 kWh/y inhab
* 130W/m <sup>2</sup>	

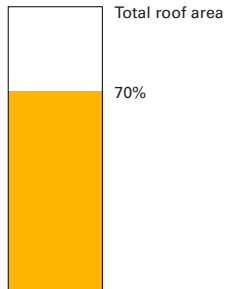


DE BARY, BASEL  
Modern Housing Development (1960's)



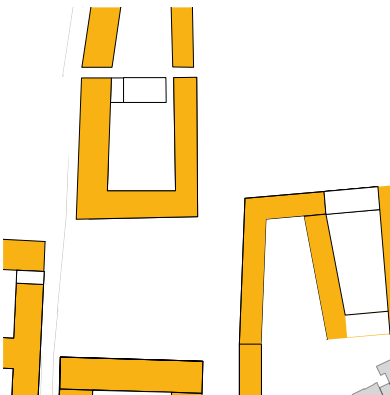
Potential area (pv)	10 173m <sup>2</sup>
Total roof surface	11 695 m <sup>2</sup>
Solar potential	86 %
Total solar power	1322 kW
Maximum potential*	0.8 kW/ inha
Total solar energy	18.6 GWh/y
Maximum potential*	1340 kWh/y inhab
* 130W/m2	

no solar plan is available for the region. results are based on mathematic calculations...

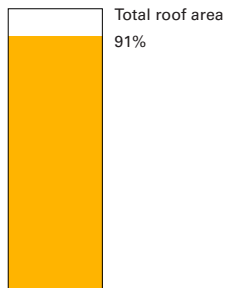


Potential area (pv)	13 617 m <sup>2</sup>
Total roof surface	19 454 m <sup>2</sup>
Solar potential	70%
Total solar power	1770 kW
Maximum potential*	1.07 kW/ inha
Total solar energy	24.8 GWh/y
Maximum potential*	17 454kWh/y inhab
* 130W/m2	

REINACH, BASEL  
Single Family House Suburbia



ERLEMATT, BASEL  
Contemporary Large Scale Block



Potential area (pv)	18 153 m <sup>2</sup>
Total roof surface	20 014 m <sup>2</sup>
Solar potential	91 %
Total solar power	2360 kW
Maximum potential*	1.98 kW/ inha
Total solar energy	26.8 GWh/y
Maximum potential*	22 623 kWh/y inhab
* 130W/m2	