

Area Types

A description of the structural and land-use categories maintained by the Urban and Environmental Information System (ISU) of the Berlin Senate Administration for Urban Development

Contracted by: Senate Department for Urban Development, III F

Author: Uta Hanschke
Drakestrasse 77 B
12205 Berlin
June 1995

Edited by: Doreen Beddig
Brückenstrasse 6, 10179 Berlin
January 2005

Table of Contents

1. Methodology	5
2. Description of Area Types	8
2.1 Area Types with Predominantly Residential Use	8
2.1.1 Type 1: Closed Courtyard	8
2.1.2 Type 2: Courtyard	8
2.1.3 Type 3: Decorative and Garden Courtyard	9
2.1.4 Type 4: Rehabilitation De-Cored	10
2.1.5 Type 5: Cautious Rehabilitation	10
2.1.6 Type 6: Shed Courtyard	11
2.1.7 Type 7: Post-War Block Edge	11
2.1.8 Type 8: Unplanned Reconstruction	12
2.1.9 Type 9: High-Rise (Large Residential Area)	12
2.1.10 Type 71: Concrete Pre-Fab Buildings of the '80s and '90s	13
2.1.11 Type 73: Compact Buildings of the '90s, 4 storeys and more	14
2.1.12 Type 74: Low-Density Residential Areas of the '90s, 1 to 3 storeys	14
2.1.13 Type 10: Large Courtyard	15
2.1.14 Type 72: Row Houses of the '20s and '30s	16
2.1.15 Type 11: Row Houses of the '50s and Later	16
2.1.16 Type 22: Garden Row-House	17
2.1.17 Type 23: Garden	17
2.1.18 Type 24: Park-Like Garden	18
2.1.19 Type 25: Gardens and Semi-Private Green Space	19
2.1.20 Type 26: Open Residential Area	19
2.1.21 Type 21: Village	20
2.1.22 Type 59: Weekend houses	21
2.2. Area Types Used Predominantly for Commercial and Industrial Purposes	
2.2.1 Type 39: Mixed Area-I (e.g. country inns)	21
2.2.2 Type 29: Core Areas	22
2.2.3 Type 38: High-Density Mixed Area-II	22
2.2.4 Type 31: High-Density Commercial Area	23
2.2.5 Type 33: Low-Density Mixed Area-II	23
2.2.6 Type 30: Low-Density Commercial District	24
2.2.7 Type 32: Utilities and Public Supply Areas	24
2.3. Public Service and Special-Use Area Types	25
2.3.1 Type 42: Postal	25
2.3.2 Type 41: Security Services	25
2.3.3 Type 43: Administrative Buildings	26
2.3.4 Type 45: Cultural Facilities	26
2.3.5 Type 12: Schools, Old Buildings (built pre-1945)	27
2.3.6 Type 13: Schools, New Buildings (built post-1945)	27
2.3.7 Type 14: Schools (age unknown)	27
2.3.8 Type 44: Universities and Research Facilities	28
2.3.9 Type 49: Churches	28
2.3.10 Type 50: Retirement Homes	29
2.3.11 Type 46: Hospitals	29
2.3.12 Type 47: Day-Care Centers	30
2.3.13 Type 51: Youth Recreation Buildings	30

2.3.14 Type 60: General Public Services	31
2.4 Transportation Area Types	31
2.4.1 Type 93: Airports	31
2.4.2 Type 91: Parking Lots	32
2.4.3 Type 92: Railyards without Track Areas	32
2.4.4 Type 99: Track Areas	32
2.4.5 Type 94: Other Transportation Areas	33
2.5. Green and Open Area Types	33
2.5.1 Type 55: Woodlands	33
2.5.1.1: Pine woods	33
2.5.1.2: Pine – black oak/ holm oak – birch woods	33
2.5.1.3: Beech – oak – linden woods	34
2.5.1.4: Floodplain and swamp woodlands	34
2.5.2 Type 56: Agriculture	34
2.5.2.1: Farmland	34
2.5.2.2: Pastureland	35
2.5.2.3: Garden land	35
2.5.3 Type 53: Green Spaces and Parkland	35
2.5.3.1: Park < 2 hectares	35
2.5.3.2: Municipal park 2-50 hectares	36
2.5.3.3: Parks > 50 hectares	36
2.5.4 Type 54: Public Squares/Promenades	36
2.5.5 Type 27: Cemeteries	37
2.5.5.1: Decorative cemetery	37
2.5.5.2: Park cemeteries	37
2.5.5.3: Wooded cemeteries	37
2.5.6 Type 34: Allotment Gardens with Low Surface Coverage	38
2.5.7 Type 35: Allotment Gardens with High Surface Coverage	38
2.5.8 Type 37: Allotment Gardens, General	39
2.5.9 Type 57: Fallow Areas	39
2.5.9.1: Infertile grassland	39
2.5.9.2: Ruderal semi-arid grassland	
2.5.9.3: Gravel, sand and clay quarries	39
2.5.9.4: Abandoned railyards	
2.5.9.5: Vacant urban lots	
2.5.9.6: Temporary ruderal fields	40
2.5.10 Type 58: Camping Sites	40
2.5.11 Type 28: Sports Facilities	40
2.5.11.1: Sports fields	41
2.5.11.2: Facilities with sports fields and halls	41
2.5.12 Type 15: Water Sports	42
2.5.13 Type 36: Tree Nurseries/Horticultural Facilities	42
2.6 Other Area Types	43
2.6.1 Type 98: Construction Sites	43
3. Bibliography	44

1. Methodology

The principle basic distinction is between areas with predominantly residential usage and those with other types of usage.

The area types with a predominantly residential use (open-space types) occur only in blocks or block sections certified as Residential Areas or Mixed Areas-1 in Environmental Atlas Map 06.01 "Actual Use of Built-Up Areas. They have been distinguished according to their typical construction and open-space structures, as well as their period of origin.

By contrast, the period of origin and structural characteristics are only of secondary importance for the other area types (use types). They do not have any characteristic spatial appearance, but rather only typical use characteristics and sometimes characteristic features of their open spaces. They are broken down into the categories of Environmental Atlas Maps 06.02 "Green and Open Spaces" and 0601 "Actual Use of Built-Up Areas," without the categories "Residential Areas" and "Mixed Areas-II". The system of the utilization categories is described in the texts for these Environmental Atlas Maps. The methodology for the definition of the area types is explained in the text accompanying Environmental Atlas Map 06.07 "Urban Structure."

In addition to its use, period of origin and structural characteristics, every area type is further characterized by its degree sealing, degree of coverage by construction, and shares of differently permeable surfacing. The **average degree of sealing** is based on the average share of built-up area (degree of coverage by construction) plus the proportion of the area not built upon, yet sealed by surfacing, compared with the total surface area of the respective block.

The **average distribution of surface-surfacing categories** indicates which surfacing was as a rule used in a given area type to pave the sealed areas which were not built upon. The surfacing types are grouped into four surface classes, according to their expected effects on the ecosystem.

Tab. 1: Overview of Surface Classes		
Sealing class	Estimated effects on ecosystem	Sealing type
1	extreme	Asphalt, concrete, paving stones with joint sealer or concrete substructure, plastic materials
2	high	Artificial stone and plates (edge length > 8 cm), concrete-stone composites, clinker, medium and large-sized paving stones
3	medium	Small and mosaic paving stones (edge length < 8 cm)
4	low	Grass trellis stones, water-bound cover (i.e. ash, pebbles, tamped ground), crushed rock, gravel

Tab. 2: Average Degree of Sealing and Construction and Surface Sealing Class Distribution for Non-Built-Up Sealed Areas by Area Types

Area type	degree of sealing	of which		sealing class for non-built-up areas			
		built-up sealed areas	non-built-up sealed areas	1	2	3	4
	%	%	%	%			
Residential areas							
Courtyard	81	51	30	56	22	3	19
Decorative and garden court	60	37	23	62	27	10	1
Reconstruction area	75	45	30	62	17	8	13
Shed court	58	30	28	46	29	13	12
Post-war block-edge	68	38	30	41	27	4	28
Unplanned reconstruction	68	37	31	45	28	13	14
Large-scale residential area	48	22	26	15	67	7	11
Residential area of the nineties >= four floors	52	29	23	20	60	10	10
Residential area of the nineties < four floors	51	29	22	20	35	35	10
Large court	45	29	16	20	37	32	11
Fifties and later row	40	21	19	49	46	3	2
Row yard	27	15	12	25	65	3	7
Yard	26	13	13	18	74	2	6
Park-like garden	28	16	12	15	60	12	13
Yards / semi-private re-greening	32	18	14	20	64	4	12
Open settlement development	22	13	9	18	74	2	6
Village	32	17	15	21	39	22	18
Core areas	83	49	34	50	34	9	7
Industrial / small business areas							
Mixed area II / industry and small business (built-up area < 50 %)	76	27	49	48	38	1	13
Mixed area II / industry and small business (built-up area >=50 %)	91	57	34	74	20	1	5
Utilities Areas	69	25	44	31	56	1	12
Public facilities							
Law enforcement	51	15	36	54	25	3	18
Postal	83	36	47	54	25	3	18
Administrative	66	32	34	41	42	15	2
Cultural	66	30	36	41	42	15	2
University/ research	53	26	27	15	70	12	3
Hospital	40	20	20	42	38	8	12
Schools	63	23	40	45	40	2	13

Sports facility	45	6	39	18	28	1	53
Water sports	32	14	18	46	29	13	12
Church	42	18	24	65	7	16	12
Child day care center	41	18	23	7	42	5	46
Playground	40	1	39	14	29	3	56
Retirement home	47	25	22	4	62	18	16
Youth center	29	12	17	4	62	18	16
Green and open spaces							
Allotment garden	20	10	10	5	31	4	60
Cemetery	16	2	14	14	27	5	54
Tree nursery / horticulture	33	15	18	35	45	9	11
Green space / park	11	1	10	30	20	5	45
City square / promenade	55	6	49	50	20	10	20
Forest	2	0	2	5	5	0	90
Agriculture (farmland)	2	0	2	10	10	0	80
Vacant areas	7	0	7	20	10	0	70
Campground	13	2	11	20	20	0	60
Weekend Cottage area	25	12	13	11	43	2	44
Traffic areas							
Parking lot	71	5	66	31	53	7	9
Railroad property	40	1	25	5	5	0	90
Airport	94	4	90	85	10	0	5
Other traffic areas	82	3	79	42	32	19	7
<p>Green spaces within traffic areas or industrial and small business areas have been treated as vacant areas (e.g. vacant areas adjacent to airport taxiways); airports are only the sealed parts, streets were not considered * sealing class is not yet determined</p>							

(state of work Tab 2: 2001-12-31)

A total of 62 different area types (22 area types with predominantly residential use and 40 area types with other uses) have been defined and included, and are described here on the basis of the reference lots of the Urban and Environmental Information System (ISU) of the Senate Administration for Urban Development. The reference lots correspond to the statistical blocks, which, in case of different uses within a block, have been further subdivided into homogeneous-use block sections.

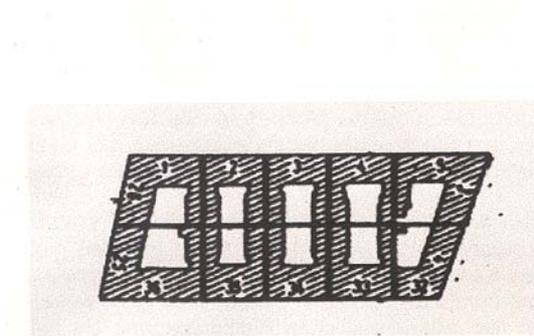
2. Description of Area Types

2.1 Area Types with Predominantly Residential Use

The following is the break-down of Area Types which have been classified according to their use as "Residential Areas" or "Mixed Areas-II." These areas are characterized by their residential function. Commercial and service providers, as well as craft and industrial businesses, are of only secondary importance.

2.1.1 Type 1: Closed Courtyard

The "Closed Courtyard" residential type is the area type with the greatest degree of building density and sealing. It is certified only for West Berlin; for technical reasons, blocks of this type in East Berlin have been assigned to the area type "Courtyard." The "Closed Courtyard" area type has a five to six-storey block structure, and was built within the Urban Rail ring during the late Imperial Era, in such a way as to permit maximum utilization of the lots. Often, there are several courtyards. As a rule, they are completely enclosed by buildings, are interconnected only by passages, and in some cases reduced to air-shaft size. The courtyards are in some cases used commercially; generally, however, they only serve as entry-ways to the lateral sides and rear buildings, and as waste-bin placement areas. The courtyards are almost complete, sealed – and in case of commercial use, completely. Asphalt and concrete predominate.

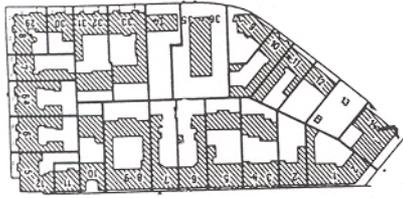


2.1.2 Type 2: Courtyard

The Area Type "Courtyard" is used to designate blocks which were primarily built within the Urban Rail ring for the fast-growing Berlin population between 1870 and 1918; they consist predominantly of closed, five-storey block buildings, largely old buildings with lateral and/or rear wings. There are also commercial and factory buildings, public-utility buildings, and renovated or new buildings at the block edges, without rear buildings. The courtyards are multi-sided, but only seldom enclosed by high buildings on all sides. They are often only separated by walls or fences from neighboring courtyards, so that they merge together to form winding block interiors, making them somewhat sunnier and more open than is the case for the "Closed Courtyard" type.

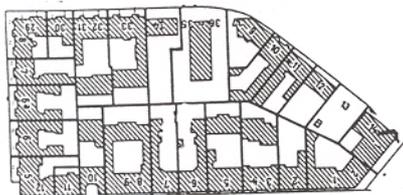
In East Berlin "closed-courtyard"-type blocks have for technical reasons been classified under the category "Courtyard."

The "Courtyard" Area Type is characterized by a mixture of residential buildings with a considerable amount of work space. Even larger commercial enterprises, which need more extensive open space for storage purposes, delivery, parking etc., can be found in this area type. The "Courtyard" type has a somewhat lower building density and degree of sealing than the "Closed Courtyard" type. In better residential areas, the courtyards contain old trees, paved pathways and beautifully tended decorative garden-beds. In poorer residential areas, the share of completely paved and minimally planted courtyards is greater.



2.1.3 Type 3: Decorative and Garden Courtyard

The "Decorative and Garden Courtyard" Area Type is characterized by four-storey block buildings. Often, front yards exist. This area type arose in the suburbs of Berlin outside the Urban Rail ring during the Imperial Era. The buildings have either lateral or rear buildings, but generally not both. A characteristic feature is a sunny block interior, which is typically landscaped. On average, a third of the lot is covered by buildings, and another quarter is sealed with such surfacing types as asphalt, concrete or concrete plates. The Decorative and Garden Courtyards vary considerably in terms of space and facilities. Generally, four original types are distinguished:



One version probably resulted from closing the empty sites at the edges of older building areas. Here, the typical dominant "Decorative and Garden Courtyard"-type four-storey block buildings are interrupted by occasional older two to three-storey town houses at the block edge; in some cases, they are somewhat recessed, and have a front yard. The yards of the old townhouses, but also those of the newer Decorative and Garden Courtyard houses, are or have been commercially used, and hence for the most part have low, one or two-storey shed-like rear buildings at the edges of the yards. In addition to the townhouses, there are also old craftsmen's buildings, which have yards open to the street, and long two or three-storey buildings at the edges of the lots. Since the craftsmen's buildings have courtyards open to the street, and the old townhouses often have a passage open to the courtyard on one side of the house, the "Decorative and Garden Courtyard" type does not have a completely closed block edge. However, since the entrances and courtyards are usually closed off by wooden-plank fences, a solidly closed street front is created. The high share of commercial use of the courtyards means that on average, one third of the courtyard land is paved, often with old pavement types, so that spontaneous vegetation can grow along its edges. The share of the individually tended gardens is very high in those courtyards which are not used commercially. The structure of these courtyards is strongly endangered today, since their commercial use is increasingly being abandoned, and the sheds are often torn down in the course of construction and modernization.

The **second version** consists of a typical four-storey front building house with correspondingly high lateral wings. The blocks show a block interior which is coherent and serrated, and subdivided only by fences. The courtyards are generally not used commercially. In the squares between the building wings, they are typically equipped with paved walkways and edged by decorative flower-beds. The block interiors are mostly used as garden, with fruit-trees and many other high, old trees and flower-beds, lawns and benches.

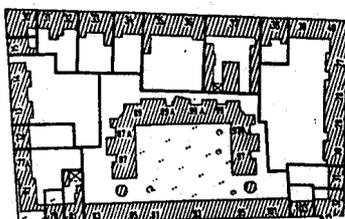
The **third version** consists of complexes with front and rear buildings, but no lateral wings. Between them is a courtyard which, together with several other such courtyards, yields a long block interior. The courtyards often have flowerbeds and fruit-trees. This version never covers an entire block.

The **fourth version** of semi-open block buildings consists of large, four-storey blocks of rental apartments with cube-like floor plans. The individual houses are separated from each other by walkways. Even the middle of the block usually contains only a narrow passage-like open area which is planted decoratively, but is hardly utilizable. This version is represented by only a few blocks in Friedenau and Steglitz.

2.1.4 Type 4: Rehabilitation De-cored

The type "Rehabilitation, De-Cored" was created after the war from areas which formerly had courtyard buildings. A distinctive feature is block-edge buildings with a high share of new building, which are still orientated toward the old Imperial-Era block structure. All rear wings and buildings, and all sheds were usually torn down in the course of rehabilitation, in conjunction with the modernization of the front building, or the construction of a new building. Thus, relatively large interiors resulted, sometimes with one or two large separate buildings in the middle, which were then landscaped as places of sojourning for the residents, with playgrounds, benches, walkways, easy-care planted areas and lawns. The degree of sealing of the open areas is often very high, in part due to the high share of underground car parks. Artificial stone and plate surfacing as well as concrete composite pavement predominate.

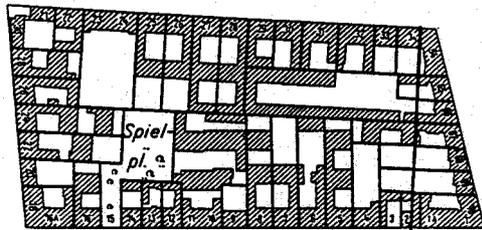
The "Rehabilitation De-Cored" Area Type is found only in West Berlin.



2.1.5 Type 5: Cautious Rehabilitation

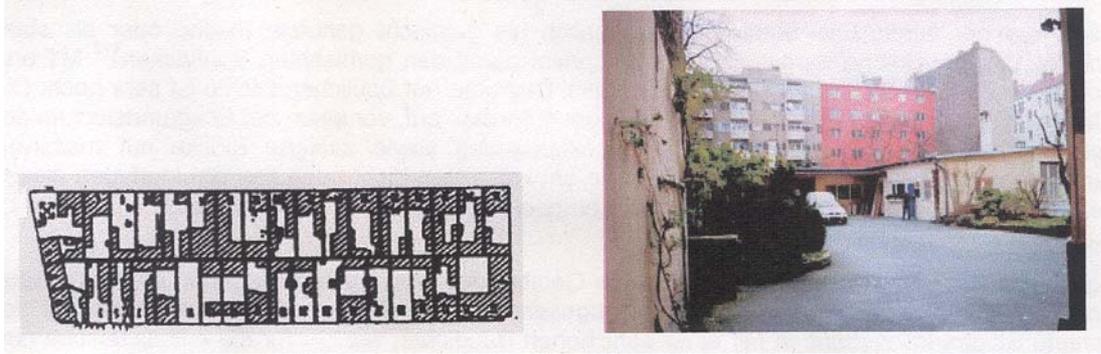
"Cautious Rehabilitation" Area Type represents the newest form of rehabilitation. In areas with old courtyard buildings, the old buildings have been modernized, and single empty sites filled by new buildings. Lateral and rear wings have been torn down only where absolutely necessary. The existing block structure, with its typical courtyards, has remained unchanged.

Redevelopment areas in East Berlin in which limited demolition in association with a merger and multiple utilization of the courtyards resulted in an enlargement of rear courtyard areas, are also classified under this area type. They are used for relaxation, playing and sports, as well as for such social facilities as day-care centers. After 1979, almost no more demolitions were carried out, either in West Berlin or in East Berlin. The degree of sealing is only insignificantly more favorable than that for the "Courtyard" type, due to the limited scale of the demolition.



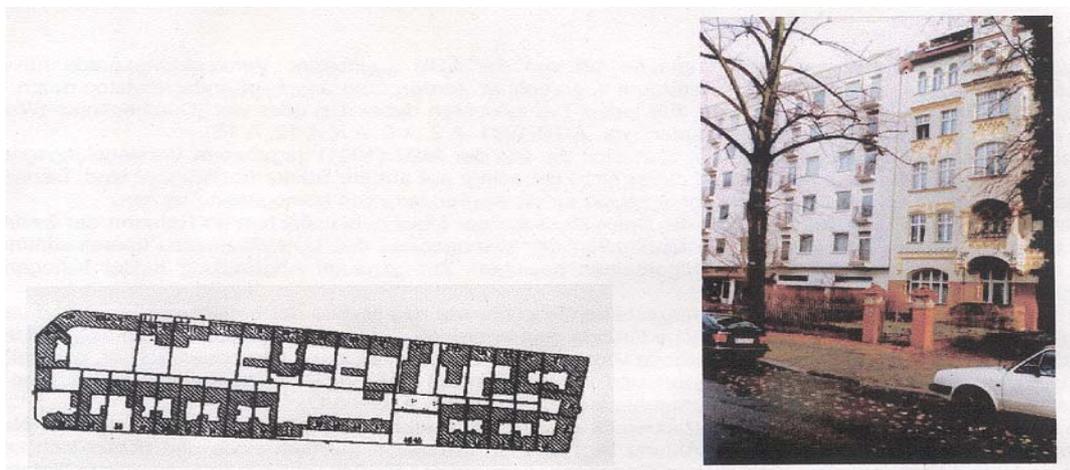
2.1.6 Type 6: Shed Courtyard

The "Shed Courtyard" Area Type is characterized by mostly two or three-storey, irregular block buildings on lots which are only partially close off. This type can be found primarily in the old village centers. Remnants of old, in some cases village-like buildings built even before 1870 and four-storey buildings of the "Decorative and Garden Courtyard" type are found here, but there are also detached houses ("Garden" type), and new buildings. The appearance of these areas differs, depending on the number of old, low houses and the degree to which newer buildings have been added. A distinctive feature of the "Shed Courtyard" type is the small-scale structure of the block interior, with workshops and storage and placement areas. The courtyards are closed off in the rear by walls and one to two-storey sheds. The courtyard areas, mostly paved with asphalt and concrete or cobblestones, are usually used commercially as access-ways, placement and storage areas, and parking lots for employees and customers. However, there are also privately-used orchards and vegetable gardens. The degree of sealing amounts to 58% overall.



2.1.7 Type 7: Post-War Block-Edge

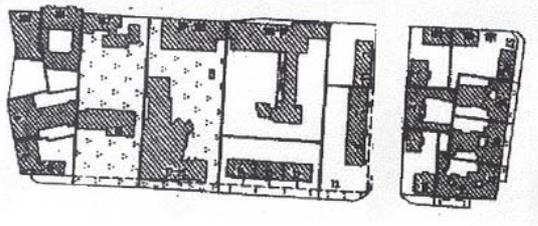
The "Post-War Block-Edge" type arose after World War II on old former block-edge buildings of the "Courtyard" or "Decorative and Garden Courtyard" types. The Post-War Block Edge buildings thus lie scattered throughout these Imperial-Era neighborhoods. The buildings destroyed in World War II were replaced either by reconstruction of the old buildings or by new buildings, to fill the gaps. As a rule, the new buildings were placed along the old line of the building edge, so that this type is characterized by a largely closed block edge which is partly interrupted by entry-ways, parking lots, vacant spaces etc. The wartime destruction and the later demolition of single rear buildings created a more open type of block interior than had been the case of the original buildings, which is however subdivided by fences along the property lines. The open areas of the individual courtyards are designed very differently. In addition to older courtyard designs, parking lots surfaced with modern materials and bordered by lawns or hedges predominate in the new and restored courtyards. The open area sealing is essentially determined by the parking spaces and the underground car parks. Other access-ways and spaces are relatively small. The share of non-built-up areas paved with grass pavers or water-bound surfacing is relatively high opposite, compared with other area types which originated during the Imperial Era. A relatively high degree of sealing of 68% altogether is the result.



2.1.8 Type 8: Unplanned Reconstruction

The "Unplanned Reconstruction" type emerged in the inner-city area of West Berlin in former block-edge-building blocks destroyed in World War II. Here, large, high residential and office buildings were built irregularly on the block areas, in rows or as single buildings, with no regard for such historical specifications as roadways and block edges. Only the old street grid usually remained unchanged. The remains of old buildings can be found only occasionally. The blocks have neither a block interior nor closed, semi-private courtyards. The open areas not used serve as car-parking spaces in the form of underground car parks and parking lots. The remaining open areas are primarily designed as unusable green margins. The degree of sealing and the distribution of surfacing categories resembles that of the "Post-War Block Edge" type.

The area type "Unplanned Reconstruction" is found only in West Berlin. Its 68% degree of sealing is approximately as high as for the "Post-War Block Edge" type.



2.1.9 Type 9: High-Rise (Large Residential Area)

The "High-Rise" Area Type (old name: Large Residential Area) includes the large residential complexes built primarily during the '60s and '70s in the outskirts areas or as smaller estates in areas in or near the city center. They consist of detached single high-rises, in some cases combined with at least six (East Berlin) or eight-storey (West Berlin) linear high-rise chains or rows. The situation of the buildings often has no reference to the street, so that there is no homogeneous street-spatial design. However, this category also includes the six-storey concrete pre-fab residential areas built during the '60s and '70s in East Berlin which included, in addition to the typical single high-rise buildings, semi-open block-edge buildings, or a mixture of block-edge and row buildings. These estates are oriented toward the street grid.

Between the buildings, there are often large open areas which are not spatially delimited. Of this, one quarter is sealed due to the installation of very generously dimensioned access-ways and a large number of parking spaces at ground level. For the most part, concrete-plate surfacing, concrete composite paving, and similar materials were used. The unsealed areas are dominated by very geometrical decorative lawn and grove plantations, generally landscaped and gardened in a planned manner.

The "High-Rise" Area Type has an average building coverage of almost 22%, and a relatively low degree of complete sealing of 48%. However, the degree of sealing is often considerably higher – more than 70% – in inner-city high-rise areas.

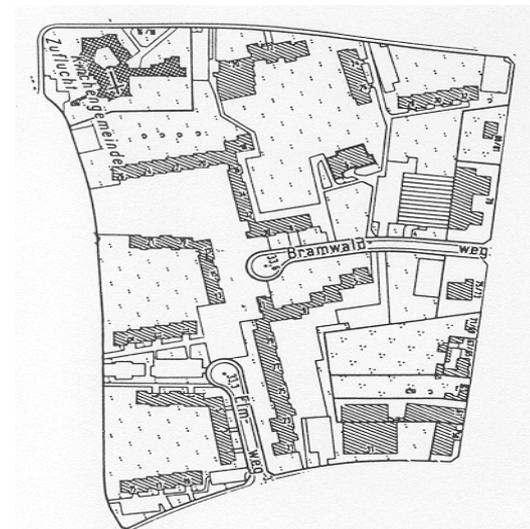


The high-rise of the Axel Springer Publishing House A high-rise in Marzahn

2.1.10 **Type 71: Concrete Pre-Fab Buildings of the '80s and '90s**

The "Concrete Pre-Fab Residential Area of the '80s and '90s" Area Type describes the large new housing estates set up in concrete plate pre-fab style in East Berlin during the '80s and '90s. They were built as semi-open or closed block-edge buildings, or as a mixture of row and block-edge buildings. The buildings are oriented toward the street grid, and have a large block interior. The large residential areas generally have four storeys; in some cases three or five storey estates also exist, however. Occasionally, blocks of the "Concrete Pre-Fab Residential Area of the '80s and '90s" Area Type were built in the inner-city and near-inner-city areas of East Berlin. The larger areas are located primarily in the eastern and northeastern areas of Berlin. The landscaping is like that of the high-rise residential areas.

Hohenschönhausen



2.1.11 Type 73: Compact Buildings of the '90s, 4 storeys and more

Since the beginning of the '90s, residential areas have appeared which differ considerably from the typical East German large residential areas (Area Type 71), and contain a wide range of urban development structures (e.g. block-edge buildings, row buildings, estates of row-houses, townhouse residential areas.) In order to permit a distinction between the concrete pre-fab residential areas and the newly developed areas in the area-type categorization, two new area types have been introduced: Type 73 and Type 74. These two types essentially cover major residential construction projects of the '90s and the first years of the 21st century, which have been in part realized in the context of urban development measures (Spandau Water Town, Rummelsburg Bay, Karow-North, Buchholz, etc.).

Area Type 73 shows a higher urban-development density than Area Type 74. The buildings are closed and semi-open courtyards, or in some cases also row buildings. The block interior is designed as a semi-public open space, and often built with a cellar and underground car parks. The average degree of sealing of the approx. 250 areas in the municipal area is approx. 54% (range: 10% to 90%), the average building-coverage degree is about 33% (range: 10% to 75%).



Moabit Werder



Upper Havel Water Town

2.1.12 Type 74: Low-Density Residential Areas of the '90s, 1 to 3 storeys (row single / duplex houses)

Area Type 74 essentially consists of detached and row-houses. The private gardens of the residents are located in the block interior area. The placement areas are on the lots in front of the houses, often in the form of carports or garages. The average degree of sealing of the approx. 80 areas in the municipal area is approx. 50% (range: 25% to 80%), the average building-coverage degree is about 30% (range: 10% to 60%).



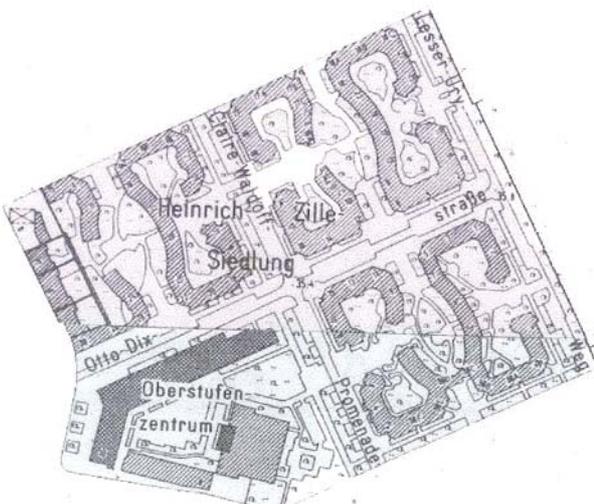
Karow-North

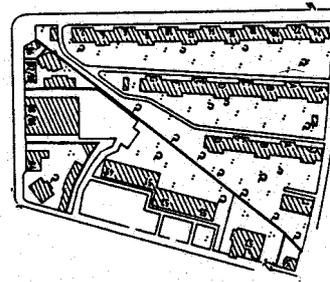
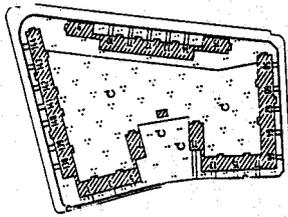
2.1.13 Type 10: Large Courtyard

The "Large Courtyards of the '20s and '30s" Area Type is characterized by large inner residential courtyards which are formed by three or four-storey block-edge buildings which close off the lots entirely or almost entirely. They are connected to the street by entrance areas designed more or less decoratively, sometimes semi-public arcades. The extensive courtyards are very little subdivided spatially. They are almost completely greened, predominately with lawns. On the lawns, there are old trees of all kinds. The

play areas for children with sandboxes and benches as well as the areas with carpet bars and waste-bin stands are delimited by hedges. In some early residential areas, the yard was used by tenant gardens delimited by hedges. "Large Courtyard" building areas are generally located at the edges of the "Decorative and Garden Courtyard" type estates.

In the case of completely closed block-edge construction, the sealing of the open areas is confined to the narrowly-designed access-ways. Otherwise, the open-space sealing consists of parking lots and garages built later. The degree of sealing amounts to 45% overall. The open areas are largely paved with pavement, artificial stone and concrete-plate surfacing. In the western boroughs, the areas of the type "Row Houses of the '20s and '30s" have been included under the "Large Courtyard" category, since there had not been certified separately.



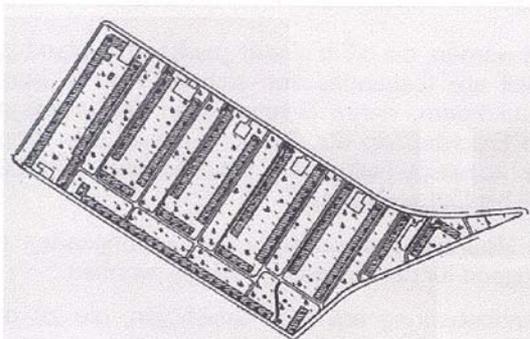


2.1.14 Type 72: Row-Housing of the '20s and '30s

The first houses built in row-house form in Berlin appeared at the end of the '20s and during the '30s. Their main purpose was to bring air and sunlight into all apartments. The long, three or five-storey building rows are parallel to each other. The clearance between the houses is long and narrow, and open at the ends. End buildings perpendicular to the rows, or in some cases, a mixture of row and edge buildings,

have often resulted in richly varied outdoor areas. In many cases, the open spaces have been closed off by walls or by multiple rows of trees or hedges at the end of the building rows. The design of the gaps in the rows is very uniform: A thick, trimmed hedge and often the access-way with the house entrances are located along the side of the buildings away from the sun. On the side facing the sun, there are balconies or loggias down to the ground floor. In some cases, there are also privately planted, narrow front-yard flower beds. Between the building rows, there are lawn strips with loosely scattered trees. The shape and character of the sealed non-built-up areas corresponds to that one of the "Large Courtyard" Area Type.

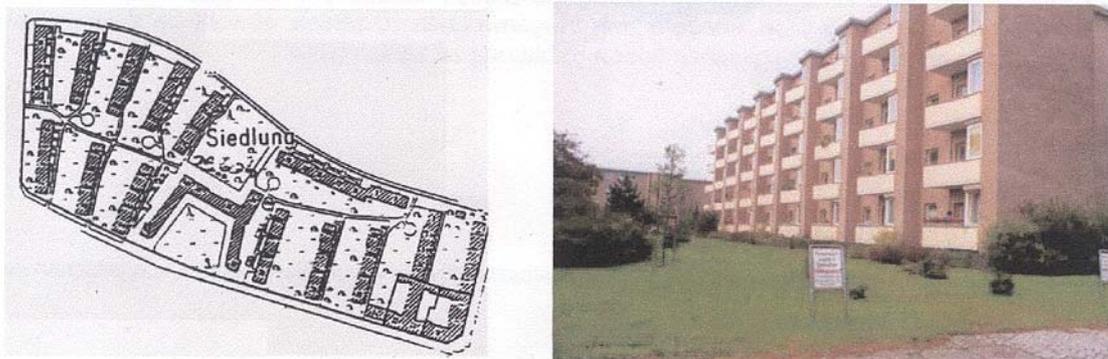
The "Row-Houses of the '20s and '30s" Area Type has been certified only for East Berlin. Such areas in West Berlin have been assigned to the "Large Courtyard" Area Type.



2.1.15 Type 11: Row-Houses of the '50s and Later

The "Row-Houses of the '50s and Later" Area Type arose in the post-war period, mainly between the '50s and the '70s, in the context of the reconstruction programs. The long, mainly four-storey blocks of row

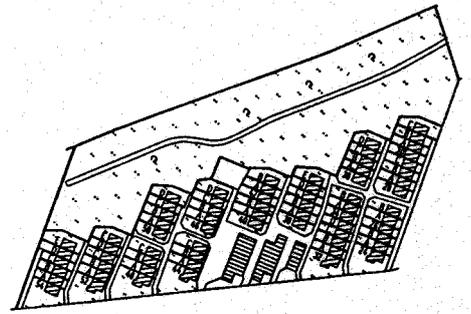
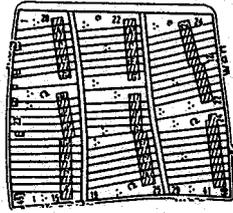
houses were generally built in the form of coherent estates in old residential areas of the center city largely destroyed in the war, as well as at the edge of the area of dense settlement around the city center. The rows are no longer oriented directly toward the predefined street grid, but are rather laid out in an east-west direction, so as to provide sunlight to the apartments, albeit no longer as strictly parallel as had been the case during the '20s. In later years, the rows were also built in a staged or staggered arrangement, or arbitrarily lined up along a curved road network. During the '70s, some areas were also built in chain-like or spider-web patterns. Their purely residential function and a high share of open space are typical for the row buildings. The open areas between the long buildings are often taken up by asphalt parking lot areas and asphalt walkways, which account for up to a third of the area. The rest of the area usually consists of lawns with trees, a few bushes, a usually simple children's play area, and planted waste-bin areas and carpet bars. As a rule, the parking lots are fenced off by bushes and trees. The walkway network is fairly minimal in the areas built during the '50s and '60s. In areas built during the '70s, the lawn areas are reduced in favor of elevated flower-beds with concrete or composite-concrete containers along the firmly sealed pathways. The overall degree of sealing amounts to 40%.



2.1.16 Type 22: Garden Row-House

The "Garden Row-House" Area Type describes estates of row-houses or narrow duplex houses with more or less long gardens. Until 1945, the size of garden lots was dictated by the area needed for subsistence raising of vegetables, potatoes and fruit, and the keeping of small animals and chickens. The share of vegetable and flower-beds, fruit-trees and bushes is high in these old garden row-houses to this day.

Until 1945, the houses were always built around the block edge, so that the gardens form a large, coherent green area inside the block. The modern row-houses are no longer located around the block edge, but rather mostly staggered inside the block area, along spur-type streets and access-ways. This means that there are no common open block interiors, but only rows of gardens, each screened off from the neighbors. The gardens of the duplex houses are a little larger than those of the row-houses. With a total sealed area of only 28% on average, the Garden Row-House Area Types is one of those with the highest open-space shares.



2.1.17 Type 23: Garden

The "Garden" type includes detached-housing areas with small, single multiple-unit dwellings built after 1945 are integrated with associated garden plots. The "Garden" Area Type arose in the '20s and is being built to this day. In the older areas, the houses are behind an alignment, behind equally wide front yards. With the newer buildings, the houses are at irregular distances from the street, so that front yards of varying widths have arisen. The intervals to neighboring houses are used differently. e.g. as entryways, for flower-beds, for sheds, etc. Behind the houses, inside the block area, the actual garden area then extends. The gardens are today mostly used for leisure activities or as ornamental gardens, but a few are also used as orchards and kitchen gardens. In the context of the block as a whole, these gardens form a large open space, which is however greatly subdivided by fences and hedges. Since 1950, the block interiors have ever more frequently been filled out with new houses built in the rear parts of the properties. The sealing and distribution of surfacing categories is very favorable.

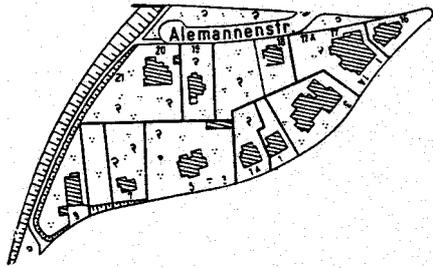
In West Berlin Areas of the type "Open Residential Buildings" have also been classified under the "Garden" Area Type.



2.1.18 Type 24: Park-Like Garden

The "Park-Like Garden" Area Type covers residential areas with villas and rental villas dating from the Imperial Era. Villas are representative detached houses with gardens. Rental villas resemble the villas in style and in their general appearance, but they are multiple-unit dwellings with a larger construction volume. Compared with the "Garden" type, the villa areas, given the same use characteristics, have larger lots and larger construction volumes. The buildings are built relatively close together on the block edge, along a single alignment, behind uniformly broad front yards. They form an easily recognizable block interior. The properties are separated by thick bushes or old masonry walls, or, in some cases, by old brick buildings which in the past have served as sheds or washhouses. In the case of rental villas, the block interior is sometimes relatively small, due to the building size, and is then kept open visually. Such gardens receive their park-like appearance from the old tree stands characterized by their size and in some cases by the exotic species. In some cases, vegetables and flowerbeds exist in the gardens, but lawns with

trees dominate. The park-like garden seldom occurs throughout an entire block in pure form, since the gaps caused by the war damage of two wars have been filled with buildings of other architectural styles. The degree of sealing is relatively low, at 27%.



2.1.19 Type 25: Gardens and Semi-Private Green Space

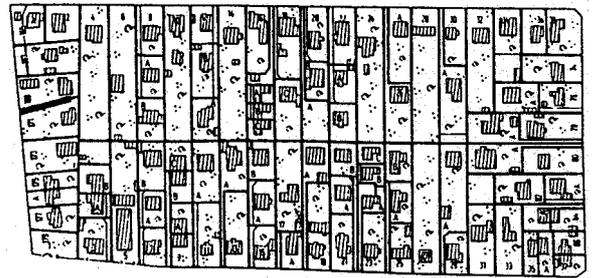
The "Gardens and Semi-Private Green Space" Area Type developed from areas of the "Garden" or "Park-Like Garden" types. Since sufficient free building land was not available in Berlin, old villas and country houses were sometimes torn down and replaced by larger rental or apartment buildings, or the lots were subdivided, and additional building built in the formerly park-like gardens. The generous block interiors were filled with buildings. The new buildings no longer have gardens, but only a uniform green space surrounding the whole house, characterized by concrete and composite concrete paving, gravel strips around the house, ground-cover, evergreen plants, decorative bushes, etc.. It appears professionally tended and usually somewhat lifeless, unlike the individual variety of the private gardens. The degree of sealing of this area type is higher than that of the Park-Like Garden type, because of the required parking spaces and the associated access-ways on the property. It amounts to 32%.



2.1.20 Type 26: Open Residential Area

"Open Residential Area" buildings are predominantly certified in East Berlin. Residential areas of this type are characterized by a mostly unplanned, non-homogeneous structure with uneven one or two-storey buildings with detached houses, bungalows, workshops and garages built in different periods. A wide variety of different uses, including residential and commercial use, recreation and gardening, occur in such areas. Open Residential Area type buildings are found in the outer boroughs of the city, bordering the compact buildings, and at the outskirts. In some cases, they cover a considerable surface area. The area type "Open Residential Buildings" has the lowest overall sealing degree of any area type of predominantly residential use.

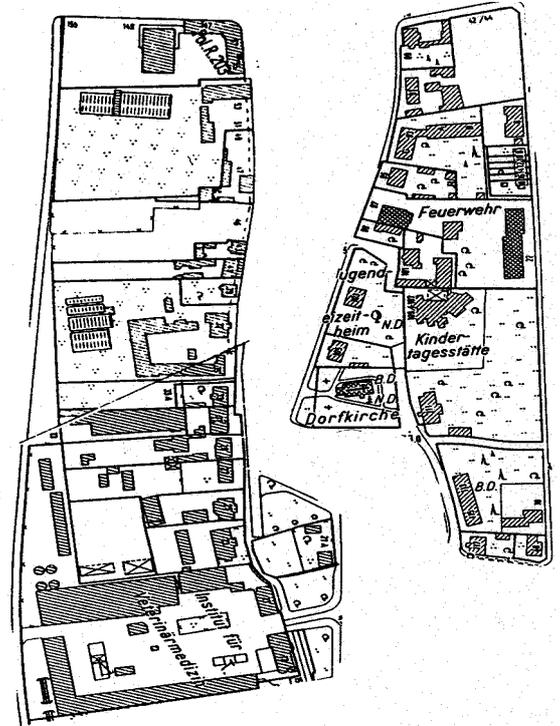
In West Berlin, as a rule, buildings of the "Open Residential Area" type are classified under the "Garden" Area Type. The degree of sealing is relatively low, at 22%.



2.1.21 Type 21: Village

The village areas are outside the Urban Rail ring, and, due to recent construction in open areas, can hardly be found in a completely preserved village structure anymore. The village buildings today consist of a mixture of new buildings and typical farms and old houses of the former village cores. The open-space elements of the village, such as the street grid, the village greens, the village ponds, the manor parks, the cemeteries next to the churches, etc., can in many cases still be recognized, and on the outskirts of the city, they have to a large extent been preserved. The typical old village structures include a single-storey residential building on the street, and next to it the entryway to the barnyard, which is enclosed by the brick farm buildings. The orchards and kitchen-gardens are in the back. The formerly one or two-storey buildings have been supplemented in areas closer to the center by multi-storeyed block buildings, and in the outskirts by detached or multi-unit dwellings. Today, besides their residential function, the old village

areas often take over the function as sub-centers, with stores and administration centers as well as workshops and garden cafés in the old courtyard buildings. A degree of sealing of 32% is not infrequent.



2.1.22 Type 59: Weekend Houses

The "Weekend House" Area Type often differs hardly at all in its external appearance from the "Garden," "Open Residential Area" or "Allotment Garden" Area Types. It is a category required under planning law. An average of 25% of the area is sealed by small houses and access facilities such as walkways and parking lots. They are usually paved with concrete plates, or water-bound surfacing types, etc.



2.2 Area Types Used Predominantly for Commercial and Industrial Purposes

These area types describe the open-area structures of the use categories "Core Area," "Mixed Area-II," "Commercial and Industrial Area," "Utilities and Public Supply Areas," and "Mixed Area-I," further differentiates them according to their degree of building coverage.

2.2.1 Type 39: Mixed Area-I (e.g. country inns)

The type "Mixed Area-I" has been assigned, for example, to large restaurants in recreational areas serving day-excursions. Large terraces, gardens and access pathways as well as many parking spaces are typical features.



Restaurant



Beach bar

2.2.2 Type 29: Core Areas

Typically, this type will have a between 75 and 100% share of commercial and service providers. Structurally, there are major differences between the individual areas. The spectrum ranges from Imperial-Era buildings to recently-built high-rises. With a 40% built-up area and an average of 77% sealed area, the "Core Areas" type has very high degrees of building coverage and sealing. The open areas are usually used intensively for supply, and for employees', customers' and visitors' parking, and are generally paved with asphalt, concrete or concrete-composite stone pavement. Core Areas are mainly to be found in the center of Berlin.



2.2.3 Type 38: High-Density Mixed Area-II

The "High-Density Mixed Area-II " describes areas classified on the basis of their use as Mixed Area-II with a residential share of at most 50%, with a building-coverage of over 50% and very intensive utilization. The outer appearance is one of commercial use. This type first appeared during the Imperial Era, but can be found throughout the municipal area today. It has multi-storey structures, frequently with factory lofts in the rear buildings and lateral wings. The scarce open areas are used very intensively, and are largely paved with concrete or asphalt.



2.2.4 Type 31: High-Density Commercial Area

The "High-Density Commercial Areas" were classified as "commercial and industrial areas," in accordance with their use. The property areas are covered by buildings to over 50% and almost without exception very intensively commercially used. The buildings consist of multi-storey industrial buildings, often laid out as commercial courtyards with factory lofts. With regard to their open-area structures and their surfacing types, the area types "High-Density Commercial Area" and "High-Density Mixed Area-II" are largely identical.



2.2.5 Type 33: Low-Density Mixed Area-II

The type "Low-Density Mixed Area-II" has been classified as "Mixed Area-II" in accordance with its use. The lots are built up to 50% at a maximum. The commercial buildings, which for the most part have only recently been built at the outskirts of the city, consist predominantly of single-storey hall and building complexes with large open-space intervals. Residential use is largely overshadowed by the commercial aspect in terms of appearance. The type "Low-Density Mixed Area-II" has quite a high non-built-up area share of more than the half the surface. On commercially used lots, these areas are used for storage, as goods shipping areas, or as a car and truck parking lots. There are also larger unused areas (vacant areas), which are usually covered with vegetation. The surfacing types are very heterogeneous, and depend on the type of business. Scrap yards, building-material markets, etc., have a high share of water-bound surfacing materials, while the non-built-up areas e.g. of shipping companies are usually concrete or asphalt-paved.



2.2.6 Type 30: Low-Density Commercial Area

The "Low-Density Commercial Areas" differ from the "Low-Density Mixed Area-II" Area Type mainly by their use. Here, the use of large lots almost exclusively serves the purpose of commercial production, storage and goods shipment, or for car and truck parking. Residential use hardly exists at all anymore. The open-area structure and the surface types of the "Low-Density Commercial Areas" are largely identical with those of the type "Low-Density Mixed Area-II." The "Low-Density Commercial Areas" are located mainly in the outskirts, particularly in areas with favorable traffic access, such as freeways, rail lines and waterways. These predominantly single-storey commercial areas with large surrounding open areas which have arisen during the post-war period show a higher share of concrete-composite paving stones and water-bound surfacing than the "Mixed Areas II" and the "High-Density Commercial Areas."



2.2.7 Type 32: Utilities and Public Supply Areas

The "Utilities and Public Supply" Area Type includes the sites of the electricity, gas, water and sewage works, the Berlin public transportation services and street cleaning as well as the central markets, port facilities, broadcast installations and the like. These lots as a rule have less than 50% building coverage. As in the case of the commercial and industrial areas, the open areas are used as parking spaces for supply vehicles and employees' cars, for storage areas and for goods shipment. The high degree of complete sealing is on the one hand due to the high share of sealed non-built-up space, and on the other hand to the fact that large open areas such as woodland around a waterworks have not been classified as "Utilities and Public Supply" areas, but rather as "Woodland."



West Port



Mariendorf Gasworks

2.3 Public Service and Special-Use Area Types

These area types further differentiate public and special-use locations sites by use. These types generally have a quite heterogeneous structure, oriented toward the architectural style existing in the surroundings at the time of their origin. The only common characteristic of the "Public Services and Special-Use Area Type" is the design of the open space.

2.3.1 Type 42: Postal

The "Postal" Area Type is characterized by a very high degree of sealing of 83%. On average, a third of the lot area is sealed due to building coverage and another 47% by access and utility areas. The high degree of sealing of the non-built-up areas is a result of the heavy supply traffic and the parking space areas for mail vehicles and the cars of the employees and customers. These surfaces are mostly paved with asphalt, concrete or large stones.



2.3.2 Type 41: Security Services

The "Security Services" Area Type includes the properties of the police, the fire department, the penal institutions, the armed forces, etc. It has a relatively low building-coverage share of 15%, comparable to that of the "Garden Row-House" area type. However, approximately half (51%) of the non-built-up area is sealed by asphalt, large pavement blocks and the like, due to its use for supply vehicles and the cars of the employees and visitors.



Prison

2.3.3 Type 43: Administrative Buildings

The type "Administrative Buildings" has been assigned to all public administrative buildings. Two thirds of the sites are sealed by office buildings and by parking spaces for employees and visitors, resulting in a high degree of sealing of 66%. The parking lots are paved with asphalt or concrete composite, mosaic pavement, etc.



The "Red City Hall"

2.3.4 Type 44: Cultural Facilities

The "Cultural Facilities" Area Type includes municipal museums, theaters, opera houses, the Philharmonic Orchestra etc. The structure of the open areas of the individual locations is very diverse. Overall degrees of sealing of up to 98% are not unusual. Thus, e.g., the share of building coverage for the German Opera is 82%, while the area needed for stationary traffic at the Philharmonic Orchestra leads to very high overall sealing values. However, the average is only 66%. The distribution of surface-surfacing categories corresponds to that of the "Administration" Area Type.



Bodemuseum



State Opera

2.3.5 Type 12: Schools, Old Buildings (built pre-1945)

The "Schools, Old Buildings" Area Type describes the schools built from around the turn of the century through 1945, generally on relatively small lots in the areas of Imperial-Era structures; they correspond in their architectural style to those structures. The non-built-up areas are used as recess areas with playgrounds, less often as sports facilities. They are largely provided with asphalt or synthetic surfacing types.



2.3.6 Type 13: Schools, New Buildings (built post-1945)

The "Schools, New Buildings" Area Type describes the schools built since 1945. Particularly those built during the '70s have very large lots, with open areas used as recess areas with playgrounds and as sports areas. The parking lot share is also considerably higher than for the old schools, but the degree of sealing is only insignificantly lower. The courtyard areas and walkways are frequently surfaced with concrete plates, while the parking lots and sports areas are often covered grass paver blocks and water-bound surfacing types.



2.3.7 Type 14: Schools (age unknown)

The area type "Schools" covers all schools of unknown date of construction. It includes schools with both old and new buildings. The introduction of this type became necessary due to the data situation in the eastern boroughs. The overall degree of sealing amounts to 63%.

2.3.8 Type 45: Universities and Research Facilities

The "University and Research" Area Type includes the institutes of the colleges and universities, as well as certain scientific research facilities. Half of their area is sealed by buildings and access and utility areas, on average. The sealing of the non-built-up areas in colleges and universities is primarily caused by walkways and public-square-type expansions. However, there are also areas for motor-vehicle traffic. Artificial stone and concrete-plate surfacing types or concrete-composite medium and large pavement blocks predominate.



Research institute for molecular pharmacology

2.3.9 Type 49: Churches

The "Church" Area Type describes church properties, which are sealed to 42%, on average. However, for smaller lots, overall sealing can also reach almost 80%, due to high building coverage. The access and utility areas are largely paved with asphalt, pavement with seam grouting, etc.



Church at Mariannenplatz

2.3.10 Type 50: Retirement Homes

The sites of Retirement Homes are only approximately a quarter built-up on average, and another quarter is sealed by bench areas and terraces, as well as by access and utility areas and fire lanes. An average

degree of sealing of 47% prevails overall. The surface types include predominately artificial stone and concrete-plate surfacing.



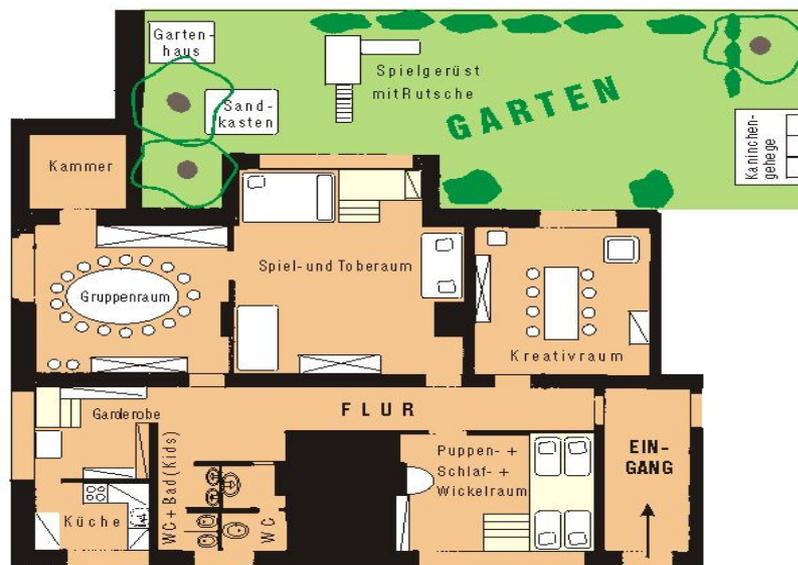
2.3.11 Type 46: Hospitals

The time of origin of the hospitals is spread over a wide range of construction periods. The clinical facilities established at the beginning of the century were in some cases built in pavilion style. The relatively large outer areas were designed in a park-like manner and have a high share of open areas. This architectural style was later abandoned in favor of a central main building. Here too, however, large, park-like outdoor areas are typical. The sealing of the non-built-up areas is 20% of a total of 40%, consisting of parking space areas for cars, access roads to the building and walkway networks with benches in the parks.



2.3.12 Type 47: Day-Care Centers

The "Day-Care Center" Area Type includes the larger day-care centers. The buildings built after World War II usually have one or two-storeys, rarely three or more storeys. The older buildings were designed according to the respective architectural style of the surroundings. Like hospital facilities, the day-care centers also show quite a high share of open area. The sealing of the non-built-up areas is caused by walkways with plate surfacing and bench areas, and by sand areas for playing. The average degree of sealing amounts to 41%, of which 23% is accounted for by the non-built-up areas.



2.3.13 Type 51: Youth Recreation Buildings

The degree of sealing is very low, at 29% of the lots. The sealing of the non-built-up areas is caused by walkways and terraces which are frequently paved with plate surfacing, etc.



Youth house "Sonne" (sun)

2.3.14 Type 60: General Public Services

The "General Public Services" Area Type covers all public-service areas which cannot be assigned to any other area type due to a lack of data or because they fit into no established category. They include e.g. camping facilities. In the current Environmental Atlas Map 06.01, federal public administrative buildings, embassies and other comparable use types are classed as "General Public Services" sites, although the Land-Use Map of the Borough of Mitte largely certifies them as Core Areas or Core Area-Type Special-Use Areas.



British Embassy

2.4 Transportation Area Types

These area types distinguish the transportation areas more precisely according to use. Roadways have not been included.

2.4.1 Type 93: Airports

The "Airport" Area Type includes the runways, air terminals and such open areas as roads and parking lots. The open areas surrounding the runways of the airports are included under the "Fallow Areas" Area Type. Due to the type of use, the degree of sealing is very high, 94%, with the sealing by buildings hardly accounting for a significant share. The open areas are mostly concrete-paved.

Airport Tempelhof



2.4.2 Type 91: Parking Lots

As a rule, the "Parking Lot" Area Type has been assigned to parking lots, car parks and garage facilities which occupy a complete statistical block. A large part of the parking lots is on public-service land around the Olympic Stadium and the Exhibition Center. But also several large parking lots in the center city and parking lots in new housing estates have also been assigned to the "Parking Lot" Area Type. The degree of sealing is quite high, at 71%. The predominant surface types are concrete composite pavement, asphalt and concrete.



2.4.3 Type 92: Railyards without Track Areas

The Area Type "Railyards without Track Areas" includes the railway facilities without the tracks, i.e., loading stations, workshop areas etc. For the determination of the degree of sealing and the distribution of surfacing categories, the railyards and the tracks were considered together. In the calculation of the degree of sealing, the gravel-covered areas of the tracks were counted to only 40% of the reference area.



2.4.4 Type 99: Track Areas

The "Track Areas" Area Type describes the track facilities of the Urban Rail and main-line service as well as the subway sections outside the tunnels in open cuts or on elevated lines, and streetcar areas. For the degree of sealing and the distribution of surfacing categories, refer to "Railyards without Track Areas;" they were not ascertained separately for the tracks.



2.4.5 Type 94: Other Transportation Areas

The Area Type "Other Traffic Areas" includes traffic islands and the like. The degree of sealing amounts to 49%.



25. Green and Open Area Types

The following area types describe the areas classified as green and open areas according to their use in Berlin. The categories "Allotment Gardens," "Sports Facilities" and "Transportation Areas" of Map 06.02, "Green and Open Areas," have been further differentiated, and the open-space design of all use categories of Map 06.02 is described.

2.5.1 Type 55: Woodlands

The "Woodlands" Area Type describes wooded areas and forest-like stands. The in any case minimal share of sealed area (2%) is accounted for by access walkways, which are almost always covered by water-bound paving.



2.5.1.1 Pine woods

This is the poorest vegetation association, on dry, sandy soil. There are no deciduous stands and only a low level of species diversity in the undergrowth.

2.5.1.2 Pine – black oak and holm oak – birch woods

These are forest associations on acidic sandy soil woods with a poor or slightly enhanced nutrient and mineral supply. A mixed deciduous and coniferous woodland consisting of pines (rarely with birches) and black and holm oaks, in which, with no disruption, the oak will in the long run become dominant, is near-natural. The herbaceous and shrub layers typically include wavy hairgrass, bilberry, May lilly, sandwort, balsam species and purple moor-grass. The near-natural version of these forest associations has been extensively replaced by pinewood forests, in which wavy hairgrass is the major herbaceous plant.

2.5.1.3 Beech – oak – linden woods

These are predominantly mesotrophic forest association on chalky sands and silt or till-dominated soils. Often, high alkaline values and/or a balanced or high water supply exist. The typical trees are beech, oak and linden, not all of which must be present at the same time. To some extent, elm, maple and ash are also present. In the near-natural formation of such associations, the pine is virtually eliminated. In the case of greater disruptions, maple species and aspen are the pioneers. The herbaceous layer typically includes wood sorrel, May lilly, woodruff, yellow archangel, lily of the valley, northern bedstraw, Solomon's seal, mountain melick, cock's foot, white wood

anemone, slender false brome, yellow anemone, wood anemone, lesser celandine, toothwort, herb paris and creeping jenny. Forestry modification include pinewood reafforestations (with wavy hairgrass, blackberry or black cherry), spruce – larch – Douglas fir forests (with little or no herbaceous layer) and ash, birch and poplar stands (with relatively thick herbaceous perennial plant growth, and a large share of nettles).

2.5.1.4 Flood-plain and swamp woodlands

This woodland type can be found on periodical or episodically flooded flood-plain locations or wet peat sites. Typical trees of the flood-plain woods are the crack willow, alder, ash, holm oak, elm, tree and bush willow, poplar and maple. The bird cherry is characteristic for the bush layer. In the herbaceous layer one finds lesser celandine, bulbous corydalis, wood anemone, ivy, slender false brome and tall brome.

The alder and the pubescent birch are the dominant tree species in the swamp forests. In the herbaceous layer, marsh fern, iris, tussock-sedge, May lilly, purple moor-grass, hare's-tail cotton grass and a well developed moss layer grow.

2.5.2 Type 56: Agriculture

The "Agriculture" type contains all meadows, pastures and paddocks and areas used as farmland. This use means that the share of sealed area is insignificantly low (2%), and is based on farmland paths etc., which are 80% paved with water-bound surfacing types.



2.5.2.1 Farmland

Includes areas mainly used for the cultivation of agricultural crops, and for commercial horticulture. They include: Sandy fields (predominately rye cultivation), loamy fields (predominating vegetable-growing), sewage farms/former sewage farms, and acreages for special crops (e.g. hops, tobacco).

2.5.2.2 Pastureland

Includes grassland which is regularly mown or grazed. They include: Pastureland (intensively-used grazing pastures), fresh meadows (grassland for mowing, on fresh, usually fertilized soil), and moist and wet meadows (pastureland on wet, groundwater-proximate sites which are cultivated more or less regularly and in some cases flooded).

2.5.2.3 Garden land

Includes Outdoor horticultural areas: They include: areas primarily used for commercial horticulture with outdoor beds; and Greenhouse cultivation: areas characterized primarily by greenhouse structures.

2.5.3 Type 53: Green Spaces and Parkland

The relatively low sealing of this area type, a share of 11%, is due mainly to the access ways and utility areas. Water-bound surfacing types predominate.



2.5.3.1 Green spaces: < 2 hectares

Predominantly decorative green, ornamentally landscaped and intensively tended.



2.5.3.2 Municipal parks: 2-50 hectares

A mixture of meadows, park woods and decorative green with medium-intensity care, and low leisure use as sunning lawns etc.



2.5.3.3 Parks: > 50 Hectares

Covers an extensive range of an inventory which often coherent forest-like stands with few care measures, and with open areas which are used, often intensively, as play areas or sunning lawns, but are in some cases also extensively tended, meadow-like areas. Smaller, more decorative areas with more intensive tending also occur.



2.5.4 Type 54: Public Squares/Promenades

The area type "Public Squares/Promenades" describes areas which serve as locations for leisure and recreation, as meeting places, market places and the like. On average, the surface is 55% sealed, predominantly with asphalt and paving with seam grouting.



2.5.5 Type 27: Cemeteries

The sealing of this type of 16% is essentially confined to the access pathways. The often very dense network of pathways can cause the degree of sealing to reach 30%, approximately a third of the cemetery area. The main walkways are usually asphalted or paved, while other pathways have water-bound surfacing types.



2.5.5.1 Decorative cemeteries

These are newer cemeteries, still largely without any stands of large trees, and without burials.

2.5.5.2 Park cemeteries

These are old cemeteries in the areas of older residential cores. Stands of old park trees and graves at the edges are typical.



2.5.5.3 Wooded cemeteries

These are new or medium-aged cemetery facilities, usually on former forest sites at the outskirts. Residual stands of old forest trees (mostly pines) and other remains of earlier forest use are typical.



2.5.6 Type 34: Allotment Gardens with Low Surface Coverage

The Area Type "Allotment Gardens with Low Surface Coverage (old name: "Allotment Gardens A")" describes allotment-garden areas with a coverage share for such access surfaces to the colony as walkways, festivities areas, playgrounds and parking spaces of less than 10% of the entire allotment colony. These access areas are paved with water-bound surfacing types like clinker, gravel or plate surfacing. This area type has been certified only for West Berlin.

2.5.7 Type 35 Allotment Gardens with High Surface Coverage

The Area Type "Allotment Gardens with High Surface Coverage" describes allotment-garden areas with a coverage share for such access surfaces to the colony as walkways, festivities areas, playgrounds and parking spaces of 10% or more of the entire allotment colony. The individual plots are relatively small in comparison with those of the type "Allotment Gardens with Low Surface Coverage." This result is an increased share of the sealed area of the plots, at the expense of the unsealed area. The main portion of the sealed non-built-up area consists of a relatively dense network of walkways, paved primarily with water-bound surfacing. This area type has been certified only for West Berlin.

2.5.8 Type 37: Allotment Gardens, General

This area type has been allocated to areas for which no information about the share of covered areas was available; it thus applies primarily to the allotment gardens in East Berlin. Water-bound surfacing predominates in the average distribution of surfacing categories. On the basis of this surfacing class distribution, the share of allotment gardens with high surface coverage should be relatively high.



2.5.9 Type 57: Fallow Areas

The Area Type "Fallow Areas" describes areas not, or are no longer used, on which a variety of vegetation has been able to develop undisturbed, such as former railyards, wetlands, sandy beaches, roadside green strips, etc. In order to determine the average distribution of surfacing categories of fallow areas, green and open areas on transportation or industrial and commercial areas, such as the open areas surrounding the runways of airports, were included in the calculation.



2.5.9.1 Infertile grassland

These are dry grassland on sandy soils which are kept free of trees.

2.5.9.2 Ruderal semi-arid grassland

These are usually extensive reforestation areas with young poplar and other tree species, on leveled former sewage-farm fields, covered garbage dumps and open sewage-farm fields with no reforestation.

2.5.9.3 Gravel, sand and clay quarries

These are non-recultivated pits with steep edges and often with small bodies of water.

2.5.9.4 Abandoned railyards

These are found primarily in abandoned urban-rail and main-line railway facilities, with undisturbed ruderal development lasting approx. 40 years.

2.5.9.5 Vacant urban lots

These are small or medium-sized vacant lots with no current official use or care measures. Various succession stadia of vegetation can often be found here, alternating over a very small area.

2.5.9.6 Temporary ruderal fields

These are predominantly the strongly disturbed locations of construction sites and warehouse operations.

2.5.10 Type 58: Camping Sites

The "Camping Site" Area Type includes tent sites, camping sites and permanent camping sites with mobile accommodations. There are built-up areas in the form of sanitary buildings, and occasionally a store or a restaurant. The access ways and surfaces account for approx. 11% of the total area, and are generally paved with water-bound surfacing. The average degree of sealing amounts to 13%, of which only 2% is occupied by built-up areas.



Camping site Kleinmachnow

2.5.11 Type 28: Sports Facilities

The Area Type "Sports Facilities" contains major spots locations with stadiums, single sports fields with or without tracks, often on school property, as well as sports halls, tennis courts, open-air swimming pools and bathing beaches, and areas for equestrian sports. At 48%, the average degree of sealing is quite high. However, the share of built-up area is relatively low, on average 6%, and consists of sports halls, changing rooms, admissions buildings, platforms, etc. Since the Area Type "Sports Facilities" includes both sports halls and sports fields, the real sealing values often diverge greatly from the average. Thus, for sports-hall facilities, the share of the built-up area can reach values of more than 50%. However, sports facilities with halls more typically have built-up shares of 10-25%; the open areas of sports facilities are 42% sealed, on the average. The sealing is predominantly accounted for by fields, while access-ways and parking lots account for only a small share. Hence, the dominance of certain particular types of surfacing material depends on the choice made for the fields. The average distribution of surfacing categories is thus reflected on a single facility only by chance, on major sports locations with several fields with different kinds of surfacing. Over the average of all sports facilities, water-permeable surface types such as ash, barn-floor-type gravel and rubberized surfaces predominate over artificial turf and asphalt or synthetic material. In fact, however, a sports facility may be 100% asphalt-covered, if e.g. only a pure playing area is certified.



2.5.11.1 Sports fields

This category includes only sports fields with relatively small buildings for dressing, storing equipment, etc. The area of the sports facilities hardly has any built-up area. The surfaces may be sealed very differently: lawns, artificial turf, ping-pong courts, cinder surfaces, etc. They are surrounded by walkways and lined by decorative plants.



2.5.11.2 Facilities with sports fields and halls

This includes sports facilities consisting of a combination of sports fields and sports halls, stadiums with major structural components, swimming pools, skating rinks, etc. The non-built-up share must predominate.

2.5.12 Type 15: Water Sports

The "Water Sports" Area Type describes areas used as water sports facilities. Small shipyards, boat halls, clubhouses, parking lots etc. are characteristic water-sports areas which show a degree of complete sealing of 35% – relatively high for an open-space area type. The non-built-up areas are mostly paved with asphalt, concrete, concrete plates or concrete composite paving, and account for a share of 19% of the degree of sealing.



2.5.13 Type 36: Tree Nurseries/ Horticultural Facilities

The "Tree Nursery/Horticulture" Area Type includes properties of borough gardens, horticultural schools, courtyards of the borough horticultural departments and certain research facilities such as the Institute for Crop Research, as well as the acreage of private tree nurseries and market-gardens. Not included areas are those with only hall buildings. The appearance of the properties is correspondingly non-uniform. Due to their area requirements, tree nurseries and horticultural enterprises are predominantly located at the outskirts of the city. On average, approx. one third of the area is sealed, half of that by greenhouses and administrative buildings, and the other half by access-ways and storage areas. The average overall degree of sealing is 33%, of which 15% is built-up and 18% non-built-up. Since the access-ways are used by cars and trucks, asphalt and concrete surfacing predominates.



2.6 Other Area Types

2.6.1 Type 98: Construction Sites

The "Construction Site" Area Type has been assigned to areas with a typical construction-site character. Since the future use was not determinable, this type has had no average degree of sealing and no typical distribution of surfacing categories assigned to it.



3. Bibliography

AGU Environmental Planning Team 1991: Extrapolation of the Environmental Planning Base for Berlin: Preparation of Environmental Atlas Maps 06.01 Actual Use of Built-Up Areas, 06.02, Green and Open Areas, 01.2 Sealing (including share of built-up area) for the municipal area of the eastern boroughs and integration into the environmental information system (UIS), under contract with the Senate Administration for Urban Development and Environmental Protection, Berlin.

AGU Environmental Planning Team 1988: Extrapolation and Adoption of the Sealing Map of the Environmental Atlas in the spatial reference system of the Berlin Environmental Planning Instrument (öPB) under contract with the Senate Administration for Urban Development

SenStadtUm (Senate Administration for Urban Development and Environmental Protection) (ed.) 1995: Berlin Environmental Atlas, vol. 3, Map 06.01 Actual Use of Built-Up Areas, 1:50 000, Berlin

SenStadtUm (Senate Administration for Urban Development and Environmental Protection) (ed.) 1995: Berlin Environmental Atlas, vol. 3, Map 06.02 Green and Open Areas, 1:50 000, Berlin

SenStadtUm (Senate Administration for Urban Development and Environmental Protection) (ed.) 1993: Berlin Environmental Atlas, vol. 1, Map 01.02 Sealing, 1:50 000, Berlin

Wünsche, G., Wellmann, C., Frank, H. 1981: *Gestaltbereiche, Analyse und Bewertung der bebauten Bereiche hinsichtlich ihrer natürlichen Ausstattung und deren Funktion und Bedeutung für das Landschaftsbild, im Auftrag des Senators für Bau- und Wohnungswesen, Berlin* [Design areas, analysis and assessment of built-up areas with regard to their natural characteristics and their function and significance for the appearance of the landscape], under contract with the Berlin Senate Administration for Construction and Housing