# Full Documentation Fiche 2008

## composed by national/regional working party of: Germany

## Zeche Zollverein Schacht XII / Zollverein Pit Shaft XII

**0. Picture of building/ group of buildings/ urban scheme/ landscape/ garden**


depicted item: Zollverein Pit Shaft XII / shafthouse and winding tower

source: docomomo Germany, Foto: Ulrich Borgert

date: June 2007

**1. Identity of building/ group of buildings/ group of buildings/ landscape/garden**

**1. 1 Data for identification**

current name: Zollverein Pit Shaft XII
former/original/variant name:
number(s) and name(s) of street(s): Gelsenkirchener Strasse 181
town: Essen
province/state: North Rhine-Westfalia
post code: 45309
country: Germany
national topographical grid reference:
current typology: ADM/COM/EDC/MON/REC/URB
former/original/variant typology: IND

comments on typology:

**1. 2 Status of protection**
protected by: Federal State of North Rhine-Westfalia / City of Essen
grade: monument / **Zollverein Coal Mine Industrial Complex**
date: 16.12.1986 (only Shaft XII), with update 20.6.2000
valid for: Shaft XII (with all buildings), Shaft I/II/VIII, Shaft III/VII/IX, Shaft IV/V/XI, Coking Plant
remarks:

protected by: UNESCO
grade: World Heritage site
date: 14.12.2001
valid for: Shaft XII, Shaft I/II/VIII, Coking Plant Zollverein, including buffer zone (cityscape Zollverein with workers housing estates in the districts Katernberg and Stoppenberg / City of Essen)
remarks: UNESCO World Heritage Site since 2001

**1. 3 Visually or functionally related building(s)/site(s)**
name(s) of surrounding area/building(s):
Shaft I/II/VIII with older brick buildings from 1899-1906 and steel frame buildings from 1956-1958, architect: Fritz Schupp;
coking plant from 1957-1961, architect: Fritz Schupp

visual relations: Shaft I/II/VIII and the coking plant are within eye-sight to Shaft XII, connected spatially and functionally to Shaft XII.

functional relations: Shaft I/II/VIII and the coking plant are connected by conveyor bridges and tracks with Shaft XII. The coking plant was built at the beginning of the sixties due to the growing demand for coke, which was required by the blast furnaces in the Ruhr Districts as fuel for the steel production.

**2. History of building(s) etc.**
**2. 1 Chronology**
*Note if the dates are exactly known (e) or approximately estimated = circa (c) or (±)*
commission or competition date:
design period(s): 1927
start of site work: 1928
completion/inauguration: 1932

**2. 2 Summary of development**

commission brief:
Since the middle of the 19th century the mining in the Ruhr district experienced a time of growth and the whole district became the largest contiguous industrial area in Europe. The mining of the black coal at Zollverein Pit in Essen began in 1851. Four autonomous pits emerged on the Zollverein area till the beginning of World War I. The Zollverein company, which had been a family business since its foundation in 1920 was bought by the mining corporation “Phoenix AG”, since 1926 part of big steel group „Vereinigte Stahlwerke AG”. Owing to rationalisation activities by the new owner the central mining facility Zollverein Shaft XII was built between 1928 and 1932, concerned with the raise and the preparation of the coal of all the active shafts on the Zollverein complex, till its closing in 1986 by the “Ruhrkohle AG”.

design brief:
When Zollverein Shaft XII was put into operation in 1932 it was not only the latest pit in the world but also paves the way for creating a special style in mining architecture which remained valid for the next 4 decades. The rationalisation of workflow (technology, economy, material, utilisation of money, productivity of labour) is reflected in the architecture and the functionalism of the whole complex.

The whole complex is identfied by stringent structural principles, kept up for the site as well as for each building: axial and symmetrical composition of the site with its buildings different in function, cubic architecture for the buildings, curtain walls with steel trelliswork grids. Schupp and Kremmer, the architects of Zollverein Pit Shaft XII, succeeded in creating their own aethetics for industrial buildings and sites in all their complexity. The largely visible winding tower became a symbol for the mining in the Ruhr district.

building/construction:
All buildings are steel skeleton constructions with the primary supporting structure inside and a curtain wall with self-supporting a steel trelliswork grid. The construction is sustainable for the aesthetics and enables flexibility and economy in the use of the building, to react to latest changes in mining technology and to make the building usable in ways suitable (extension or disassembly).

completed situation:
With the *completion* of Shaft XII 1932 the Zollverein pit became the largest coal mine in Europe with up to 5.000 employees.

**2. 3 Relevant persons/organisations**
original owner(s)/patron(s): Vereinigte Stahlwerke AG / Gelsenkirchener Bergwerks AG (GBAG) with Albert Vögler / Friedrich Wilhelm Schulze Buxloh / Gustav Knepper
architect(s): Fritz Schupp / Martin Kremmer
landscape/garden designer(s):
other designer(s):
consulting engineer(s): Zoepke / graduate engineer
building contractor(s): Vereinigte Stahlwerke AG, Dortmunder Union und Wanheim / steel skeleton constructions;
Gesellschaft für Elektroschweißung mbH / welding

**2. 4 Other persons or events associated with the building(s)/site**
name(s): association: event(s): period:

**2. 5 Summary of important changes after completion**

1) type of change: alteration: closing of Zollverein Pit (after 54 years in operation)
date(s): 23.12.1986
circumstances/reasons for change:
The end of coal output in the Ruhr District because of economic reasons
effects of changes:
long years of vacancy for the surface buildings, in individual cases: demolition of buildings when the operation period of the pit had ended (not Shaft XII),
Shaft XII: still being used as the water drainage for the central Ruhr area in connection with joined pits in operation
persons/organisations involved:
closing by the former owner “Ruhrkohle AG”

2) type of change: alteration:
Development / planning for the Zollverein aera being a centre for culture and design and a location important for economy and tourism in the future
date(s): in development since 1987
circumstances/reasons for change:
sale of the Zollverein area to the federal state of North Rhine-Westfalia
effects of changes:
preservation, restoration, conversion and extension of the listed surface buildings
persons/organisations involved:
site owner (since 1986):
LEG Stadtentwicklung GmbH & Co.KG (as trustees of the Federal State of North Rhine-Westfalia);
developer, responsible for Zollverein area (since 23.5.2001):
Entwicklungs-Gesellschaft Zollverein, EGZ / The Zollverein Development Corporation
public relations / tourism (since 1998):
Stiftung Zollverein (with visitors centre)

institutions involved with the development / planning before:
*preservation of the site:*
Bauhütte Zeche Zollverein Schacht XII GmbH, 1989-1999
Essener Arbeits- und Beschäftigungsgesellschaft mbH / EABG, 1990-1999
*other institutions:*
Internationale Bauausstellung Emscher Park (IBA), 1988-1999

*superior planning for the industrial and cultural environment to the Zollverein area:*
Masterplan “Walled City”: Rem Koolhaas / Office for Metropolitan Architecture (OMA), Rotterdam 2001;
Masterplan “Industrial Community”: Office for landscape architecture Agence Ter, Prof. Henri Bava, Karlsruhe/Paris 2003

3) type of change: alteration / conversion of individual buildings (here: only Shaft XII)
effects of changes (general measures: valid for the majority of the buildings):
changes relating to the floor plans, refurbishment of the facades (in line with accepted conservation practice): thermal insulation (in part), inside; supply with rooms for office use, rooms for performances and exhibitions

*Electricity workshop (1931)*
date(s): 1989-2001
circumstances/reasons for change: conversion for the Bauhütte (1989), Conversion with exhibition hall (1992), Conversion for the EGZ (2001)
persons/organisations involved:
Heinrich Böll & Hans Krabel architects, Essen

*Central workshop (Mechanical workshop) (1931)*
date(s): 1990-2003
circumstances/reasons for change: conversion for the EABG (1990/2003), Conversion with a central exhibition hall (1990/91)
persons/organisations involved:
Heinrich Böll & Hans Krabel architects, Essen

*Electricity Distribution Station (1931)*
date(s): 1991-1999
circumstances/reasons for change: conversion office building (1991-1992),
arrangement for a visitors centre (1999)
persons/organisations involved:
Heinrich Böll & Hans Krabel architects, Essen

*Boiler house (1928)*
date(s): 1996
circumstances/reasons for change: conversion for the North Rhine-Westphalian Design Centre / „red dot design museum“ (1996)
effects of changes: renewal (almost completely) of the curtain wall façade with the steel trelliswork because of advanced corrosion
persons/organisations involved:
Sir Norman Foster architects, London / Heinrich Böll & Hans Krabel, Essen

*Compressor house (1928)*
date(s): 1996
circumstances/reasons for change: Conversion „Casino Zollverein“ (1996)
effects of changes: two-storey extension (with panel sheet façade) in front of the eastern façade to the boiler house
persons/organisations involved:
Heinrich Böll & Hans Krabel architects, Essen

*Tipper house and Coal Sorting house (1931)*
date(s): 1992-1994
circumstances/reasons for change: conversion with visitors centre
persons/organisations involved:
Heinrich Böll & Hans Krabel architects, Essen

*Coal Preparation Plant (the washery) (1930)*
date(s): ab 2000
circumstances/reasons for change: conversion with the main visitors centre for the Industrial Heritage Route / conversion „RuhrMuseum“ (in progress, opening 2009)
effects of changes: complete renewal of the facades including the steel trelliswork because of highest requirements for the new museum concerning air conditioning and insulation; extension with a Gangway at the western façade and pavilion extension on the roof (Erich-Brost-Pavillon);
persons/organisations involved:

1999 competition for the conversion of the coal preparation Plant to the RuhrMuseum“:
winner Diener & Diener architects, Basel (unimplemented);
2007 conversion by Office for Metropolitan Architecture / OMA, mit Floris Alkemade, Rotterdam und Heinrich Böll architect BDA, Essen

4) type of change: extension:
date(s): 2006
circumstances/reasons for change: new building, School of Management and Design
persons/organisations involved:
SANAA architects, Tokio

**3. Description of building(s) etc**.

**3. 1 Site/building character**
*Summarize main character and give notes on surviving site/building(s)/part(s) of area. If a site: principle features and zones of influence; main elements in spatial composition. If a building: main features, construction and materials.*

*exterior:*
Instead of extending and upgrading the elder shafts on the Zollverein site Shaft XII was erected. It was responsible for the raise and the preparation of the coal of all the active shafts on the Zollverein complex. All surface buildings are combined to a functional and aesthetic unit. Layout and composition of the buildings is based on a planning to organize the whole complex in an axial and symmetric way. So on one hand the requirements of a mining function program (organisation, technic, workflow) are complied to its best and on the other hand the design of Shaft XII represents the highest demands of a modern architecture.
The shaft house with the distinctive, soaring winding tower – from a distance visible and new symbol of Zollverein pit- was placed by the architects in the centre of the Zollverein site shaft XII. Shaft house and winding tower configure the endpoint of the main axis, beginning with tiny lodges at the entry of Zollverein pit. In front of the shaft house is a square with the transformer hall on the left hand side and low electricity workshops on the other side. Square and electricity workshops mark the beginning of the second axis with the boiler house and soaring chimney as functional and optical endpoint of the axis. Due to danger of collapse, the chimney was demolished in 1979. On front of the boiler house and on both sides of the axis are the compressor houses.
At the backside of the shaft house is the complex for coal preparation, consisting of the turnaround cycle (with the tipper house and the sorting house), the slack tower and the coal preparation plant, the largest building of Shaft XII. Conveyors and tracks complete the technical equipment and guarantee the coal transport between the buildings.

*facade:*
The symmetric, axial composition of Shaft XII and its scenic effect is pushed by the pure cubic design of the buildings. The functionality and economy of the façade steel construction (light, easy to built, low-cost) became the initial point of the conceptual design with an extensive use of equal materials (steel, brick, glass) within a rasterized bracing. The main feature is the closeness and the unity of the square-stone shaped buildings with red brick infill, flush with the façade, and narrow rows of steel windows with smallest profiles, painted in the colour of the bricks.

A few buildings show variant solutions from this façade design, but only for functional reasons and only for parts of the building, such as the slack tower and the coal preparation plant. The bottom sections of these buildings with the collecting bins are constructed with reinforced concrete. The shaft tower, symbol of the pit, is a double-rack winding tower with solid-wall steel poles.

*interior:*
When Zollverein Shaft XII was put into operation in 1932 the technical equipment (for example sieve drums, wind sifters, jigging machines, picking belts, compressors) inside the buildings were up-to-date and on the highest level of the mining technique.

*construction:*

The aesthetic of the facades, designed by Schupp and Kremmer, is directly connected to the construction of the buildings: the separation of a primary bearing system with a steel frame construction inside and (independent of the primary system) a curtain wall façade with a light, non-load-bearing steel framework (rastered *standard-waler-construction*), only there for weather protection and to bring light in the building.
The primary bearing system consists of welded steel portals (bending resistant pin-joined frames).
The construction systems of the buildings allows to react flexibly to demand-oriented or technical changes, necessary for the progress of producing and preparation the coal. Extension or disassembly of buildings were possible at any time.
" So the design of these buildings connotes a contribution towards the theory of the development of the architectural design from the construction." (Schupp / Kremmer, Monatshefte für Baukunst und Städtebau, 1933, No.2, S.54)

**3. 2 Current use**
of whole building/site:

Zollverein Pit Shaft XII is an open-air museum for the history of the mining in the Ruhr district, but also a public monument of international significance for the architecture of modern movement, here industrial buildings. Considering this background the preserved buildings themselves are exhibits, opened up by a museum path with visitors centre. In the long run the Zollverein area (including the coking plant nearby) will be developed into a lively centre for culture and design in the very near future. For this purpose some buildings were or will be converted for a new use.

of principal components (*if applicable*):

Till today the conversion into a centre for culture and design brought changes for the following buildings:
*Boiler house:* North Rhine-Westphalian Design Centre / „red dot design museum";
*Compressor house:* location with restaurant „Casino Zollverein";
*Coal Preparation:* main visitors center and „RuhrMuseum" (in progress);
comments: for more information see point 2.5

**3. 3 Present (physical) condition**
of whole building/site:
Since closing the pit and conferment the status of a monument in 1987 the responsible owners have continually carried out measures for the preservation of the buildings on the Zollverein site. When Zollverein Pit Shaft XII was listed as World Heritage Site the measures for the preservation of substance were intensified, especially when the conversion to a centre for culture and design was decided. Both decisions were vital for the success of the building preservation, including the technical equipment inside the buildings as well as for the open spaces between the buildings.

of principal components (if applicable):
The preservation efforts concerning the buildings were primarily focused on the restoration of the curtain wall façade with the steel framework, providing the repair of defective building elements. So original substance could be preserved well.
Exception: The facades of the Boiler house and the Coal Preparation are reconstructions, analogue to the original.

of other elements *(if applicable)*:
of surrounding area *(if applicable)*:
comments:

**3. 4 Note(s) on context, indicating potential developments**
*Indicate, if known, potential developments relevant for the conservation/threats of the building/site*

The proposed conversion of the Zollverein area into a public vibrant artistic site (with new use of buildings for touristic purposes) will implicate an intensive use and increasing numbers of visitors in the future and maybe an overexploitation for certain buildings.
The conversion of the Coal Preparation for the new RuhrMuseum with the much discussed façade reconstruction could be a cautionary tale.

**4. Evaluation**
*Give the scientific reasons for selection for docomomo documentation*

***Intrinsic value***
**4. 1 technical evaluation:**

During the time it was in operation the Zollverein Pit Shaft XII was regarded as the most beautiful coal mine in the world and it used to be the world's largest and most modern colliery. It was the most modern colliery because of optimised processes in producing and preparation 12,000 tonnes of hard coal a day and the new architecture for industrial buildings, designed by Schupp and Kremmer.
The Zollverein Pit Shaft XII documents the stage of development concerning steel skeleton constructions around 1930, marking the transition from revited steel constructions to welded steel constructions. Before 1930 steel skeleton constructions were riveted constructions with composed steel profiles (usually U-, T- or L-profiles). At Zollverein Pit Shaft XII for the first time welded constructions were used mainly in form of solid-wall steel poles, especially for the primary bearing system with its frame carrier poles. Zollverein Pit Shaft XII thought to be by then the biggest welding-construction in Europe. Welded constructions promises to be more economical concerning the consumption of steel. Furthermore welded constructions now could be produced as plate girder in a bended form. This was relevant for the architecture, concerning the construction of spanned halls or in its aesthetical significance. The double-rack winding tower of Zollverein Pit Shaft XII is a vivid example, although the winding tower is not a pure welded construction.

**4. 2 social evaluation:**

Together with the mining museum in Bochum the Zollverein Pit Shaft XII documents the mining history in the Ruhr district over a period of more than 150 years, from the beginning in the first half of the 19$^{th}$ century to its rise to the largest mining region in Europe with more than 750.000 miners in the 1950$^{th}$.
Zollverein Pit Shaft XII is the main attraction and central anchor point along the "Industrial Heritage Route", a tour along an museum trail to industrial architecture put to creative re-use all over the Ruhr district. The Zollverein Pit Shaft XII documents the Ruhr area's structural change. The name of this imposing industrial location no longer stands for the production of "black gold". Some 500.000 people visit the Zollverein Pit each year: living history.

**4. 3 cultural and aesthetic evaluation:**

„We ought to acknowledge that gigantic industrial buildings are no longer a blot on the urban landscape but a symbol of work, city monuments for local citizens to show to outsiders alongside public buildings, and with as much pride." (Fritz Schupp, 1929)
Fritz Schupp's statement expresses his immense confidence in modern architecture, for he demanded that industrial architecture be given the same value as sacred and other public buildings. (vgl.

www.stiftung-zollverein.de)

Schupp and Kremmer, responsible for the planning and design of Zollverein pit Shaft XII, brought industrial architecture to a new level and a cultural dimension. Zollverein Schacht XII: a symbiosis of form and function, an „Industrial Heritage Cathedral“.

When it began operations in 1932 Shaft XII was already universally acknowledged as a technical and architectural masterpiece. It is simultaneously an aesthetic “Gesamtkunstwerk”, based on a planning to bring the creative principles of functionalism and modernism to its best. Zeche Zollverein Pit XII became the archetype of many later central mining facilities till the sixties.

***Comparative significance***
**4. 4 canonical status (local, national, international)**

“The Zollverein industrial complex in North Rhine-Westfalia consists of the complete infrastructure of a historical coal-mining site, with some 20th-century buildings of outstanding architectural merit. It constitutes remarkable material evidence of the evolution and decline of an essential industry over the past 150 years. The Zollverein XII Coal Mine Industrial Complex is an exceptional industrial monument by virtue of the fact that its buildings are outstanding examples of the application of the design concepts of the Modern Movement in architecture in a wholly industrial context. The technological and other structures of Zollverein XII is representative of a crucial period in the development of traditional heavy industries in Europe, when sympathetic and positive use was made of architectural designs of outstanding quality.” (homepage World Heritage Committee)

**4. 5 historic and reference values:**

The Zollverein Pit Shaft XII marks the end of a development (preliminary) concerning steel skeleton constructions in combination with curtain wall facades. The most famous examples for curtain wall buildings in Germany are the Fagus Factory in Alfeld by Walter Gropius and Adolf Meyer (1914) and the workshop wing of the Bauhaus building in Dessau by Walter Gropius (1926). Almost unknown is the (probably) earliest example: Steiff factory in Giengen an der Brenz (1903)

**5. Documentation**

**5. 1 archives/written records/correspondence etc. (state location/ address):**

Bergbau-Archiv Bochum
Am Bergbaumuseum 28
44791 Bochum
info@bergbaumuseum.de
www.bergbaumuseum.de

Zeche Zollverein eV.
Gelsenkirchener Strasse 181
45309 Essen
info@zollverein.de
www.zeche-zollverein.de

**5. 2 principal publications (in chronological order):**

Kremmer, Martin, Schupp, Fritz, Architekt gegen oder und Ingenieur, Berlin 1929;
Schupp, Fritz / Kremmer, Martin, Industriebauten im Ruhrbergbau, Der Industriebau 1930, p. 93-102;
Schupp, Fritz / Kremmer, Martin, Industriebauten, Bauwelt 1931, No.6, p. 1-16;

Schupp, Fritz, Das Entwerfen von Industriebauten, Baugilde 1931, No.19, p. 1502-1509;
Schupp, Fritz, Gestaltungsfragen beim Industriebau, Zentralblatt der Bauverwaltung 1932, No.54, p.638-643;
Zoepke, Geschweißte Konstruktionen bei den Übertagebauten einer Gr0ßschachtanlage, Der Bauingenieur 1932, Vol. 13, No. 21/22, p.297-302;
Schupp, Fritz / Kremmer, Martin, Schachtanlage im Rheinisch-Westfälischen Industriegebiet, Monatshefte für Baukunst und Städtebau 1933, No.2, p. 49-56;
Bauer, Fritz, Zeche “Zollverein” in Essen-Katernberg, Zentralblatt der Bauverwaltung 1934, No.9, p.101-105;
Busch, Wilhelm, F.Schupp, M.Kremmer: Bergbauarchitektur 1919-1974 (= Landeskonservator Rheinland, Arbeitsheft 3), Köln 1980;
Busch, Wilhelm, Zeche Zollverein (= Rheinische Kunststätten, No.319), Köln 1987;
Mainzer, Udo, Eine Architekturleistung von Weltrang - Zeche Zollverein XII in Essen, Die Denkmalpflege 1999, p.28-35;
Ganzelewski, Michael, Slotta, Rainer, Die Denkmal-Landschaft „Zeche Zollverein“ – Eine Steinkohlenzeche als Weltkulturerbe?!, Bochum 1999;
Busch, Wilhelm, Scheer, Thorsten (Edit.), Symmetrie und Symbol – Die Industriearchitektur von Fritz Schupp und Martin Kremmer, Köln 2002;
Mainzer, Udo, Zeche Zollverein XII in Essen – Ein Baudenkmal der Industriegeschichte von Weltrang, Denkmalpflege im Rheinland 2005, No. 3, p.99-103;
Zeche und Kokerei Zollverein – Das Weltkulturerbe (=Arbeitshefte der rheinischen Denkmalpflege 70), edited by Udo Mainzer, Worms 2006;
Bösch, Delia, Zollverein entdecken – Unterwegs auf dem Weltkulturerbe, Essen 2007³;
Tiggemann, Rolf, Zollverein Schacht XII, Essen 2007

**5. 3 visual material (state location/ address)**

original visual records/drawings/photographs/others: recent photographs and
survey drawings: film/video/other sources:

**5. 4 list documents included in supplementary dossier**

**6. Fiche report**

name of reporter: Ulrich Borgert
address: Winfried Brenne Architekten, Rheinstrasse 45, 12161 Berlin
telephone: 0049 30 859079-13
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e-mail: mail@brenne-architekten.de
date of report: 16.6.2008

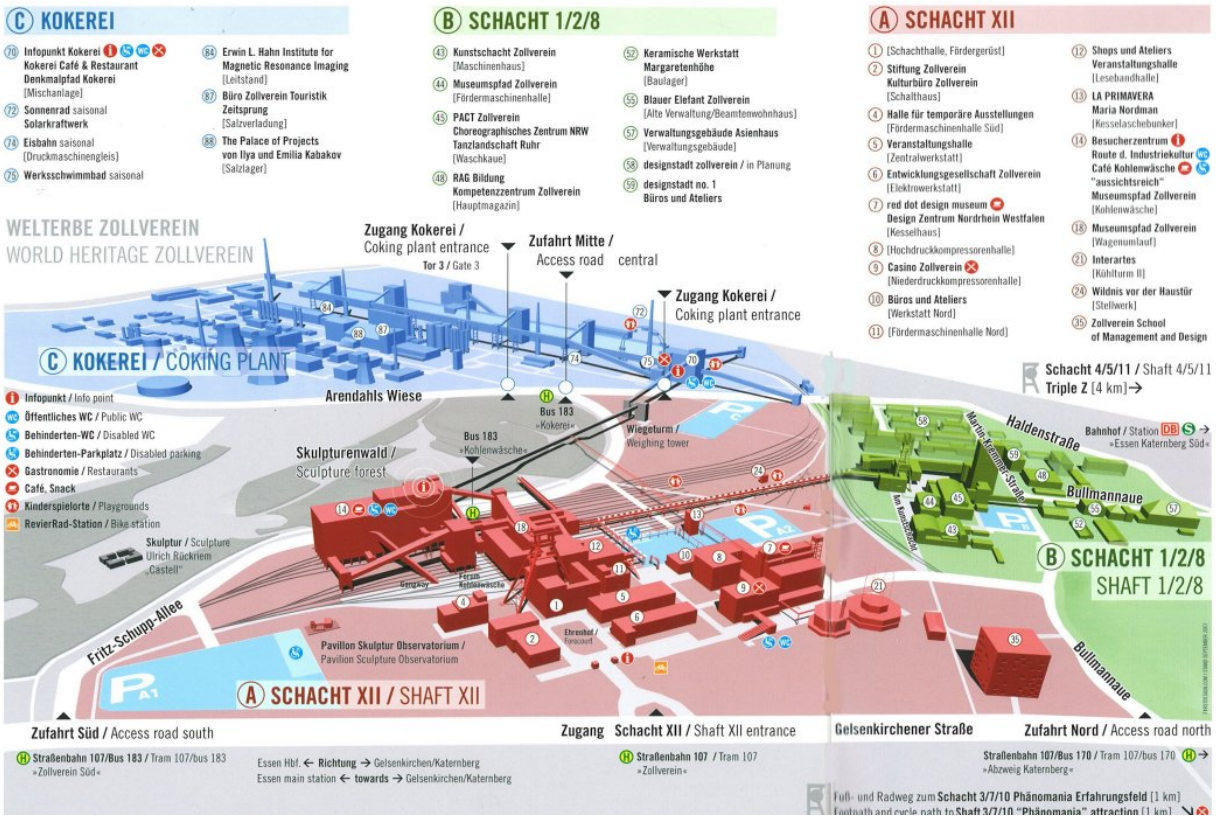
**examination by DOCOMOMO national/regional section**

approval by working party co-ordinator/registers correspondent (name):
Ulrich Borgert
sign and date: 26.6.2008

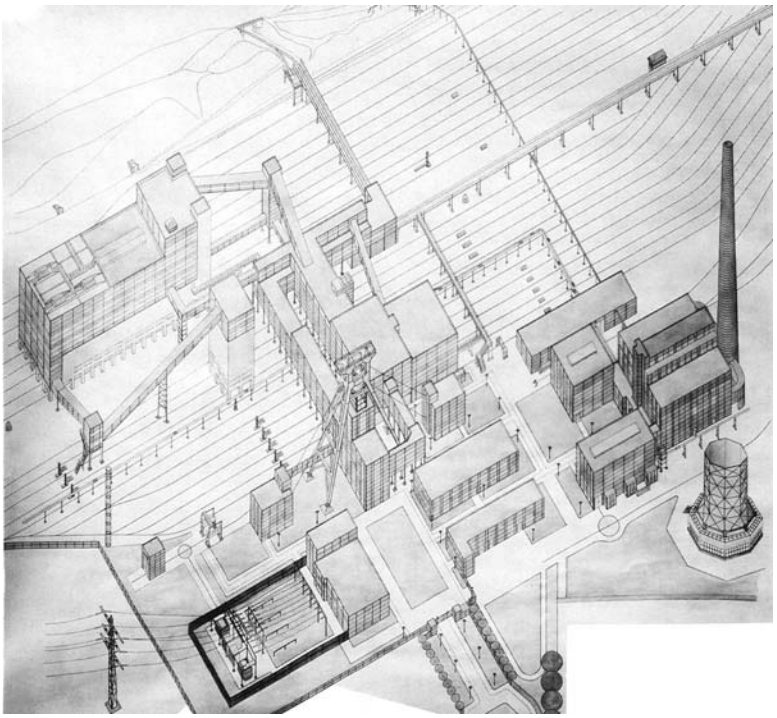
**examination by DOCOMOMO ISC/R**

name of ISC member in charge of the evaluation:
comment(s):
sign and date:
ISC/R approval: date:
working party/ref. n° :
NAi ref. n° :

5. 3 visual material (state location/ address)
original visual records/drawings/photographs/others: recent photographs and survey drawings: film/video/other sources:




depicted item: site plan World heritage Site Zollverein, bottom Pit Shaft XII
source: Zollverein – Ein Erlebnis – An experience, edit. by Stiftung Zollverein, Essen
date: 2008



depicted item: isometry Zollverein Pit Shaft XII
source: Bauwelt 1931, Nr.6, p.1
date: 1931

depicted item: Zollverein Pit Shaft XII with workshop buildings
source: docomomo Germany, Foto: Ulrich Borgert
date: June 2008

depicted item: view to boiler house
source: docomomo Germany, Foto: Borgert
date: June 2008

depicted item: view to transformer hall
source: docomomo Germany, Foto: Borgert
date: June 2008

depicted item: coal preparation house
source: docomomo Germany, Foto: Markgraf
date: September 2007

**d o _ c o _ m o _ m o _**

ISC/R members update 2003
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International working party for
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modern movement