

E. Schwenk Zementwerke KG

A new clinker production line at the Bernburg plant (Germany)

view clinker plant



section clinker plant



clinker storage



control station



cement mill



limestone storage and silos for additives



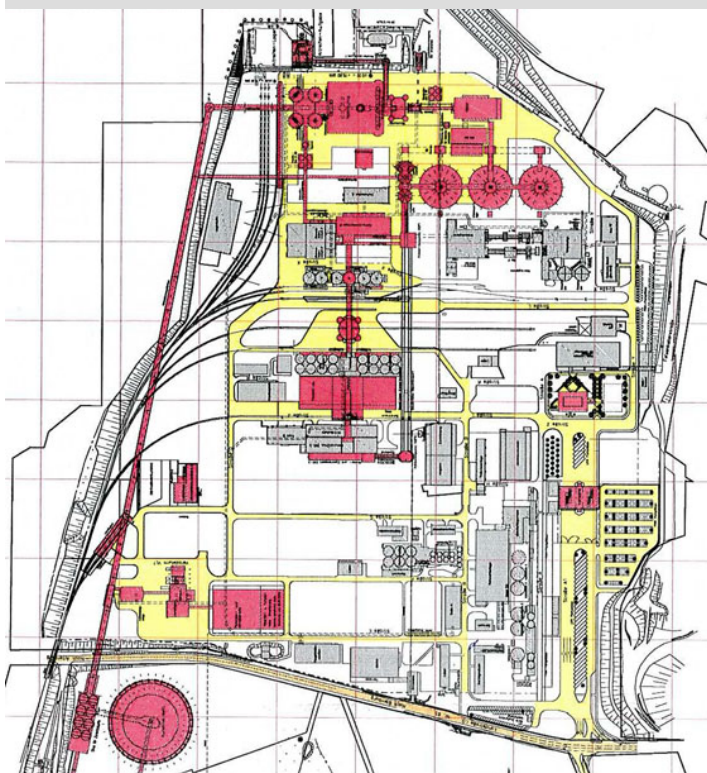
After the German Unification in 1989, E. Schwenk Zementwerke KG added the Bernburg cement plant to its enterprise with the objective of modernizing the existing facilities and increasing its production capacities.

In order to accomplish these objectives it was necessary to shut down the obsolete production facilities and to plan a new clinker production line which would achieve a capacity of 5,000 tons of clinker per day.

Working together with Bernburgs management, a new plant layout was developed to achieve the modernizations of the facilities and the extensive changes in the layout structure in an organized and consistent manner. This layout included the locations of the new installations and the necessary connections with the existing facilities.

The design and realization of the new installations and construction was accomplished successively using this new plant layout.

Scherr+Klimke was in charge of the general planning of the new facilities.



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Rüdersdorfer Zement GmbH

A new clinker production line at the Rüdersdorf plant (Germany)

view clinker plant



section clinker plant



isometry of clinker plant



After the German Unification, Rüdersdorfer Zement GmbH added the Rüdersdorfer cement plant to its enterprise with the objective of modernizing the existing facilities and increasing its production capacities.

In order to accomplish these objectives it was necessary to shut down the obsolete production facilities and to plan a new clinker production line which would achieve a capacity of 5.000 tons of clinker per day.

Working together with Rüdersdorfer management, a new plant layout was developed to achieve the modernizations of the facilities and the extensive changes in the layout structure in an organized and consistent manner. This layout included the locations of the new installations and the necessary connections with the existing facilities.

The design and realization of the new installations and construction was accomplished successively using this new plant layout.

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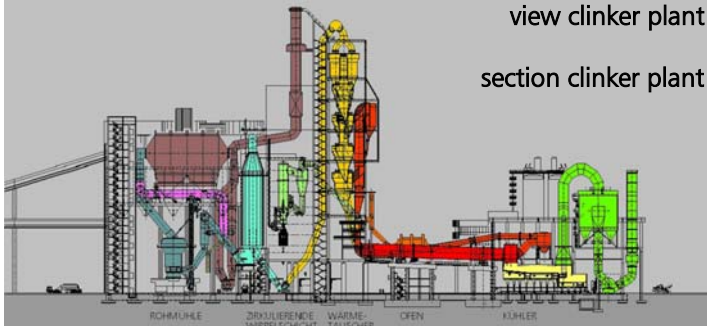
control station

limestone storage

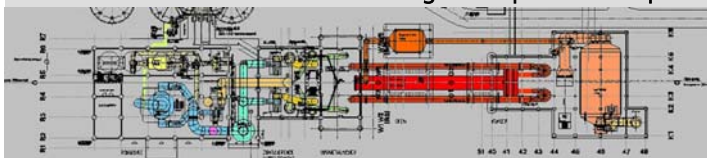


view clinker plant

section clinker plant



ground plan clinker plant



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Raysut Cement Co. (Oman)

New kiln line 1500 tpd

project information:

tasks/capacities:

- limestone crusher
- longitudinal limestone storage/homogenization
- raw material grinding plant
- homogenizing silos
- pre-heater tower
- rotary kiln
1500 tpd
- clinker storage
2 x 22000 t
- cement mills
- packing plant
- fuel handling
- main entrance
- water re-cooling
- new infrastructure

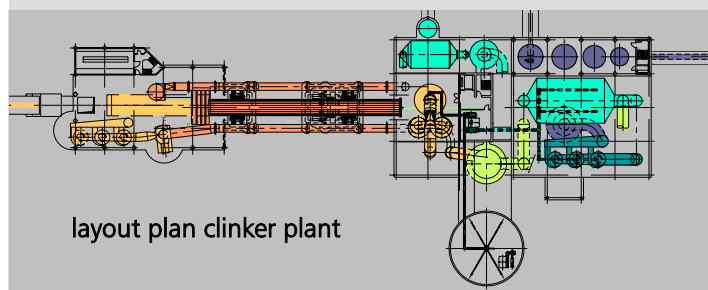
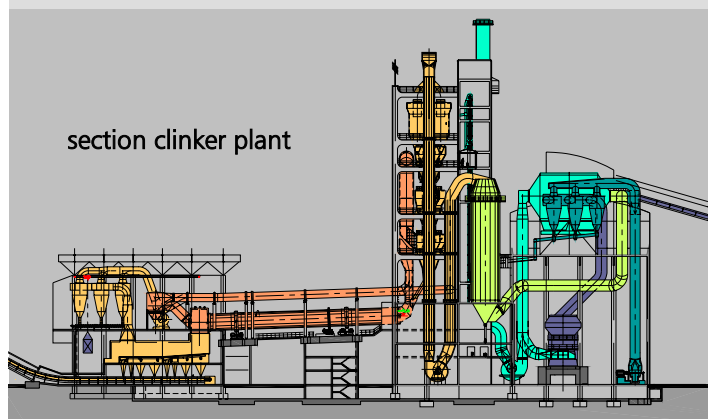
In order to increase clinker production capacity the management of Raysut Cement Co. planned to build a second kiln with a capacity of 1,500 tons of clinker per day.

Besides the installations and buildings needed for the new kiln line, it was necessary to develop a new concept including supplementary facilities like a new crusher, new storage buildings, new transports and many others. In close cooperation with Holderbank Management and Consulting LTD (HMC), a project team developed the plant layout, plans for the kiln line and periferical facilities.

In cooperation with the Holderbank Management and Consulting LTD (HMC), a new plant layout was developed to achieve the modernizations of the facilities and the extensive changes in the layout structure in an organized and consistent manner.

The realization was taken on by KHD as general contractor while HMC accompanied the project on the equipment side and Scherr+Klimke on the building side.

After determining the location of all the necessary new facilities (see table left) and the material-handling systems, the team concentrated on the layout of the future kiln line, which was placed parallel to the existing clinker production facilities.



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Dornburger Zement GmbH & Co. KG

Planning new clinker production line,
 incl. environmental assessment

project information:

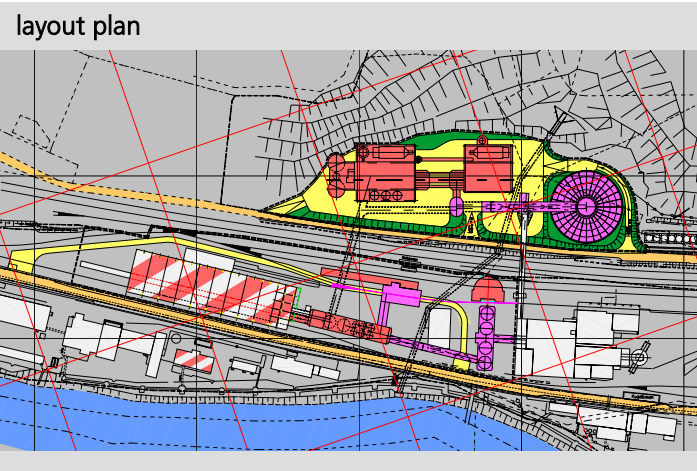
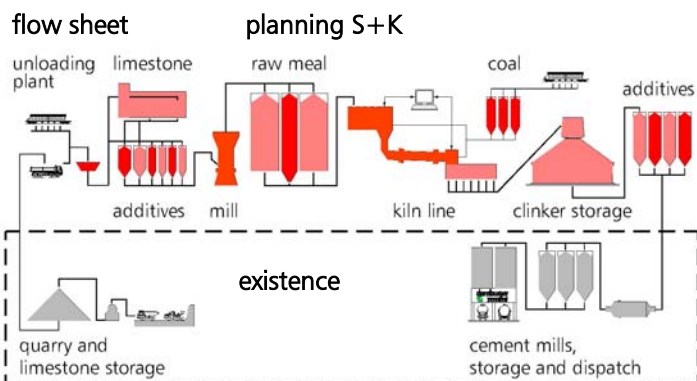
tasks/capacities:

- truck/train unloading plant
- rebuild existing limestone storage
- limestone transports
- additives for the raw mill
- raw material grinding plant
- 2 x homogenizing raw meal silos
- pre-heater tower
- rotary kiln 950 tpd
- clinker storage 40,000 t
- additive silos cement mills
- control tower
- coal unloading plant
- coal storage
- new infrastructure

After taking over the existing plants on the industrial area from Steudnitz by the Dornburger Zement GmbH & Co. KG, a firm from the Thomas-group, the rehabilitation and renovation of the plant started in order to achieve an environmentally acceptable site for the cement production.

The renovation measures were planning of a new clinker production line with a capacity of 950 tons of clinker per day, including all facilities (see table left) taking the existing raw materials into account.

Scherr+Klimke was assigned to do the planning and to develop a plant concept for the environment assessment for the authorisation procedure (in Germany §4 BImSchG).



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Rheinische Kalksteinwerke GmbH

A new clinker production line at Flandersbach (Germany)

project information:

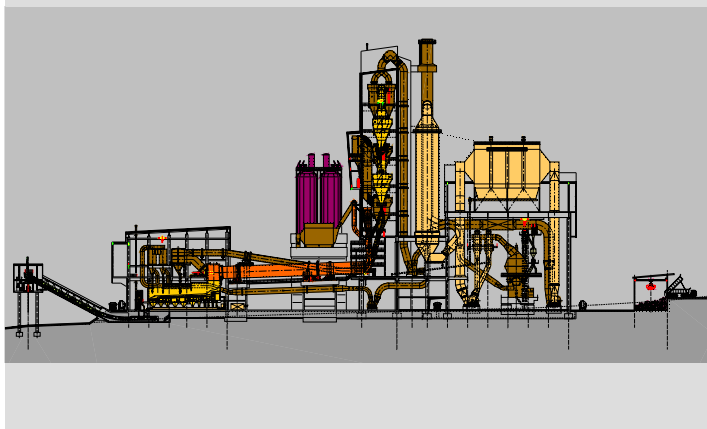
invest volume:
200 million €

tasks/capacities:

- truck/train unloading plant
- limestone crusher
- limestone transports and homogenization
43,000 t
- additive storage
- raw material grinding plant
2 x 180 t/h
- raw meal silos
- pre-heater tower
- kiln line
3,500 t/d
- control station
- clinker storage
2 x 70,000 t
- cement mills
2 x 180 t/h
- cement silos
10 x 2,500 to
- packing plant
- fuel handling
- additive fuels:
tires etc.

Up to 10 million tons of limestone are crushed per year in the quarry of the Flandersbach plant. The plant is delivering limestone and calcium oxide as additives for the steel and the chemical industry. Besides, there are production facilities for cement, gypsum and plaster.

In order to secure the production site at Flandersbach, the management decided to build a new clinker production line in addition to further measures. The total capacity of the clinker production should be raised up to 3.500 t/d. Hence Scherr+Klimke was appointed to develop a general layout and detailed plans of the arrangement of the mechanical equipment. These plans were also used as permit drawings for the authorization procedure.



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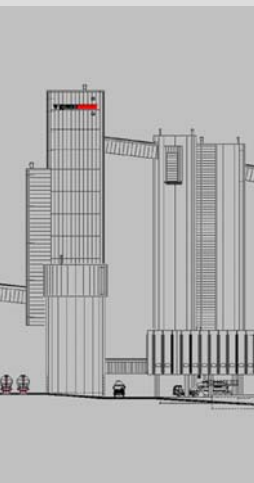
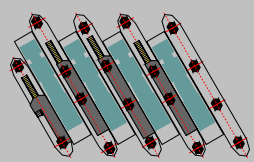


E. Schwenk Zementwerke KG

A new cement storage and loading plant in Allmendingen (Germany)

project information:

- construction period
1.5 years
- storage capacity
11800 m³
- loading capacity
4 x 280 t/h



The company E. Schwenk Zementwerke KG wished to increase its cement storage capacities and to modernize the cement loading plant taking into consideration the future production requirements of the plant.

Scherr+Klimke was given the task of developing a new cement storage concept with the following specifications:

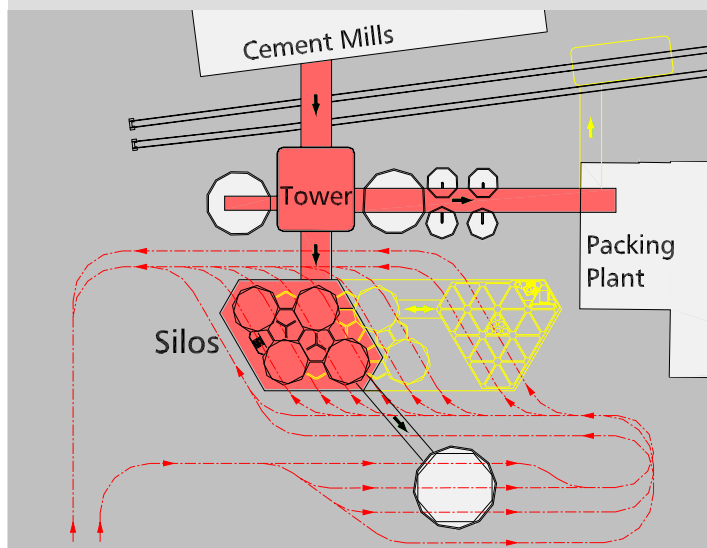
- high flexibility in the use of the cement silos for the storage of different qualities of cement
- a loading plant for the delivery of cement on trucks and trains
- possible expansion of the cement storage plant nearby
- possible integration of a cement mixing plant in the future

Besides the mentioned specifications it was necessary to modify and modernize the transport systems, in order to connect the existing cement silos with the existing cement mills and the future facilities.

After evaluation of pros & cons of several concepts, the decision for a diagonal oriented patching facility with 4 round silos and 6 intermediate silos was made (see fig. below).

In order to connect the existing silo group and packing facility and still to be flexible in cement transportation a 73-m-high bucket elevator was erected in first phase of construction between the existing cement silos.

During the second phase of construction the loading silo group with four truck loading lines for raw cement dispatch was built.



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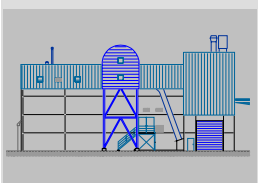
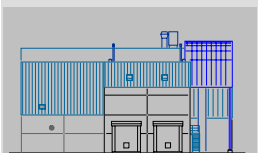
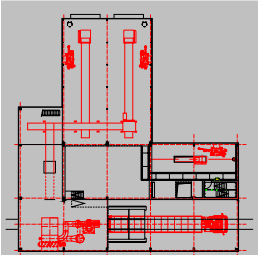
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E. Schwenk Zementwerke KG

Secondary fuels, Plant Allmendingen (Germany)

project information:

- construction period
1 year
- storage capacity
2 x 1000 m²
- mechanical storage
300 m³/h
- mechanical precipitation
100 m³/h



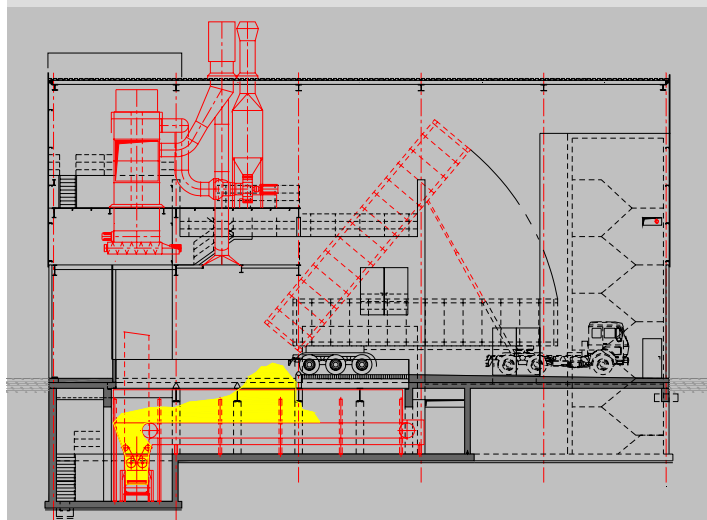
For the production of cement clinker, the energy consumption is one of the highest cost factors. In order to reduce production costs the consumption of primary fuels, as natural gas, coal and oil should be minimized. The cement industry is therefore aiming to use alternative fuels.

The kiln from cement plant Allmendingen is using mainly coal dust as primary fuel and tires as secondary fuel.

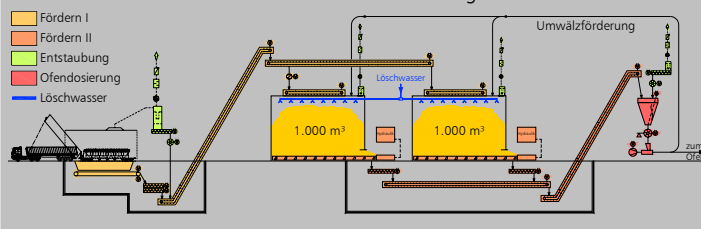
Several tests have shown, that product specifically industrial waste (BPG) can be used as alternative fuels.

Scherr+Klimke was assigned to general planning and to develop a plant concept for using secondary fuels (BPG), which include following facilities:

- a combination railway and lorry delivery
- storage for 1 - 2 days
- patching discharge out of the storage and pneumatically transport to the rotary kiln



Sekundärbrennstoffe im Werk E.Schwenk-Allmendingen



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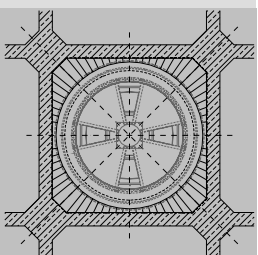
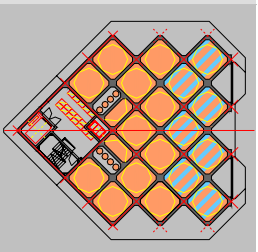
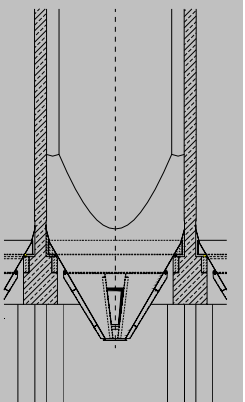
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E. Schwenk Zementwerke KG

Binding blended cement plant, Plant Mergelstetten (Germany)

project information:

- **time to built**
1 year
- **silos capacity**
4000 m²
- **mixing capacity**
120-140 m³/h
- **loading capacity**
280 t/h



After building a new binding mixing plant in Mergelstetten (see preamble photo), E. Schwenk Zementwerke KG can finally produce different blended cement and sell it to the clients as bulk ware, sack ware or in big-bags.

The project target was to establish an expandable plant with a connection from the existing cement transport to the cement mills and to the existing cement silo group and packing house .

Scherr+Klimke was assigned to general planning, including the production site analysis, layout- and design planning, realization and construction control and site supervision.

After several project studies with different layouts, the decision has been reached in favour of a new multiple cell silo group, which is placed in extension to an existing cement silo group and over a powerful existing conveyor transport line.

The raw material is delivered through a transport line from the existing cement mills or the cement silo group or by silo vehicles. It is conveyed pneumatically into diverse raw material silos.

After patching the raw material out of the silos, the material is fed in a charge mixer with 4,6 m³ net volume. The final cement is then stored in particular cement silos or conveyed directly to three lorry loading lines. The blended cement can be loaded directly or indirectly out of the cement silos.



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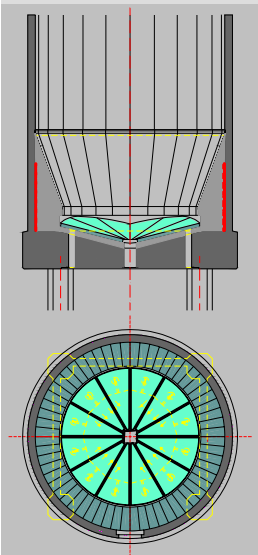
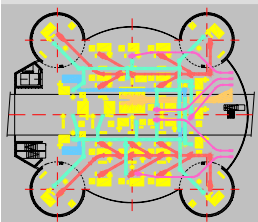
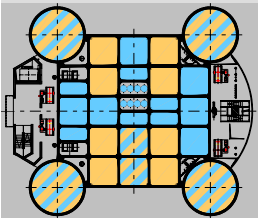
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E. Schwenk Zementwerke KG

Binding blended cement plant,
Bernburg (Germany)

Project information:

- **time to built**
1 year
- **silos capacity**
4500 m³
- **mixing capacity**
120-140 m³/h
- **loading capacity**
280 t/h



After building a new binding mixing plant in Bernburg (see preamble photo), E. Schwenk Zementwerke KG can finally produce different blended cement and sell it to the clients as bulk ware, sack ware or in big-bags.

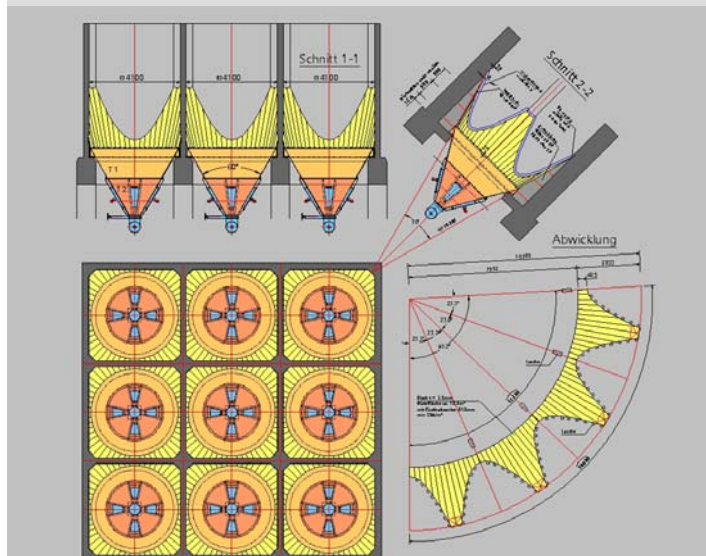
The project target was to establish an expandable plant with a connection from the existing cement transport to the cement mills and to the existing packing house.

Scherr+Klimke was assigned to general planning, including the production site analysis, layout and design planning, realization and construction control and site supervision.

After several project studies with different layouts, the decision has been reached in favour of a new multiple cell silo group which was placed below the existing powerful conveyor transport.

The raw material is delivered by a transport line from the existing cement mills or by silo vehicles. It is conveyed pneumatically in diverse raw material silos.

After patching the raw material out of the silos according to cement grade, the material is fed in a charge mixer with 4,6 m³ net volume. The finished article (goods) lays in final cement is then stored in silos or conveyed directly to lorries or to railway loading lines. The blended cement can be loaded directly or indirectly out of the cement silos.



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E. Schwenk Zementwerke KG

A new plaster and mortar, Plant Karlstadt (Germany)

project information:

- **construction period**
1.5 years
- **construction**
< 15 m concrete
> 15 m steel
- **building dimension**
L x B x H
75 x 35 x 70 m
- **limestone silos**
2 x 600 m³
- **drying plant**
3000 kg/h
- **mixing plant**
silo capacity:
~ 4500 m³
~ 35 steel silos
- **loading tower**
silo capacity:
~ 1560 m³
~ 12 steel silos
- **loading capacity**
280 t/h
- **bag transport**
2000 bags /h

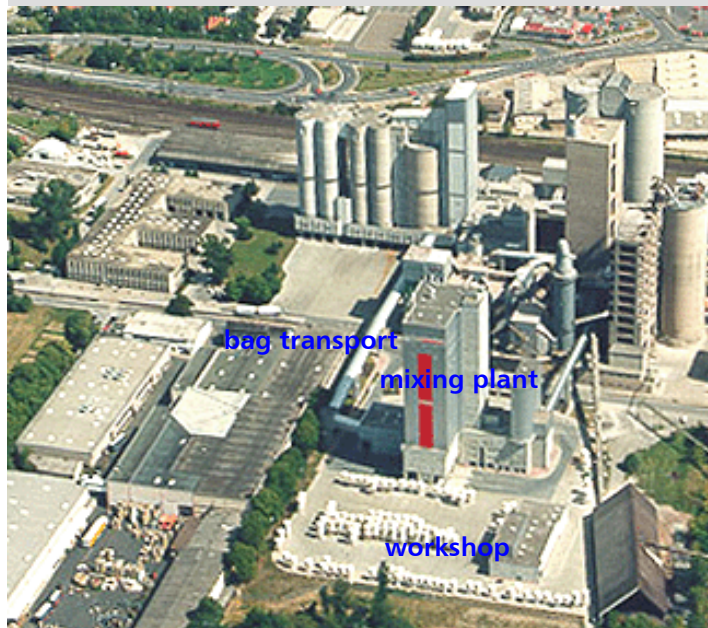
After building a new plaster and mortar mixing plant (see left photo below) and a new container workshop (see right photo below) in Karlstadt, E. Schwenk Zementwerke KG can finally produce different blended cement and sell it to the clients as bulk ware, sack ware or in big-bags.

The project target was to establish an expandable plant with a new bag transport facility connecting the existing limestone transport with the existing packing house (see right photo below).

The essential parts of the plant are the 70 m high mixing and loading towers in steel by the disclose tower (stair house, elevator and bucket elevator) in reinforced concrete.

At first, the raw material from the limestone quarry will be broken, dried and sieved. Subsequent it will be embedded, mixed and stored in silos to be ready for lorry transport.

Scherr+Klimke was in charge of the general planning, including the production site analysis, layout and design planning, realization and construction control and site supervision.



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E. Schwenk Zementwerke KG

Old tire combustion, Plant Bernburg (Germany)

project information:

- **construction period**
1 year
- **pre-combustion chamber**
5 t/h
- **transports**
5 t/h old tires,
tire feed box,
roller conveyor
to control, to
single, to weight
and to sort out,
belt conveyor,
wavy edging
conveyor,
tire rotary sluice
- **old tire storage**
55 m x 55 m
3000 m²,
8 m high,
2000 t
- **buildings**
concrete tire storage,
conveyor bridge to
the corner tower and
to the pre-heater

The secondary combustion with old tires in the cement plant Bernburg was increased from 1,5 t/h to 5 t/h.

Thereby the existing passenger car tire feeding (with 1,5 tons of tires per h) was process-technical replaced by a new pre-combustion chamber (with 5 tons of tires per h, see photo left above), including a new automatically tire transport (see photo below) and a new reinforced concrete tire storage facility.

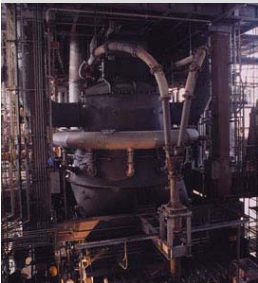
The tires were feed from the storage facility into a tire feed box by a wheel loader and then automatically separated to single tires, controlled and transported over several roller conveyor and subsequently belt conveyor to the tire rotary sluice.

In the rotary sluice the old tires were turned gastight. Afterwards the tires fall in the pre-combustion chamber, where they were converted to a coke dust fuel gas, which is used in the calciner as fuel.

In order to place the „large“ pre-combustion chamber in the pre-heater tower, it was necessary, to rebuilt a large part of the steel construction in the pre-heater tower and to recheck the static calculations.

Further a torch was mounted by a helicopter on the top of the pre-heater tower. It will be process-technical used, if there is a kiln disturbance (see photo left below).

Scherr+Klimke was in charge of the general planning, including the production site analysis, layout- and design planning, realization and construction control.



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Berger Holding GmbH

Works developing plan and structure plan for the cement plant Ladce (SL)

project circuit:

tasks/capacities:

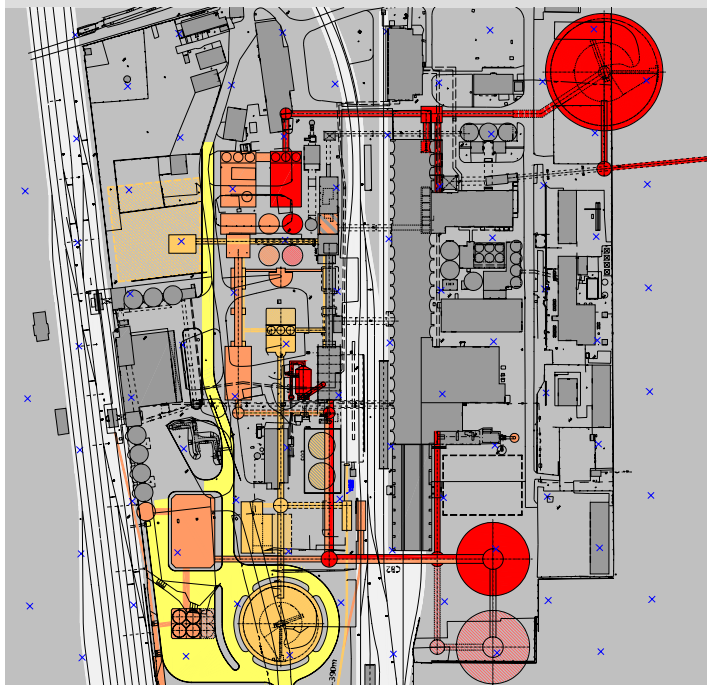
- **raw material transports and homogenization**
25,000 t (round blending bed)
- **new kiln line 2**
2200 t/d
- **unloading, transports and storage of additives**
- **clinker transports and storage**
2 x 75,000 t
- **cement storage and delivery with truck and train**
- **substitute fuels plant**
firm, lumpy, fluid
- **raw coal homogenization**
6500 t (round blending bed)
- **coal-grinding plant**
- **pulverized coal storage and proportioning**

After revision the economy of the existing productions plants, the board of directors from the cement plant Ladce (SL) planed to modernize the old facilities and long-term to increase step by step the capacity of the clinker production.

Before approval for investment, Scherr+Klimke was appointed to work out a works developing plan and structure plan (see figure below) to realize step by step and a controlled plant expansion and modernization without an interruption of production.

The target was to define the boundary and elementary conditions to serve as a basis for further planning and investments:

- Determining the necessary and possible modernization of the plants and the works expansion
- Defining the invest order and urgency
- Identifying the planning expansion and capacity
- Fixing the location of the new facilities under consideration the existing works structure
- Planning the necessary transport lines and logistic in accordance to the existing plant facilities
- Checking and verifying the concepts through preliminary design of the planned expansion
- Cost estimate of mechanical equipment and construction



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CEMENTOWNIA
Warta S.A.

Cementownia Warta S.A. (PL)

Plant development and structural design for the Warta cement plant

project information:

tasks/capacities:

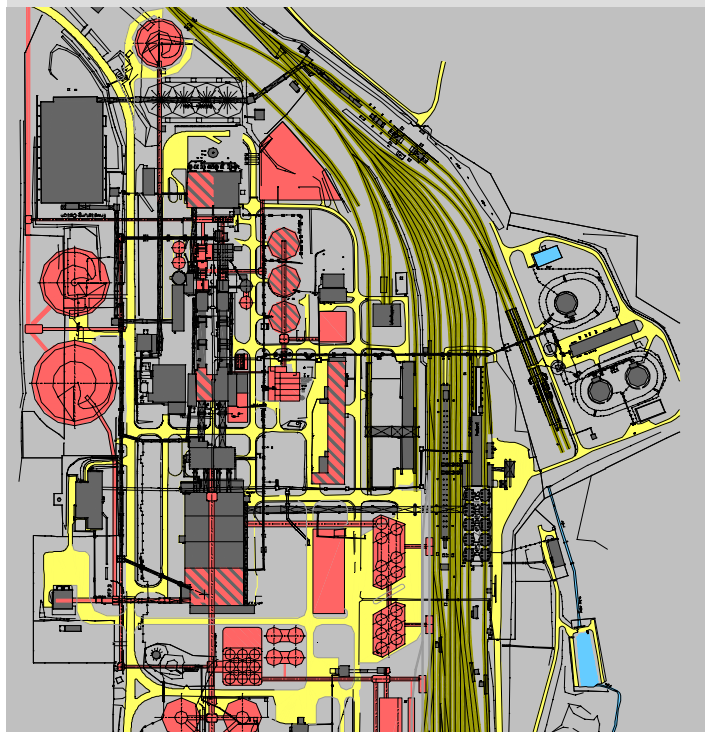
- raw material transports and homogenization
43,000 t
- modernization of the existing kiln line no. 6
3,000 tpd
- transp. and storage of additives
20,000 t
- blast-furnace sand plant
10,000 t
- fly ash plant
5,000 t
- clinker transports and storage
2 x 75,000 t
- cement storage and delivery
- substitute fuels plant
- raw coal homogenization
6,000 t

The cement plant Warta (Poland) with a clinker production capacity of 1,8 million tons per year is split into two independent productive facilities: Warta I and II. Warta I contains of 4 clinker kilns, based on a „wet production technology“, each with a capacity of 550 tpd. Warta II operates using an existing kiln which is based on a „semi dry production technology“ (1,600 tpd) and with a new kiln line with a capacity of 3,000 tpd.

After a detailed verification of the profitability of the existing production facilities and an investigation of possible future development of the cement plant, the management developed the following long-term objectives:

- further modernization of the facilities in stages and increasing the capacity of the production facilities Warta II
- shut down of an extensive part of Warta I's production facilities
- relocation and concentration of the clinker and cement production in Warta II's production facilities

In order to accomplish the modernization of the facilities and to realize the extensive changes in layout in an organized and consistent manner, Scherr+Klimke was appointed to develop together with Warta's management a developmental plan for a 10 year period in which the changes would be completed.



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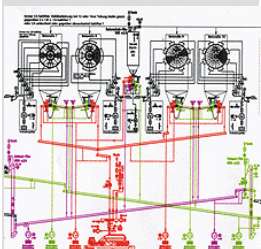
HeidelbergCement AG

Renovation of cement despatch, Plant Lengfurt (Germany)

project information:

- **construction period**
2 years
- **8 concrete silos**
each 1000 t
- **2 new steel silos**
each 200 t
- **2 truck despatch with transports**
each 280 t/h (red)
- **transports to ship despatch**
280 t/h (green)
- **transports to packing house**
80 t/h (magenta)
- **aerated silo floor**
trapezoid steel airslide with fabric (blue)

flow-sheet



section along



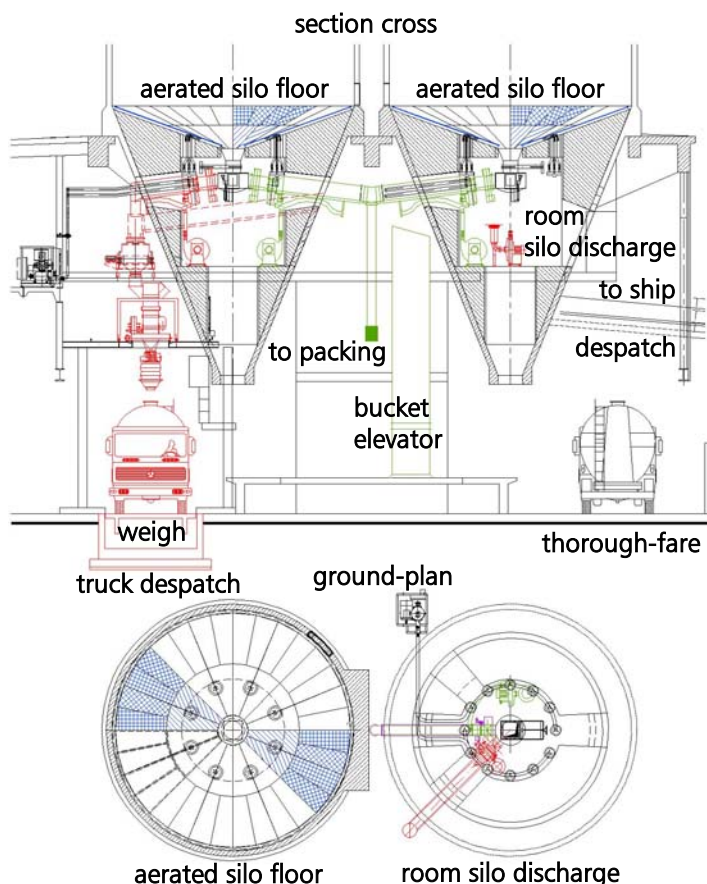
In the cement plant Lengfurt from the HeidelbergCement AG an over 40 years old group of cement silos with 8 concrete silos and 2 steel silos was to be rehabilitated and renovated.

Thereby a complete new concept of the silo aeration with 20° trapezoid inclined silo air-slides which guarantees almost 100 % rest discharge of the cement in the cement silos was realized.

The existing conical concrete silo hoppers were re-concreted. Hereon that a complete 50 % tacted aeration floor (blue) was implemented and in the lower part an additional space where the discharge equipment and the pipe installation are placed.

The cement can be transported from each silo to the truck and ship despatch and to the packing facilities.

Scherr+Klimke was in charge of the general planning, including planning structural works, steel construction and machines with realization and control of each part.



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