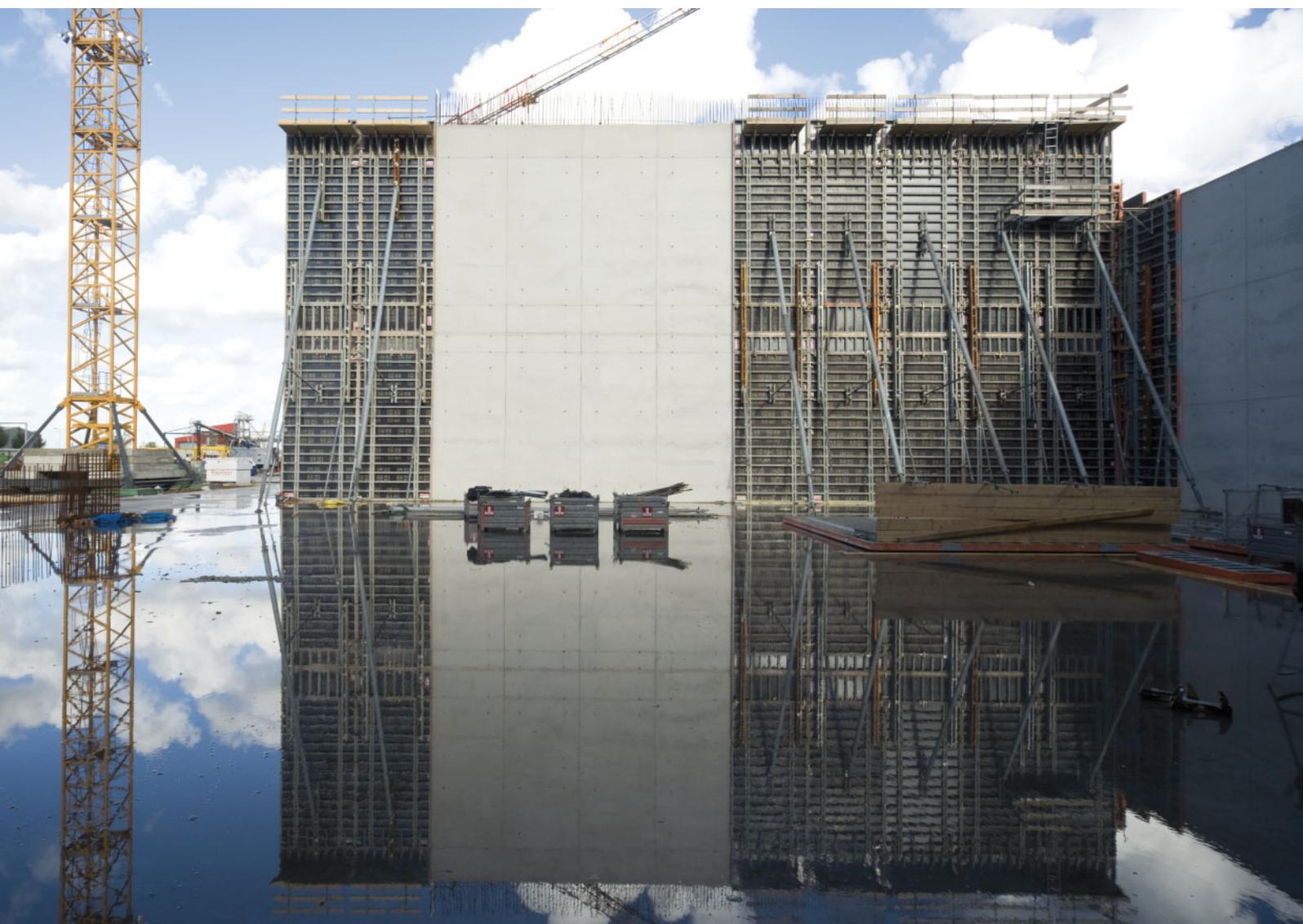




NOE® report



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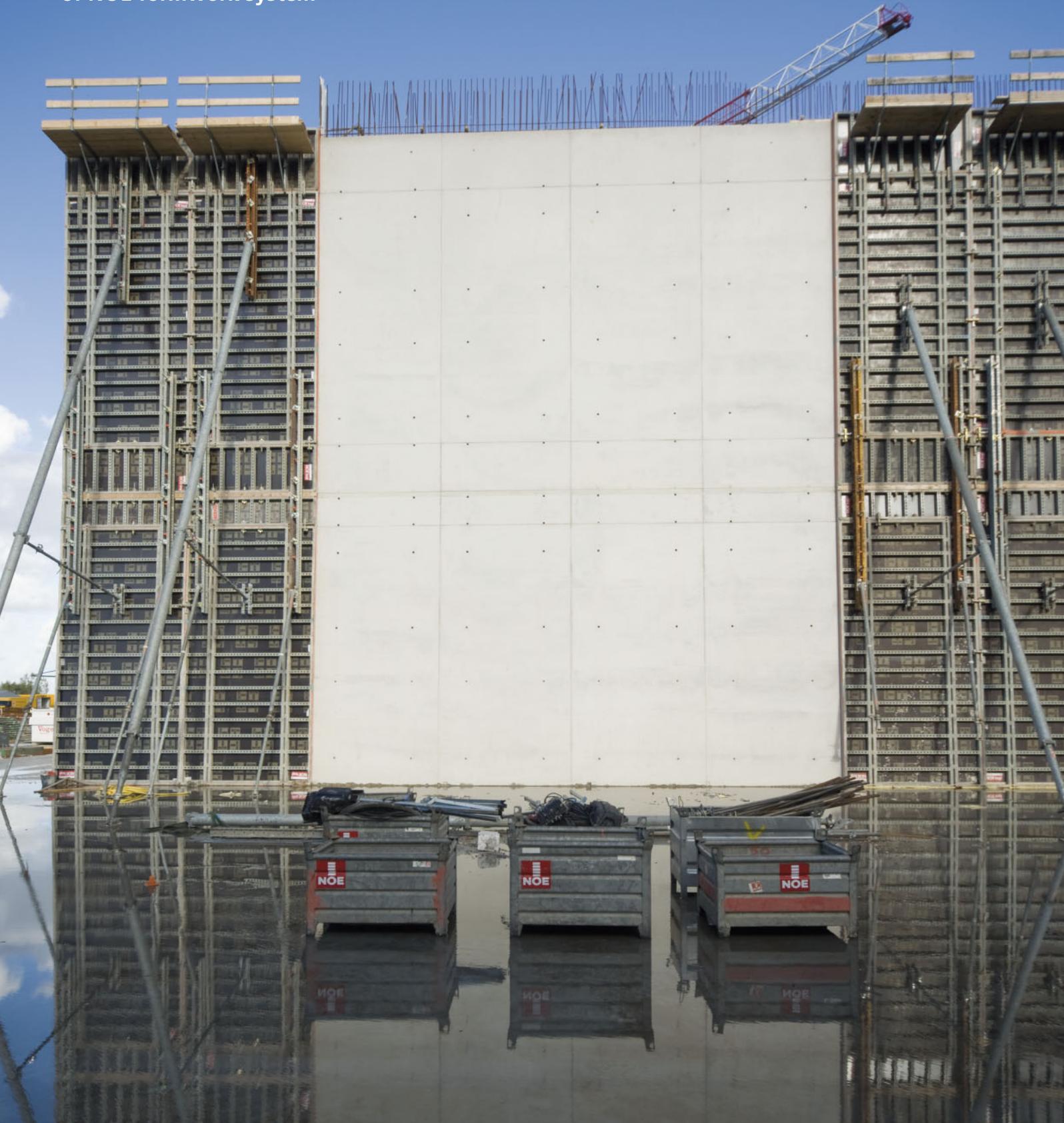
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From nought to eighteen in two lifts

18 m high walls in only two concrete lifts / Working in unusual ways with the help of NOE formwork system



The integral bracing of the NOEtop large panels allows the tie rods to be freely positioned anywhere within the bracing. This allows tie rods to be installed horizontally even in conical cross-sectioned walls.

Dutch general contractor Cordeel, Zwijndrecht built a 65,000 m³ bulk store in Europort Rotterdam. On this project, Cordeel benefited from a formwork solution developed for the project by NOE Bekistingstechniek, Arkel, Netherlands, the Dutch subsidiary of NOE-Schaltechnik, Süssen. The most notable features: the up to 13.00 m high side walls were poured in one lift and the up to 18.50 m high end walls in just two. Another aspect to take into account was the conical shape of the walls on the inside. One metre thick at the base, the walls taper to 0.5 m at a height of 6.50 m. The formwork solution devised by NOE Bekistingstechniek for this task was based on the large panels with integral bracing of the NOEtop formwork system.

Rotterdam is home to the world's third-biggest sea port, which is also Europe's biggest by some margin. Consequently, the warehouses and storage facilities also need to be on a correspondingly large scale. The Dutch general contractor Cordeel constructed a 170 m long, 52 m wide building for the bulk store. From the concreting point of view, the contractor chose a rather unconventional way to build the structure: the side walls were cast in one and the 18.50 m high end walls in just two lifts!

Panels over 14 square metres in area

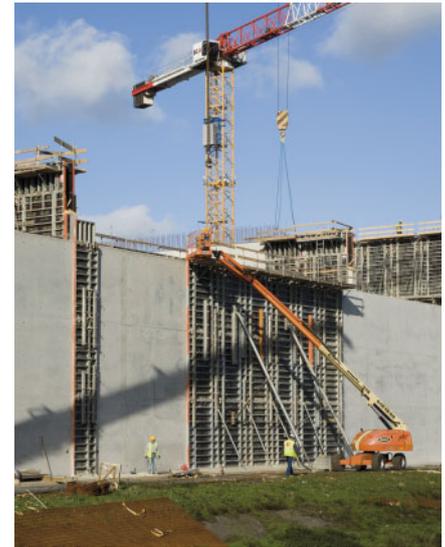
The company opted for the NOEtop formwork system from NOE. The system proved to offer numerous advantages. For example, the tie rods can be positioned anywhere within the bracing on the large panels, which allows great flexibility of use. This flexibility is further enhanced by the range of sizes offered by the system manufacturer. NOEtop is available in panel heights of 0.66 m up to 5.30 m and widths of 0.25 m up to 5.30 m. All panels can be combined on their ends or sides without any disruption

to the panel grid and with no reduction in the allowable formwork pressure of 88 kN/m². For the decision makers on the Rotterdam site, there was yet another good reason for their choice: NOEtop is also available in an XXL version, i.e. with dimensions of 5.30 x 2.65 m.

Therefore formwork for over 14 square metres of concrete can be erected in a single operation – saving time and cost on site.

Walls tapering down as they go up

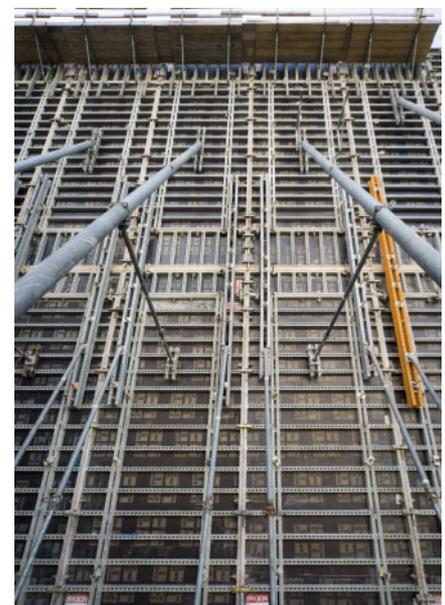
For the first section of structural concrete on the Rotterdam bulk storage building, the structures team erected a 13.00 m high first face form, fixed the reinforcement and then put a 6 m high second face form in place. This was extended during concreting by a further 7.00 m high section. By adopting this method of working, it was possible to make sure the bottom wall section was well compacted. Because the structure is used to store bulk, the designers also had to take into account the compressive forces on the wall. As a result, the reduction in wall thickness with height is even more



The side walls up to 13 m high were concreted in one operation.

pronounced. The thickness at the bottom is one metre, while at the top it is only half as thick. The integral bracing of the NOEtop large panel formwork system allows the wall formwork to be tied horizontally, despite its conical shape. This is thanks to the free positioning of

The first face formwork was erected to full wall height. The second face formwork was erected in two stages.



NOEtop panels can be combined on their sides and on their ends, without disturbing the panel grid.

the tie rods within the bracing. The formwork panels can be placed at the required angle with the minimum of effort. After the first section of concrete was complete, the team used another product from NOE-Schaltechnik: the NOE AB 300 working platform.

Safe working on NOE working platforms

They provide a working width of 2.10 metres and an allowable service load of 300 kg/m². The platform can be used on site direct from the lorry and is fitted with self-locking suspension hooks for rapid erection. The AB 300 is also available as practical external and internal corner units and can be mounted cen-

trally or eccentrically (up to 25 cm). The manufacturer also offers modules with hatches to allow the user to move quickly and easily to working platforms above and below. The NOE AB 300 gave the Rotterdam construction workers a solid base from which they could erect the first and second face formwork. The upper part was then concreted in a second lift. Using this method of construction, the general contractor was able to construct the bulk store in the shortest possible time. Concreting work started at the end of August 2013 and was completed by November 2013. The store is expected to be accepted for use in the first quarter of 2014.

Site board

- **Client:**
European Bulk Service EBS,
Rozenburg, Netherlands
- **Contractor:**
Cordeel Nederland b.v.,
Zwijndrecht, Netherlands
- **Formwork, formwork design:**
NOE-Bekistingstechniek b.v.,
Arkel, Netherlands



Impressive concrete surface.

Left: The NOE AB 300 working platform was used for the 18 m high walls.

Below: The volume of the bulk store built for European Bulk Services is 65,000 m³. When the store is full, it sinks up to 5 cm into the ground.



High horsepower in fine form

Concrete, steel and glass – a new building for road horsepower enthusiasts

In Böblingen – near Stuttgart – a building designed to bring the dream of freedom and speed within reach rises from the ground. The building is an extension of the Meilenwerk Centre – a forum for driving culture for the Stuttgart region. Soon the premium marques Harley-Davidson, Ferrari and Maserati will be on sale here. An American restaurant completes the ensemble. However, it is not just the high-horsepower road vehicles that are extraordinary, the building in which they are presented is an eye-catcher too.

For petrolheads, the Meilenwerk is a trendy meeting place which showcases high horsepower of a particularly fine form. Now it has been extended by another section of building. In the immediate neighbourhood of the A 81 motorway stands a building immediately noticeable for its expanse of glass and concrete, and its many unusual shapes. Constructing the structural frame of the building was the responsibility of Wurster Bauunternehmung, a construction contractor based in Grafenberg. The contractor had the task of forming the concrete elements, some of which were highly curved. This he entrusted to NOE-Schaltechnik, Süssen. Foreman Karl Köhler had this to say on the formwork: "We

have worked for years with NOE on large projects. In most cases, we use standard NOEtop formwork. On Meilenwerk, however, we found ourselves using circular and special formwork as well."

The big plus – integral bracing

The architecture of the building is remarkable for the many skews and inclines of the walls. The NOE engineers were able to make use of the special advantage of NOEtop: the large-area formwork panels have integral bracing. This allows the heavy push-pull braces required for concreting the skews to be



An eye-catcher aiming to become a landmark. The tower of the extension to the Meilenwerk Stuttgart. (Photo: ACTIV-Immobilien GmbH & Co. KG, Schemmerhofen)



The new mecca for motorbike fans captures the eye with its many skews and curves. NOE-Schaltechnik supplied the formwork solutions.

Site board

■ Contractor:

Wurster Bauunternehmung
GmbH, Grafenberg

connected directly to the panels so that additional bracing was unnecessary. The largest panels on the market were used for the walls' external faces: the 5.30 x 2.65 m NOEtop XXL panel. The internal surfaces were formed with side-on panels. It was made possible by two further advantages of the NOEtop panel system: the tie rods can be positioned anywhere within the length of the braces and hence the panel widths and heights can be chosen to maintain the panel grid.

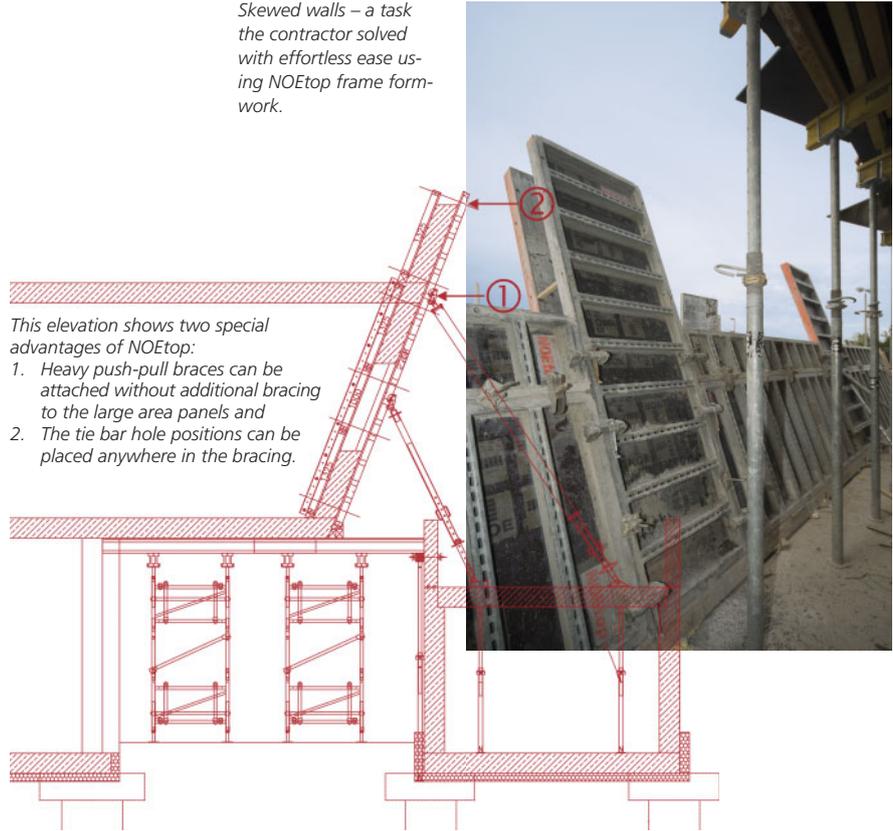
A formwork system for beautiful curves

The time saved in the construction of the ordinary straight walls was available for constructing the curved and skewed building elements. Karl Köhler: "This site was a pleasant challenge for us. We had the opportunity of demonstrating our expertise in construction at various points in the project. The building has a lot of curves, and no two radii were the same." The site team relied on NOEtop R 275 to construct the curved walls quickly and cost effectively. This system is suitable for radii from 275 cm upwards and combines very well with the NOEtop panel system. As usual with NOE, the formwork left the factory already set at the radius required for its first use at the Böblingen site. Thus the formwork arrives on site prefabricated and ready to

Skewed walls – a task the contractor solved with effortless ease using NOEtop frame formwork.

This elevation shows two special advantages of NOEtop:

1. Heavy push-pull braces can be attached without additional bracing to the large area panels and
2. The tie bar hole positions can be placed anywhere in the bracing.

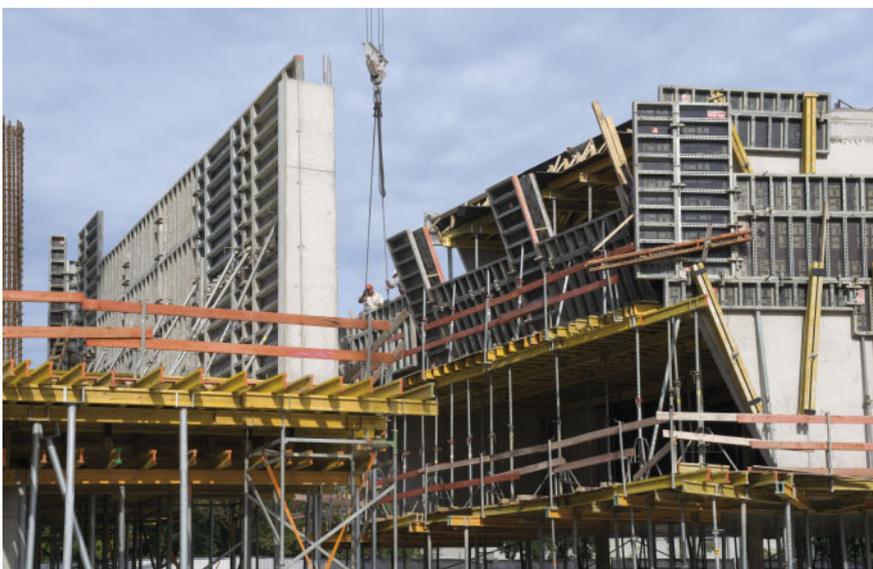


install, which means all the site staff have to do is unload it before they are free to start using it straight away. It was equally easy to adjust the circular formwork to the requirements of the next building elements to be poured. The required radius is set by turning the integral spindles. NOEtop R 275 can be simply extended for use on higher walls. In spite of this, special formwork was needed in some places.

Professional individuality

In this respect as well, NOE-Schaltechnik provides solid support to Wurster Bauun-

ternehmung. Karl Köhler on special formwork: "Of course we tried to construct as many components as possible using standard formwork, but in some places we had to use special elements. NOE has been really helpful to us here." In addition to the sale and rental of formwork systems, the formwork manufacturer is appreciated by its customers for excellent service. This includes the preparation of individualised formwork drawings as well as the design and construction of special elements. NOE-Schaltechnik also manufactured special formwork for the Meilenwerk extension to ease the task of constructing this remarkable building. The NOE staff consider providing customers with means of working quickly and economically on their projects as a key part of their job. This is also confirmed by Karl Köhler: "Our working relationship with NOE is excellent, everything is done with the minimum of formalities. If something is required at short notice, it is delivered in equally quick time. We are satisfied with NOE and expect to be working with the company's formwork again in the future." A manufacturer could wish for no greater praise.



NOEtop frame formwork brings its big plus to bear in the extension of the Meilenwerk Böblingen: the well thought-out panel grid.

Remembering old construction techniques in concrete

New NOEplast Camargue textured formliner with reed motif

A high school with many ancillary buildings was built in the district of Sérignan in southern France. The facades of the new school have exposed concrete quality surfaces. The surface has a relief that recalls a traditional form of construction used in the Camargue. To realise this idea, architect François Fontes in conjunction with NOE-France, the French subsidiary of NOE-Schaltechnik, Süssen, Germany, designed a customised formliner, which has now been added to the standard range of NOEplast textured formliners.



It takes a certain amount of intuitive flair to combine a modern form of construction with another, older form, the use of which was rapidly receding in people's memories, to create an example of discerning architecture. The aesthetic outcome of such a process is what architect François Fontes created with the Lycée

Marc Bloch in Sérignan. He was responsible for the design of a complex that has provided for the education and leisure needs of a great many children since it opened in autumn 2013.

The facade surface of the buildings is for the most part fair-faced concrete that reproduces a relief pattern of bundled

The exposed concrete surfaces of the walls of the Lycée Marc Bloch in the district of Sérignan in southern France look as if they incorporate bundles of reeds. They are intended to make reference to a centuries-old traditional construction technique used in the Camargue. The look of this form of construction was revived by the architect François Fontes. Photo below: Région Languedoc-Roussillon, Direction de la Communication, Montpellier)





Die sichtbaren Beton-Oberflächen der Wände des Lycée Marc Bloch im südfranzösischen Sérignan sind aufgestellten Schilfbündeln nachempfunden. Sie sollen an eine jahrhundertealte Bautradition in der Camargue erinnern. Diese wurde so durch den Architekten François Fontes zu neuem Leben erweckt.



(Photo: Région Languedoc-Roussillon, Direction de la Communication, Montpellier)

reeds in its textured finish. In choosing this design, the architect is referring back to 700-year-old construction technique used in the Camargue. It is based on the use of reeds as an organic construction material and earlier formed a source of income for women. Their task was to go down into the marsh and harvest the reeds. After they cut the reeds with a long-handled scythe, they carried them to dry land by boat, where they were bundled and tied together with twine or wire. The organic material was used as a roof covering, for insulation and even for making walls. The construction elements it was used for usually showed a typical relief. It was this typical relief that François Fontes picked up and gave new life to in the exposed concrete facade of the complex. He chose NOEplast textured formliners from NOE-Schaltechnik to achieve this unusual design in the surface of his concrete.

A new formliner

NOE markets the polyurethane mats under the name NOEplast and markets a large range of standard formliners. Moreover, the company also offers customers the option of creating their own individual motifs.

François Fontes took advantage of this opportunity and designed a completely new formliner. So that the concrete relief was as close to the original as possible, the manufacturer used natural reeds in the production of the NOEplast textured formliner. A mould of the reeds was made with liquid polyurethane. The formliner has been on the market since the beginning of 2014. The tradition at NOE-Schaltechnik is always to name a new textured formliner after the place of first use of the motif. This time, it is named after the area where the traditional reed

construction method originated. The formliner designed by François Fontes bears the name Camargue.

Use of the formliner

As with any textured formliner, the Camargue must also be placed properly in the formwork. After the release agent has been applied, the concrete can be poured. As soon as the concrete has hardened, the formliner is removed and the relief exposed. To make its customers' task as simple as possible, NOE-Schaltechnik offers a special service: on request, the company will glue the formliners on to the formwork panel or on to a supporting surface which is then screwed to the formwork. This is particularly helpful on in-situ concrete sites because they do not usually have any level, dust-free areas available and temperature fluctuations



may also make it difficult to glue the formliner in place. This step does not have to be done on site, which can save time and money.

Repeated use saves money

A further advantage of NOEplast is that a formliner can be reused up to 100 times depending on the required characteristics of the surface finish. In most cases, all

that is necessary before reuse is that the formliner be cleaned with water and the release agent reapplied. In this way, the cost per square meter comes down with every reuse. The manufacturer reinforces the back of the formliners with a glassfibre fabric to ensure long-term dimensional stability and durability, another feature that lifts NOEplast formliners above many others. With the design and production of this formliner, bundles of reeds will

appear in future in relief not only in the Camargue, but in concrete walls all over the world, a lasting reference to the traditional construction technique.



Site board

- **Architect:**
Fontes Architecture, Montpellier, France
- **Main contractor:**
DUMEZ SUD (Vinvi Construction Group), Hérault branch
- **Textured formliners:**
NOE-France, St. Quentin, France
NOE-Schaltechnik Georg Meyer-Keller GmbH + Co. KG, Süssen, Germany

Aesthetic architecture in concrete for a utility building

High-quality architecture for the shaft-top building above Kulch Tunnel near Lichtenfels with NOEplast textured formliners and NOEtop frame formwork

Deutsche Bahn AG is building a continuous rail line between Nuremberg and Berlin. One of the structures along its route is Kulch Tunnel, whose shaft-top building was constructed with the help of NOEplast textured formliners in combination with NOEtop frame formwork manufactured by NOE-Schaltechnik, Süssen, Germany.



Deutsche Bahn AG is currently constructing a continuous rail line between Nuremberg and Berlin as part of the German Unity Transport Project Number 8. Starting in 2017, ICE trains will run along these tracks at 300 km/h. Rail passengers will be able complete the journey between Munich and Berlin in only about four hours instead of the present six. 25 tunnels are among the engineering works required to make this possible. One of these is the Kulch Tunnel near Lichtenfels. It was built by a consortium consisting of Hochtief Construction AG, Alpine Untertagebau GmbH, Alpine BeMo Tunnelling GmbH and Bickhardt Bau Aktiengesellschaft.

The consortium completed the part project to the architectural requirements of DB ProjektBau GmbH with great care and attention to detail. These high standards also applied to the shaft-top building above the Kulch Tunnel at the side of the road between Altenbanz and Rossach. The 8.60 x 8.60 m surface-level building provides ventilation to the tunnel, accommodates services cables and ducts, and is the exit from the rescue access shaft. The building was not intended to

be of great architectural significance. However, the client thought it important that the building integrated well into the surrounding landscape. It was therefore decided to give the concrete facade of the building the outside appearance of a masonry wall. The solution chosen was NOEplast textured formliners in conjunction with NOEtop wall formwork from NOE-Schaltechnik, Süssen.



A NOEtec girder ensures the formwork for the 9 m long walls can be put in place and stripped in one piece. The interlocking shape of the edges, which allows the formliner to be extended in height and width, is plainly visible (but only in the formliner).

Formed with textured formliners

To give the outside walls of the shaft-top building the desired look, the designers opted for the "Murus Romanus" motif. This formliner leaves a concrete surface that gives the observer the impression of looking at a random rubble masonry wall. NOE markets the polyurethane (PU) formliners under the brand name NOEplast and has a large range of different motifs. The manufacturer also offers customers the opportunity of realising their own design ideas. These could range from a simple relief to the reproduction of a photograph, almost anything in fact.

Use of textured formliners

The consortium had to fix the textured formliners firmly to the formwork panels. In the precast concrete works, it would be enough simply to place them on the vibrating table. Whether the concrete

element is cast on site or in the precasting works, it is always recommended that the formliner be coated with a release agent specially developed by NOE. This ensures that the formwork can be easily stripped after concreting. All subsequent steps in the construction of an in-situ concrete wall are as normal – and the same process can be applied for almost all types of concrete. As soon as the concrete has hardened sufficiently, the formwork panels are removed along with the formliners to reveal the relief.

Special service

NOE-Schaltechnik is the only manufacturer to offer formwork panels and textured formliners from the same source. Therefore it can also offer a special service: textured formliners and formwork panels supplied ready for immediate use on site. This is beneficial above all for in-situ concrete sites, where there are often

Site board

- **Client's Representative:**
DB ProjektBau GmbH Southeast
RegionMajor Project VDE 8,
Erfurt
- **Contracting Consortium:**
ARGE Tunnel Kulch consisting of:
HOCHTIEF Solutions AG, Essen
Alpine Bau Germany AG, Eching
Alpine BeMo Tunnelling GmbH,
Innsbruck, Austria
Bickhardt Bau Aktiengesellschaft,
Kirchheim
- **Formwork, textured formliners:**
NOE-Schaltechnik, Süssen,
Germany

no level, clean set-down areas and temperature fluctuations can make gluing the formliners in place problematical. This was one of the arguments that convinced the consortium's site team to have the textured formliners supplied attached to a supporting board by NOE. Another was the sizes of textured formliners required. The Murus Romanus motif has a standard width of 6.00 m. However, the textured formliners themselves can be extended by any amount in length and width. The textured formliners for this utility building at Kulch needed to be 8.20 m wide (2.20 m larger than standard) and have no visible joints. As a result, the formliners had to be shaped so as to interlock vertically and horizontally with one another for the concrete to appear as a continuous masonry wall.



A NOEtec girder made it easy for the site team to erect and strip the formwork.

An ideal combination of NOEtop frame formwork and NOEplast textured formliners. The NOEplast Murus Romanus textured formliner was supplied attached to a supporting board by NOE.





Once the concrete surface has gained a little patina, only an expert will be able to tell at first glance that the walls are concrete and not masonry.

Use on site

The formliners supplied by NOE already attached to supporting boards were fixed to NOE's standard NOEtop formwork panels by the consortium's site team. These panels are known for being especially robust and very versatile in use. The manufacturer supplies them in four heights up to 3.31 m. The tallest variant was used on the Kulch Tunnel site. In addition, several formwork panels had to be joined together to make a unit 9.00 m wide. The site team used a NOEtec girder as a spreader beam to ease the task of working with this relatively wide formwork unit. The NOEtec girder was attached to four NOEtop crane hooks to simplify operations. All the walls of the building were erected in a very short time.

No visible working joints are to be seen in the exposed concrete surface.



The NOE system components (formliners and formwork panels) complement each other excellently and thus ensure a perfect result.

On close inspection, it is obvious that the consortium's careful planning paid off. Once the concrete walls have developed a little "patina", only an expert will be able to tell at first glance that they are made from concrete and not stone.

Well planned

The details were carefully agreed between the client's representatives, the construction engineer and the site staff before the works were planned, designed and carried out. For example, all wall ends and door openings are formed in smooth concrete. This was achieved by dispensing with the texture on these surfaces to create a pleasing, uniformly flat frame around the openings in the natural stone relief. The client also stressed that the walls should

not have any visible working joints in the concrete. As a result, the walls were concreted up to top of ceiling slab level and bent-out bar connections used to join the ceiling slab to the walls.

Being able to call upon the experience and know-how provided by a one-stop-shop supplier proved to be a particular advantage for the consortium. In this case, it was the manufacturer's expertise in using formwork with textured formliners to create reliefs in concrete surfaces. This project – although only small – showed that a simple utility building can fit aesthetically into its immediate surroundings with just a small amount of carefully applied design flair.

All wall ends, door openings and penetrations are formed in smooth concrete. This was achieved by dispensing with the texture on these surfaces. The clean lines of the frame create a pleasing calm next to the natural stone-like relief on the walls.



Sine wave facade

Ingolstadt Nord railway station: Ivory-coloured concrete lisenens with a travertine stone effect gives station a distinctive look

North Ingolstadt has a new railway station. The distinctive feature of the building's facade is the narrow vertical ivory-coloured concrete lisenens, which each bulge in such a way that in series they create the shape of a sine wave. The facade conceals the various building uses and presents a uniform external appearance. The surface of these lisenens looks like the natural stone travertine. NOEplast textured formliners make this possible.

Architecture

The new station north of the old town brought to fruition under the overall control of the Munich architects Zurmöhle Architekten Munich and Maier Neuberger Projekte GmbH is now a key transportation hub.

The new railway station building consists of an office block incorporating a parking garage and a bus station with a travel centre on the ground floor. The office block has three upper storeys, the parking garage four parking levels and roof-top parking. The facade has 224 precast units, each 13.20 m long and arranged so that their bulges in sequence create the appearance of a sine wave on the face of the facade.

To allow the new building to give an impression of being light, almost floating, the architects decided that the ground

floor should be as inconspicuous and open as possible. Therefore they dispensed with the usual facade in this area and supported the building on a number of walls and 13 circular columns. The storeys above are of different heights depending on their use. These various uses and room heights posed the architects a tricky problem. For their brief was to create a homogenous appearance for the building. First they thought of cladding the whole building in aluminium, but the employees of the transport operators and a majority of the population rejected this design. As a result, the designers came up with the idea that the building should have slender, vertical, fair-faced concrete quality lisenens. These should be

placed on the building like ribs and link all the various uses of the building together. To strengthen their rib-like impression, the lisenens had to be ivory or cream in colour. The designers sought to achieve this colour by using white cement dyed with a yellow pigment.

Concrete lisenens

It was important to the architects that the facade incorporated curves to avoid looking too severe. The lisenens therefore portray the shape of a sine curve. However, the designers worried it would not be possible to build the lisenens to the desired quality. They looked for a solution and found it in NOEplast textured formliners manufactured by NOE-Schaltechnik, Süssen. Eckart Zurmöhle, the lead architect for the project, comments: "Because we feared that it would be too expensive to cast the lisenens with sharp edges, we tackled this possible problem at an early

Site board

- **Client:**
IFG Ingolstadt GmbH, Ingolstadt
- **Architect:**
Zurmöhle Architekten, Munich
Maier Neuberger Projekte
GmbH, Munich
- **Site Management:**
Commendas projektmanage-
ment GmbH, Ingolstadt
- **Main contractor:**
Xaver Riebel Bauunternehmung
GmbH & Co. KG; Mindelheim
- **Precasting works:**
Wertach Fertigteilwerk GmbH,
Pforzen
- **Installation:**
Montec, Münsterhausen
- **Textured formliners:**
NOE-Schaltechnik, Süssen,
Germany



stage and decided to shape them with the help of textured formliners from NOE. This allowed any unevenness to be disguised. The concrete surface always looked simply perfect." When asked why the designers decided in favour of the formliners from NOE, he answered: "Our partners from Maier Neuberger Projekte GmbH already had extensive experience of using formliners from this manufacturer and had always found them very satisfactory. Thus it was natural to consider using them for Ingolstadt as well." In fact NOEplast textured formliners have been on the market for more than 40 years. As well as a comprehensive range of standard motifs, NOE also offers to create formliners to suit individual wishes, e.g. special lettering, numbering and coats of arms.



The set-back ground-floor storey contains a travel centre and a bus station.

Formliners

The designers chose the "Travertin" textured formliner for Ingolstadt Nord station. It reproduces the surface structure of natural stone very well indeed. Another great advantage of NOEplast is that it can

be used up to 100 times and therefore saves money with each reuse. This advantage was put to good effect by precasters Wertach Fertigteilwerk GmbH, Pforzen: to manufacture the station's 224 lisenen, the precasting works required 28 sets of formwork panels clad with textured formliners. Each set of panels was used almost 50 times.

The textured formliners must be soundly fixed to the formwork to ensure a precise reproduction of the texture in the concrete. For concreting on site, this usually means it is glued to the form-



A travel centre, office and car parking garage are integrated into Ingolstadt Nord station. The continuous series of 224 concrete lisenen around the building gives it a uniform exterior. 28 different precast forms were required for the lisenen to create the impression of a continuous sine wave.



The surface of the lisenen looks like the natural stone travertine. This appearance was created by placing NOEplast textured formliners in the precast concrete unit forms. Architect Zurmöhle remarked: "... the concrete surface always looked simply perfect."



The ivory-coloured lisenen could be mistaken for natural travertine. Only a specialist would be able to tell the difference. The use of "Travertin" NOEplast textured formliners allowed any slight unevenness to be disguised.



A logistical challenge: the transport and installation of the 13 m plus long lisenen on Ingolstadt Nord station in possibly windy conditions.

work panels. Alternatively the textured formliners can be glued to an inexpensive sacrificial facing, which is then attached to the formwork panels.

In the precasting works, the textured formliners can just be placed in the forms on the vibrating tables. In this case, self-weight is enough to keep the formliners in place. The concrete can be poured once the formliners are properly in position. As soon as the concrete has hardened sufficiently, the user can release the formwork from the concrete element to reveal the relief pattern.

Service

To make its customers' task as simple as possible, NOE-Schaltechnik offers a unique service: at the customer's request, the company mounts the formliners on to the formwork or a supporting board and supplies the element ready for use. This greatly simplifies the work involved, particularly on sites using in-situ concrete. The special difficulty for the Wertach precasting works was not the construction of 28 forms, although the curves of the lisenen presented a real challenge. It was in the transport and installation of the precast lisenen themselves. With a length of 13.20 m, a width of 20 cm and a height

in some places of only 15 cm, the greatest difficulty was to transport the lisenen to site without damaging them and install them on the building despite the possible effects of wind. The success of Münsterhausen-based contractor Montec in this task is reflected in the high satisfaction of Ingolstadt's resident population and visitors.

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