Doka **Xpress**

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Climbing High and Reaching Far to Basoli, J&K

Transforming residential construction

Framed formwork Frami Xlife and Slab formwork Dokaflex being used at Suvilas Royal Gardenia project, Bangalore

Energizing India

Speedy construction of Cooling tower with Cooling-tower formwork SK175 at 2 x 800 MW supercritical thermal power station

Reaching heights

Self climbing formwork SKE50 being used to cast the sloping core walls of Signature tower, Chennai

The Formwork Experts.

doka

Editorial

Dear Readers,

It is with immense pride that I introduce and present to you our second edition of Doka Xpress for India. This piece of literature, I believe, will serve as a conduit between the company and readers across the construction market in India.

With the onset of the 5th anniversary of Doka's foray into India's business community, Doka continues to witness numerous achievements and reach several milestones, most of which are highlighted in this edition. However, the most significant development has been the immense trust that our Clients and Business Partners have shown in us.

Past one year has been a significant year for Doka, with the introduction of Dokaflex 15, Frami eco and Dokadek 30 into the Indian market. During the year Doka continued to add newer dimension to the Industry by delivering distinctive and innovative solutions in a gamut of infrastructure and connectivity projects.

I would like to take this opportunity to thank our partners for their faith, constant support and guidance. Needless to say, despite Doka's appreciable operational progress in India so far, the Company is aiming to continually expand Doka as a brand and explore the enormous opportunities the growing Indian infrastructure industry has to offer.

Your sincerely
Anupam Kumar Sharma
Managing Director Doka India Pvt. Ltd

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Cover picture: Cable stayed bridge, Basoli, J&K

Doka News

bC India 2013, Mumbai

Doka India showcased the innovations in formwork technology in bC India 2013, an international exposition for Construction Machinery, Building Material Machines, Mining Machines and Construction Vehicles. Visitors had a chance to touch and feel the systems and also to get solutions for their ongoing projects. The newly introduced slab formwork system Dokaflex 15 was demonstrated lively, which made one of the visitors's to quote that "Dokaflex 15 wins out over traditional forming methods for its attractive price level". Moreover, Panel floor formwork Dokadek 30 marks a significant advance on various aspects of the systems hitherto available on the market. This evolutionary development now makes it possible to form both the typical and infill zones simply, quickly and in great safety. //

▲ Load-bearing tower d2 is being used to cast the slabs at a height more than 6 m.

Speedy solutions for thermal power plant

R.K.M Powergen Pvt Ltd is coming up with a 4 x 350 MW thermal power project at Uchpinda in Dabar Taluk in Jangir – Champa district of Chattisgarh. Doka has provided the Framed formwork Frami Xlife for column construction and Load-bearing tower d2 for construction of Central control building (CCB).

As the project is located in a remote location, the contractor is facing an acute shortage of man power and is also entangled with the time constraint. In order to improve the forming time and decrease labor involvement, Doka has provided manhandled Framed formwork Frami Xlife for the columns. This system is ideal for quick, economical forming of columns and moreover its flexibility on the site reduces the commissioning quantities. Above all, though, the system shortens the forming-times, ensuring fast workflows: a hammer is the only tool needed. Moreover, to cast the slab at a height more than 6 m for CCB, Load-bearing tower d2 is being used. This modern system is quick and easy to erect and can be adapted to any plan layout or height by connecting various standard frames by user friendly and self aligning quick couplers and spring locked connecting pin. Simple stacking of the basic frames, no tools required for assembling and integrated climbing rungs in the frames are some of the added advantages of the system. Moreover, by using different lengths of diagonal braces, the spacing of the d2 frames can be adjusted to provide exactly the required loading capacity. //

The facts

Jobsite: 4 x 350 MW thermal power project at Uchpinda

Location: Champa district, Chattisgarh

Customer: R.K.M. Powergem Pvt. Ltd.

Building: Central control Building

Systems fielded: Load-bearing tower d2, Framed formwork Frami Xlife

A potential germinating: Under construction is a new cable stayed roadway bridge over the river Ravi in Jammu-Kashmir with a main span of 350 m and a total length of 592 m.

Bridging the gap

In an effort to better road connectivity between Punjab and J&K, S. P. Singla construction is constructing cable stayed roadway bridge in Basoli. For this project, Doka has delivered a formwork solution with Large-area formwork Top 50 with Climbing formwork MF240 and the Automatic climbing formwork Xclimb 60.

The facts

Jobsite: Pylon for Cable stayed bridge

Location: Basoli, J&K

Contractors: S. P. Singla Construction Pvt.Ltd.

Start of construction: September 2010

Completion scheduled: September 2014

Height: 108 m each pylon

System fielded: Automatic climbing formwork Xclimb 60, Crane lifted climbing formwork MF240, Large-area formwork Top 50

Basoli, situated on the right bank of River Ravi at an altitude of 571,8 m is in the northern most state of Jammu-Kashmir, India. The connectivity options available from Punjab and Basoli were mainly road via Basoli – Lakhanpur – Kathua through which River Ravi passes and a manual ropeway near Basoli. But with the commissioning of Ranjeet Sagar Dam which is located about 14 km downstream of Basoli, both the road link from Basoli to Kathua and the ropeway link to Punjab got submerged. The alternative alignment from Basoli to Mahanpur having a length of 32 km has been constructed, but this has resulted in increasing the distance from Basoli to Lakhanpur from 47 km to 82 km and Pathankot from 46 km to 88 km.

The upcoming bridge will shorten this distance and will have a main span of 350 m, side span of 121 m, and a total length of 592 m. It overlooks a deep valley with a channel width of 250 m, which at high flow further widens to nearly 300 m.

Faster construction cycle

The site plan also includes constructing a 106 m high pylon. The span layout is symmetric (121-350-121 m), with pylons positioned at the top of the river banks, out of each from the water below. In order to keep the pylons fairly lightweight and also to accommodate any special detailing requirements, the section is a hollow box shape above deck level with a wall thickness of 0.5 m, and below deck the legs are solid.

Pylon has a modified diamond configuration extending up to a height of 52.7 m and then a straight vertical portion of 53.3 m height making a total height of 106 m. Climbing formwork MF240 has been provided for each leg of the lower diamond

▲ Novel stability, in effect – Doka's solutions are not only designed from the operational point of view, it also ensures the safety of the site crew in face of erratic weather conditions.

shape base of the pylon, which will move on to the second pylon once the first pylon is cast up to the cross beam bottom.

Afterwards, for upper part of diamond shape of the pylon, Automatic Climbing formwork Xclimb 60 has been provided for each leg of the pylon and the same set will move on to the second pylon, once the first pylon is cast up to the transition area. For the straight portion, same set of Xclimb 60 with necessary modification will be used to cast the 53.3 m long vertical portion. This has ensured safety of the site crew, smooth and efficiency of operation at the site despite the erratic weather conditions.

Complexity, delivered through simplicity

Drawing on past experiences, Doka has supplied the Basoli project with a customised solution, certain to meet all the requirements. Identical to any project, Doka had resorted to an approach that was simple, flexible, technically sound, and viable. Both the crane-guided and the automatic climbing formworks, viz. MF240 and Xclimb 60 respectively, are driven by efficient and simpler mechanism. These systems could be fitted, modified and reset with minimal human intervention and, thus, error. //

▲ Nuances of a sturdy foundation – Doka India has supplied formwork solutions like Climbing formwork MF240 for the base of the pylon, and Automatic Climbing formwork Xclimb 60 for the upper part of the diamond shape, which will also be used for the straight part of the pylon. Both the formwork variants are adaptable to the structure lending flexibility and versatility to the entire system.

Signature Tower on its way to get a global recognition! Horizontal working platforms are a bigger support system for workers, working on sloping walls.

Signature Towers: an iconic endeavor of Doka

Tata Consultancy Services is all set to build an IT park at Siruseri, Chennai and Larsen & Toubro is constructing this iconic structure. Doka is providing a safe, fast, efficient and easy to work Automatic climbing formwork system SKE50 which not only increases the efficiency with reduced cycle time but also provides horizontal working platforms on sloping wall.

Signature Tower can be said as one of the most creative, innovative yet challenging projects. It is because it is one-of-its-kind in the entire country and the project has sloping walls which are decreasing in width with height. This commercial project is consisting of 28 stories and is 130 m tall in height. Acquiring around 28 ha of land area the Techno Park is at a mere distance of 2 km from the Indian Ocean. The park is estimated to host around 20,000 workers on an average. Standing as one of the unique project, Signature Tower is all set to redefine the stereotypic definition of the IT sector of India. Signature Tower has a creatively unique architectural concept blending both business and lifestyle statements.

Competencies of Doka

The formwork concept involved in this project was very unique and have been planned out with utmost precision. The biggest advantages in this regard were the highly experienced professionals and formwork instructors. Automatic climbing formwork SKE50 was used in the interior of the shaft (the structure resembles English alphabet "E", with one wall stacked inside the other). It was really dangerous to work on sloping walls and the horizontal working platform of Doka was too beneficial in this regard. It increased the efficiency and saved time. Due to heavy rebars, L&T was forced to introduce the SCC concrete, due to which Doka experts designed Top 50 formwork to resist the pressure of 90 kN/sq.m which helped them in not only solving the problem of concreting at heavy pressure but also provided a good finish concrete.

The project was initiated during February 2012 and is scheduled to be completed within December 2013. After completion, this would be the very unique kind of project in South India; a master plan standing upright on the Southern location of the country. //

The facts

Contractor: Larsen & Toubro, Chennai

Initiation of the project: February 2012

Due date for completion: December 2013

Height: 130 m

Architects: Carlos Ott Architects and Carlos Ponce de León Architects

Systems fielded: Automatic climbing formwork SKE50, Large-area formwork Top 50

The Challenge

To provide Automatic climbing formwork for the sloping core walls with horizontal working platform.

The solution

Automatic climbing formwork SKE50

◂ Signature Tower on its way to get a global recognition! Horizontal working platforms are a bigger support system for workers, working on sloping walls.

The facts

Contractor: Larsen & Toubro

Height: 63 storeys

Architects: Woha and Sitectonix

Systems fielded: Automatic climbing formwork SKE50, Large-area formwork Top 50

The challenge

To have the connecting beam casted in midst of the shear walls, along with simultaneous erection of shear wall to offer stability to the structure using automatic climbing formwork.

The solution

Framed formwork Frami Xlife panels were used for Beam side support and Automatic Climbing formwork SKE50/100 was provided for core walls.

Wadala Towers

The Lodha Group is envisaging the construction of "New Cuffe Parade" in Mumbai, which will fulfill the longstanding aspiration of city dwellers to experience a premium lifestyle. The hyped residential complex will feature a cluster of 63 storey residency towers scattered over a plot of 23 acres.

▲ Automatic climbing formwork SKE50/100 for working at elevated heights.

New Cuffee Parade will stand tall in all its splendour in the heart of Mumbai's latest city centre. Lodha Elsium, the 63 storied magnificent towers, draws its inspiration from the exalted construction principles of Indian architecture. The tower encircles around central atriums that resemble conventional Indian chowks. The tower frontage will be embraced by vertical foliage walls to facilitate natural cooling of the structure and augment oxygen levels.

The ground-breaking architectural concept of Woha and Sitectonix, exceptional civic infrastructure by Larsen & Toubro along with European standard amenities will veritably prove to be a haven for a luxurious living. Doka is providing a strategically efficient and crane time saving formwork system which can prove to be the ultimate technical solution to the casting of beam and shear walls together. This formwork system can save labour as 15 to 20 platforms can be raised at a time.

▲ Wadala Towers, soon to stand as a national recognition! Working platforms are one of the most important safety measures taken by Doka for those working at greater height.

Doka's architectural triumph

The most demanding part of the architectural venture was to have the connecting beam casted in midst of the shear walls, along with simultaneous erection of shear wall to offer stability to the structure. Doka's empathic engineering answer to the challenge was the Automatic climbing formwork SKE50/100.

Platform mounting on concrete walls are mounted on the concrete walls via suspension shoes, separately for each side of the formwork. This enables independent rising of Automatic climbing formwork SKE50/100 system to subsequent floor level for the interior shafts and core wall's exterior face hence facilitating advance installation of pre-fabricated rebar cages.

Doka provides comprehensive solution for core wall with the beams and core wall opening formwork. The retraction process is simplified through induction of special corner panel. For difficult wall corners, roller fitted rollback frame has been devised for hassle free stripping and formwork striking. For connecting Framed formwork Frami Xlife panels and Large-area formwork Top 50 panels' connection, special steel corners is developed. Floor to floor climbing sequence was adopted for external four shear walls that feature inside shutters of Frami panels and outside shutter of Top 50. This will be conducive for easy disassembly; Frami panels can be removed and kept outside and then moved automatically. This will dramatically reduce labour and logistics cost. **//**

▲ Strategic construction layout of Doka in the pursuit of bringing another architectural excellence to the forefront.

Suvilas Royal Gardenia

Suvilas is spearheading the drive to offer luxurious residential apartments in India, which thoroughly embrace the European construction standards to the core. In this endeavor Doka is adding to this strategic construction plan by providing Dokaflex 1-2-4 system with beam side support and Frami Xlife system.

The professional

"We started using Doka formwork and the result was amazing. The time taken for erection, the amount of workforce used and the minimum set of formwork materials consumed, finishes and de-shuttering procedure, made us confident about the total use of Doka. Easy maintenance, adaptability and stacking is another plus point of using this."

Shivakumar K.R,
General Manager – Projects

Standing by its commitment to serve and cater to the needs of suave people looking to add an edge to their lifestyle, the homes will be handed over within 20 months from launch date, i.e. mid 2013. The mammoth project of 127 Crores will sprawl across 2 acres 5 guntas of company owned land. The project comprises of two blocks, each accommodating 36 residential units arranged in 9 floors. The apartments have floor area in the range of 2,600-4,000 sq. ft, and have 3 to 4 bedrooms. The burgeoning residential area of Jalahaali, Bangalore stands witness to the revolutionary leap in quality living and takes pride to host Suvilas's signature project "Suvilas Royal Gardenia".

Integrating Doka's strength for expeditious construction

Doka's proven track record of successfully delivering on critical construction projects has been capitalized for Suvilas's ambitious plan. For Slab, Doka has provided its Dokaflex 1-2-4 system with beam side support. Dokaflex 1-2-4 comes with the pre-defined '1-2-4' system-grid. This grid

▲ Construction workers feel at ease to work with innovative, scientifically designed Doka construction methods. Enhanced productivity and work efficiency ensure safe and timely completion of projects.

◂ Doka is facilitating Suvilas' ambitious residential project to take off the ground in full-fledged manner. The project is tentatively poised to be handed over to homeowners by the start of 2015. Doka has implemented lightweight method to erect sturdy, fine-tuned structures in line with European construction standards.

The facts

Contractor: Suvilas Properties & Constructions Pvt Ltd

Project Initiation tentative Date: June, 2013

Due date of completion: February 2015

Height: ground and nine levels

Systems fielded: Dokaflex 1-2-4 system, Framed formwork Frami Xlife

uses marks on the beams to show the maximum spacing between the props and beams, permitting 'no-worry' pouring of slabs up to a maximum thickness of 20 cm. The system makes forming-up a lot faster by cutting the time needed for measuring-up, and also a lot safer. Once the floor-slab formwork has been set up, the foreman can check it quickly and easily.

For foundations, columns and walls, Doka has provided Framed formwork Frami Xlife, which is easy to manhandle, yet sturdy enough for large-area forming, also with a low-load crane its wide range of different tying options shortens forming times. The need for any extra stiffening reinforcements is done away with through use of self-aligning panel connectors. These robust construction technologies are being used for first time on Indian soil. //

▲ Doka formwork set in place to strategically optimize load to spacing ratio. Self-aligning panel connectors eliminate the need of extra stiffening reinforcements.

Cooling tower formwork SK175

The facts

Project: Cooling tower

Contractor: Tata Project limited

Height: 172.5 m

Maximum Diameter: 132.1 m

System fielded: Cooling-tower formwork SK175

Andhra Pradesh Power Development Company Limited (APPDCL) is implementing 2 x 800 MW Super Critical Thermal Power Station near Krishnapatnam. Construction of cooling tower for the project is being handled by Tata Projects Limited, who in turn is relying on the high-performance Doka SK175 cooling tower formwork for construction of the 172.5 m high cooling tower.

The geometry of the cooling tower, which will stand 172.5 metres high when finished, is characterised by a maximum diameter of 132.10 metres in the first ring, tapering to to 76.403 metres at the waist and fluting out to 77.42 metres for the diameter of the topmost ring. The cooling tower is being built to the strict specifications of the "Structural design of cooling towers" guideline issued by the FICHTNER Consulting Engineers (India) Private Limited. The tolerances set out in this guideline place ultra-high requirements on precision in cast-in-place concreting and therefore on the dimensional accuracy of the cooling-tower formwork. The variation in wall thickness, for example, is tolerance at a mere 0 to 20 mm. Geometric deviation is permissible only within the range plus/minus 50 mm. The horizontal joins in the concrete, moreover, can project no more than 5 mm. Doka SK175 cooling-tower formwork is designed for precision adjustment, so these tight tolerances are easily met in each and every one of the concreting sections, totalling 113 in all.

Straightforward adjustment for precision forming

The formwork panels precision-adjust to the changing circumference longitudinally by means of two joining plates, one at each butt face. After

▲ The cooling-tower formwork adapts easily and quickly to the tower's changing cross-section, and the adjustments are carried out from the platforms.

every six to eight steps up, a compensating element is simply removed and the telescopic waling shortened accordingly. The robust steel formwork incorporates an ample number of joining plates to make extending the panels for the widening of the tower above the tapered waist an easy matter. This flexible longitudinal adjustment means that all 128 climbers stay on the tower from the first concreting section right through to the 113th. So there is no need whatsoever to break the workflow for time-consuming adaptations such as removing or adding climbers in the course of the build.

The new cooling tower for 2 x 800 MW Super Critical Thermal Power Station will be 172.5 metres high and is being built with the fully mechanised Doka SK175 cooling-tower formwork.

The cooling-tower formwork adjusts easily to the variation in slope with easy-to-use adjusting spindles. The maximum angle of inclination achievable in this way is an impressive 22 degrees off the vertical. "So the formwork tracks easily through curves radiused down to a mere 70 metres, and that covers all the geometries normally encountered in the field of cooling-tower construction", explains Andreas Guttenbrunner, specialist for automatic climbing formwork at Doka. The working platforms adjust quickly and easily to the angle of the structure with one central spindle for all platform levels at the same time.

In all, there are 128 units of the Doka cooling-tower formwork deployed on this build. The climbers carry robust steel formwork and are climbed from section to section by 14 powerful electromechanically actuated lifter systems. The lifter mechanism is designed for easy manual handling and that too makes for efficiency even when the formwork assemblies in question are large. The climbers and the formwork are securely guided along the structure throughout the entire climbing process. Consequently, the cooling-tower formwork can climb safely even at high wind velocities. //

▲ The rectangular format of the Dokadek 30 panels also makes it easy to form higher rooms from the safety of floor-level work.

Floor-slab formwork at its most evolved

Doka has long offered an extensive line of slab formwork systems for every field of use. The Formwork Experts' new Panel floor formwork Dokadek 30 marks a significant advance on various aspects of the systems hitherto available on the market. This evolutionary development now makes it possible to form both the typical and infill zones simply, quickly and in great safety. To enable early striking of the panels, Dokadek 30 is also available with drop-heads. By accurately monitoring the strength development of the concrete, Concremote also allows Dokadek 30 to be used for early striking without drop-heads.

▼ Because Dokadek 30 has so few separate parts, and such a straightforward erection sequence, even semi-skilled labourers can soon use it correctly.

Dokadek 30 is a beamless hand-set formwork system, designed as a lightweight steel construction with powder-coated frames and rugged Xlife sheets. This panel floor formwork system stands out for safety, ease of handling and high speed, not only during set-up but also during dismantling. "Think about how you're going to take it down even while you're still putting it up" is an old maxim of experienced formwork foremen that Dokadek 30 very much takes to heart.

At a spacious 3 m^2, the panels are ideally sized for forming large areas, fast. Dokadek 30 has only a small number of separate parts needing shifting. This speeds up the whole forming-operation. The construction workflow is also much faster, as no crane is needed during formwork set-up and removal. With the suspension clamp, even infill zones can be formed quickly and easily, as the new system transitions seamlessly to the Dokaflex floor-slab system.

In fact, Dokadek 30 can be seamlessly combined with all Doka's flex and table systems – for getting the optimum match between equipment and task. The stripping-down operation is ergonomically comfortable, with no time-consuming overhead work. For the ultimate in workplace ergonomics, up to four Dokadek 30 panels can be placed on the DekDrive and wheeled to the next casting section.

Productivity on safe ground

Dokadek 30 panels are erected working from the safety of floor level, with no need to walk on the formwork. The panels' rectangular shape means that it takes users much less effort to engage them in the prop heads and then to tilt them up safely from below, even when forming higher rooms. When the panels are being engaged, the Dokadek heads hold them and fix them safely. At the usual heights,

▲ The big, 3 m² Dokadek 30 panels make for high-speed forming of large areas, as there are far fewer parts to be shifted.

the free ends of the panels are raised with the Dokadek assembling tool, while at greater heights the DekLift P 4.50m is used. This new development is a manually operated device for forming up and stripping out Dokadek 30. The anti-liftout guard integrated in the Dokadek 30 heads reliably prevents panels accidentally falling off. At the same time, the panels are also automatically secured against accidental lift-out and wind action, with no extra precautions needed. The constructional design and accessories of Dokadek 30 prevent operator error and unnecessary extra worksteps, both when it is being put up and when it is taken down. Moreover, by making it unnecessary for the crew to attempt dangerous improvisations, the clearly pre-defined erection sequence makes for a consistently high level of safety.

Easy to explain, easy to use

The beamless hand-set system Dokadek 30 is very easy to operate, with an erection and dismantling sequence that is so straightforward that even semi-skilled crew members are soon familiar with it. Only brief introductory training is needed on the site, as the system has such a small number of different components and meshes seamlessly with Dokaflex. The system manages with only two sizes of panel. This simplifies both the planning and the site logistics, and the forming crew spends much less time searching for the right item.

Free choice of working method: Dokadek 30 either without or with drop-head

Depending on the requirements, users can opt for Dokadek 30 either without or with drop-heads: simply exchanging the heads and using closure panels turns the standard system into a drop-head system. Even after very many times of use, the proven Xlife sheet from Doka delivers an immaculate concrete finish with a clean, uniform joint pattern. //

▲ With the suspension clamp, infill zones can be formed quickly and easily, as Dokadek 30 merges here seamlessly with Dokaflex.

In brief

News, dates, media, awards

Fair faced concrete with Doka

Project: Padmashree Dr. D.Y.Patil University Management School, Mumbai. **Client's requirement:** To have fair-faced concrete with defined pattern on wall, slabs and column. **Solution:** Doka provided tailor made formwork solution using Slab formwork Dokaflex 1-2-4, Load-bearing tower Staxo 40, Large-area wall formwork Top 50

Realizing the effectiveness of Frami eco

Project: PG House, Matunga (Mumbai). **Client's requirement:** To have framed formwork solution for casting of columns and shear wall. **Solution:** Framed formwork Frami eco was provided considering the columns and shear walls on the typical floor. On recommendation of Doka, the same panels were used to cast the retaining wall, which not only helped the contractor to save the cost but also retaining walls were casted in a short span of time.

Flexible and cost-efficient solution for residential building

Project: Ace City, Greater Noida. **Clients requirement:** Fast and efficient formwork system for residential building. **Solution:** For slab, Dokaflex 15 was used, which reduced the forming-time and labor due to the optimized weight and load capacity of its system components, which makes it lighter than conventional formwork systems. Moreover, for Core walls, columns, foundation & retaining wall framed formwork Frami eco is being used. Frami eco scored for its simple system-grid and low form-tie ratio. This provides flexibility on the site, reduces the commissioning quantities and minimises infill zones. Above all, though, the system shortens the forming-times, ensuring fast workflows: a hammer is the only tool needed.

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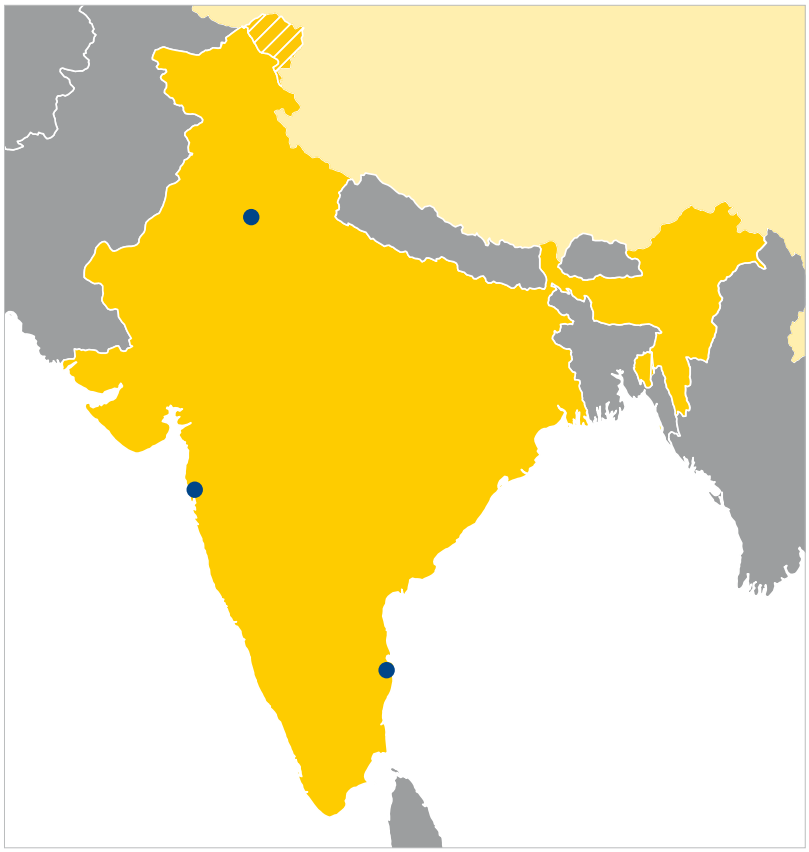

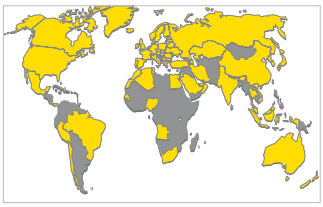

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In some cases the site photos show the situation during formwork assembly and are therefore not always complete from the point of view of safety.