

Reliable. High-performing. Inspiring.

Formwork-technology pathbreakers Doka's innovationsPage 4

Speedy slab-forming operations Lot 171, Singapur ... Page 8 Perfect formwork for mass concrete LNG tanks, Taiwan ... Page 10

Efficient engineering Metropolian Rapid-Transit System, Taiwan ... Page 11



Editorial



Dear readers;

The demands being made on the market and at construction sites are changing. Among other things, it is becoming ever more important for project owners to comply with the statutory safety regulations! Hardly surprising, when you consider just how much a client's image, costs and deadlinekeeping depend upon work progressing safely and quickly. Nowadays, the construction work itself is in any case expected to be executed in perfect quality.

For any supplier aiming to help construction firms meet the ever-tougher demands being made of them, dependable long-term partnerships are thus crucial. All construction-sector suppliers are now coming under intense scrutiny. In times like these, the only firms that "make the grade" as real corporate partners are the ones that have a highly efficient organisation and bags of staying-power, that can take on challenges, and that are underpinned by rock-solid balance sheets.

The Doka Group is one such firm. It gives its clients highly professional support in every phase of the construction sequence with reliable, high performing formwork solutions and services.

Yours. Josef Kurzmann Executive Director, Doka Group

Doka News

Single-source complete solution for speed on site

Gran Canaria. Viaducto 5 is currently the single biggest ongoing infrastructure project on the island. Doka España planned and supplied two pairs of Doka cantilever forming travellers, one set of bridge hammerhead formwork, and SKE50 automatic climbers.



▲ Landmark infrastructure with Doka

Algeria's East-West Highway development is the world's largest current highway construction project. It will extend 1216 km, linking Algeria to Tunisia and Morocco. To form 18 viaduct piers, Doka has supplied its crane-lifted Climbing system 150 F to this project.





Moving together without touching

Envisaged as a pair of dancers moving together without touching, the Shining Towers are rising with Doka formwork solutions in Abu Dhabi. These 42 and 33-storey towers appear to lean in two directions. Doka supplied 98 automatic climbers SKE 50.

Page

Index

		0
	Extremely high concreting sections Sanagawa Bridge, Japan	. 3
Doka's innovations	Formwork-technology pathbreakers, Doka at bauma 2010	. 4
	Slab forming without the crane, Lot 171 and Glomac Tower, Singapore	. 8
Lot 171, Singapore	Formwork and rebar platform in one lift, Taichung Harbour LNG Tanks, Taiwan	10
	Fast and efficient structural engineering, Taoyuan Airport Access, Taiwan	11
Taoyuan Airport, Taiwan	In Brief	12

2



Extremely high concreting sections

On Japan's main island of Honshu, the motorway between Tokyo and Nagoya is being upgraded.

Japanese construction company Kajima is responsible for the project lot in the Aichi prefecture and has commissioned Doka Japan to supply a formwork solution for six bridge pylons. The requirements for the quality of the finished concrete are ultra-high: the pylons will be up to 89 metres in height and have to be cast in flawless fair-faced concrete quality in sections 5.5 metres high. Crane capacity has to be freed up for other tasks, so the customer wants automatic climbing formwork and a solution that will work out to be as costeffective as possible. The Expertise Center for Automatic Climbing Formwork opted for Xclimb 60 in combination with Top 50 beam formwork.

The concreting sections are 5.50 metres high, but by using an intermediate platform and an intermediate shoe they can be climbed with standard components and the hydraulic cylinders do not have to be changed. Another challenge was

that the customer wanted reinforcing work to lead by two concreting sections so that progress on the build would be as rapid as possible. Doka met this particular challenge by making the concreting platforms extra-wide and adding more supports; now the platforms can carry mobile scaffolding that the rebar crews work off. Meeting the rigorous quality requirements unfailingly over all the concreting sections was of crucial importance, so the Doka formwork engineers opted to bond nonrusting steel sheet 1 mm thick to the face of the Dokaplex sheeting for the outside of the pylons. Each of these formwork panels measures 3 x 6 metres and they were all assembled directly on site. The first few pours sufficed to show that the finished concrete is of outstanding quality. The concrete is as smooth as glass and completely free of nail-head indentations, and now work is progressing steadily with the pylons being climbed in a seven-day cycle. 🗖

The panels were faced with sheet metal for ultra-smooth fair-faced concrete.

The facts

JOBSITE Nakanihonkousoku Sanagawa Bridge

LOCATION Honshu, Japan

CUSTOMERS Kajima Corporation

PRODUCTS IN USE Automatic climbing formwork Xclimb 60 REQUIREMENTS Flawless fair-faced concrete surfaces for six bridge pylons.

The solution

Automatic climbing formwork Xclimb 60 in combination with large area formwork Top 50 and bonded stainless steel panels.



▲ The concreting sections were higher than usual and as well as that the concreting platforms had to be big enough and strong enough to enable the rebar crew to work two levels in advance.



▲ The unique H-shaped frame geometry of the Doka load-bearing tower Staxo 40 permits barrier-free workplace access routes.

Formwork-technology pathbreakers

At bauma 2010, Doka presented solutions for the challenges of the future: groundbreaking innovations that lay down a wholly new standard for ergonomic design and safety.

Load-bearing tower Staxo 40

Revolutionary load-bearing tower for the building construction segment

With **Staxo 40**, Doka unveiled a lightweight framework scaffolding for the building construction segment that sets a new benchmark for workplace ergonomics and speed. It has 50 % fewer separate components and comes with optimised lightweight H-frames, so it can be erected in half the time that a single-leg system would take. Its unique frame geometry permits barrier-free working beneath the towerframe superstructure. Even for great shoring heights, the system is quick and safe to erect and dismantle, as it comes with extensive safety accessories.

Monotec tying system

The fastest wall-tying system in the business

The Monotec single-side tie shortens the form-tying operations by 25 %. A combination nut holds the tie-rod and substitutes for the Quick-acting clamp RU, saving 40 % of the connectors.

▼ The new Formwork beam I tec 20 has 80 % higher load capacity and optimises the materials usage of formwork systems.



The single-sided Monotec tying system for Framax framed formwork and all Doka timber-beam formwork can even be retrofitted right at the site, and lets users make big savings on the time and equipment needed for tying – but without investing in a new formwork system. With this simple upgrade, timeconsuming form-tying operations can be shortened by 25 %.

Formwork beam I tec 20 Twice the load capacity, same weight

The new **Formwork beam I tec 20** now offers yet another technological leap forward. Compared to conventional 20 cm high timber formwork beams, it has roughly the same weight but an over 80 % higher load capacity! This opens up radically new scope for optimising the materials usage of formwork systems.

As well as with the proven end-reinforcement from the "Top" beams, the I tec 20 is also reinforced with plastic along its flange, which makes it less prone to splintering when nailed. The I tec 20 has the same dimensions as the H20 top, so it is fully compatible with all Doka systems.

. . doka i



Large-area formwork Top 100 tec Super-fast forming times for walls

Whenever walls need to be poured particularly fast and in superlative quality, Large-area formwork Top 100 tec is now the very first choice. The high-load I tec 20 beam makes it possible to dispense with entire waling levels and still benefit from fast pours. This reduces the number of wall-ties – and the labour costs – by 1/3. Tailor-made for every project, the shape, size, tie-hole pattern and form facing (screwed-on from the rear so as to leave no screw-head imprints) can be adapted to all possible requirements.

Dokaflex 30 tec Less equipment – more performance!

With **Dokaflex 30 tec**, Doka offers a flexible hand-set formwork system for floor-slabs that scores for extremely low costs-per-use. The high-load I tec 20 formwork beam is used here for the primary beams, allowing the props to be spaced much further apart. This saves around 1/3 of the floor props that would be needed by flex systems using H20s as their primary beams. As less equipment is used for the same area of formwork, the system takes 15 % less time to set up, and the equipment and logistics costs are also lower.



▲ The new Large-area formwork Top 100 tec does without an entire waling level. This reduces the number of wall-ties – and the labour costs – by 1/3.

✓ Wall formwork FF100 tec delivers high-specification concrete finishes, with no limits on the pouring rate up to a height of 3.60 m.

▼ On the Dokaflex 30 tech system, the I tec 20 formwork beam allows wider spans, saving 1/3 of the floor props.



clerk en tive 20 clerk en tive 20

Wall formwork FF100 tec

Unbeatably fast formwork for fair-faced concrete

The high-load **Wall formwork FF100 tec** is based on the Formwork beam I tec 20 and delivers high-specification concrete finishes. Its high-load-capacity components save 1/3 of the form-ties, with equipment and labour-cost savings to match. Walls up to 3.60 m high can be filled in a single pour, with no need to worry about the pouring rate.

With its symmetrical form-tie pattern located well inside the element, and its form-facing screwed on from the rear, FF100 tec produces aesthetically appealing and top-quality fair-faced concrete surfaces. The self-climbing TLS makes it possible to form floor-slabs 100 % cranelessly, while enhancing safety in the lifting operation.

▼ The revolutionary DoKart shifting appliance is extremely manoeuvrable and stands out for its rugged design and very high lifting speed.



DoKart and Table Lifting System TLS Even more mobility and flexibility when forming floor-slabs

Doka has brought out two innovations that speed up the repositioning of tableforms yet again, in even greater safety and wholly independently of the site crane. For repositioning tableforms on the same level, Doka now offers its new **DoKart**. This compact unit is extremely nimble, can travel sideways and even turn on its own axis. The DoKart is robustly built for long life and high reliability, with large wheels that give it generous ground clearance. Its high lifting speed is equally revolutionary.

Now a self-climbing version of the **Table Lifting System TLS** makes it possible to form floor-slabs 100 % cranelessly, at the same time as enhancing safety during the lifting operation. This makes the self-climbing TLS particularly suitable for use on tall buildings. As it is structure-guided at all times, it can be safely raised even in poor weather conditions, either hydraulically or by crane.





▲ The advantages of the Xlife sheet are now also available in Framed formwork Frami Xlife and Column formwork KS Xlife.

The Xsafe plus platform system enhances workplace safety on all Doka wall formwork systems. It comes completely pre-assembled ready for immediate use.

Platform system Xsafe plus and Sideguard system XP Workplace safety boosts productivity



Doka has extended its broad range of safety accessories again, this time with the **Platform system Xsafe plus**, which fits on all Doka wall formwork systems. It is pre-assembled, saving 30 % of the manhours needed by conventional platform systems. The Xsafe plus and the formwork can always be repositioned as a unit in a single crane cycle – meaning that Xsafe plus is back in action 40 % sooner.

Another innovation that scores not only for enhanced on-site safety, but also for being particularly quick and easy to assemble, is the **Sideguard system XP**. This universal safety solution for all edge-protection needs fits in ideally with the Doka systems, and safeguards all drop-off edges.

Doka cantilever forming traveller (CFT) and Forming wagon TU

Strong in infrastructure construction



Doka is underlining its decades of expertise in the civil engineering field with pathbreaking innovations such as the **Doka** cantilever forming traveller (CFT), with integrated formwork. With the CFT, clients now only have one partner to deal with for both the formwork and the shoring. By optimising the interfaces in this way, Doka helps work to move ahead smoothly. The new Forming wagon TU makes it possible to cast cantilevered parapets without taking up any workspace on the bridge. It runs in a rollertrack fixed to the underside of the bridge superstructure. The CFT and the Forming wagon TU are fully rentable and can easily be adapted to widely differing cross-sections. 🗖

The Forming wagon TU runs on the underside of the bridge and allows cantilevered parapets to be poured with zero disruption to traffic.

Dokadek 30 Pathbreaking innovation in the slab-forming field

Dokadek 30 is the first panel floor formwork that forms both the typical and the infill zones in record time. While its large 3 m² panels get work up to top speed in the typical zone, rapid forming of infill zones is taken care of by a systemcompatible connection interface with Dokaflex. This unique combination within a single system shortens forming-times by 20 %, which in turn cuts the labour costs. Dokadek 30's ability to be set up safely from below, its integrated wind bracing and its early-stripping function make it the safest and most cost-efficient panel floor formwork on the market.





Doka service The very best support in every phase of construction

Every construction project is unique. Nevertheless, all projects undergo the same five phases, from development all the way through to completion of the shell. To fulfil the varying requirements made in each phase and give clients effective assistance to help them succeed onsite, Doka has put together a tailor-made package of efficient services for each of these phases. The exact scope of the **Doka service** is defined here by a detailed performance specification, creating clarity right from the outset about the benefits that can be achieved. ▲ Doka has put together a tailor-made package of services for every phase of construction work. These give clients the ideal help to make a success of every single phase of their project.

◄ With its integrated interface to the versatile hand-set system Dokaflex, the Dokadek 30 panel floor formwork puts a halt to time losses in the infill zone. ► On Lot 171, 5000 m² of Dokamatic tables, two Table Lifting Systems TLS and the Protection screen Xclimb 60 are making for speedy slab-forming operations.

The facts

JOBSITE Lot 171 and Glomac Tower LOCATION Kuala Lumpur CUSTOMERS Daewoo and Haw Ah Bee Construction PRODUCTS IN USE Dokamatic tables, Table Lifting System TLS, Protection screen Xclimb 60 REQUIREMENTS Fast and safe slab-forming operations on both towers



The solution

Daewoo decided to use the unbeatably fast combination of 5000 m² of Dokamatic tables and two Table Lifting Systems TLS. To safeguard the slab-forming operations, 30 units of the Doka protection screen Xclimb 60 have been installed. Haw Ah Bee is also benefiting from the easyto-install beam formwork of the Dokamatic-tables.

Slab-forming without the crane

The young City of Kuala Lumpur is home to the tallest twin buildings in the world, the Petronas Towers. Two major projects going up directly opposite these mega-towers are Lot 171 and the Glomac Tower. For both developments, Doka Singapore has supplied safe, fast and efficient formwork systems. With a structure height of 267 m, Lot 171 will be another landmark in the business district of Kuala Lumpur. Contractor Daewoo Engineering & Co Ltd. started construction in October of 2009. To cast the slabs of this 65-storey building in the most economical way, Daewoo decided to use the unbeatably fast combination of 5000 m² of Dokamatic tables and two Table Lifting Systems TLS.

The site crew became really enthusiastic when it experienced how fast and easy the handling of the large tableforms was. With their sturdy steel walings, the Dokamatic tables support high fresh concrete loads without any bending. And the Dokamatic swivel-head makes it possible to fold and lock the floor props at angles of 75 and 90 degrees – for easy manoeuvering over parapets without removing the props. Only one man is needed to reposition the table effortlessly, with the electro-hydraulic shifting trolley plus attachable driving unit.

Even when it comes to vertical lifting up into the next floor, no crane is needed. Two Table Lifting Systems TLS – hoistplatforms suspended from the slab – allow tables to be lifted in less than one

minute, at the push of a button. In order to safeguard the crew operating the Dokamatic tables, 30 units (approx. 3000 m²) of the Doka protection screen Xclimb 60 have been installed. The protection screen encloses the structure around the slab-edges in such a way that the crew can work in conditions that are just as safe as at ground level. The climbing procedure is equally fast and efficient. Mobile lightweight hydraulic cylinders push up the protection screens into the next level. In combination with the Table Lifting System TLS, Doka eliminates the crane for all slab-forming operations. This valuable crane time can be used for other works on the site, which are crucial for meeting the time schedule.

Dokamatic tables are also speeding up work on the 150 m tall Glomac Tower, where cast-in-place slabs are braced with drop beams. The site crew of contractor Haw Ah Bee Construction installs the necessary beam formwork quickly and easily by using the Dokamatic floor beam plate 60 cm. The advantage: These tables can be timesavingly repositioned together with the mounted beam formwork.



Glomac Tower -Mr. Ong Tien Ling, Executive Director

The professional

Dokamatic Tables with the automatic shifting trolley and especially the TLS is the most up-to-date formwork system I have ever used. My decision to buy it was a good one."



Lot 171 -Mr. Song Ho Joon, Construction Manager

The professional

We have definitely chosen the best system for the slabs, including the protection screen. The two TLSs will help us to speed up work, thanks to the greatly reduced crane requirements."

The Dokamatic tables are equipped with an integrated downstand-beam solution.

The facts

JOBSITE Taichung Harbour LNG Tanks, CPC Corp. LOCATION Taiwan

CUSTOMER

Obayashi – Fu Tsu JV

PRODUCTS IN USE Mass concrete dam formwork D 15

REQUIREMENTS

3 x 160,000 m³ full containment above-ground RC tanks with an inner diameter of 76m, outer diameter of 80m and a wall height of 43.6m.

The solution

Doka's formwork experts planned and delivered the mass concrete dam formwork D 15. This economical formwork system stands out for its high loadability and safety.



The professional

With the Doka formwork solution, we were able to finish the wall shell four months ahead."

Formwork and rebar platform in one lift

Three giant LNG tanks are being built in Taiwan using Doka formwork technology. The climbing formwork includes platforms for working and pouring, as well as a special upper platform for the rebar work.

In order to supply the gas needed in central and northern Taiwan, a LNG receiving terminal is being built in Taichung. This project includes three 160,000-kiloliter LNG tanks which are being constructed by Obayashi & Fu Tsu JV, using Doka formwork technology.

The tanks measure 80 metres in diameter and can each store 160,000 m³ of liquefied natural gas. The cylindrical, 43.6 m high walls of the solid CIP concrete outer shells are a special challenge, since the contractor requested an additional rebar platform on the climbing system.

Perfect formwork for mass concrete Doka's formwork experts planned and delivered the mass concrete dam formwork D 15. This economical formwork system stands out for its high loadability and safety. The Doka dam formwork D15 is designed for block heights of up to 4.10 m and tensile forces of the anchor of up to 150 kN. Its 2.40 m wide working platforms offer high safety and plenty of working space.

The figures tally at about 800 m³ of concrete per section, and formwork for 2100 m² of wall surface. Forty-eight Doka D15 climbing brackets are in use for the outside of each LNG tank, and another forty-eight Doka D 15 climbing brackets on the inside. With this formwork solution, the site crew is achieving a two-week cycle for the concreting sections, each of which is 4.1 metres in height. This ensures smooth construction progress.



Fast and efficient structural engineering

Rest of the local division of the local divi

As part of the extension of the Metropolitan Rapid-Transit System to connect Taipei City with Taoyuan County and Taoyuan International Airport, several viaducts and tunnels are being built.

The MRT line is more than 51.5 km long (38.5 km of elevated bridges and 13 km of tunnels), including 15 elevated stations and 7 underground stations, some of which are being built using Doka formwork technology.

Only one pour per wall

4 underground stations and 3 opencut tunnels are being built by contractors Continental Engineering using the cut-&-cover method. A very tight construction schedule, combined with high requirements regarding the finished concrete surface, was the challenge the contractors had to meet. Doka wall and slab formwork is in use for a 207 m long underground station and 800 m of open-cut tunnels. For the single-sided wall formwork, Doka supplied supporting construction frames together with 3600 m² of Large-area formwork Top 50. Because of the cut-&-cover method, the single-sided wall formwork had to be applied underneath already existing structures.

Bridge segments in 4-day-cycle The contracting company Pan Asia

is responsible for the construction of 9000 m of elevated bridges for the same MRT System. In addition, 95 spans of cast-in-place viaduct and 196 free cantilever segments have to be cast using Doka formwork and shoring systems. The contractor opted for a supporting scaffolding system combined with Large-area formwork Top 50 from Doka. Doka helped the contractor to modify the free cantilever method into an economical supporting cantilever solution. Top 50 timber-beam formwork is a made-to-measure modular system that perfectly fits all shapes and sizes. Only three system components combine to shape even the most unusual geometries. In combination with 12,000 m³ of rugged Load-bearing tower d2, it provides a safe and speedy solution for the CIP segments of this bridge. The site crew can achieve a 4-day-cycle for the 5 m long FCC bridge segments. And the cycle time for 30~45 m of CIP bridge viaduct has been accelerated to 15 days per span. Pan Asia was especially satisfied with the planning and the advice and consulting from the Doka Formwork Instructor. 🗢

◀ To support the superstructure, the proven Load-bearing tower d2 system was in use. It is the perfect shoring system whenever high loads have to be carried and extra stability is a major requirement.

The facts

JOBSITE Taoyuan International Airport Access

LOCATION Taiwan

CUSTOMERS Continental Eng. Corp./ Pan Asia Corp.

PRODUCTS IN USE Supporting construction frames, Largearea formwork Top 50, Loadbearing tower d2

REQUIREMENTS Construction of a 207 m long underground station and 800 m of opencut tunnels in fair-faced concrete, as well as 9,000 linear meters of elevated bridges

The solution

For the single-sided wall formwork, Doka supplied supporting construction frames together with 3600 m² of Large-area formwork Top 50. Combined with Top 50, 12,000 m³ of the rugged Load-bearing tower d2 system have permitted a 4-day-cycle for the 5 m long FCC bridge segments.

In brief

News, dates, media, awards



The new Doka formwork catalogue provides a complete overview.



Real formwork professionals offer the best consulting service.



Doka presented pathbreaking innovations at bauma 2010.

Doka GmbH

www.doka.com

www.doka.com

IT'S ALL ABOUT FORMWORK

The new Doka formwork catalogue will be issued right on time for bauma 2010. Its 516 pages provide a complete overview of the Doka formwork systems and their areas of application. Services and system components are also covered in detail as central topics. The entire catalogue is structured for clarity so that you can find exactly the information you need quickly, whenever you need it. Pick up the new Doka formwork catalogue at the bauma 2010 trade fair or ask your personal Doka advisor for a copy.

HIGH CONSULTING CAPABILITY

At Doka, everyone from senior management to field sales has to stay right up to speed on the latest developments in formwork technology. That is crucially important, because only real formwork professionals with hands-on experience can offer Doka customers the best and most cost-efficient solutions for each new construction challenge as it arises.

Recently, managers from right across Doka's Latin American organisation met up to hone their skills in the safe and efficient routines for working with highend Doka systems. And the agenda also included time for an exchange of experience on the best formwork solutions for the different construction methods favoured in the various parts of this huge region.

DOKA AT BAUMA 2010

With a pathbreaking demonstration of its capabilities at bauma 2010, Doka inspired some 100,000 customers and prospects who toured the 3000+ square metres of the Doka hall, bringing the total number of visitors very close to the 2007 record. At this year's fair the innovations were brought to the trade public in the new exhibition concept of application-oriented theme worlds. Doka succeeded once again in satisfying the high expectations, because increased efficiency and effectiveness are the groundwork for all the innovations on show.



Impressum: "Doka Xpress" is a publication of the International Doka Group. Publisher: Doka GmbH, Josef Umdasch Platz 1, A 3300 Amstetten, Austria. Editor-in-chief: H. Bachinger. Layout design: COMO GmbH, Linz, Austria. Printers: Sandler, Marbach, Austria. 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.

China

Doka Formwork (Shanghai) Co., Ltd Building 2, No.3883 Yuanjiang Road Minhang District, Shanghai 201109 Tel. +86 (0)21 6090 0899 Fax +86 (0)21 6090 1099 E-Mail: China@doka.com www.doka.cn

India Doka India Pvt. Ltd. Doka inola Pvt. Lto. Hiranandani Business Park "SENTINEL" Building, 2nd Floor, Commercial Premises No. 201&202 Powai, Mumbai - 400 076 Tel. +91 22 40 26 44 35 Fax +91 22 40 26 44 36 E-Mail: India@doka.com www.doka.com

Doka Japan K.K. Miwanoyama 744-6 Nagarevama-shi 270-0175 Chiba-ken, Jap Tel. +81 (0) 4 7178 8808 Fax +81 (0) 4 7178 8812 E-Mail: Japan@doka.con www.dokaiapan.co.ip

Korea Doka Korea Ltd. Room No. 220, Doosan Venture Digm Bldg. 126-1 Pyeongchon-Dong, Dongan-GU 431-755 Anyang City, Gyeonggi-Do Tel. +82 (31) 478 3700 +82 (31) 478 3701 Fax +82 (51) +100 E-Mail: Korea@doka.com www.doka.co.kr

Singapur, Malaysia, Indonesia Doka Formwork Pte. Ltd. 9 Gul Circle Singapore 629565 Tel. +65 6897 7737 Fax +65 6897 8606 E-Mail: Singapore@doka.com www.doka.com

Taiwan DEC Engineering Corp. 7 Fl., No.123, Sec.4 Pa-Te Rd. TAIPEI, TAIWAN R.O.C. Tel. +886 2 / 2753 42 61 Fax +886 2 / 2753 33 38 E-Mail: dokadec@ms1.hinet.net www.doka.com

Thailand

Subway Engineering & Supply Co., Ltd. 4 th floor, B.S.V. Building 487, Sri-Ayudhaya Road Rajthevi, Bangkok 10400 Tel. +66 2/247 3910-4 Fax +66 2/247 3915 -Mail: nath@subway.loxley.co.th www.doka.com

Vietnam Specialist Construction System (HK) Ltd. Hanoi Representative Office Mr. Siah Chee Seng No. 57, Ngo 5, Lang Ha St., Ba Dinh Dist. Hanoi

Tel. +84 90 403 9388 ax +84 4 514 5122 E-Mail: scs.specovn@fpt.vn