ACE
Advanced Construction Engineering

FORMWORK DESIGN HOW TO BE

AGENDA

- HOUSE KEEPING
- SYSTEMS WE CAN DESIGN
- OUR FORMWORK DESIGN IN SITES
- OUR PROFESSIONAL PROGRAMS
- WHY ACE?
- OUR CONTACT

HOUSE KEEPING

ACE understands that during the construction phase, maintaining Housekeeping can be at times a challenging task when faced with project time constraints. However, we strongly believe our pre-planning of all activities big or small is key to maintaining the highest standard to delivering a project safely and on time!

Let’s take a look at some key points and activities implementing housekeeping strategies.

ACE
Advanced Construction Engineering

HOUSE KEEPING – ACE OFFICE

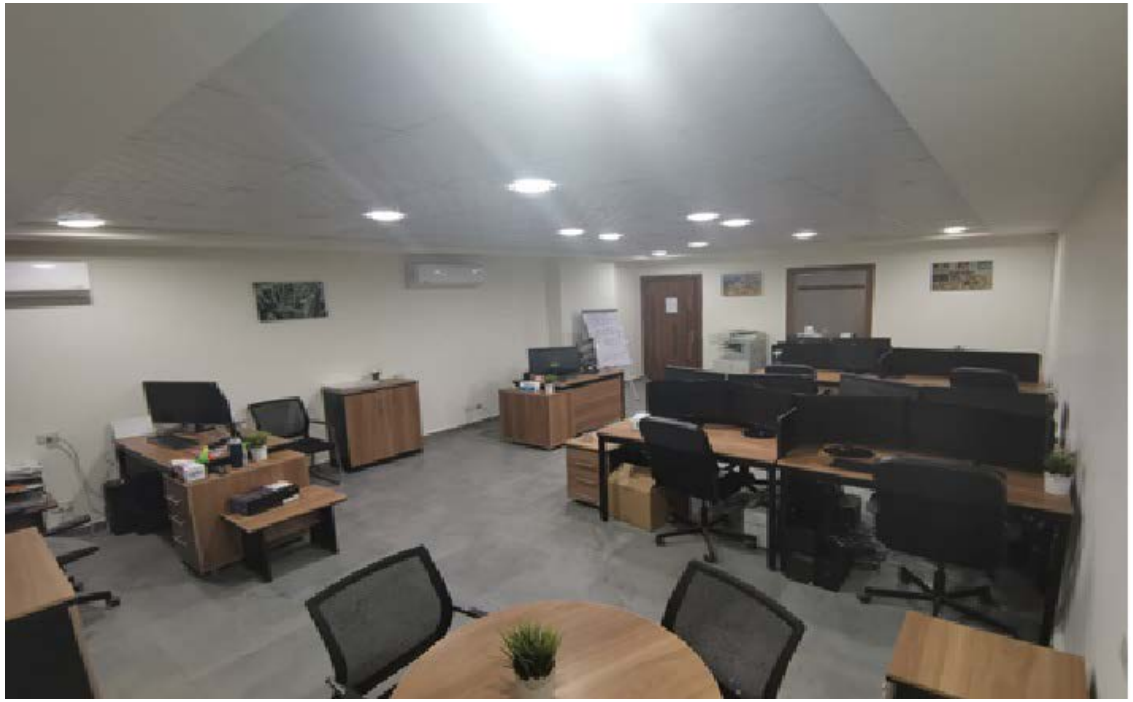
House keeping starts at the top!

It is imperative that our site team is organized with its processes, procedures and management of safety documents company policies and client policies.

All documents can be found within ACE office and is available to all workers should they request. Policies will be displayed within the office.

Managing and upkeeping of such documents and processes is reviewed monthly with a strong emphasis on improving procedures for high risk activities.

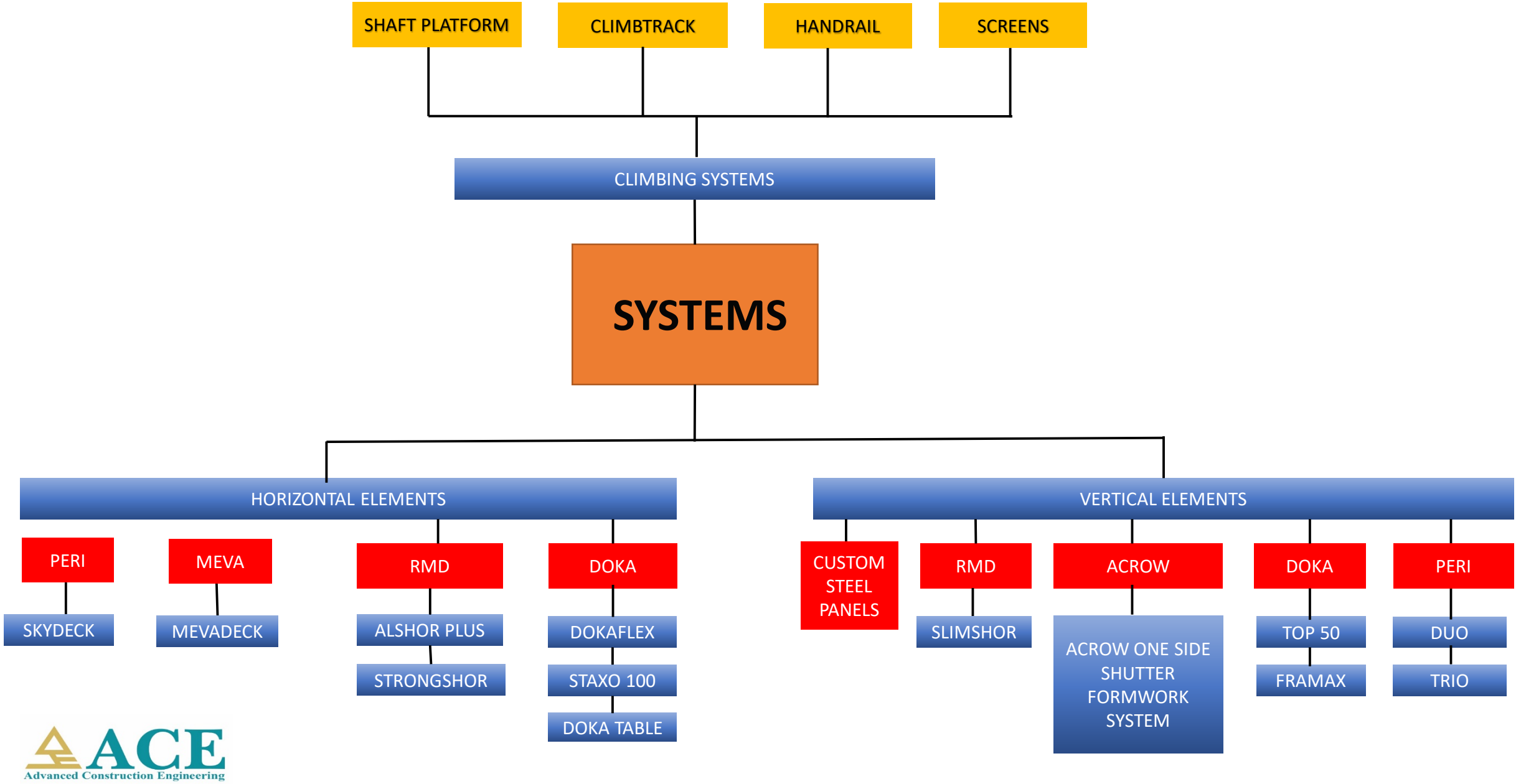
All site management are competent in delivering and advising all workers on housekeeping procedures and standards.



ACE
Advanced Construction Engineering

ACE
Advanced Construction Engineering

- SYSTEMS WE CAN DESIGN



ACE
Advanced Construction Engineering

METHODOLOGY

- **OUR FORMWORK DESIGN IN SITES**

A- DESIGN OF HORIZONTAL ELEMENTS :

A.1 FLEX SYSTEM:

System description

Dokaflex
The versatile hand-set system for floor-slabs

Dokaflex:
1 system – 2 possible ways of using it

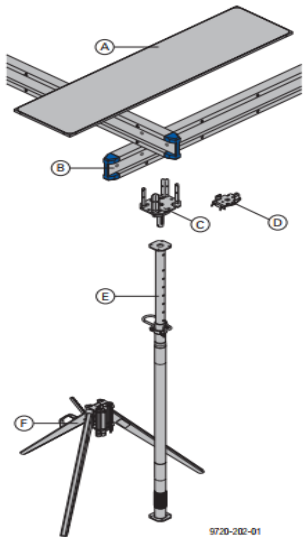
Dokaflex 1-2-4
The easy-to-use floor-slab formwork with a logical, built-in system for setting up the formwork
- marks on the beams show you the maximum spacings between secondary beams, props and primary beams, for floor-slabs up to a thickness of 30 cm
- having only 2 different lengths of beam facilitates logistics and reduces the time spent searching
- you can tell at a glance whether the formwork has been set up correctly

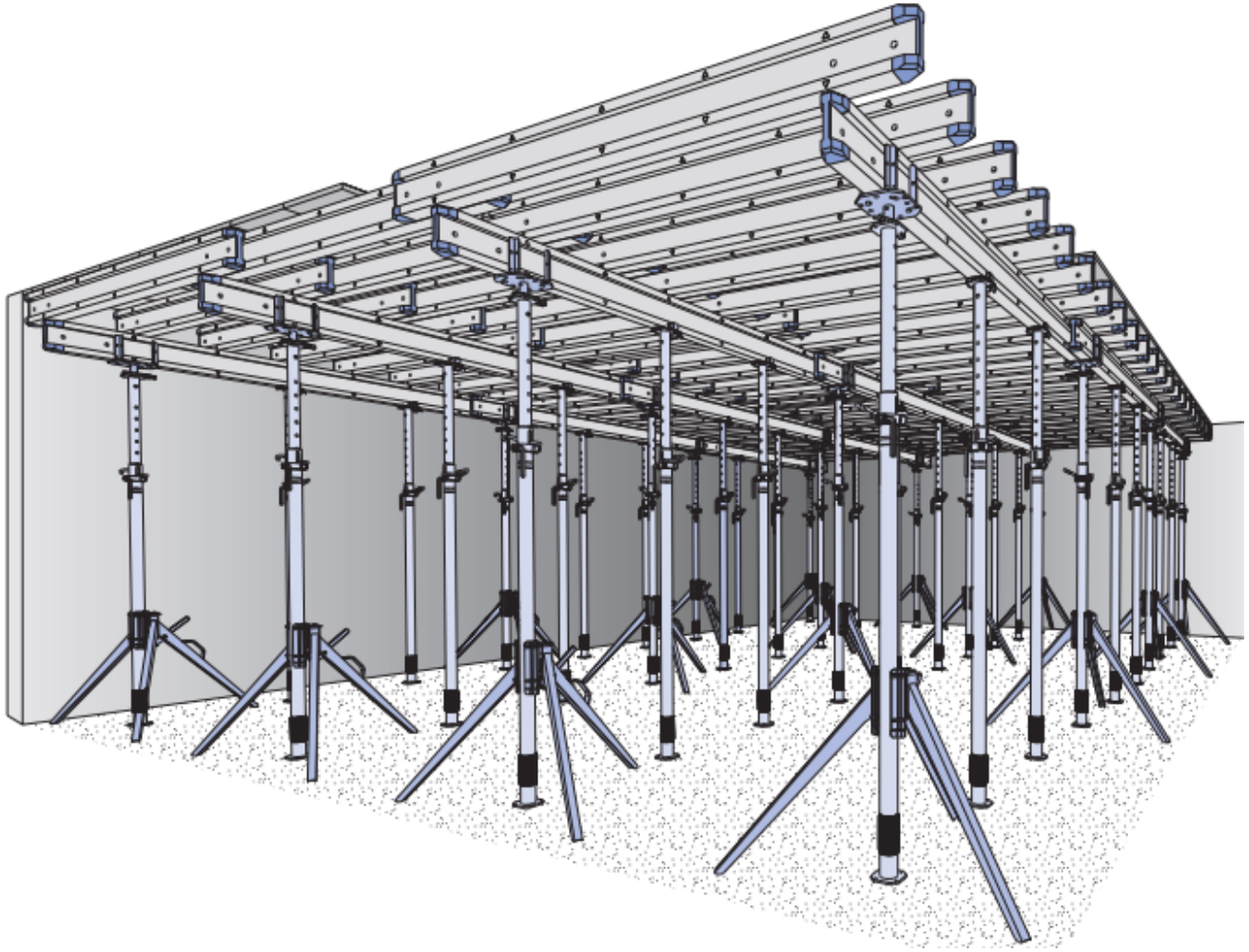
Dokaflex 20
The tailor-made solution for your specific project requirements:
- very little equipment is needed thanks to statically optimised beam and prop spacings, which are in accordance with the room geometry and the loads that occur
- drop beams and floor extensions can easily be managed 'within the system'
- significant reduction in commissioning quantities thanks to the Doka Xtra head, which allows early stripping

General features

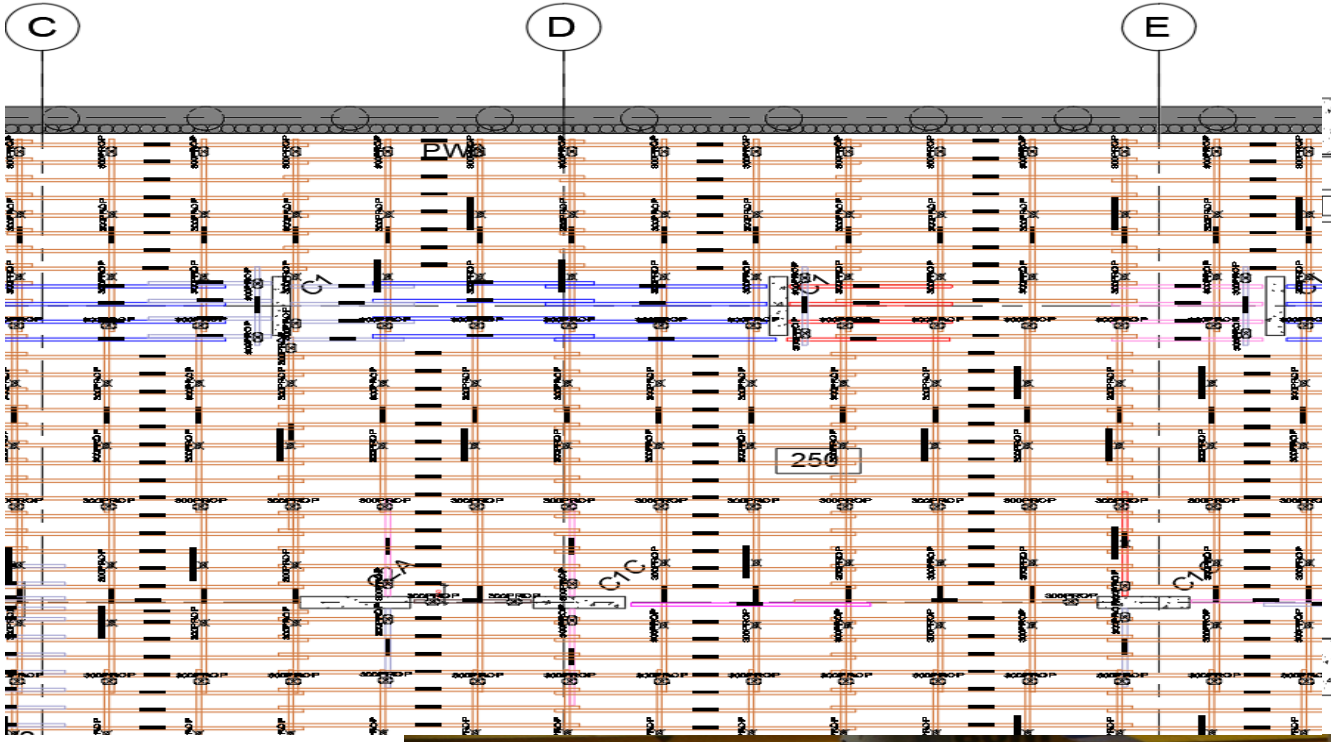
The system is ideal for enclosed spaces where the formwork superstructure can rest up against walls on all sides.
Horizontal forces at exposed slab-edges, downturned beams or steps in ceiling slabs must be restrained by bracing or tie-backs.
General advantages of Dokaflex:
- infill zones are managed within the system, making it easy to adapt to walls and columns
- for shoring heights of up to 5.50 m
- any type of form-facing can be used

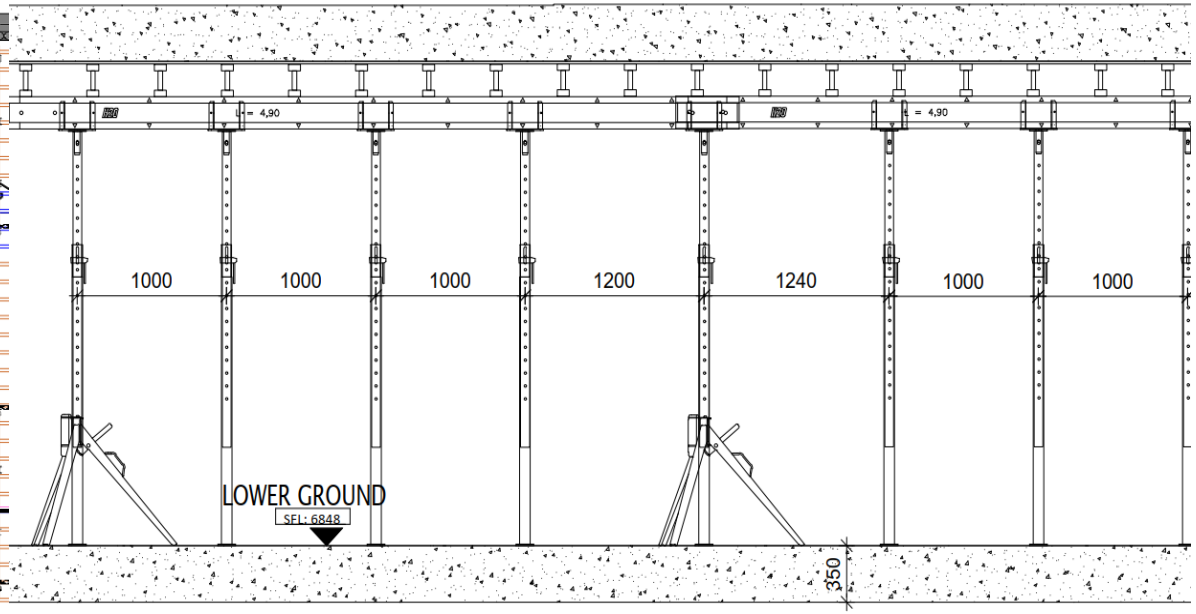
Small number of system components - all perfectly co-ordinated





ACE
Advanced Construction Engineering





ACE
Advanced Construction Engineering

A.2 STAXO 100 SYSTEM:

Load-bearing tower Staxo 100 – the extra-high-capacity, fast load-bearing tower made of steel, with integral safety features

Staxo 100 comes with all the field-proven advantages of Staxo – meaning that it is robust, fast and versatile. On top of all this, Staxo 100 has been given an extensive package of built-in safety features, and its load capacity greatly increased.

Sturdy galvanised steel frames, in three different heights, are the basis of this high-speed, high-performance load-bearing tower system.

High load-bearing capacity, quick and easy assembly using integrated connectors, and great versatility - these are the outstanding characteristics of Staxo.

Wherever high loads occur, in either the building-construction or civil-engineering fields, this load-bearing tower is the ideal solution.

The high-performance load-bearing tower

- high capacity of up to 97 kN per leg
- with lightweight components (frames up to h=1.20 m can be manhandled)
- ergonomical: easy-to-handle parts

... speeds up work

- the small number of system components makes for easier handling and means that no time is wasted searching for parts
- the connector components are captively integrated into the frames and so cannot be lost
- no tools are needed for assembling the towers

... provides optimum safety

- high stability, due to its 1.52 m wide frames
- slip-proof ladders integrated in the frames
- suspension points for chest harness

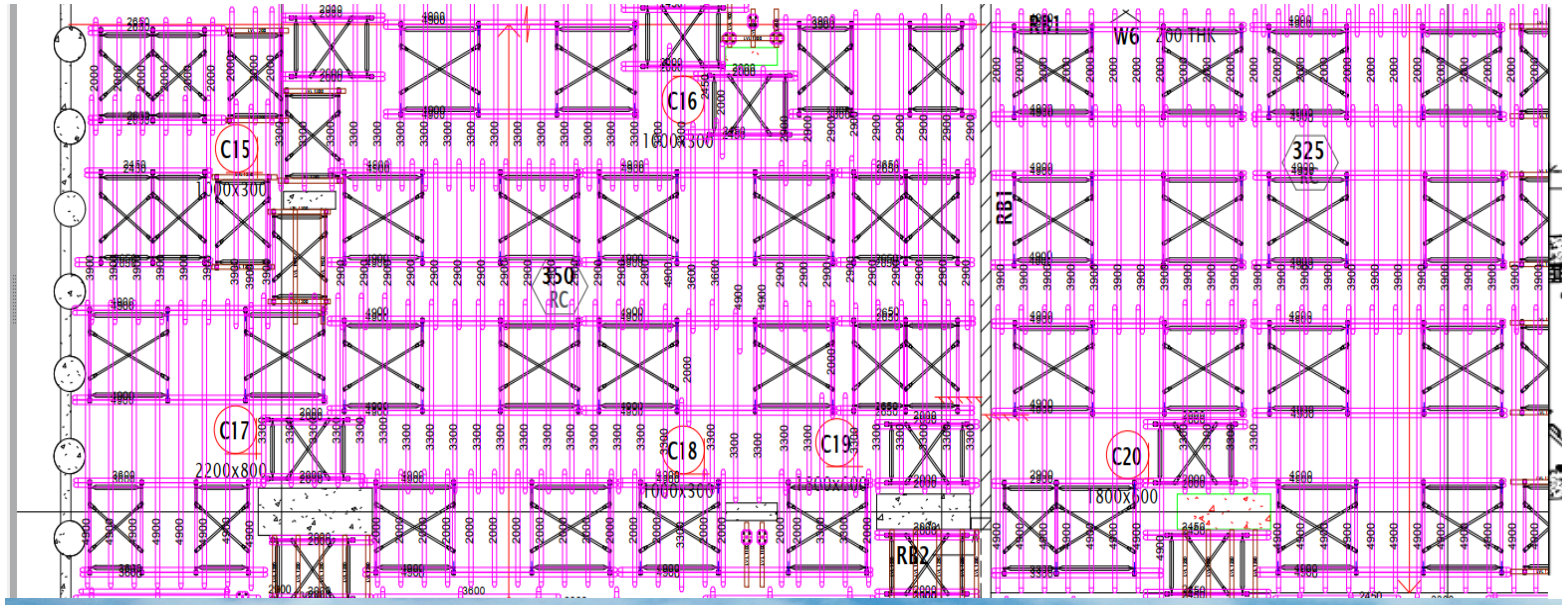
... is flexible

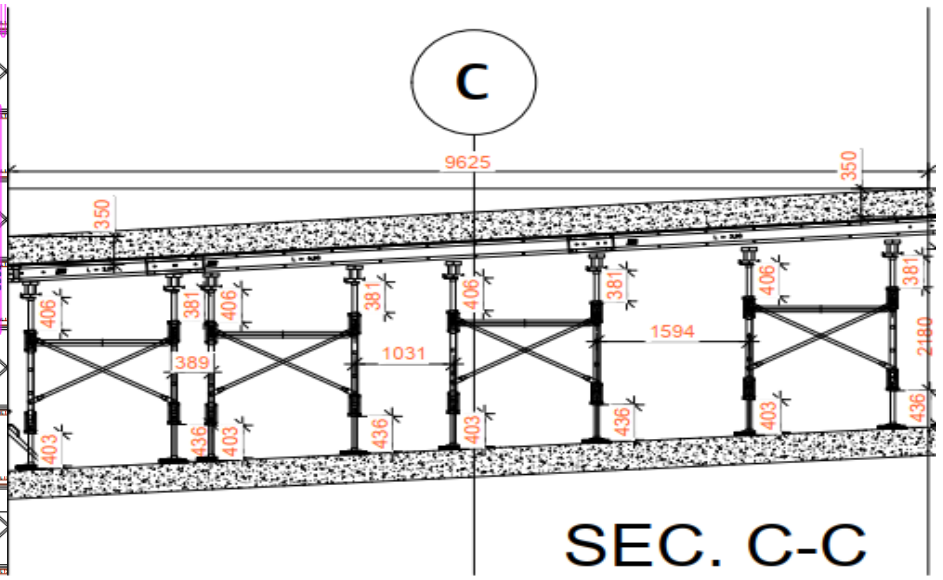
- the inter-frame spacing can be varied (from 0.60 m to 3.00 m), for optimum utilisation of the frames' load-bearing capacity. (From 1.00m, in 50 cm increments).
- different frame heights - 0.90 m, 1.20 m and 1.80 m - for rough height adjustment in 30 cm increments: 0.90, 1.20 and 1.80 m
- fine adjustment by means of screw-jack U-heads and feet
- can be used in conjunction with floor props and Dokaflex

... is economical

- The tower units are quick and easy to assemble:
  - either on their sides or in the upright
  - for tall towers, tower units can be pre-assembled on their sides, and then simply stacked by crane
  - scaffold planking units make it easy to erect and dismantle the tower and superstructure
- with special wheel units, complete tableforms can quickly be wheeled to their next location
- the Forklift shifting device TG makes the job of erecting, dismantling and transporting Doka load-bearing towers very much easier.

ACE
Advanced Construction Engineering


C15
C16
C17
C18
C19
C20
W6 200 THK
RB1
RB2
325
350
RC


C
9625
350
1594
1031
389
2180
SEC. C-C

A.3 DOKA TABLE SYSTEM:

Dokaflex tables are easy and practical to set up and can be shifted and adapted very quickly. This makes them a cost-effective and efficient way of carrying out large-area slab projects.

Dokaflex tables are fully combinable with Dokamatic tables.

- assembled from components of the Dokaflex 1-2-4 system
- 4 standard formats with an underlying “grid” logic:
  - 2.50 x 4.00 m
  - 2.50 x 5.00 m
  - 2.00 x 4.00 m
  - 2.00 x 5.00 m
- tableform faced with 3-S plus formwork sheets, 21 or 27 mm
- for slab heights up to 5.90 m
- can start to pay off after as few as 2 re-use cycles
- custom formats are also possible where needed
- site-ready, custom-format Dokaflex tables can be supplied by the Doka "Ready-to-Use" Service
- wedge-lock makes quick and easy work of attaching and detaching props
- low stacking height when transported and stored
- safe, fast shifting appliances, saving time and money
- forming can continue seamlessly into infill zones and closure gaps
- the technically perfected individual components make a big contribution to higher speeds
- commissioning quantities are easy to tailor to the construction schedule – a weekly cycle is no problem

Doka floor props Eurex top

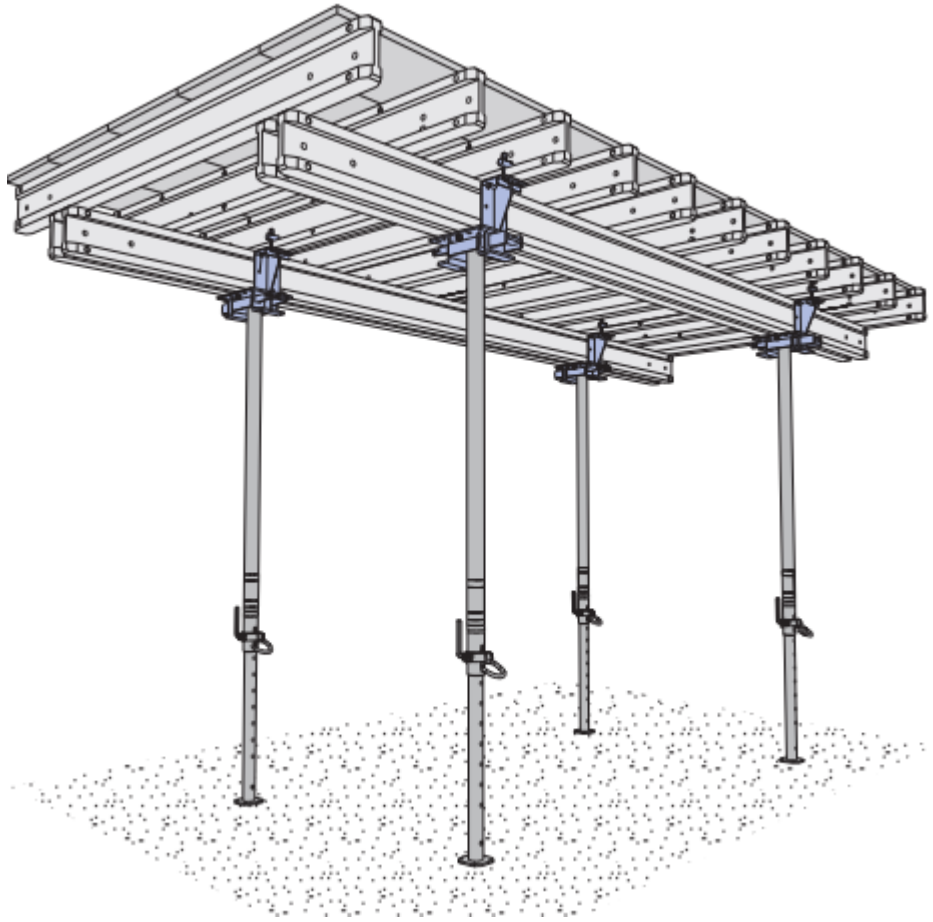
- DIB (German Institute of Construction Engineering) approval n° Z-8.311-905
- EN 1065-compliant prop

Their high load-bearing capacity is complemented by many practical details making them very easy to handle:

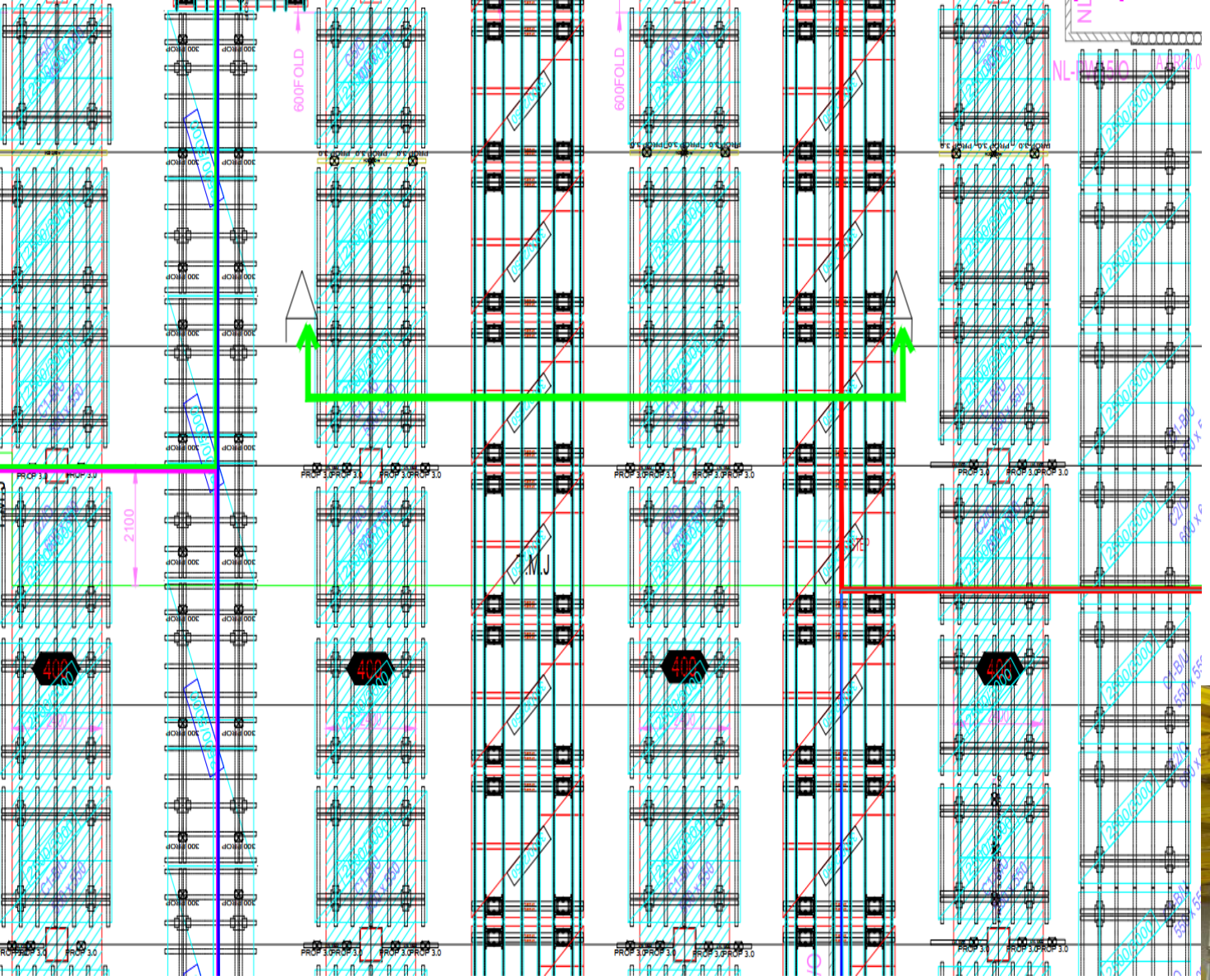
- numbered pegging holes, for easier height adjustment
- elbowed fastening clamps, reducing the risk of injury and making the props easier to operate
- special thread geometry, which makes the prop easier to release even when it is under high load

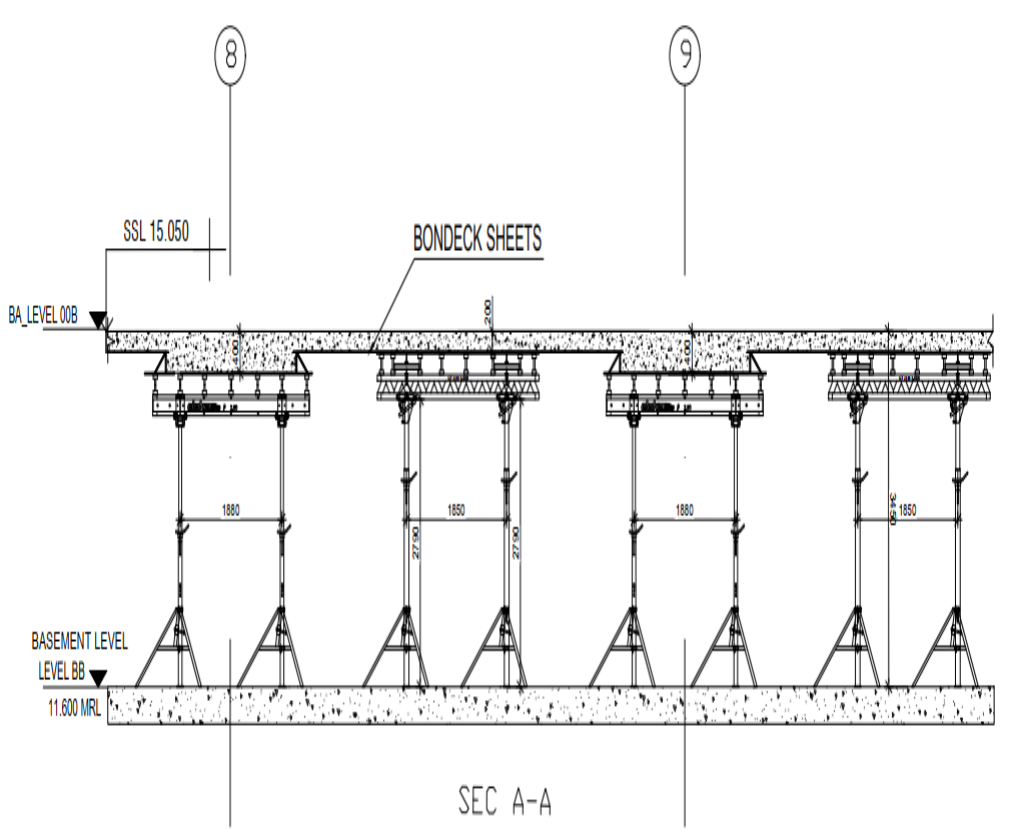
The flexurally rigid link with the tableform superstructure increases the load-bearing capacity of the floor props by 10 kN, so that:

- permitted capacity of Eurex 20 top:
  - when completely extended: 30 kN
  - when inserted by min. 30 cm: 35 kN
- permitted capacity of Eurex 30 top: 40 kN



ACE
Advanced Construction Engineering



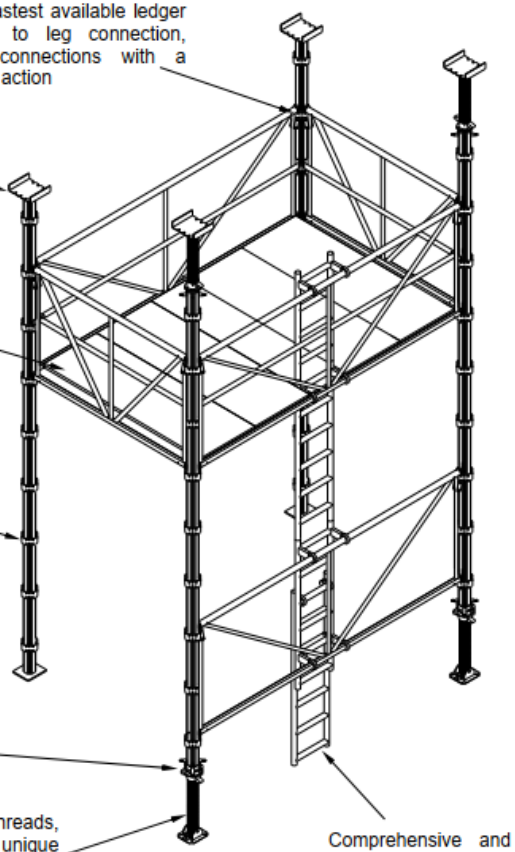


ACE
Advanced Construction Engineering

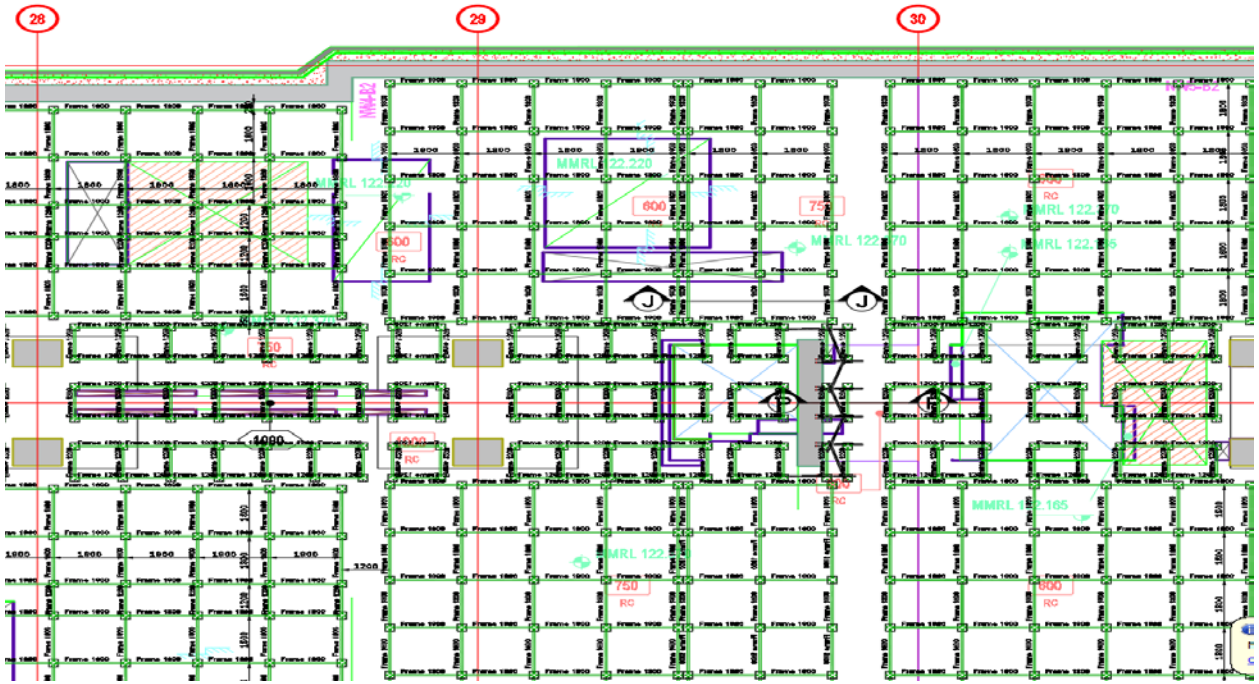
A.4 ALSHOR PLUS SYSTEM:

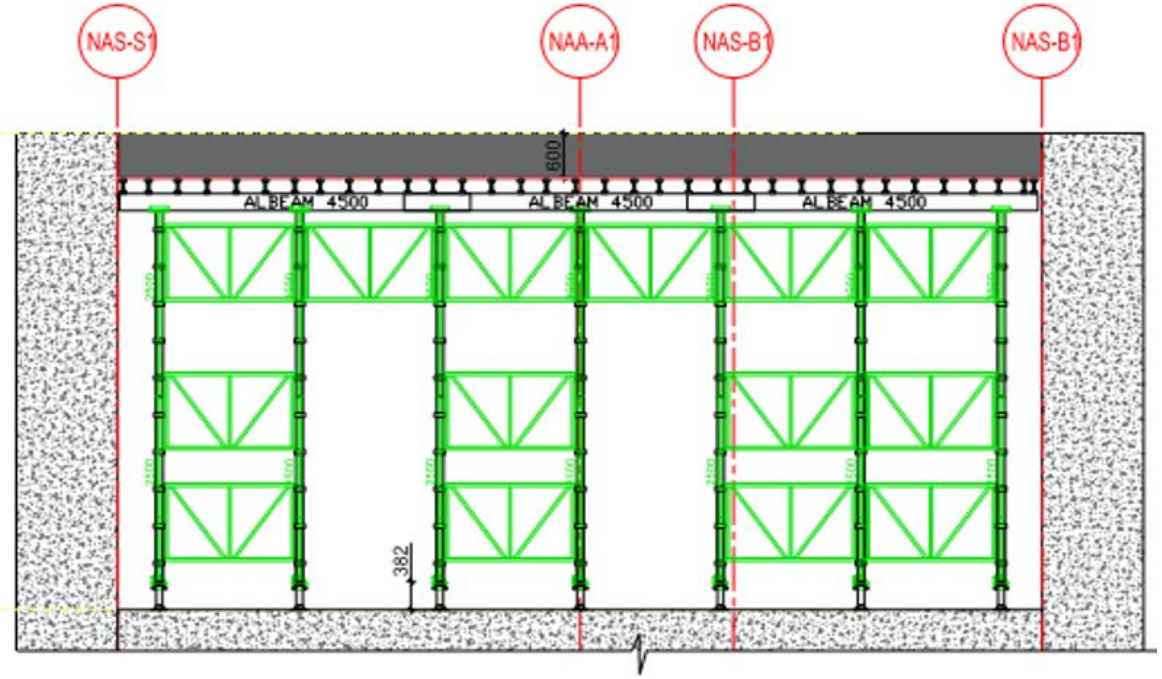
Introduction

Alshor Plus represents the latest concept in Aluminium Shoring. Refined and developed following many years of experience in this market Alshor Plus breaks new ground in speed of erection, ease of striking and safety.



ACE
Advanced Construction Engineering





ACE
Advanced Construction Engineering

A.5 STRONGSHOR SYSTEM:

new, lighter Strongshor frames that can be easily handled by one person

Strongshor has been designed specifically as a heavy-duty support system with fewer components required than with other shoring systems.

Strongshor is comprised of four main components: frames, spigots, cross braces, head and base jacks. Fewer components result in savings in time, labour, storage, transport and inventory costs.

The new **lighter weight Strongshor frames** enable site operatives to more easily place components, which means greater on-site productivity, less labour and lower construction costs.

Strongshor frames are designed to enable working platforms to be positioned at regular height intervals. Frame bracing provides increased strength and stability, particularly for high towers.

Strongshor will shore safely to any practical height. Its frames have a maximum safe working load of 90kN and subject to correct bracing procedure this load bearing capacity does not reduce as shoring height is increased.

features and benefits

- S.W.L. of 90kN, 45kN load on each leg - thereby providing strong support.
- Only four main components means it is easier to order, assemble and track components.
- Light and easily handled - means less labour and lower construction costs.
- Cross braces automatically align and space frames providing productivity gains.
- Frames can be lifted as a large section, reducing labour costs on repetitive applications.
- The range of frames, together with adjustable jacks, provide any desired height.

components

Telescopic Frame

Specifically designed to gain additional shoring height. Adjustment up to 1200mm in height.

Code	Size	Weight (Kg)
SHA10050	600-1200mm	21.6

Long Solid 'U' Head Jack

A high capacity, solid stem jack with a fixed 8 inch 'U' head. Adjustment 500mm.

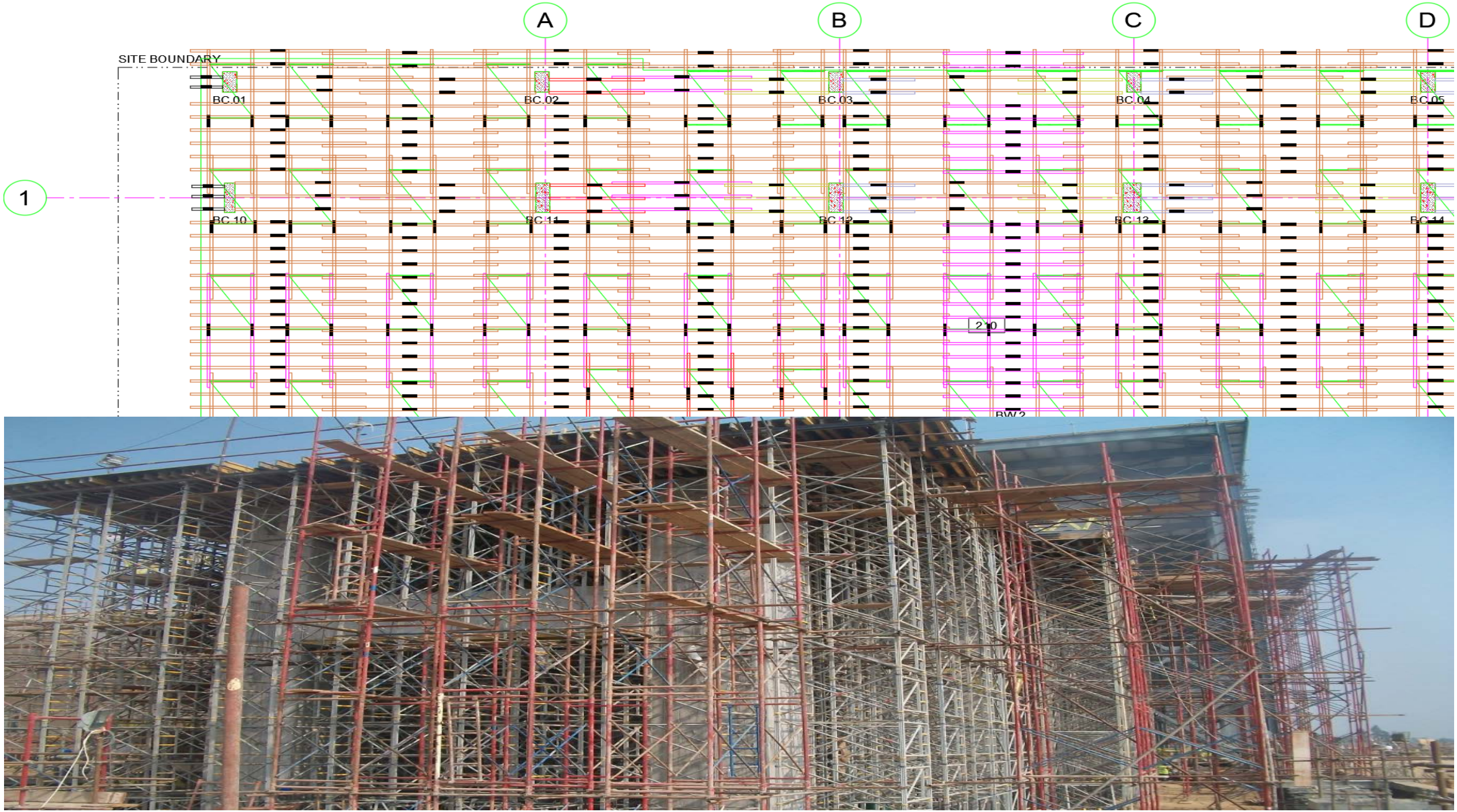
Code	Weight (Kg)
SHA20005	10.2

Fork Head

108mm and 210mm.

Code	Size	Weight (Kg)
SHA10030	108mm	1.5
SHA10045	210mm	2.2

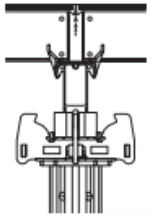
ACE
Advanced Construction Engineering


A
B
C
D
1
SITE BOUNDARY
BC.01
BC.02
BC.03
BC.04
BC.05
BC.10
BC.11
BC.12
BC.13
BC.14
210
BW2

A.6 SKYDECK SYSTEM:

SKYDECK minimises cleaning costs

The SKYDECK panels and main beams have **self-draining edges,** and the edges of the panels are undercut.
This keeps the side surfaces clean and reduces cleaning to a minimum.



The SKYDECK main beam with

powder coating and plastic rack is designed to **minimise cleaning,** and is therefore **an important factor in the speed achieved with this system.**

The main beam lies protected under the panels. This reduces cleaning.

SKYDECK components are made of aluminium to make them very light.

No part weighs more than 15 kg.
Thanks to the low individual weights PERI SKYDECK enables easy and tireless erection and striking.

Die besondere Pulverbeschichtung von PERI
PERI ECC
Easy Clean Coating
schneller sauber

The ECC powder coating prevents concrete adhering to SKYDECK.

SKYDECK has manageable parts.

The largest part measures only 1500 x 750 x 120 mm. This allows optimum transport between the rows of props and through door and window openings.

Working with SKYDECK means easy and tireless erection and striking the whole day.

The cost-effective slab formwork with many advantages for the user

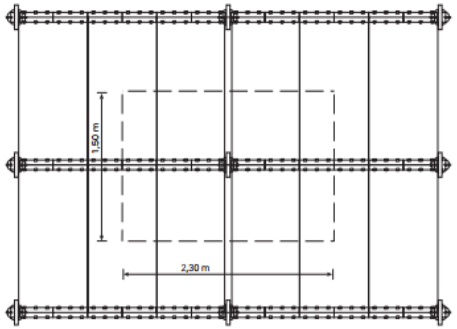
SKYDECK forms slab thicknesses of up to 950 mm.

See design tables.

The outward projecting teeth "catch" the panels. The panels clip in and lie securely in the rack. The SKYDECK system provides working safety during erection.

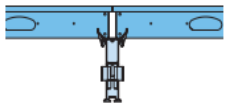
SKYDECK panels positioned from above.

3.45 m² are erected with one standard field.
Using main beam SLT 225 means only 0.29 props per m².

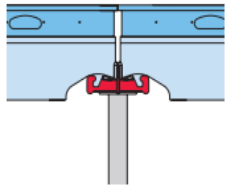


SKYDECK offers a systematic erection sequence and safety features that rule out erection errors. Handling is **quickly mastered,** even by **personnel unfamiliar** with this system.

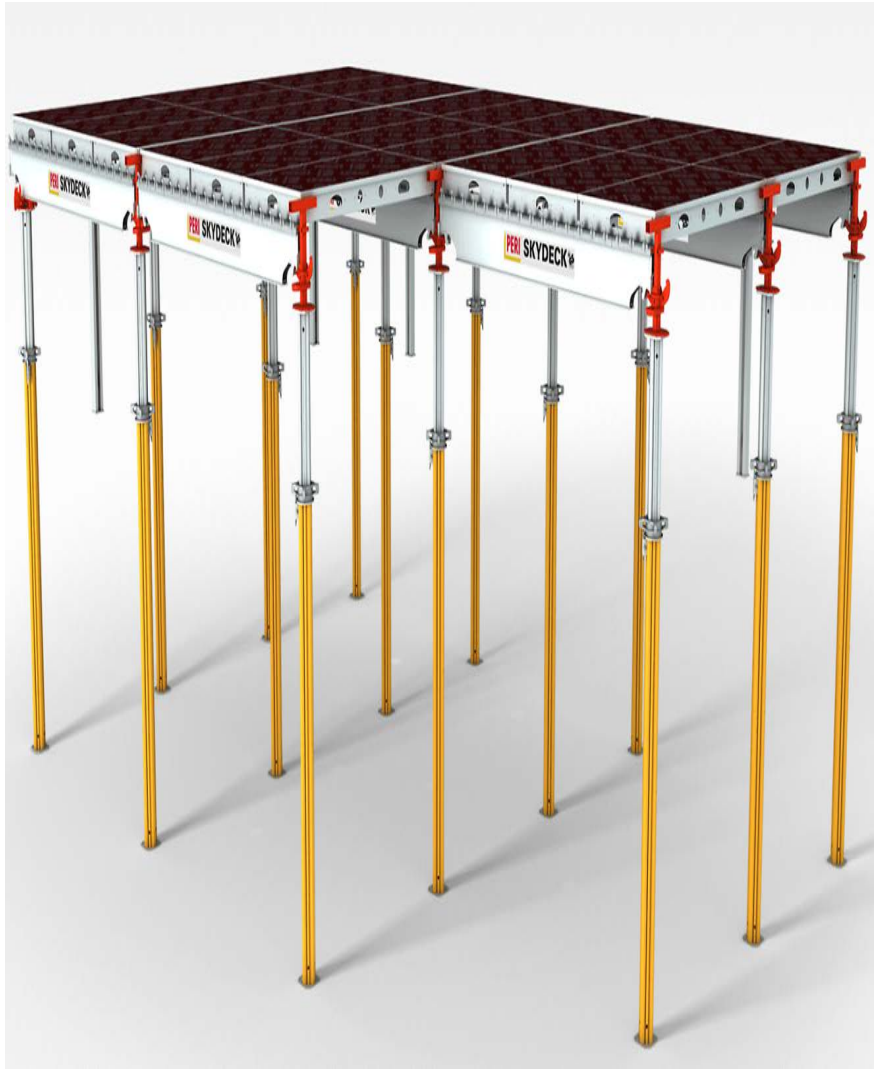
SKYDECK systematization means you
- no longer have to set out props
- don't have to determine primary and secondary beam spacings
- do not have to take account of the load capacity of the formlining



The panels are secured automatically by the lugs on the main beam.



The main beam is mounted rigidly on the drophead or prophead and cannot tilt.



ACE
Advanced Construction Engineering


4
5
6
7
PRECAST BALUSTRADE
PCC6
300D x 900W
Sim
PCC4
300D x 2000W

A.7 MEVADECK SYSTEM:

One system – three slab-forming methods

Drop-head-beam-panel method (FTE)

The FTE method uses only three components: panels, primary beams and props with drop heads. MevaDec is the flexible answer for almost all slab requirements in a single system, even for slab thicknesses of well over 30 cm. The system is independent of the grid pattern in one direction, and the free selection of the beam orientation reduces the number of compensations.

The panels can be installed and positioned freely, ensuring maximum flexibility and allowing the formwork to be simply adapted to suit every building geometry. The MevaDec drop head (lowers the primary beams and panels by 19 cm) makes early stripping possible, thus allowing optimised material stock on the construction site as well as rapid construction progress.

The beams and panels can be stripped effortlessly and used for the next pouring cycle. It is thus possible to complete a slab in three days.

Primary-and-secondary-beam method (HN)

The HN method uses only four components: primary beams, secondary beams, props with drop heads, and facings. This method thus enables the advantages of early stripping to be exploited. The system enables the loose facing to be freely selected:

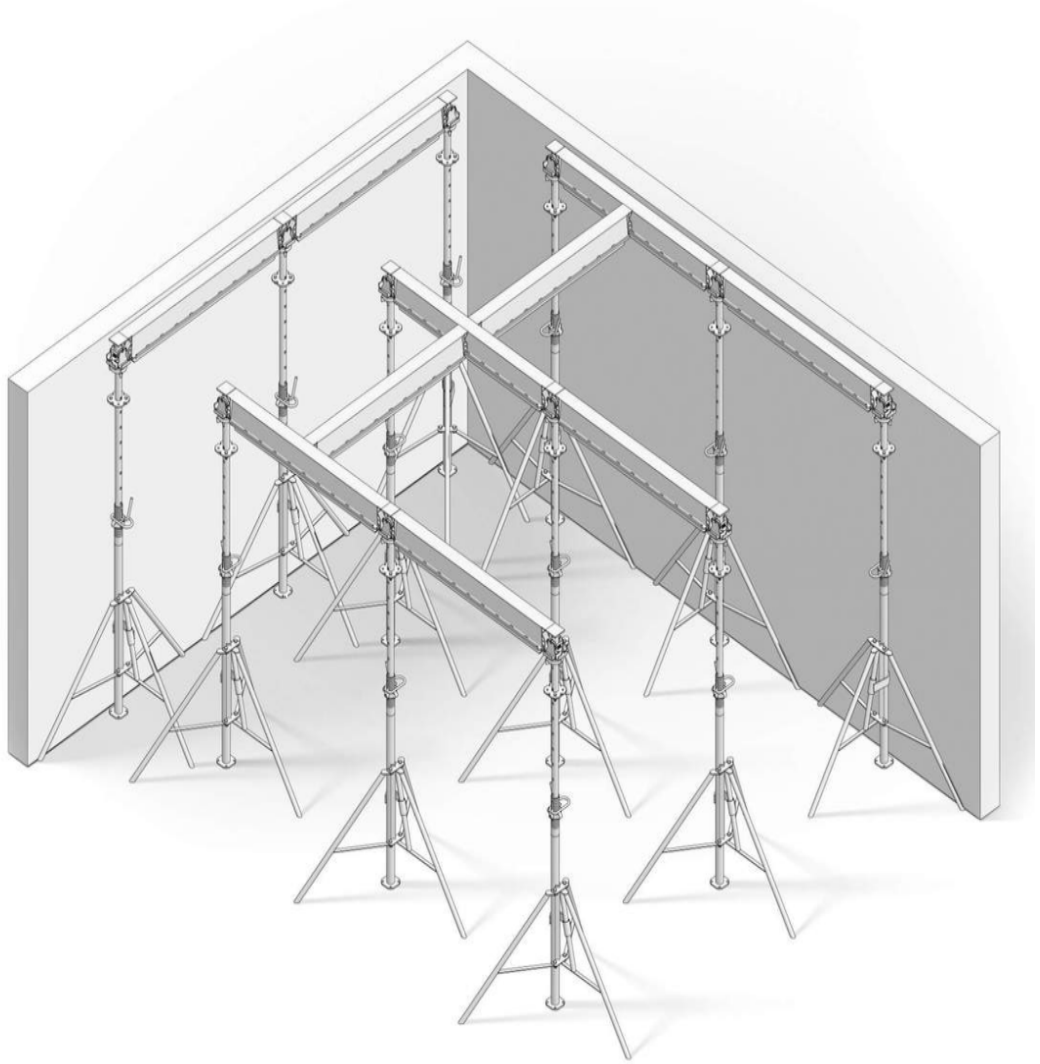
- Shuttering panel 3S
- alkus all-plastic facing
- Other alternatives

Panel method (E)

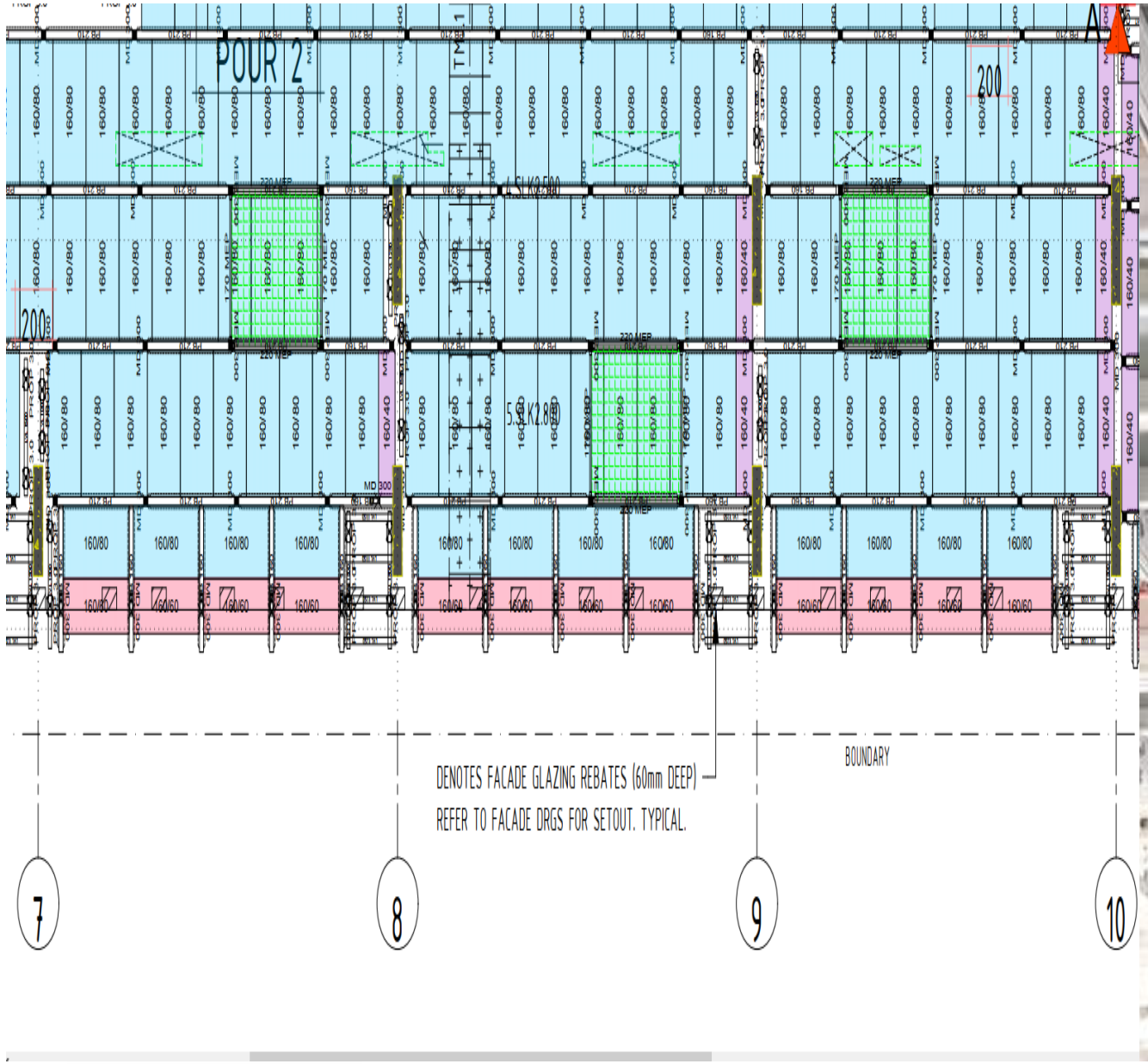
The panel method (E) uses only two components: panels and props with prop heads.

This method is the ideal option for building layouts and filler areas involving small surface areas in conjunction with simple logistics.

Thanks to the clever design of the MevaDec prop head, the panels are automatically secured to prevent them coming loose and moving unintentionally.



ACE
Advanced Construction Engineering



ACE
Advanced Construction Engineering

B- DESIGN OF VERTICAL ELEMENTS :

B.1 SLIMSHOR SYSTEM:

slimshor

heavy-duty vertical, horizontal and raking shoring

A heavy-duty support for vertical, horizontal and raking applications for use on a variety of civil engineering and building work. Ideally suitable for supporting both large walls and precast units.

The Slimshor components connect directly to Super Slim Soldiers. The addition of standard adjustable jack units at the ends of the Super Slim Soldiers with suitable end connections convert the conventional Super Slims into effective push-pull props. These props can be used to position and stabilise both large wall forms and existing walls or precast concrete wall elements. Adjustment of length is easily performed by the rotation of the Super Slim Soldier body.

Jack Spanner

Used in conjunction with the Foot Jack Adaptor for adjusting the height of the vertical shore, the Jack Spanner also performs as a fastener connecting the Foot Jack Adaptor to the Jack.

Code	Weight (Kg)
SSA20015	1.76

Strut Adaptor

Developed for use in raking shore applications. Strut Adaptors connect between the webs of the Super Slim Soldiers (vertical member) using two connecting Pins and Clips. The jack end is secured to the Strut Adaptor using a Pivot Pin.

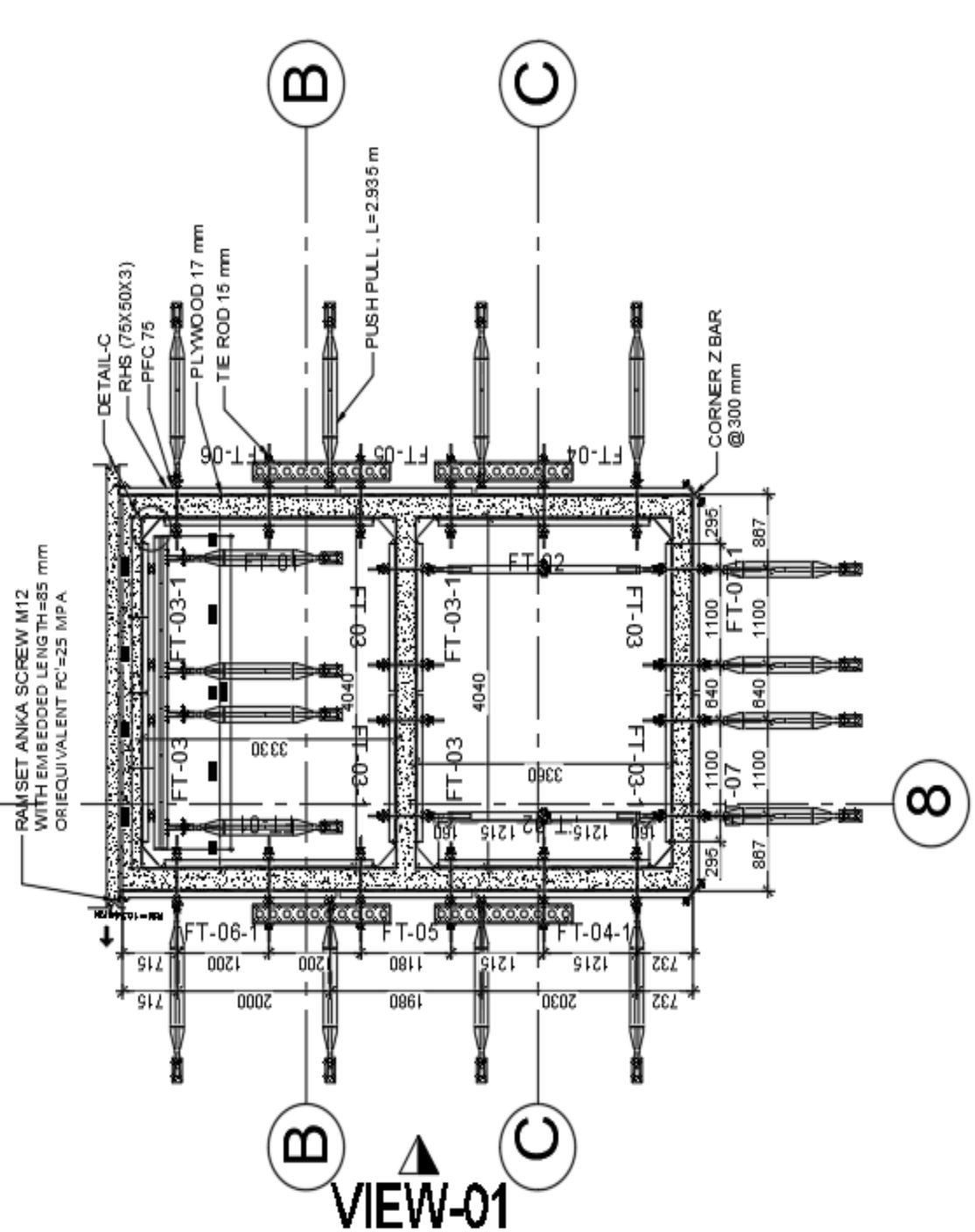
Code	Weight (Kg)
SSA10345	4.06

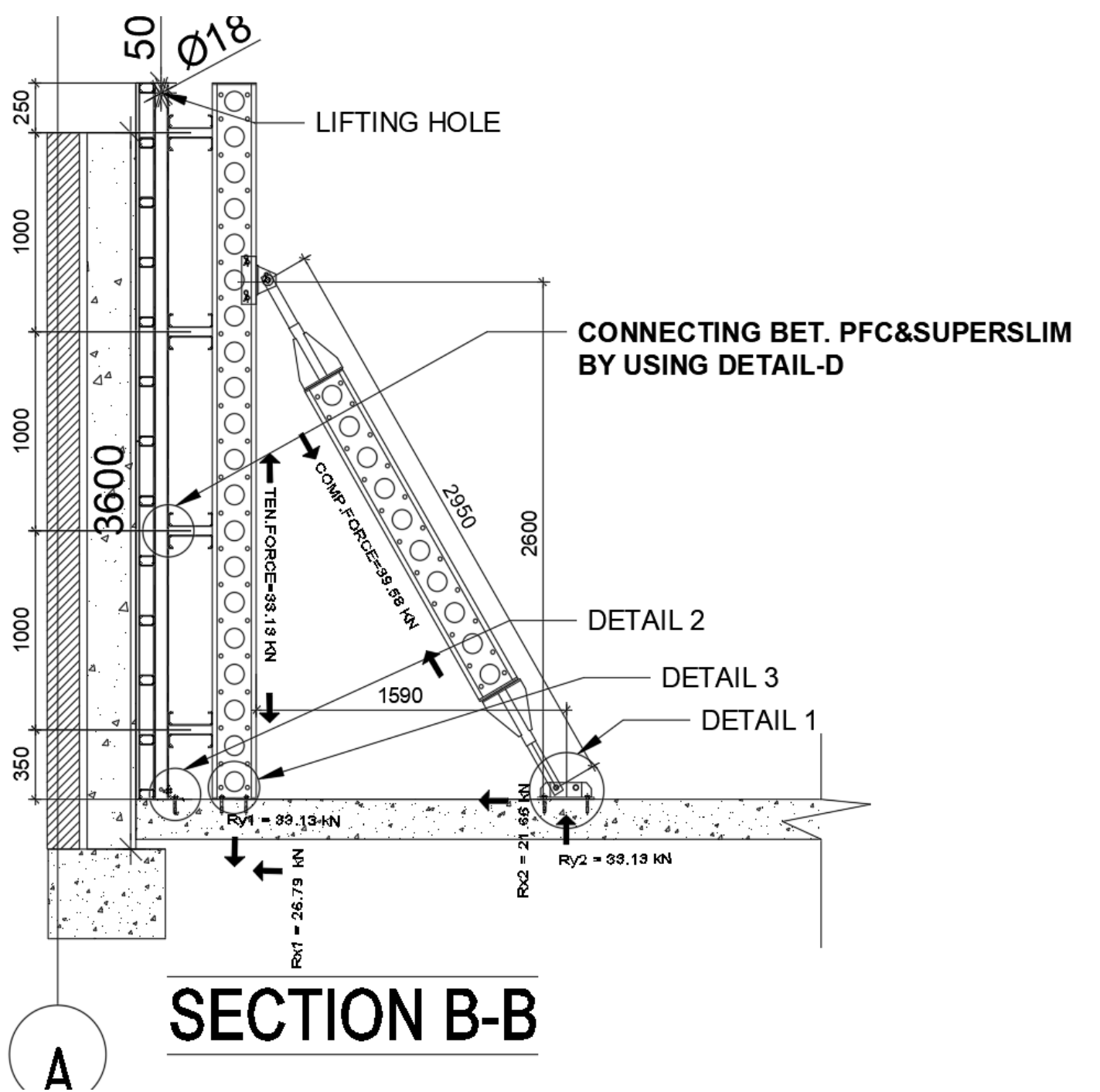
Foot Jack Adaptor

Specially designed foot plate used in conjunction with jacks. The Foot Jack Adaptor is a load distributing base which enables variable compensation for uneven ground levels.
Used together with a Jack Spanner, the Foot Jack Adaptor can also manually adjust the height of the vertical shore applications where the rotation of the Soldier is not possible. Horizontal shores require one at each end.

Code	Weight (Kg)
SSA20020	5.68

ACE
Advanced Construction Engineering

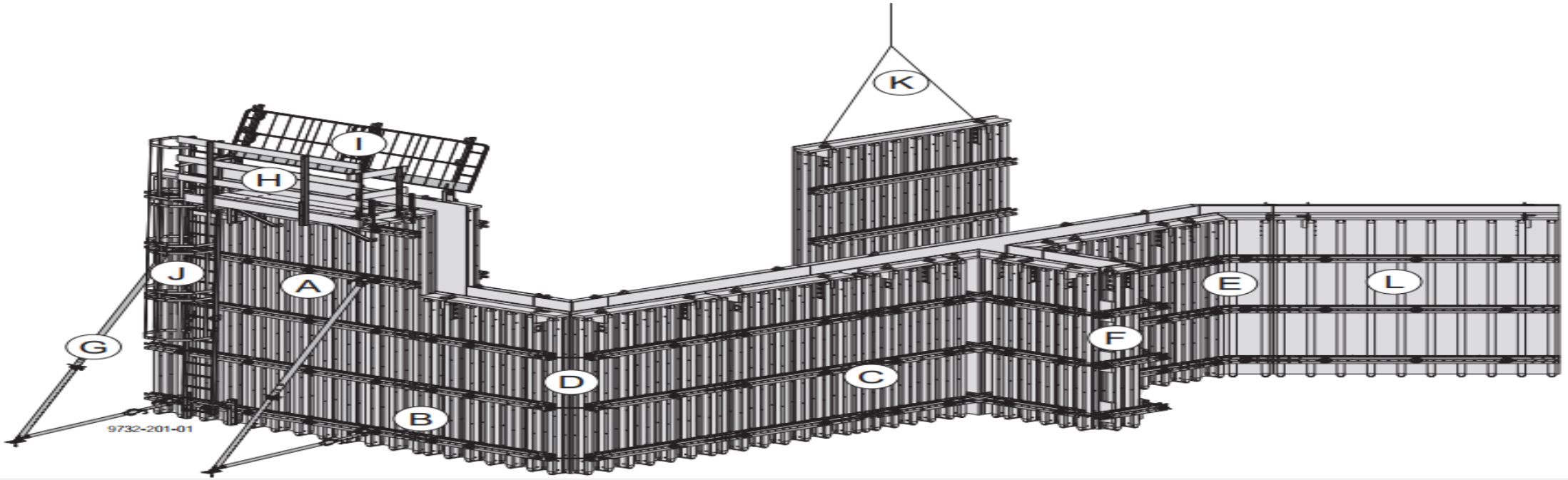

B
C
8
DETAIL-C
RHS (75X50X3)
PFC 75
PLYWOOD 17 mm
TIE ROD 15 mm
PUSH PULL, L=2.935 m
CORNER Z BAR @300 mm
RAMSET ANKA SCREW M12 WITH EMBEDDED LENGTH=85 mm ORIEQUIVALENT FC'=25 MPA
FT-01
FT-02
FT-03
FT-03-1
FT-04
FT-04-1
FT-05
FT-06
FT-06-1
FT-07
FT-07-1
4040
3330
3360
1100
840
1215
160
295
887
715
1200
200
1180
732
2000
1980
2030
B
C
VIEW-01


50
Ø18
LIFTING HOLE
250
1000
1000
1000
1000
350
3600
CONNECTING BET. PFC&SUPERSLIM BY USING DETAIL-D
TEN.FORCE=33.13 KN
COMP.FORCE=39.58 KN
2950
2600
1590
DETAIL 2
DETAIL 3
DETAIL 1
Ry1 = 33.13 kN
Rx1 = 26.79 kN
Rx2 = 21.66 kN
Ry2 = 33.13 kN
A
SECTION B-B

B.2 TOP 50 SYSTEM:

Doka large-area formwork Top 50 – for any shape and any load

Doka large-area formwork Top 50 is designed to be tailored to many very diverse types of task – so it gives you ideal scope for adapting the shapes and sizes of the elements to suit your structure.
The element size-grid and tie-hole pattern provide the adaptability needed to accommodate architectural demands. The large-area elements and exact joins make for a perfect joint pattern.
You can choose whichever form-face material best meets your requirements – e.g. for smooth fair-faced concrete, wood-textured surfaces, intensive re-use etc.
A range of practical accessories makes work on the site a lot easier and does away with the need for costly job-site improvisations.
Doka will plan the most economical solution for you. Also, having your formwork pre-assembled by the Doka Pre-assembly Service saves time and space on site.



ACE
Advanced Construction Engineering

B.3 FRAMAX SYSTEM:

Doka framed formwork Framax Xlife

For crane-assisted gang-forming of large areas

Framax Xlife is the framed formwork system that uses only a very few different panel formats to achieve a consistent 15 cm increment-grid, no matter whether the panels are stood upright or on their sides.
All the connectors and accessories fit seamlessly into this grid – making for fast forming-times and high efficiency.

Reduced close-out costs

thanks to superior product quality
Highly economical, thanks to
- its plastic-coated Xlife sheet
- its rugged hot-dip galvanised and powder-coated steel frames
- the fact that the Xlife sheet is so easy to clean and recondition

Faster working

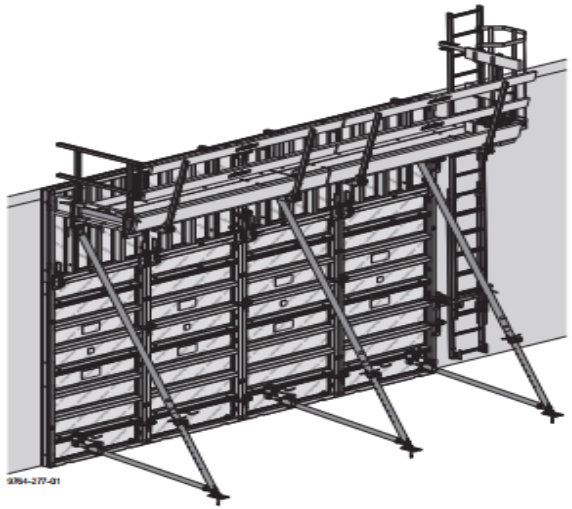
due to the low form-tie count
Wide spacing (up to 1.35 m) between form-ties means
- shorter forming-times
- lower labour costs

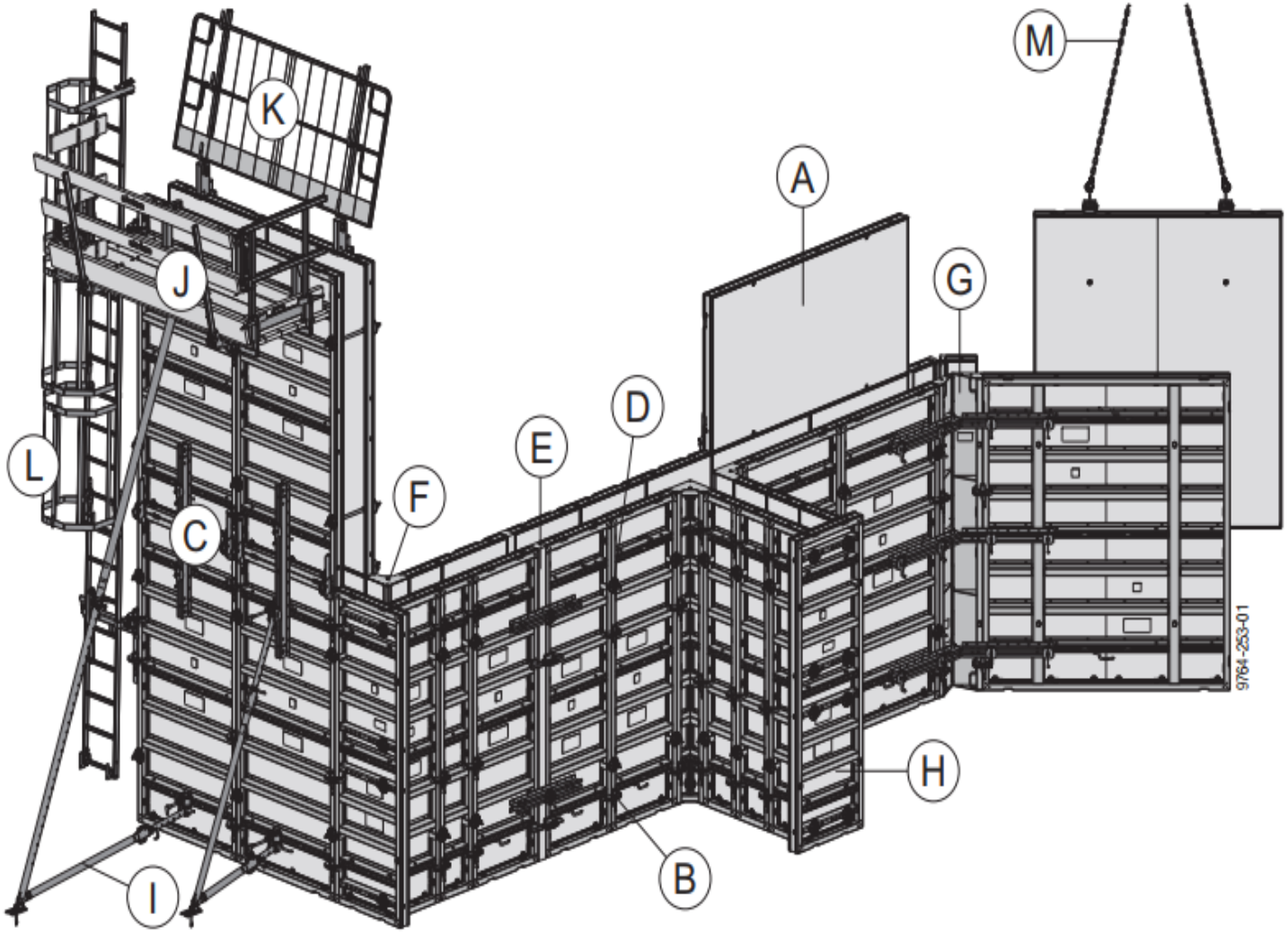
Easy handling and planning

thanks to logical system-grid
The 15 cm grid, with 5 different widths of panel, results in
- optimum adaptability to every layout
- compact gang-forms for short crane times
- easy planning and logistics
- a neat joint pattern

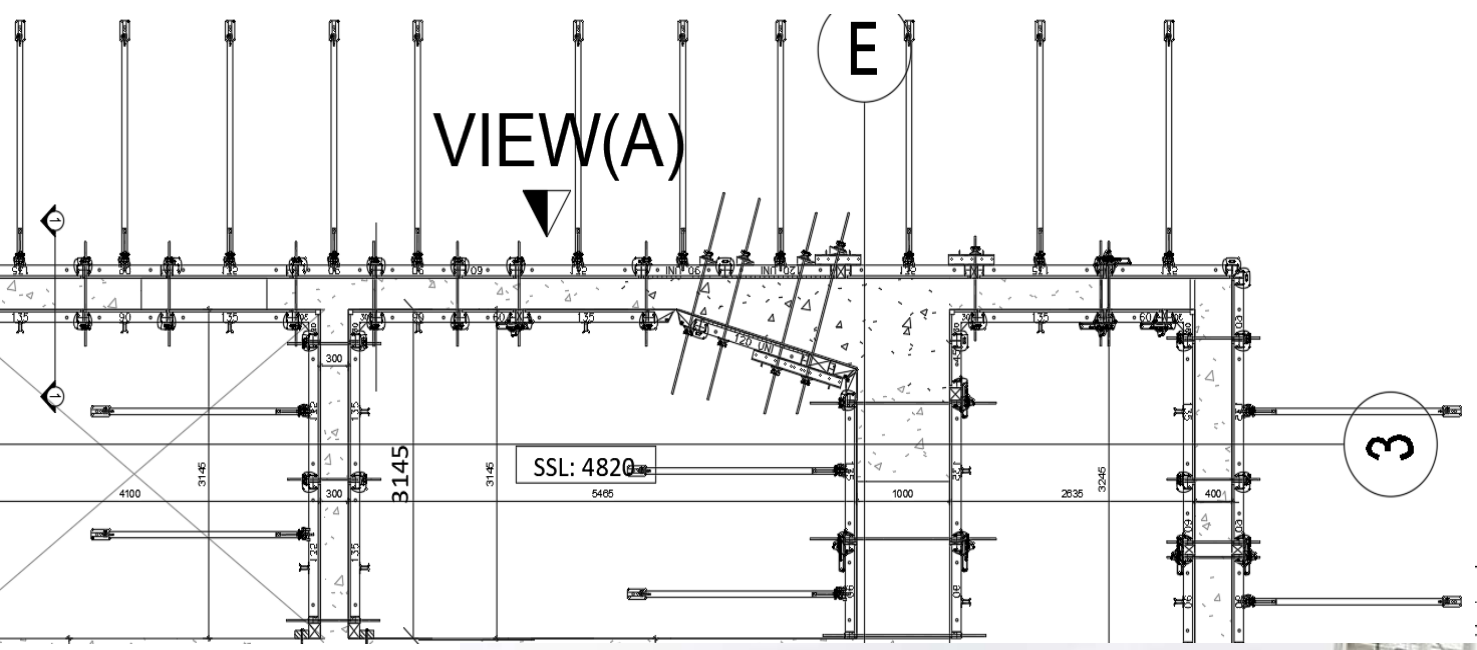
High safety

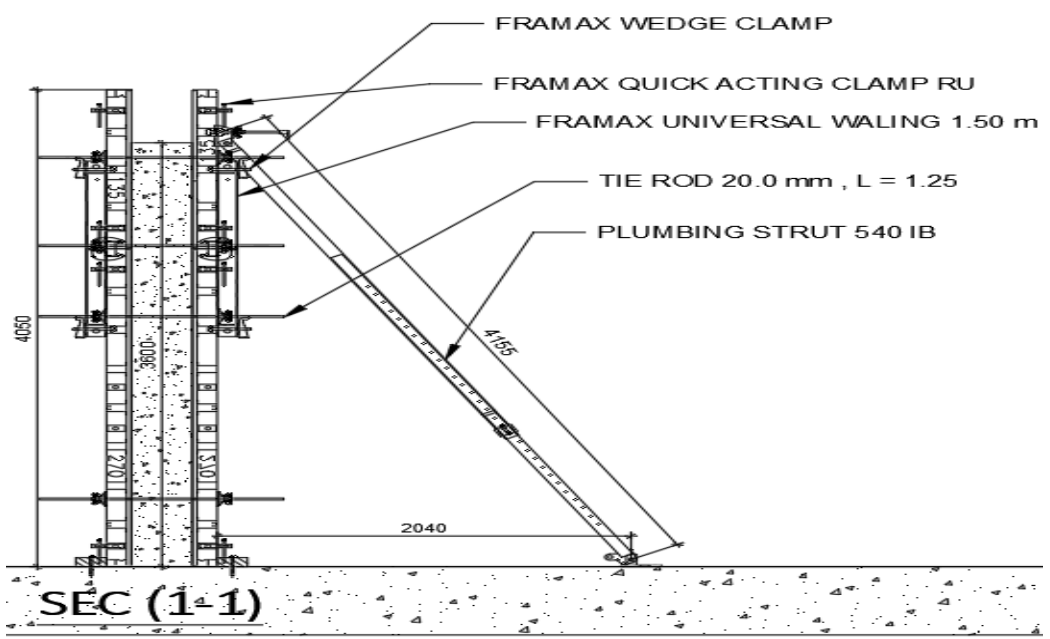
at your site
The accident risk is reduced, and legally compliant working conditions are ensured, by
- the safe ladderways of the Ladder system XS
- combining the formwork with the Platform system Xsafe plus

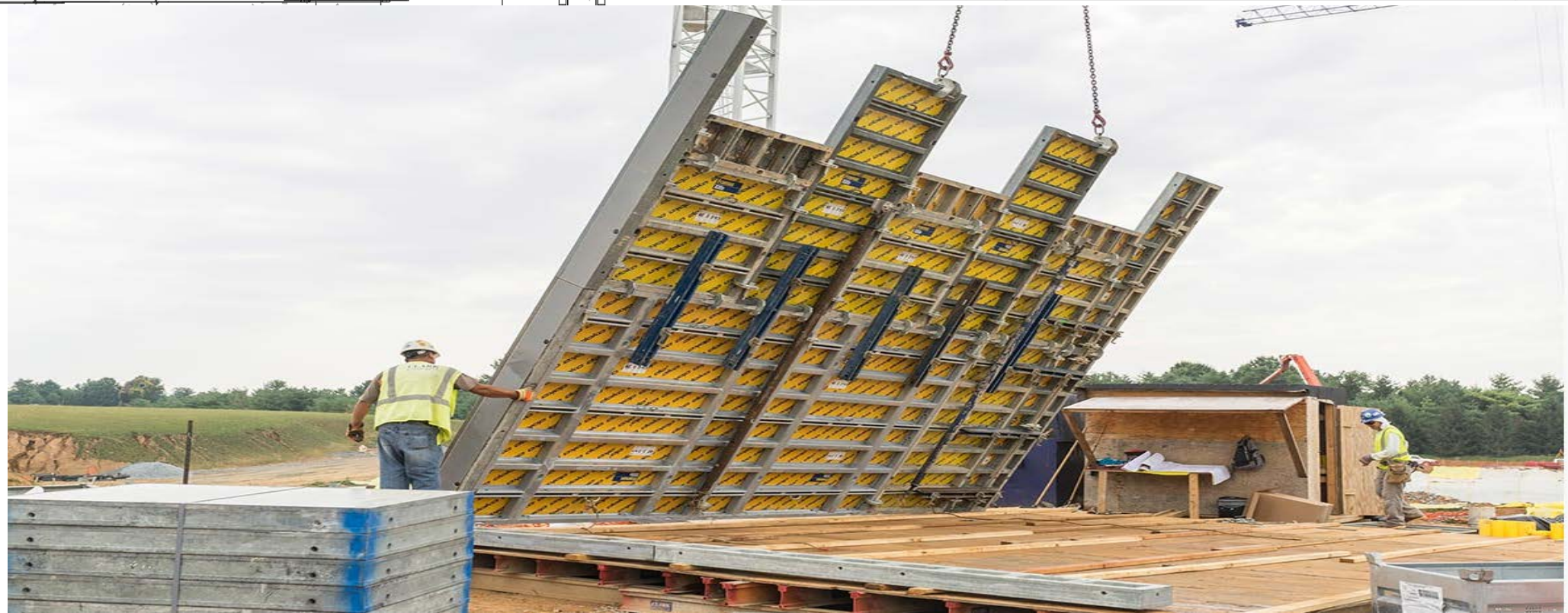




ACE
Advanced Construction Engineering







ACE
Advanced Construction Engineering

B.4 DUO SYSTEM:

The universal lightweight formwork for walls, foundations, columns and slabs

The DUO system formwork is characterized by its low weight and extremely simple handling. Not only the material used is very innovative, but also the entire concept: with a minimal number of different system components, walls, columns and slabs can be easily and efficiently formed with only a minimal number of different system components. DUO is the optimal solution for small-sized components with lower surface requirements as well as for restoration work where no crane can be used.

Besides the panels including the formlining, most DUO accessories are made of the new innovative composite material with a polymer basis. This material is extremely light and, at the same time, has a high load-bearing capacity.

Apart from the material, the developers focused on ensuring that the formwork system was easy to handle. Almost all operations with DUO can be carried out without tools, and the working steps are easy to understand. Even less experienced users of system formwork can work quickly and efficiently with DUO.

The fact that the majority of system components can be used for walls, columns and slabs additionally increases the performance. Last but not least, DUO reduces noise pollution on the construction site – an important aspect, for example, on inner-city construction sites.

Universally applicable

High utilization rate of the components through flexible forming of walls, columns and slabs using only one system

Fast and easy to assemble

Fast working procedures thanks to simple formwork rules and uncomplicated application without the use of a hammer

Installation without the use of a crane

High productivity and crane-independence due to the low weight

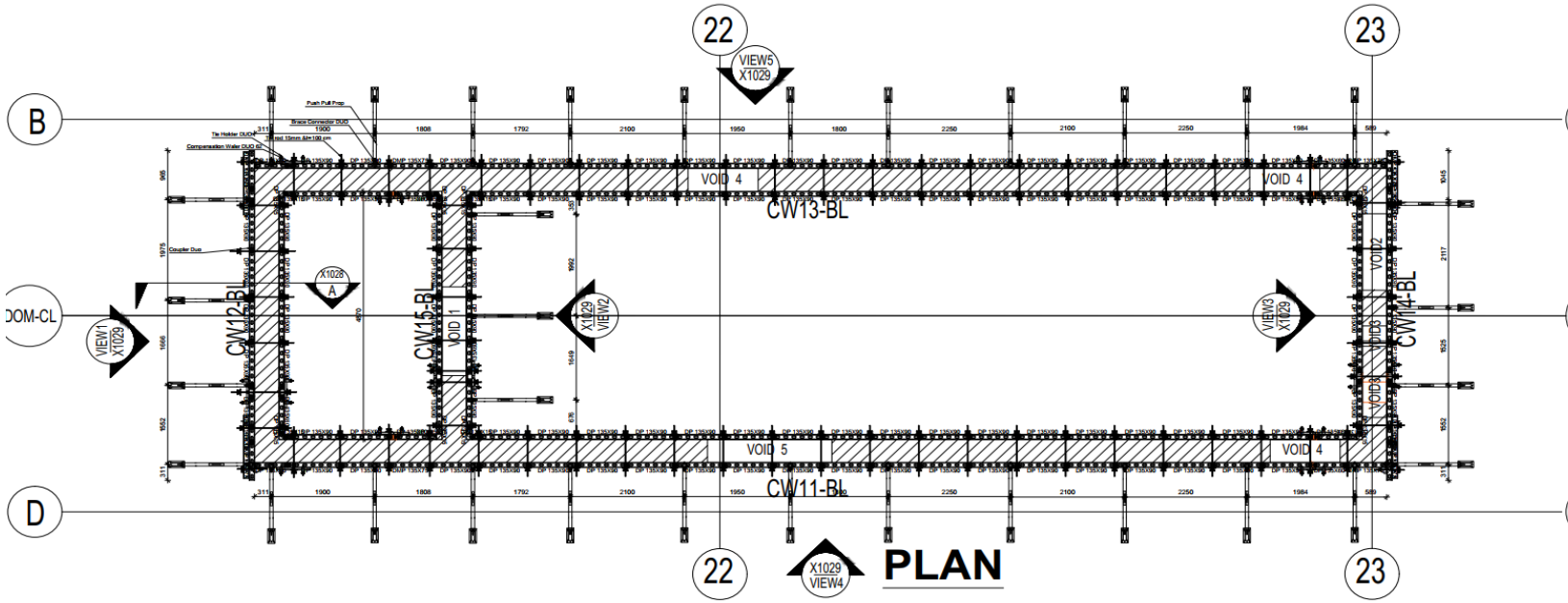
The core components

The core components of the system are the DUO panels including the formlining and DUO Couplers – completely manufactured using a polymer-based composite material.

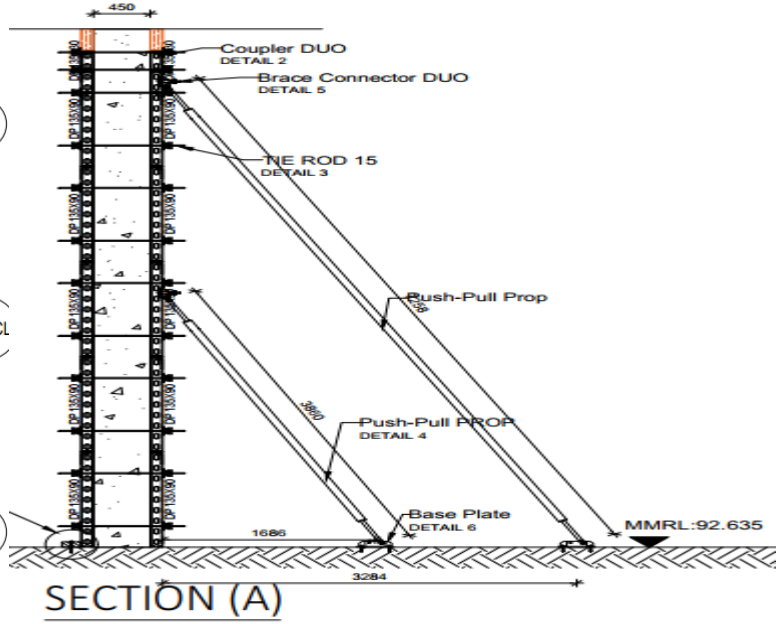
The DUO Coupler connects panels evenly. No tools are required for installation.

DUO Panels are available in heights of 135 cm as well as 60 cm. With 6 different panel widths ranging from 15 cm to 90 cm, adjustments in 15 cm increments are possible.

ACE
Advanced Construction Engineering



PLAN



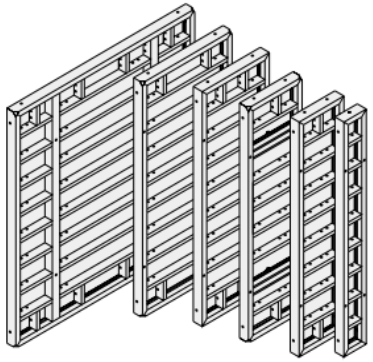
SECTION (A)

ACE
Advanced Construction Engineering

B.5 TRIO SYSTEM:

There has to be a reason why PERI TRIO has become the most successful panel formwork

PERI's development engineers have focused on minimising the shuttering costs and the number of individual components.



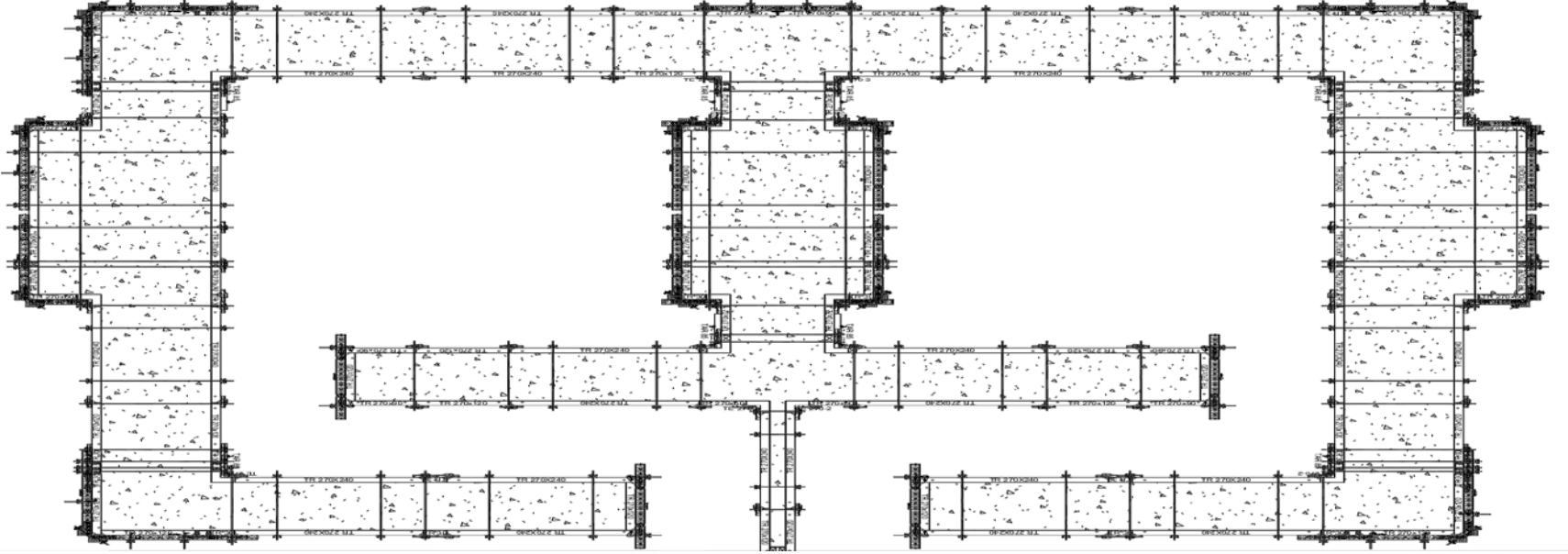
Only 6 panel widths
for any layout

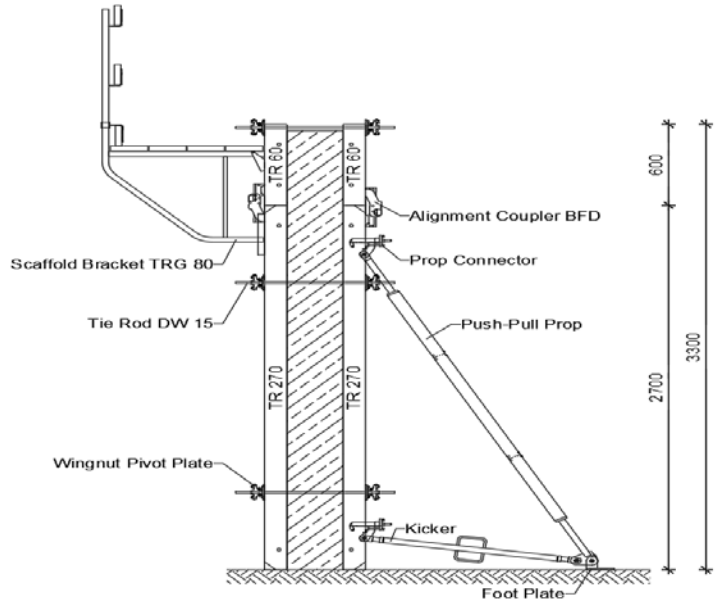
TRIO can be used
On small ...

... and large sites

The BFD **is the only coupler required.**

ACE
Advanced Construction Engineering





ACE
Advanced Construction Engineering

B.6 ACROW ONE SIDE SHUTTER FORMWORK SYSTEM:

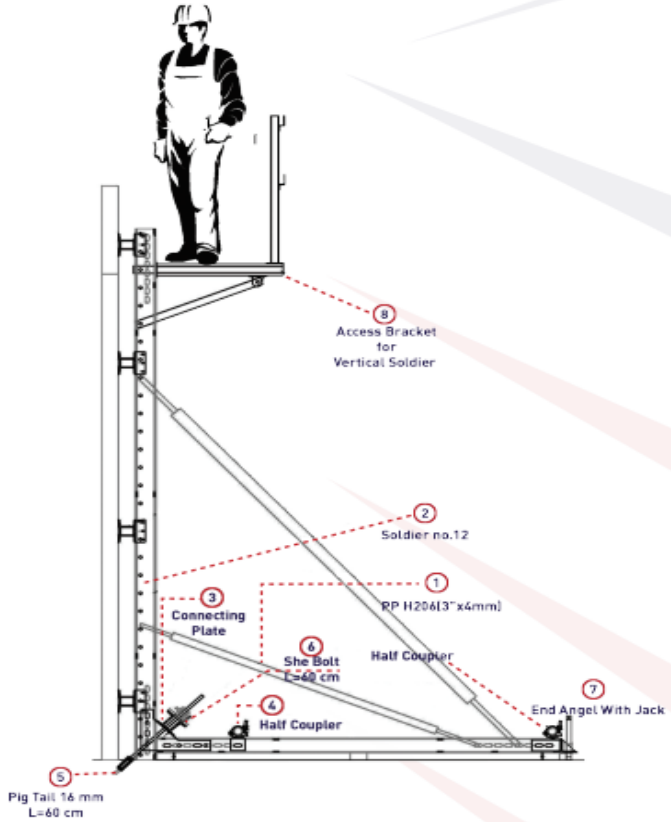
Supporting frame

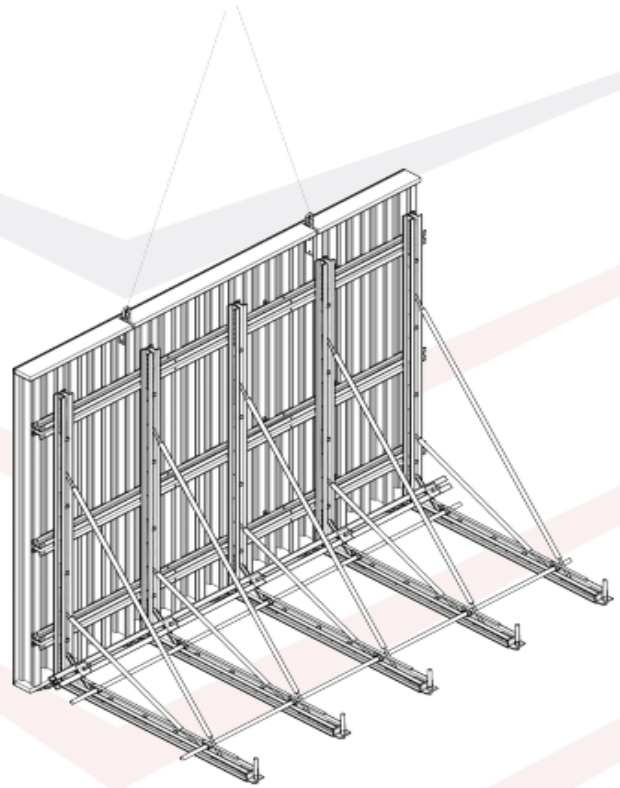
Advantage for supporting frame for wall height up to 7.60 M:
•The A, B, C acrow supporting frames with various combinations enables any wall height up to 7.60 m to be poured in one shot.
•For wall with variable heights, the A, B, C supporting frames can be separately used to shutter small heights, after that they can be connected together vertically to get a higher wall section.
•The modular supporting frames can be easily connected without the need of any additional parts.
•The top of any A, B, C supporting frame can be used as an access platform by adding handrail posts.
•The individual parts dimensions are fit for a lorry or sized container.
•It can be customized with different shuttering systems.
•Each frame can be braced using scaffolding tubes.

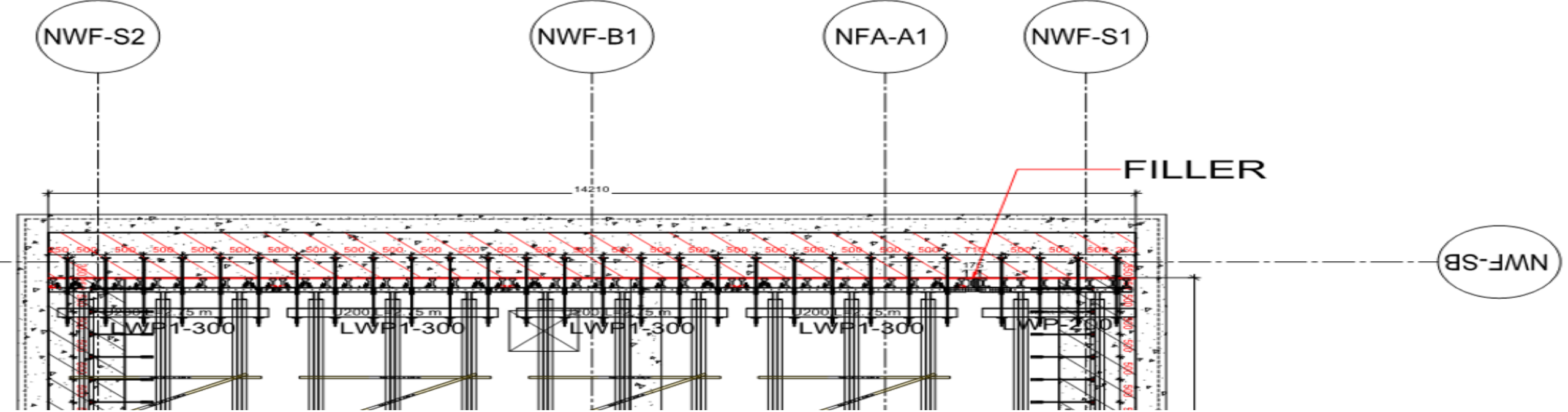
ACE
Advanced Construction Engineering

Vertical Solider Overview

Solider and turn buckle up to 4.00 m:
- PPH 206 (3»x4mm)
- Solider # 12
- Connecting plate
- Half coupler C/W bolt and nut
- Pigtail anchor
- She bolt C/W wing nut and steel washer
- Rear jack
- Access bracket for vertical solider

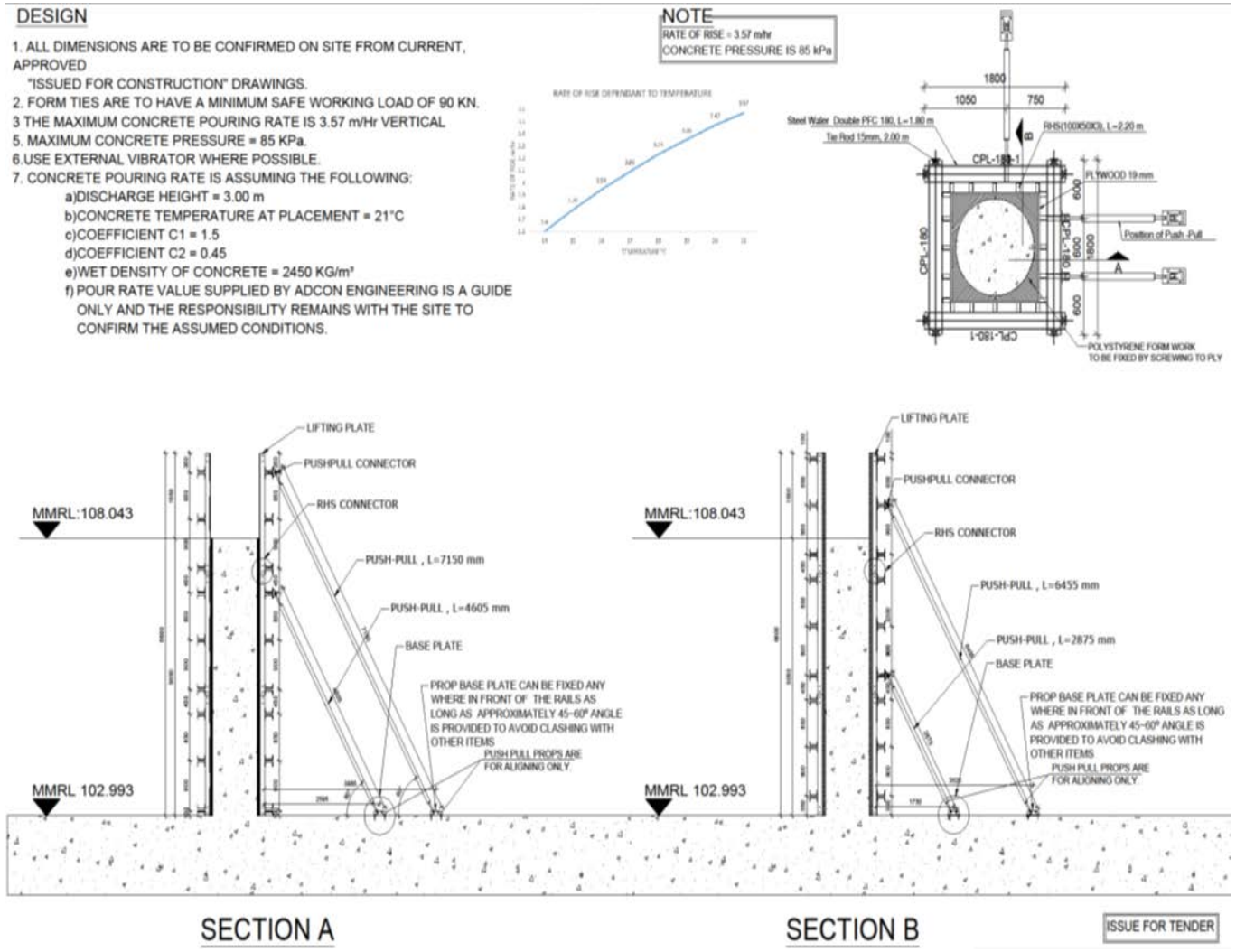





NWF-S2
NWF-B1
NFA-A1
NWF-S1
FILLER
14210
NWF-SB
LWP1-300
LWP1-300
LWP1-300
LWP1-300
LWP-200

B.7 CUSTOM STEEL PANELS FORMWORK SYSTEM:

ACE
Advanced Construction Engineering



C- CLIMBING SYSTEMS:

C.1 SHAFT PLATFORM:

The climbing formwork for inside-shafts

Shaft platforms permit quick and easy repositioning in just one crane cycle. This makes them a cost-effective system for forming inside-shafts.

Ingenious modular system

- uses telescopic shaft beams for easy accommodation to any structure plan
- makes the system quick and easy to assemble
- facilitates attaching a follow-up platform

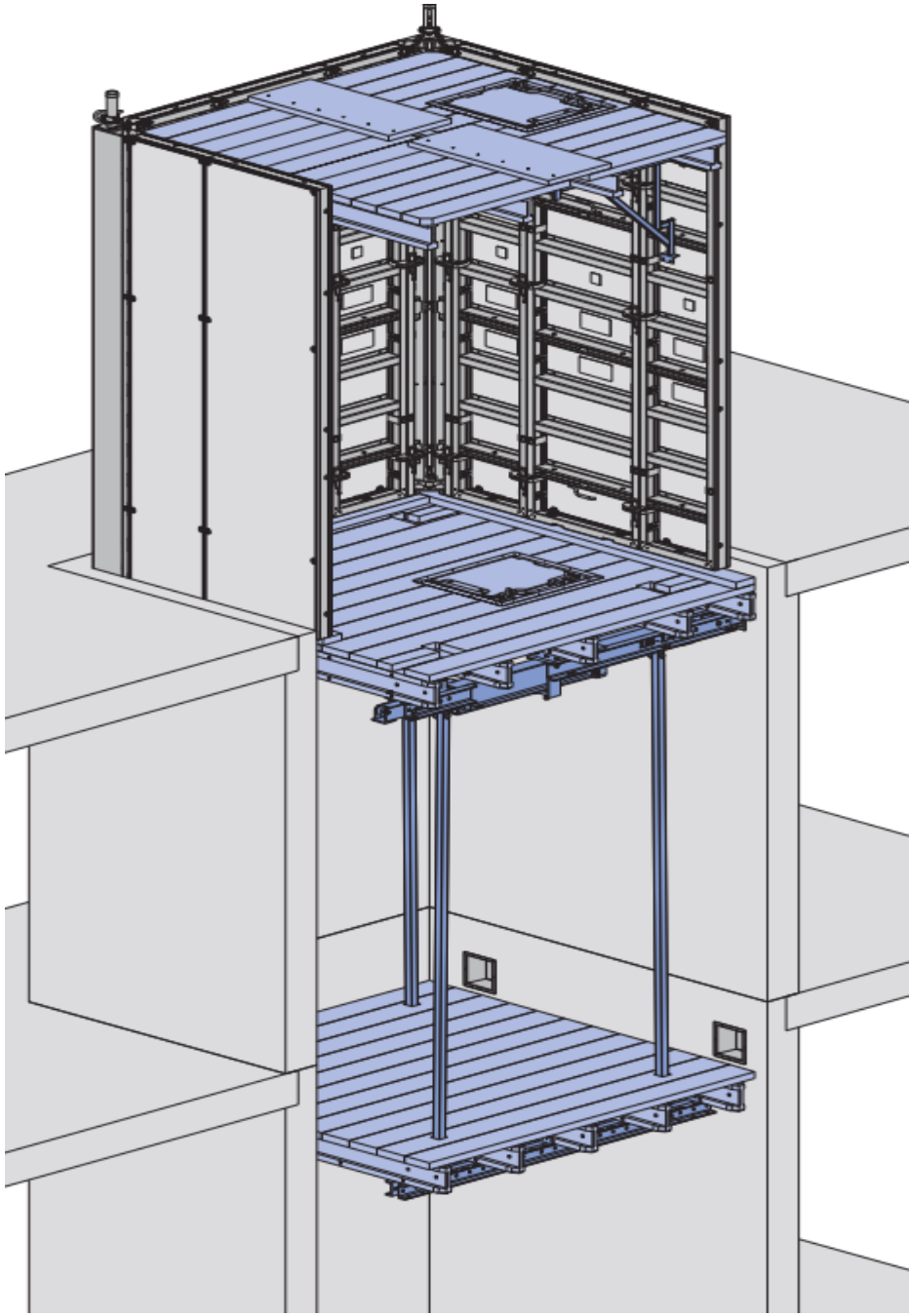
Easy to operate

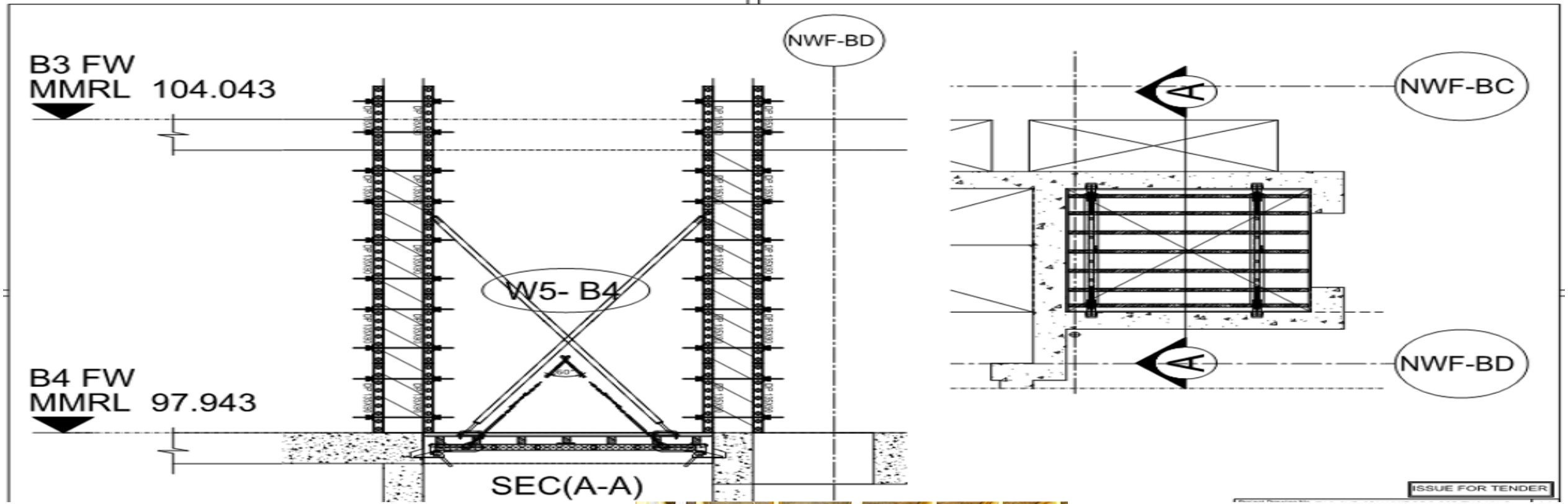
- formwork can be set up and struck quickly with no need for a crane
- cuts back on crane time by enabling fast repositioning of the entire unit (platform plus shaft formwork)

Easy mounting-system

- provides maximum safety
- with either Main beam head or pawl

ACE
Advanced Construction Engineering



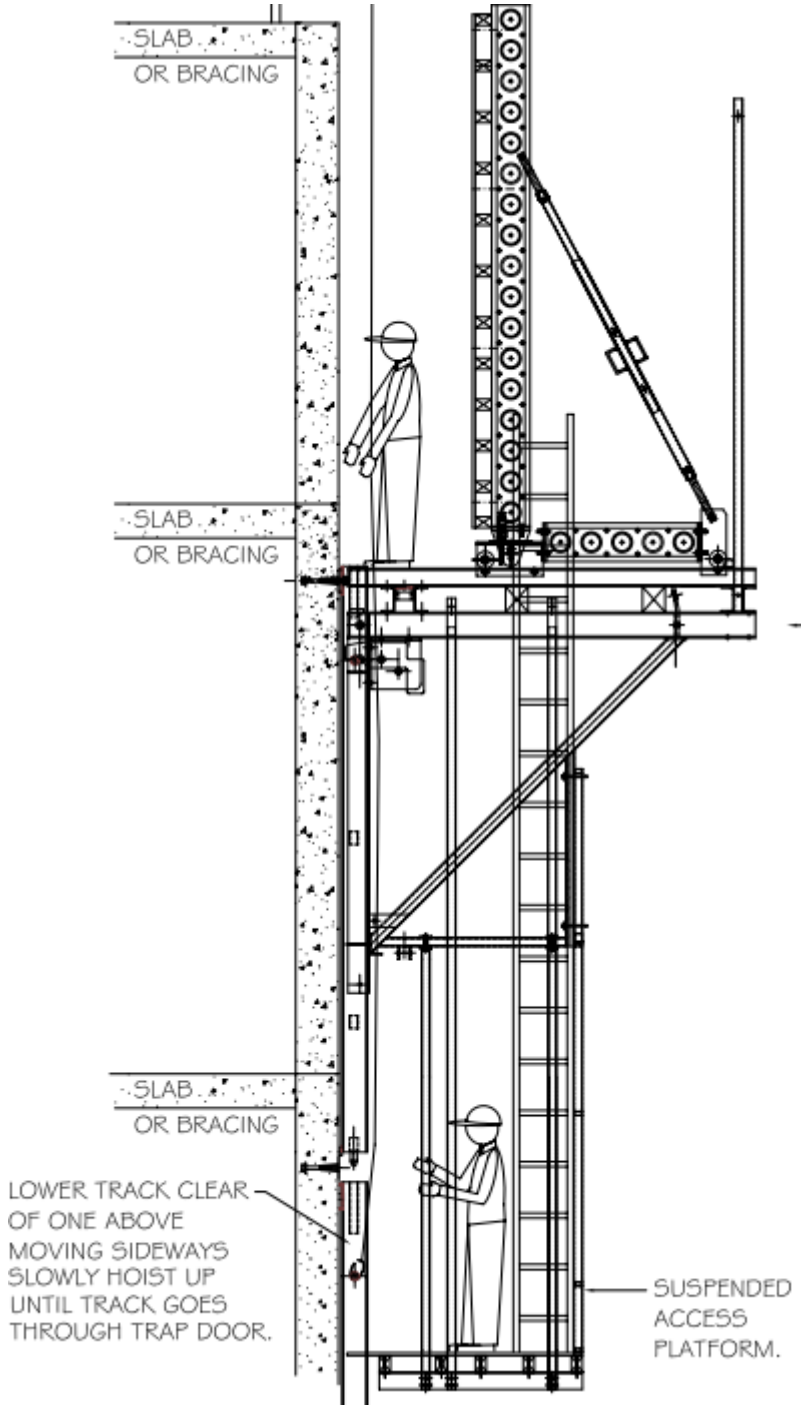


ACE
Advanced Construction Engineering

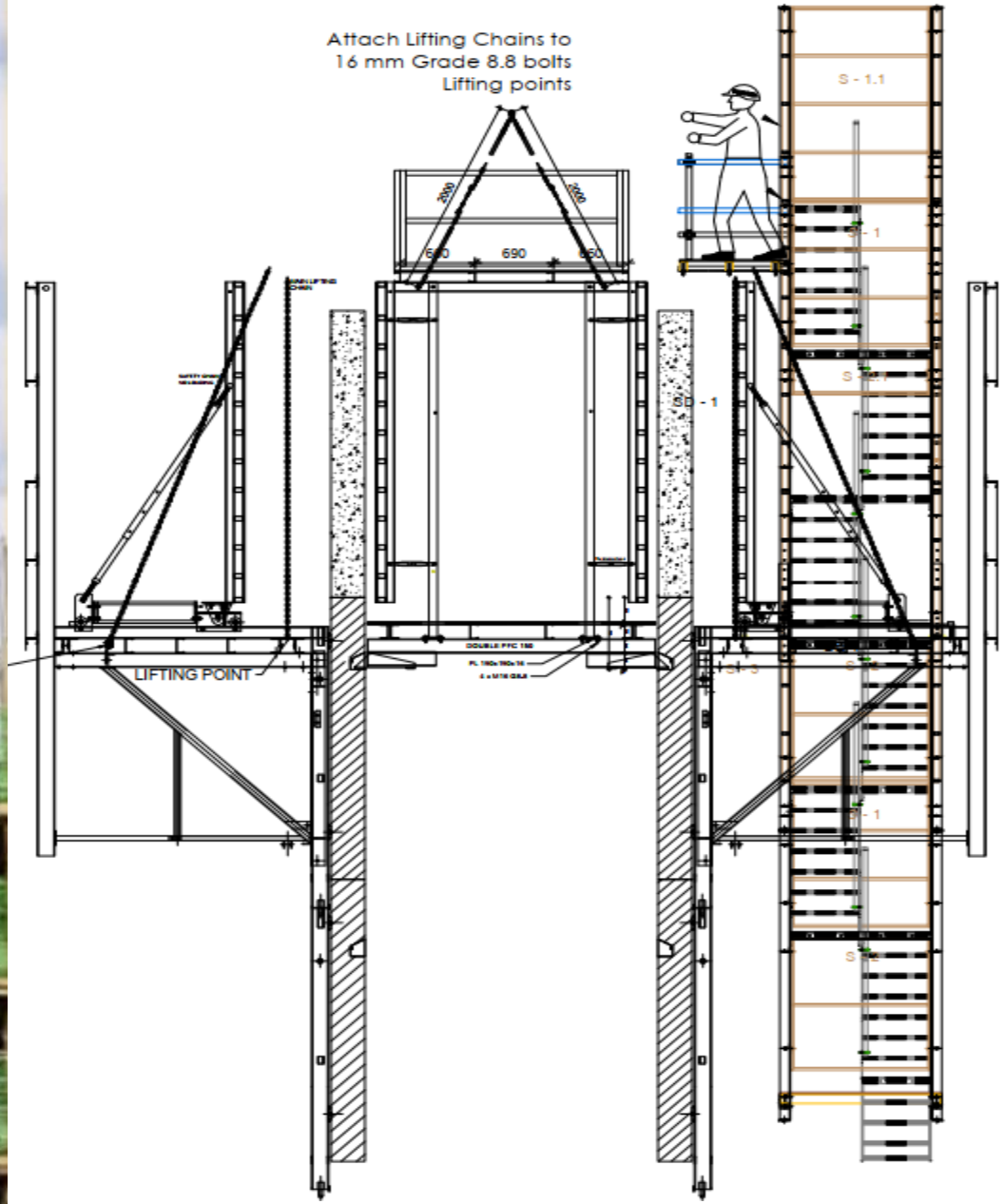
C.2 CLIMBING TRACK:

The system has been designed to allow the safe crane lifting of Platforms together with shutters whilst remaining captive on the concrete structure during lifting operations.

A comprehensive Method Statement is provided for instruction in the safe use of the system.

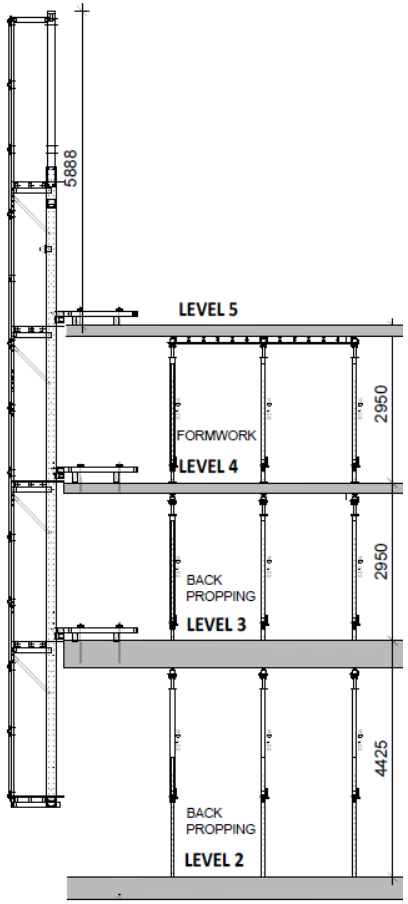


ACE
Advanced Construction Engineering

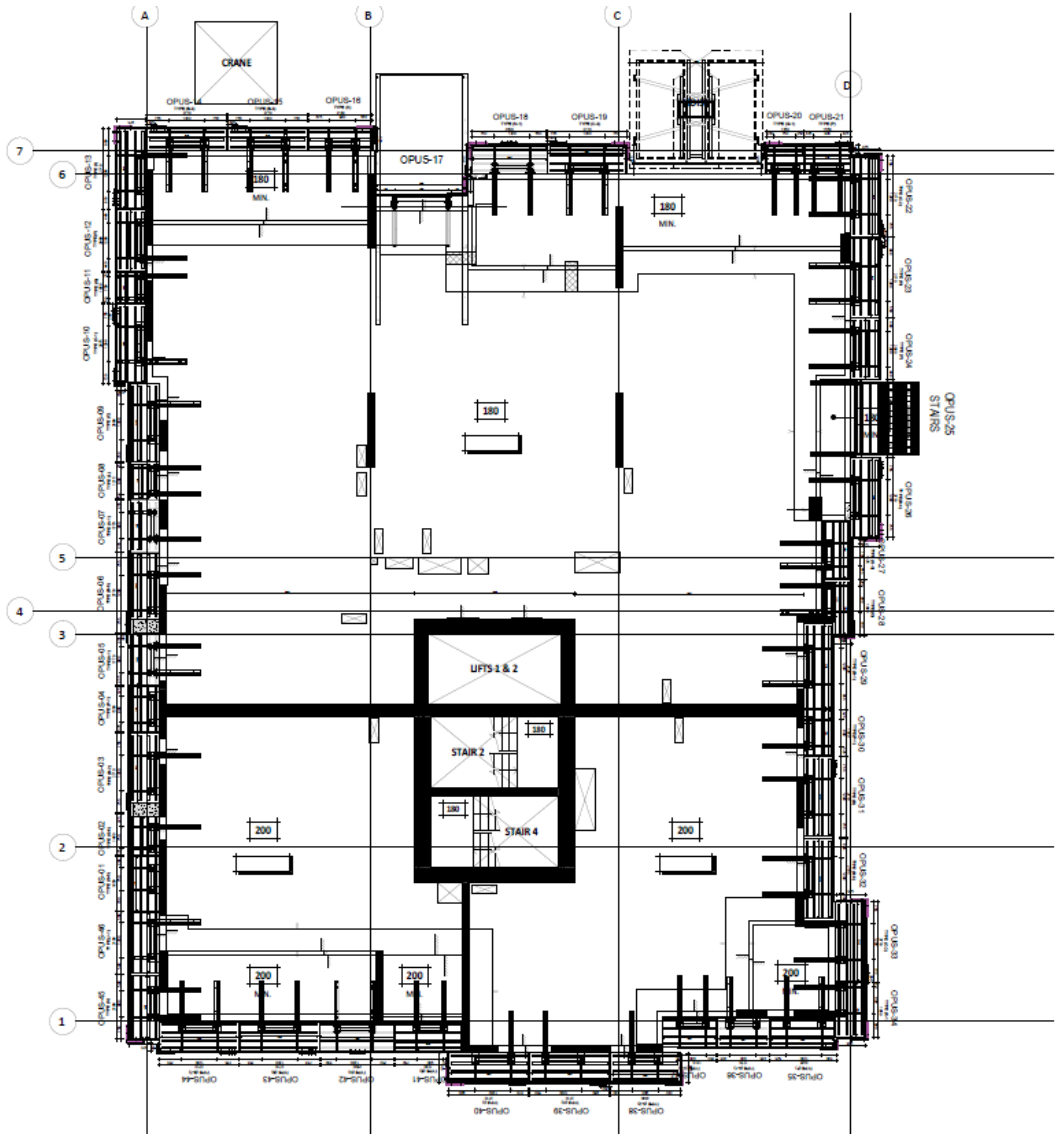


ACE
Advanced Construction Engineering

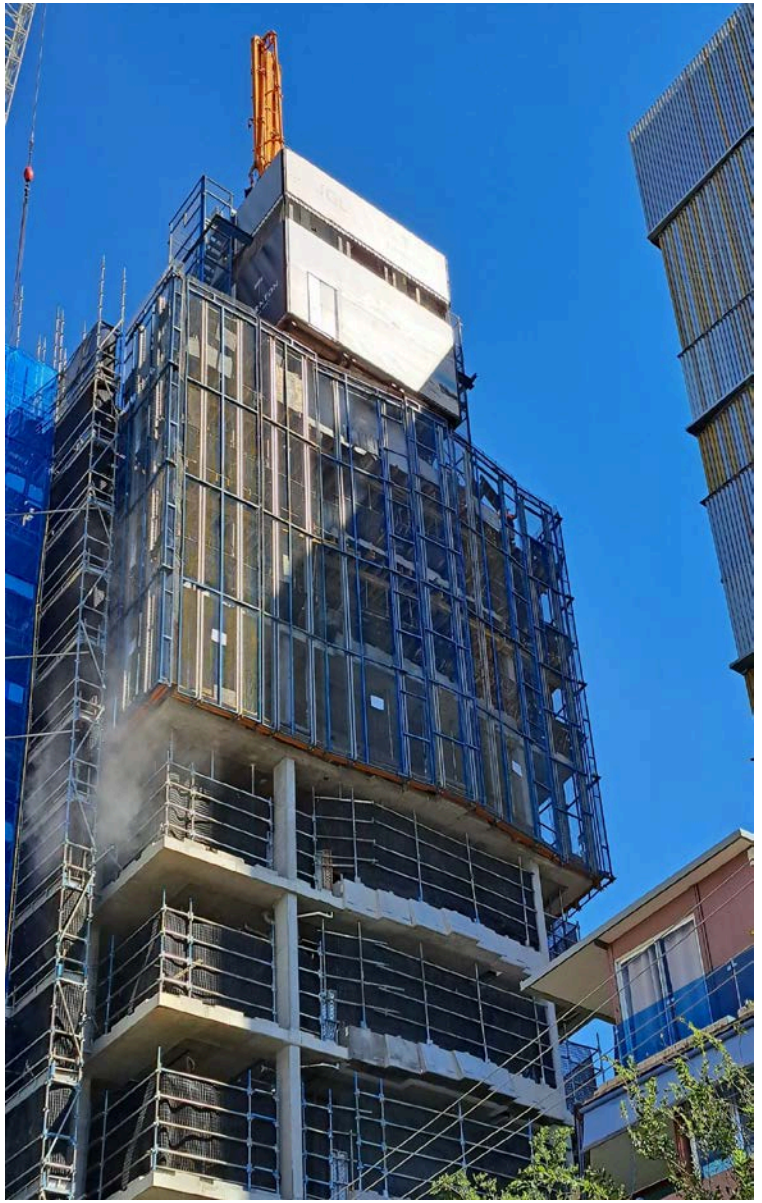
C.3 SCREENS:

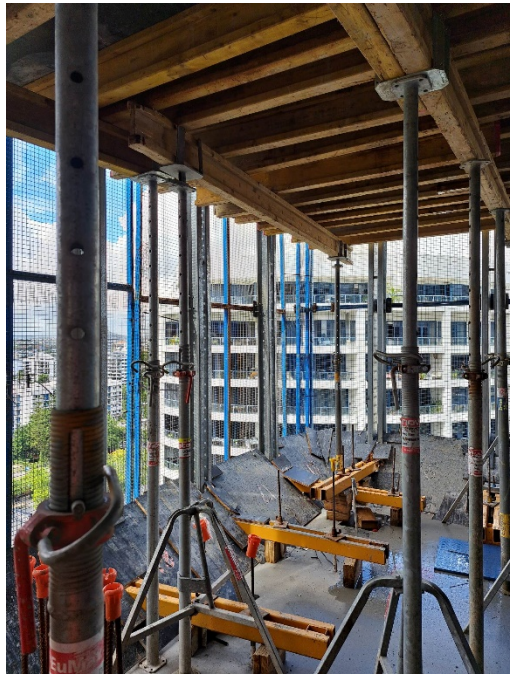


5) JUMP THE SCREEN ONE LEVEL
THEN REPEAT STEPS 5 TO 7



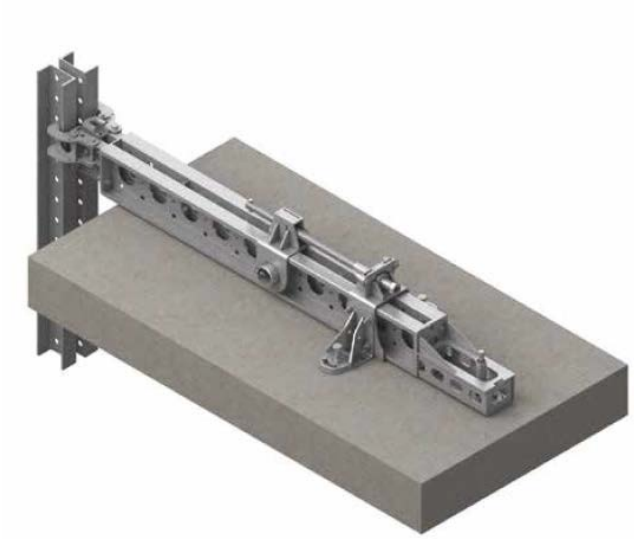
ACE
Advanced Construction Engineering





ACE
Advanced Construction Engineering

Standard unit
(upper ply decks, inner elevation, not shown for clarity)



ACE
Advanced Construction Engineering

- **OUR PROFESSIONAL PROGRAMS**


SAP2000


AUTODESK®
AUTOCAD®


PERI®


doka


AUTODESK
Revit


R·M·D
KWIKFORM


Trimble®


ACROW
Formwork Technology


Tekla®


RFEM
RSTAB
Dlubal


SGB


meva


ACE
Advanced Construction Engineering

- **WHY ACE?**

- Large percentage of repeat clients
- Team with proven and shared experience
- Key focus on delivering customer value
- Our straight forward design
- Methodologies focus on efficiency and safety
- Proven project performance to deliver program
- Significant time savings to program

ACE
Advanced Construction Engineering

- **OUR CONTACT**

linkedin.com/company/advanced-construction-engineering-Egypt

www.facebook.com/ACE.EGY.org

(+20) – 1220201461

info@aceegy.org

23 Albatrawy Street, Naser City, Cairo

ACE
Advanced Construction Engineering