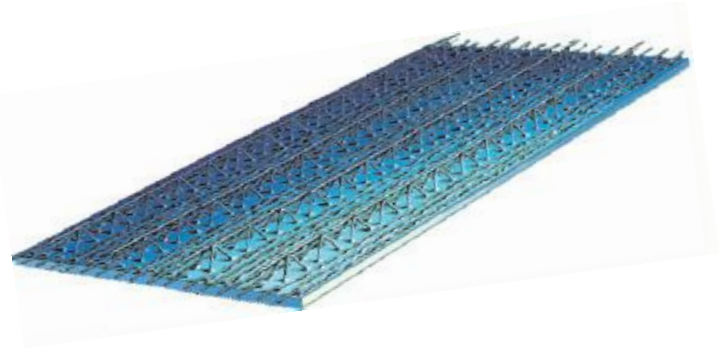
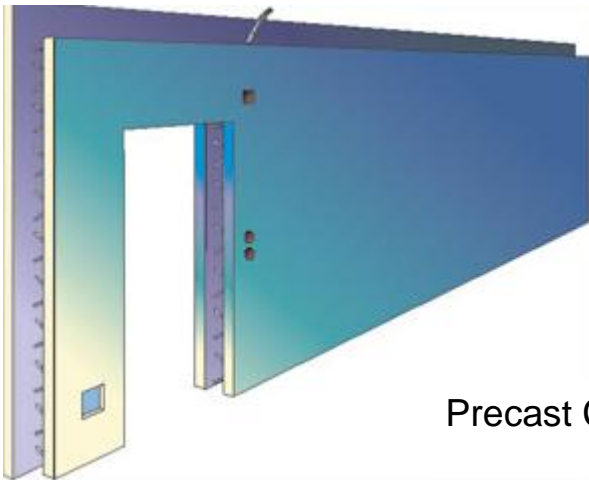


Precast Concrete Solutions for NEPAL



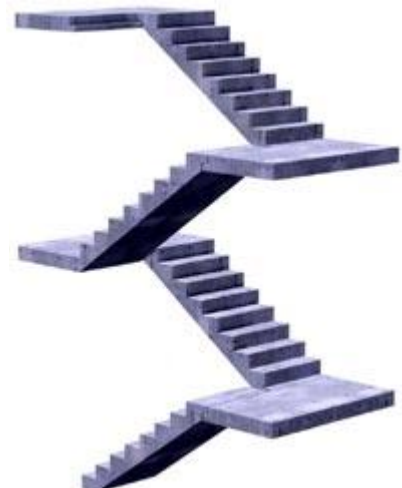
Precast Concrete Floor Slabs



Precast Concrete Walls



Stairs, erection and installation and various other Engineering and Architectonic Solutions



Precast Concrete Solutions for NEPAL

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Precast Concrete Elements

Precast Concrete is fast becoming the choice Building product worldwide thanks to its versatility, economy and speed of construction. Combining the strength and durability of concrete with the flexibility and aesthetics of precast elements, it is considered of one the most economical and attractive construction solutions available.

ICCL targets to introduce and to establish itself as the leading Precast Concrete production company in Nepal for the purpose to serve the local civil construction industry in execution of Real Estate Projects, Commercial Projects, Civil Engineering Projects or Infrastructure Projects in Nepal.

Only few building materials available today offer the economy, flexibility, and reliability of precast concrete.

Both, Architectural and Structural components have proven themselves in low-rise and high-rise buildings of all kinds, as well as Schools, Multi Storey Car parks, Villas, Boundary Walls, Drainage Systems and other structures.

Casting concrete in a factory or field factory allows the manufacturer to exercise precise control over all variables that affect its durability, strength, and appearance. ICCL will produces precast elements under strict quality assurance and quality control, complying with the ISO 9001 International Standard for Quality with the support of international management skills.

The carefully quality controlled conditions under which the concrete is moulded and cast ensures that the dense precast concrete components will have smooth surfaces that resist moisture penetration, fungus, and corrosion.

Fast construction means earlier completion. This, in turn, means earlier occupation or use is possible, and reduces the high cost of both on-site labour and interim financing. Factory production methods will also permit ICCL to vastly expand the design flexibility possible with precast. Custom form liners can be used to introduce reveals, patterns, and other architectural effects.

Variation of sands, cements and coarse aggregates, and the use of chemical and mechanical treatments, will result in striking rich and varied differences in colour and texture. Stone, tile or other masonry materials can also be cast into precast panels while still at the factory, enabling designers to achieve the look of a much more expensive material at a fraction of the cost.

Advantages

1. Factory Engineered products under strict quality control

Precast Concrete is made of cement combined with natural materials: coarse aggregate, sand, cement and water, all of which are produced in an environmentally friendly way.

Precast concrete production takes place under strict controlled conditions in a factory; as a result, better consistency of product quality can be achieved, together with safer working conditions and reduced impact on the environment.

2. High performance, quality and durability

Precast concrete elements are produced under strict quality controlled to the highest standards, ensuring their durability, strength and appearance.

3. Wide choices of finishes

Whether off-form, smooth or textured, with contrasting exposed aggregates, or slightly etched and pigmented, precast concrete surfaces finishes offers a rich and varying array of possibilities, allowing greater freedom and creativity.

4. Flexibility of forms and shapes

With Precast Concrete, architects and designers can full reign to their imagination allowing all sorts of decorative patterns, reveals, cornices, recesses and curvatures in their design.

5. Superior heat and sound insulation

Precast Concrete sandwich panels, with their dense concrete and incorporated middle insulation layer, offer a far superior heat and sound insulation than traditional construction systems, which means substantial energy savings and healthier environment.

6. Economy and speed of production

Precast concrete elements are mass produced with minimum manpower in the shortest possible time. Their remarkable qualities: Strength, durability and Insulation offer significant cost savings in construction cost, energy consumption and later maintenance costs.

7. Fast and efficient installation

The use of standardized Precast Concrete elements contributes to efficient and fast installation, significantly reduced construction time.

Assembly of large and complex components can be carried out easily and quickly, producing little or no dust, noise or waste, as well as giving a faster return on investment.

Moreover, good quality control in the factory prevents unnecessary delays, and just-on-time deliveries reduce the need for storage at the construction site.

**In addition to the advantages listed above,
Pre-stressed Precast Systems *offer the following added features:***

1. Light economical construction

Pre-stressing and High Strength concrete make it possible to use less material to achieve similar load-bearing capacity and, hence, make substantial cost savings in both reinforcement and concrete. Reduced section sizes lead to lower dead loads and can improve transport efficiency.

2. Long spans

Pre-stressing of the Precast elements means longer and more efficient spans, allowing large, open spaces and reducing the number of columns and beams in the structure.

3. High load capacity

Precast pre-stressed elements can carry much heavier loads as compared to normal reinforced concrete structures, which makes them ideal for heavy load bearing structure such as tunnels, bridges, car parks, reservoirs, etc..

4. Minimum propping and scaffolding:

Precast pre-stressed elements need very little propping or formwork, leading to cost saving and greater access all through the work areas.

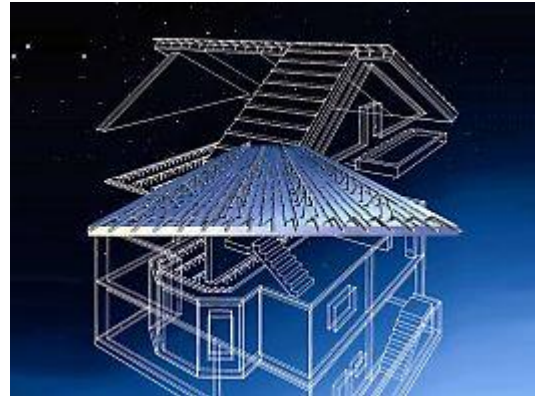
**No matter what type of project you are interested in,
Precast Concrete is demonstrating its superiority.**

**Combining quality, economy, speed, and flexibility,
it is the building material of choice.**

Floor Slab Elements

The element slab is a precast concrete slab with a statically supporting in-situ concrete layer according to DIN 1045 (German Standard), chapter 19.7.6.

The 4 to 6 cm thick, prefabricated concrete element contains a reinforcement in form of a braced girder (Lattice Girder) which is necessary for the assembly rigidity as well as the bending tensile reinforcement lengthwise and crosswise which is necessary for the assembly and the final state.



All later cutouts, slab cutouts, electrical boxes, drip noses, biases, mounting parts etc. are considered.

The prefabricated slab element serves as formwork during the construction phase and is, after depositing and hardening the in-situ concrete, jointly carrying as bulk cross section.



The prefabricated element contains, in form of the braced girders, the compound and pushing reinforcement which is necessary for the final state.

In the final state, after hardening the in-situ concrete, the prefabricated slab with a statistically supporting in-situ concrete layer is like a monolithically fabricated reinforced concrete slab.

The statistically and constructively countable interaction of the precast element and the in-situ concrete is guaranteed by the specifically roughened surface during the element production, which guarantees an optimal adhesion between element and concrete layer.

The inserted compound and pushing reinforcement in form of braced girders ensures the interaction. By the CAD/CAM design of this system all statistically required reinforcements and constructive details are executed according to the norms and registrations.

Therefore all different kind of plans and weight loads are economically possible by a specific prefabrication.

In the final state there are, from the technical point of view, no differences to the monolithically fabricated slab. By the equality of the precast slab with statistically supporting in-situ concrete layer and the in-situ concrete slab the requirements for, Fire signaling,

Thermal protection and Sound proofing are identical. The valid regulations are applicable on element slabs without any difference.

The major advantages:

1.) No formwork required

Extensive time consuming works for providing, installation and dismantling of formworks are not required.

2.) No lower slab reinforcement

The entire lower part of the slab reinforcement is already installed in the 5 – 7 cm thick precast concrete slab. Only the placing of joint reinforcement and upper layer slab reinforcement is required.

The lattice girder is functioning as the spacer for the upper reinforcement.



3.) No plastering required

The precast slabs will be produced on steel pallets. The smooth downside of the slab does only require minor level out of the joints with appropriate joint filler. The slab soffit can be painted immediately.

4.) Low weight

The precast slab weight will be in a range of 125 kg/m² in can be placed with a ordinary mobile crane or tower crane as site conditions will permit.

5.) Every structural / statics system possible

By the in-situ concrete layer different deflections of the precast slabs will be avoided. In the final stage the system (precast slab element with in-situ part) will perform like a conventionally executed in-situ slab. Hence various / every structural system whether 1 span, 2 span or more, even crosswise is possible.



Savings / Advantages for Developer, Owner and Civil Construction Companies

- Time and costs savings at material for formwork and supports (propping) and its installation compared to, if slabs would be executed as entire in-situ slabs.
- Time and cost savings due to reduced installation time of lower slab reinforcement.
- Time and costs savings due to no requirement for plaster of slab soffit.
- Earlier completion of the Project, hence earlier usage possible and earlier financial recoveries.

Double Wall Elements

The double wall consists of two at least 5 to 7 mm thick wall shells made of reinforced concrete, which are combined with each other by means of braced girders. An empty space remains between the shells of at least 7 cm. The shells of the elements get the required main and cross reinforcement according to the structural requirements. This reinforcement is already installed.

After assembly of the precast segments the double wall elements can be poured with in-situ concrete. As soon as the in-situ core is hardened, the total cross-cut has the effect of a monolithically manufactured in-situ concrete wall.

All additional components like cellar windows, fire retardant doors, door frames, electrical wiring conduits and splitting boxes etc. can be installed at the factory.



General advantages of the system

- The double wall has the effect of a homogeneous in-situ concrete wall.
- The components are delivered "just-in-time"
- No investment costs for formwork
- Wage costs are considerably lower
- Formwork transport, as well as erecting and dismantling the formwork is superfluous
- The fast progress in construction makes it possible to keep the pre-financing costs much lower
- The double wall needs no plaster work
- Pre-casting takes place in work sheds and therefore weather conditions are irrelevant
- No time limits for dismantling of formwork
- Less construction site equipment and materials
- Smooth formwork surface, immediately ready to be painted and papered from inside and outside, no plaster required

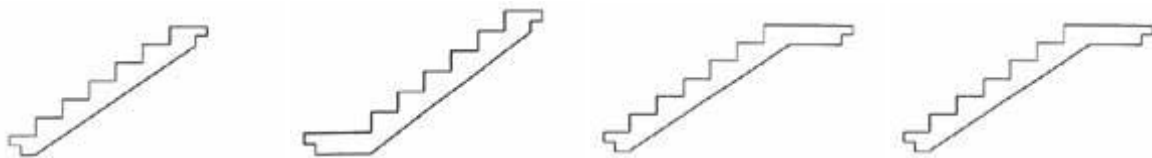


Linear Stairs

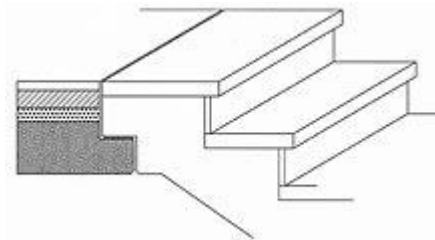
- up to 20 steps per linear stair
- step heights of approx. 15 to 22 cm depending on in-situ project situation and storage levels
- variances in stair heads from approx. 21 to 32 cm
- width up to 2.50 m
- thickness of stair slab from approx. 12 to 25 cm



Various linear forms with stair tops or stair starter possible



Connections to floor slabs variable

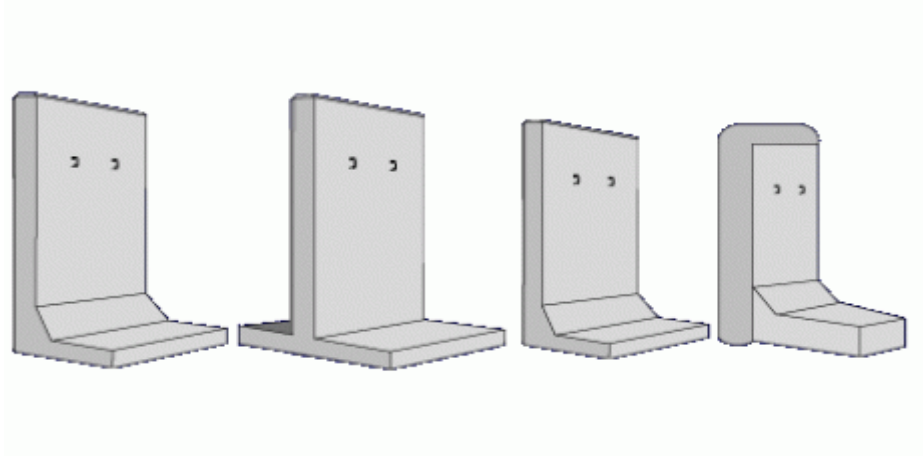


Major advantages

- Delivery "just-in-time" No investment costs for formwork
- Wage costs are considerably lower
- Formwork transport, as well as extensive time for erecting and dismantling the formwork is superfluous
- Immediately useable as access to the floors under construction
- No plastering on stair slab soffit required, can be painted immediately.
- The fast progress in construction makes it possible to keep the pre-financing costs much lower

Retaining + Support Wall Elements

A product range out of L – shape or T – shape retaining + support wall elements useable for a variance of applications in project like road construction, garden- and landscaping, etc..

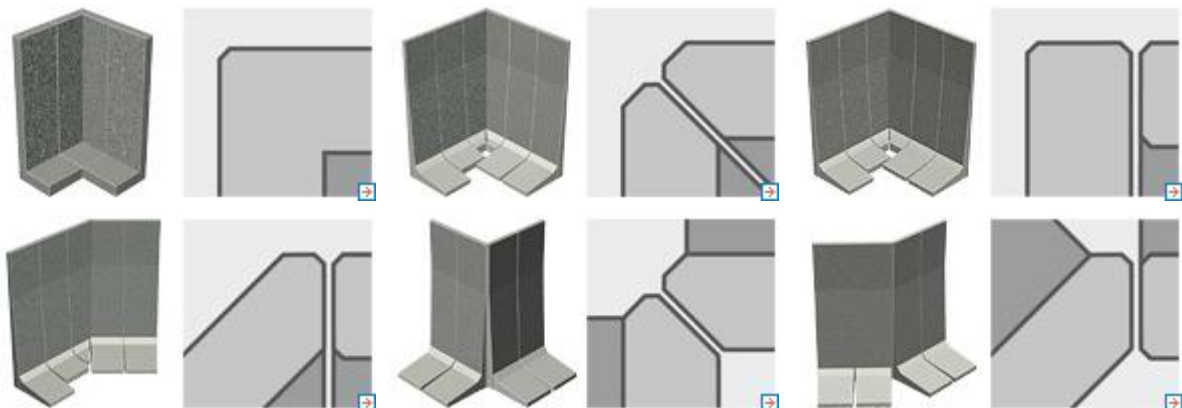


Load performance + Wall thickness

Individual execute able, as per Project requirements. Wall thickness from 10 cm.

- Exposed concrete surface either smooth, sand-blasted or with texture as per clients wish.
- Concrete grades as per structural requirements
- Color, concrete grey or alternative as per clients wish.

Various corner joints possible



Examples for Application



Commercial and Real Estate



Industrial Projects



Road- and Bridge Construction

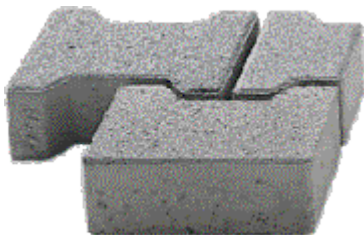
Other various Precast Solutions as per Client's requirements

1.) Architectonic Solutions for external Real Estate Surroundings and Landscaping

1.1) Fencing and natural slope creation / protection



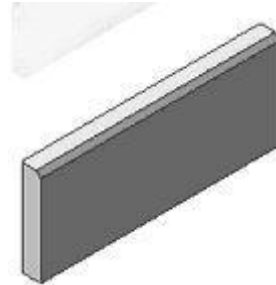
1.2) Variations of Pavements



1.3) Variations of Kerbstones



L = 100 cm, H = 25 cm, T = 5 cm
T = 8 and 10 cm



L = 100 cm, H = 20 – 30 cm,

2.) Individual Civil Engineering requirements

2.1) Columns and Beams for Industrial Projects



2.2) Girders for Bridge Construction pre-stressed or ordinary reinforced



Cost Comparison of Building Systems:

"Pre Cast Parts" against "In Situ Concrete"

Based on European Prices because no comparison in Nepal available yet.

Production Cost

Pos.	Name	Filigree Slab 1 m ² Price in Europe	Double Wall 1 m ² Price in Europe	Solid Wall 1 m ² (150 mm thick) Price in Europe
A	Concrete	2,15 €	4,35 €	6,53 €
B	Reinforcement (10kg/m ²)	3,10 €	3,10 €	3,10 €
C	Helping Material	1,10 €	1,50 €	2,00 €
D	Inserts (e.g. Door and Window frames)	-	-	5,00 €
E	Energy Cost	0,25 €	0,50 €	1,00 €
F	Maintenance	0,60 €	0,80 €	0,55 €
G	Heating system	0,10 €	0,20 €	0,30 €
H	Labour Cost Production	3,20 €	6,50 €	10,00 €
I	Labour Cost Office	0,50 €	0,70 €	1,00 €
J	Principal and Interest	2,25 €	2,25 €	2,25 €
K	Administration	0,35 €	0,35 €	0,35 €
Production Price of one m ²		13,60 €	20,25 €	32,08 €

Transport of the Elements

Name	Filigree Slab	Double Wall	Solid Wall (150 mm thick)
L Load on one Truck (25.000 kg)	140 m ²	80 m ²	60 m ²

Building Site

Construction Type	Factory Required time in man hours per squaremeter	Building Site	Total
M Bricks / Cast In Place	0,05	3,00	3,05
N Pre cast parts	1,00	0,25	1,25

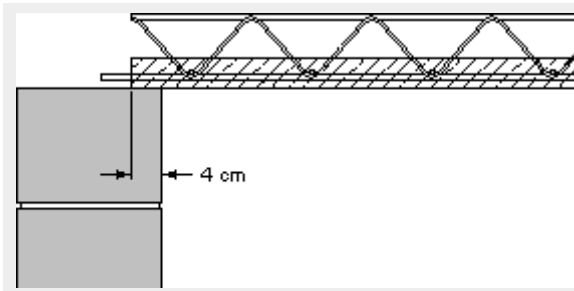
Work on the Building Site

In Situ Concrete	Action	Time	
		In Situ Concrete	Pre Cast Parts
Errction of the Outside Formwork	Mounting of the Wall Element	1	1,2
Reinforcements, Inserts	Reinforcement for the Connection	1	0,2
Errction of the Inside Formwork		1	-
Placing the Concrete		1	-
Treatment of the Concrete		1	-
Placing the Formwork for the Floors	Mounting the Floor Elements	1	0,33
Lower Reinforcement in the Floor	Reinforcement for the Connection	1	0,2
Placing the Concrete on the Floor	Placing Concrete (Wall and Floor)	1	1,7
Removing the Formwork	Removing the Supports	1	0,2
Follow up Treatment	Follow up Treatment	1	0,2
		10	4,03

1 = 100% of the Work Time by in Situ Concrete

Construction Details of Precast Slab Elements

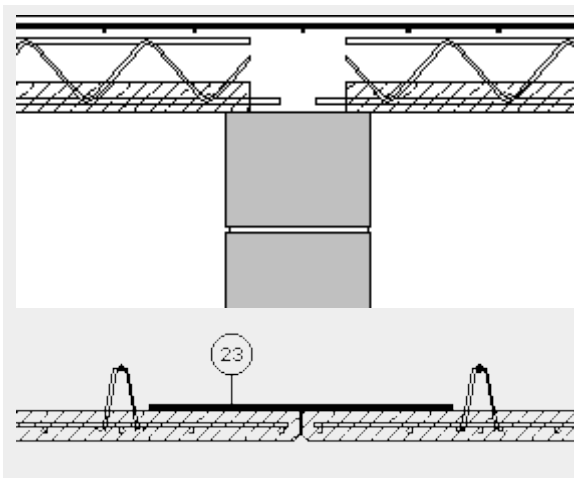
1.) Ordinary Support at Brickwalls or Concrete Walls



The Element of the Precast Slab are simply to be placed on the even / smooth upper wall surface.

Commonly the support depth is 4 cm.

2.) Joints of Elements

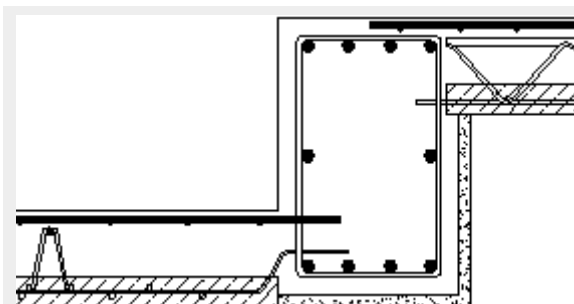


In longitudinal direction the slab elements are joining on walls, girder, support beams, etc..

These joints will be connected with a upper reinforcement as per structural requirements.

In cross direction the slab elements are joining together. The joint as such will be connected with a joint reinforcement.

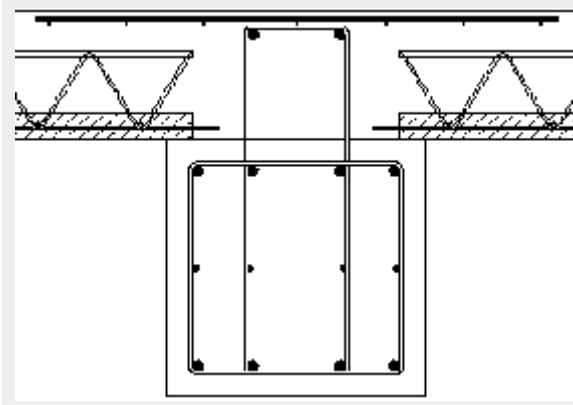
3.) Elements at in-situ girders / beams



The Elements can be connected without any problem to any in-situ concrete part (e. g. in-situ girders, beams, etc..)

As temp. Support the formwork used for the in-situ concrete part can be used.

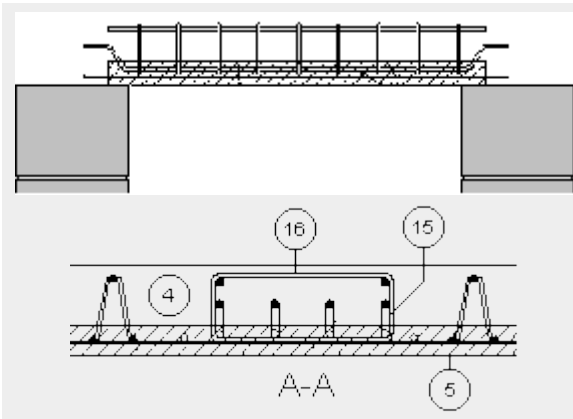
4.) Elements at already casted girders / beams



The support of the Elements at already casted girders / beams are the same as at walls.

The monolithic connection of the in-situ part of the slab will add to a optimum of utilization of reinforcement and concrete.

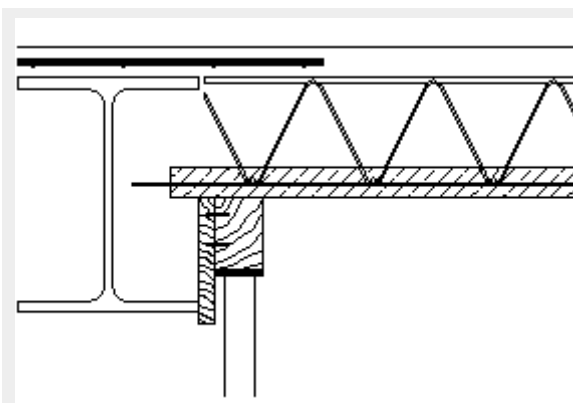
5.) Extraordinary Load Cases



For extraordinary structural forces to be considered, e. g. point loads or linear loads, the related reinforcement can already being installed and placed at the concerned slab areas.

Cutting, bending and placing of reinforcement on site is not necessary anymore.

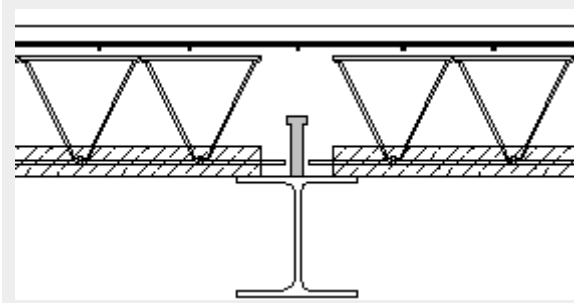
6.) Support of Elements at steel beams



The slab element will be adjusted to the correct height by props and timber.

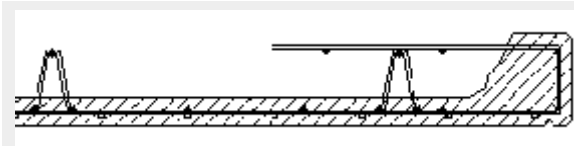
At the timber the formwork blank can be fixed for closing the gap at the steel beam.

7.) Elements used at composite construction



Support of the slab element like at walls and beams.

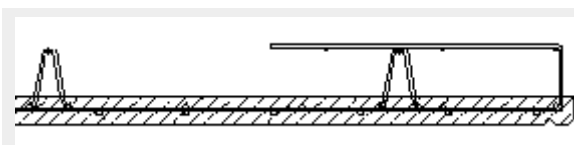
8.) Elements with finish edges



The slab elements can be poured in the factory at it's edges already to the final thickness. For example at cantilever slabs.

Expensive scaffolding works and formworks are not required.

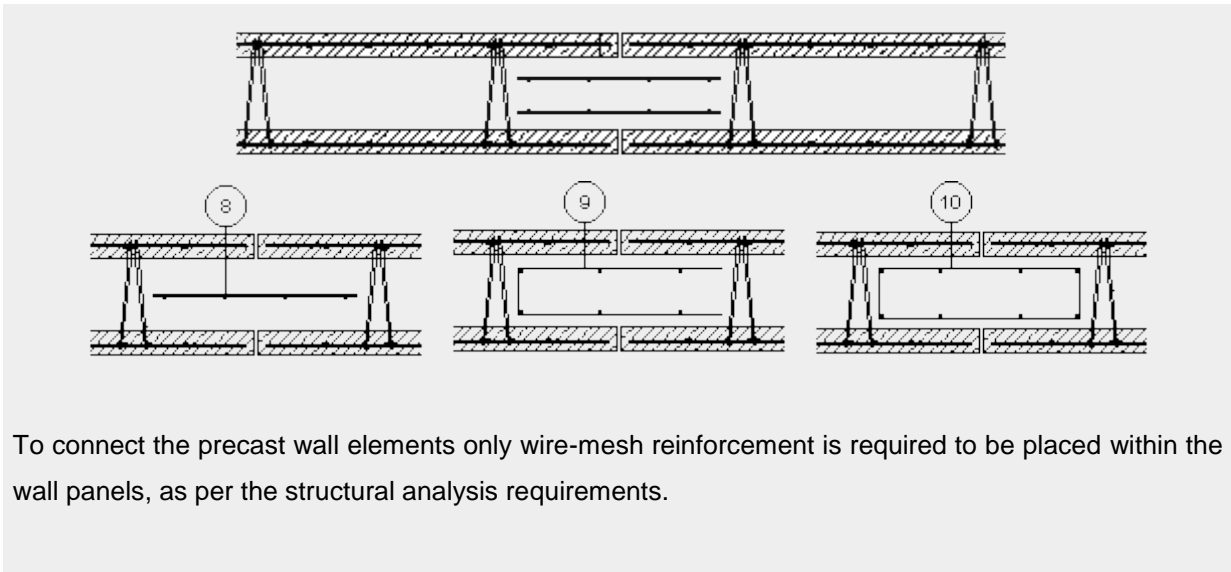
9.) Individual Cases



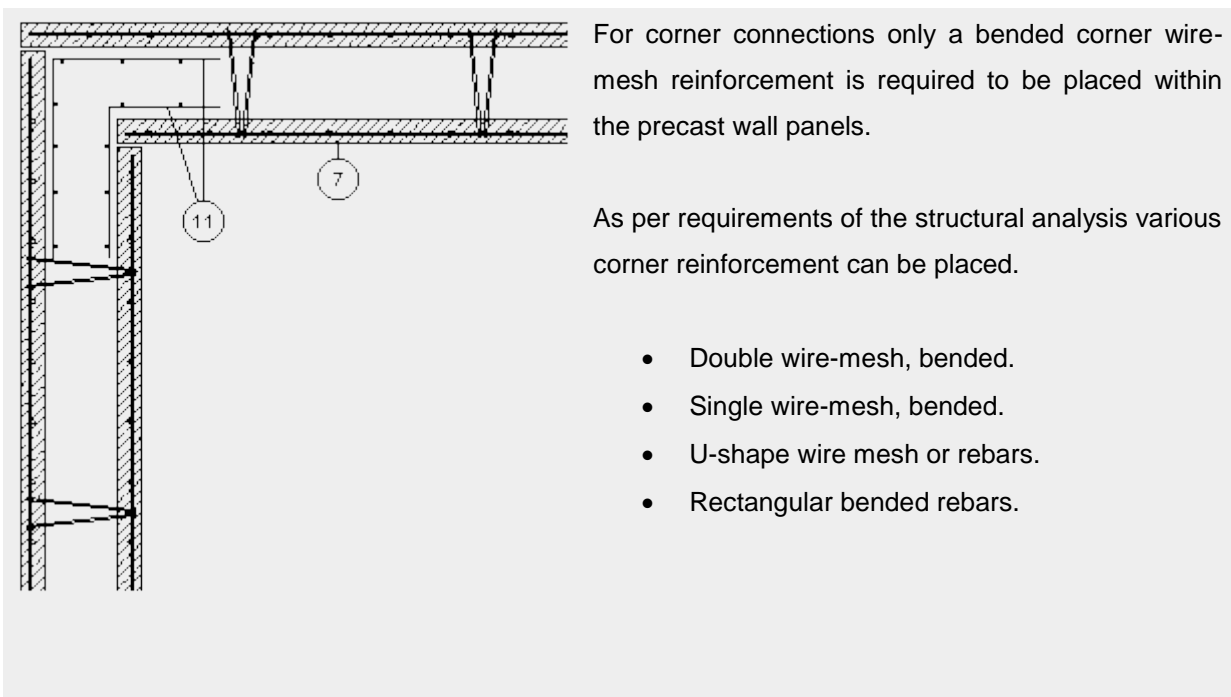
Nearly each individual case can be already planned and executed in the factory, e. g. dripping noses, etc., etc..

Construction Details of Precast Wall Elements

1.) Wall Joint in longitudinal direction

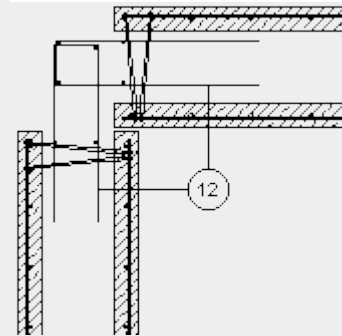
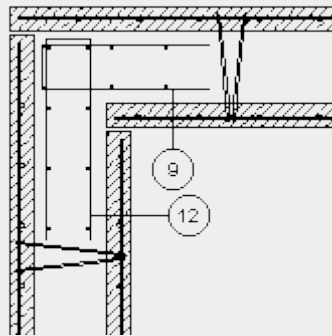
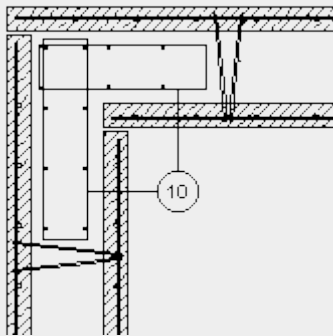
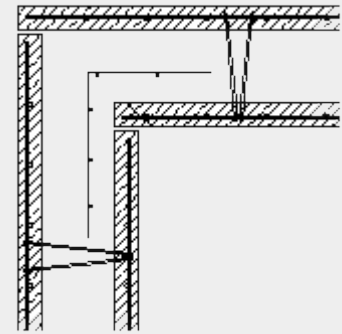


2.) Corner Joints

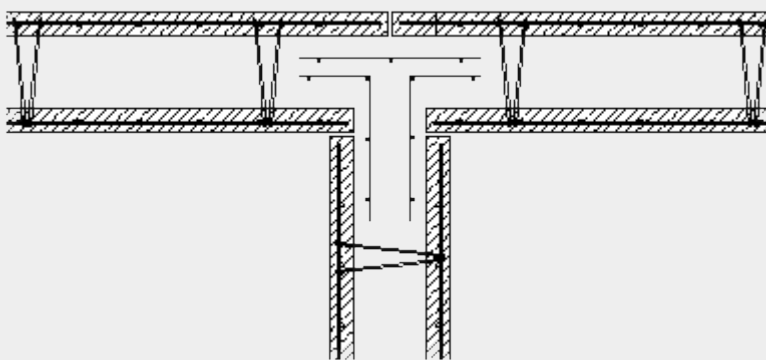


If extraordinary reinforcement is required the concerned joint can be left open.

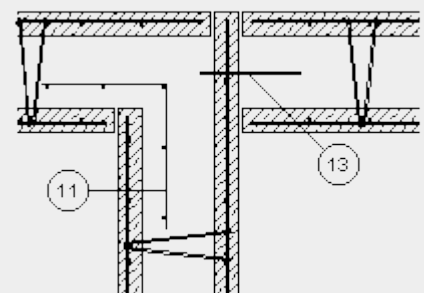
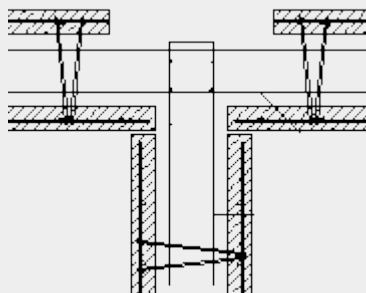
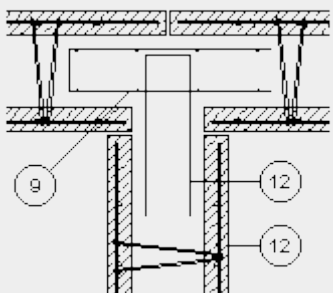
After placing the reinforcement the corner will receive it's formwork and poured in-situ.



3.) T- shape corners



Various T-shape corner joints are possible. Reinforcement being placed as per structural analysis requirements.

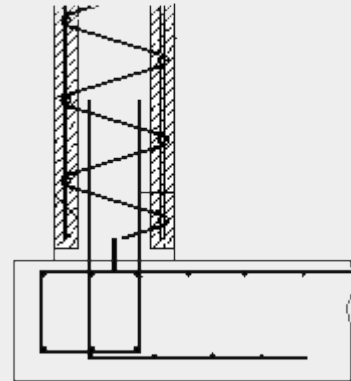


4.) Connection to Foundationslabs

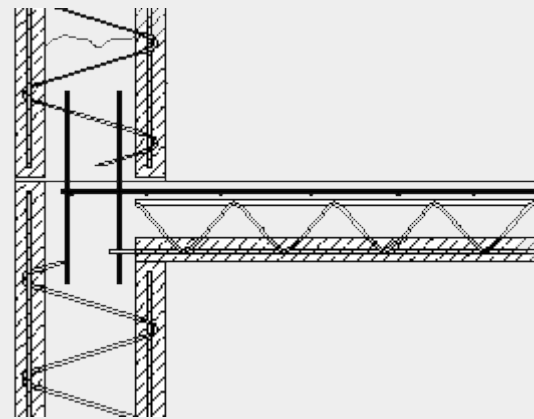
To allow for an appropriate connection between wall elements and foundation slab in connection with the bending-moment a gap between top of foundation slab and lower part of wall element of approx. 3 cm shall be provided.

The gap shall be properly filled and compacted while pouring the in-situ concrete between the wall panels.

If necessary water stops can be installed within the wall panels.



5.) Floor by Floor



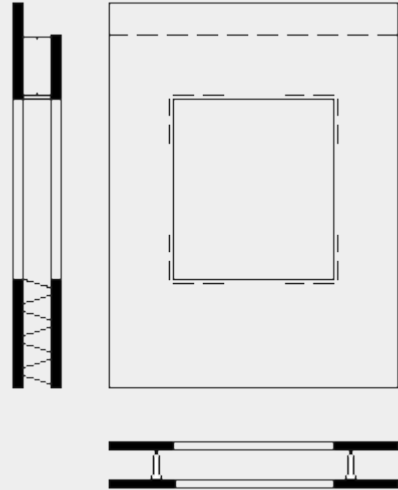
Precast Slab Elements can be directly supported by the Precast Wall Elements and connected together by pouring in-situ concrete between the wall panels.

6.) Block-outs for Windows

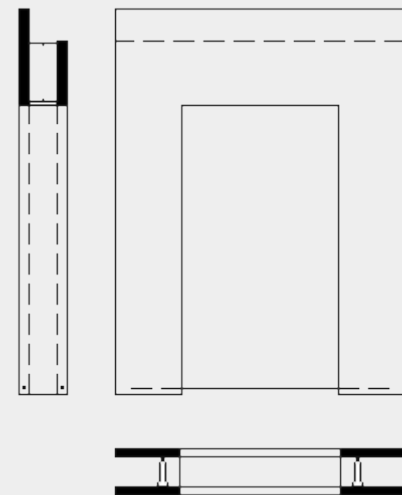
Various sizes for block-outs, e. g. for windows can be already executed with the precast wall element.

Block-out formwork can be already pre-installed in the precast element and left in place for pouring the in-situ concrete between the wall panels.

Same applies for possible required reinforcement above and around the block-outs.

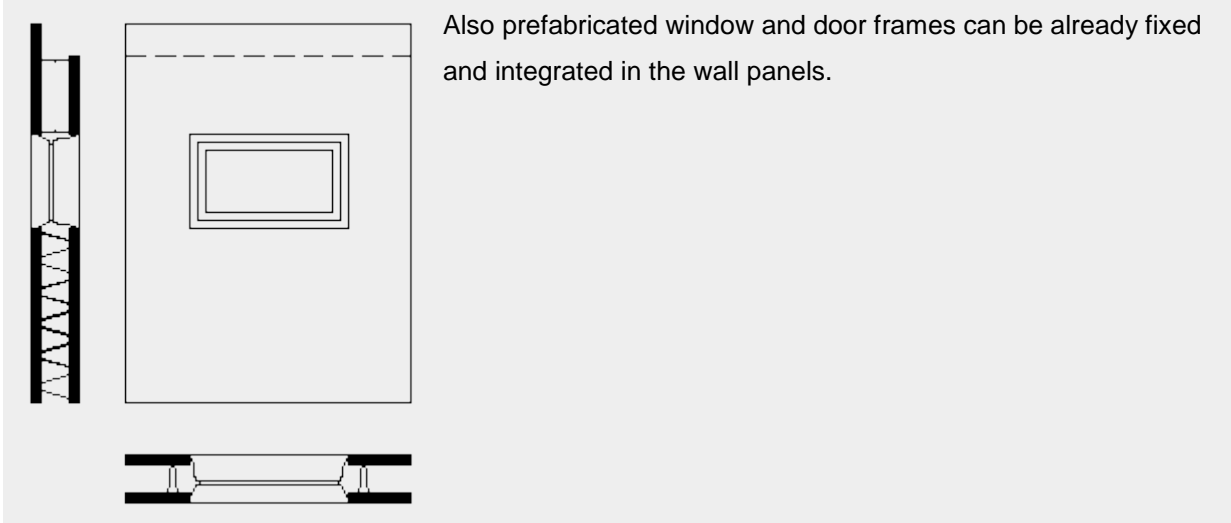


7.) Blockouts for Doors



The same what applies for window block-outs is valid for door block-outs.

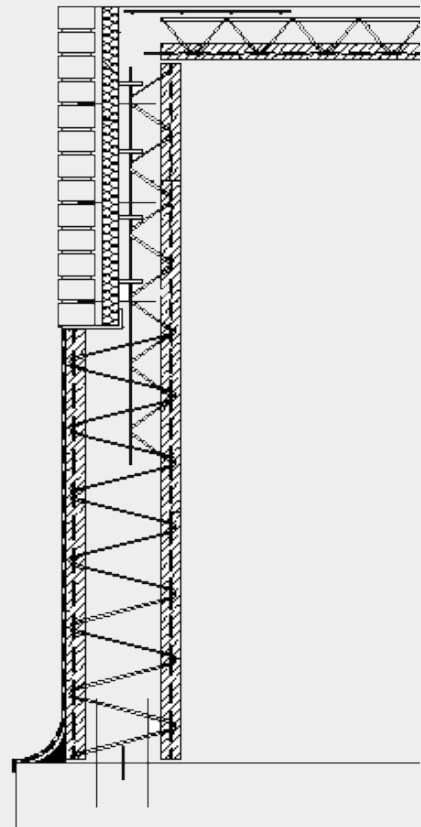
8.) Pre-fixed Window- and Door Frames



9.) Various construction / design possibilities.

Various design and construction details can be foreseen and integrated in the precast wall element solutions.

Individual solutions can be discussed in advance prior to final design decisions.



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ICCL is a leading Nepalese company providing a wide range of general construction services in Nepal.

ICCL offers a unique blend of local and international knowledge, innovation and technical excellence that enhances and sustains the built, natural and social environment – and creates a better world in which to work and live.

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