



# skyrail

mono-directional slabs system



- REUSABLE
- MODULAR
- RESISTANT







## SKYRAIL VISION

*By wisdom a house is built, and through understanding it is established.*

*(Book of Proverbs, Old Testament)*

## GEOPLAST INVITES YOU TO DISCOVER THE POWER OF LIGHTNESS, BUILDING WITHOUT WASTING THE SOURCES NATURE OFFERS

To live in a safe, healthy and comfortable house, resistant to dangers is not a dream, today this is possible!

All you have to do is choose the right ally: ABS. This is an extraordinary material that makes the structure light and solid at the same time. These characteristics will make a lot of differences in the case of an earthquake.

ABS, does not absorb water as other materials used in traditional building do, so it does not even release humidity over time: your house remains dry and comfortable.

Moreover, it is a recycled material that does respect Nature.

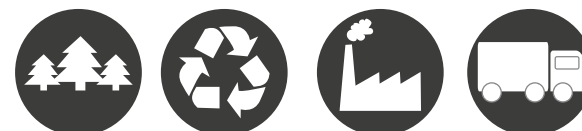
Geoplast S.p.A. in Green Building Council Italy,  
the Network for Eco-friendly Building.



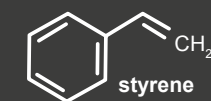
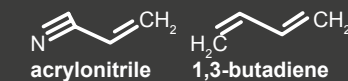
## SKYRAIL FORMWORK IN TECHNOPOLYMER

**SKYRAIL** reusable formwork allows the creation of ribbed mono-directional slabs without elements between the ribs. The result is a reduction of the slab's weight with consequent advantages for beams, pillars and foundations. It also creates a technical room for the pipes.

The weight reduction improves the structure seismic behaviour, because the seismic mass of the building is reduced too.



## Why ABS (Acrylonitrile Butadiene Styrene)



High mechanical resistance •

Shock absorption capacity •

Resistant to high temperatures •  
(-30°C / + 70°C)

High surface quality •

Recyclable material •



# SKYRAIL ADVANTAGES



Reusable formwork system  
to build mono-directional slabs

## technology



**SKYRAIL** system allows  
the slab's lightening  
without any material  
between the ribs

## lightness



The elimination  
of the typical  
lightenings allows weight  
reductions and a reduced  
load over beams, pillars  
and foundations

## reuse



ABS plastic allows an  
easy removal of the  
formwork for later use

## seismic mass reduction



The elimination of the brick  
elements allows the slab's  
weight reduction and the  
obtainment of huge seismic  
advantages

## technical empty



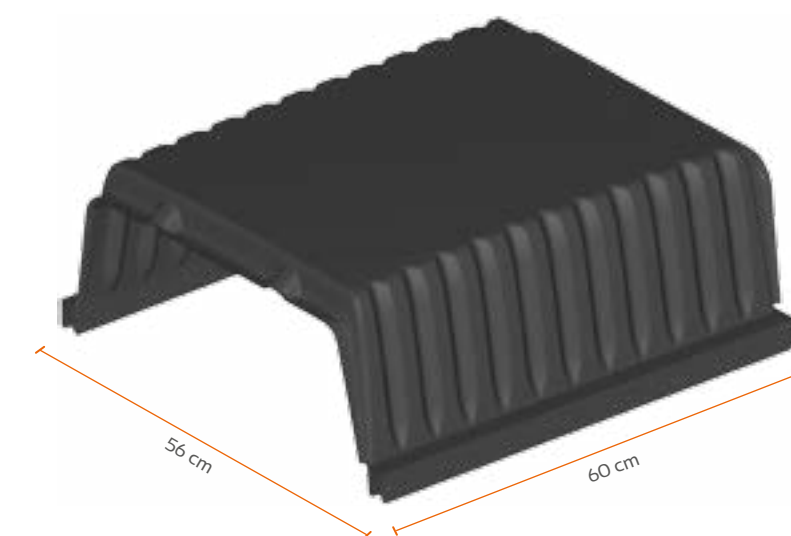
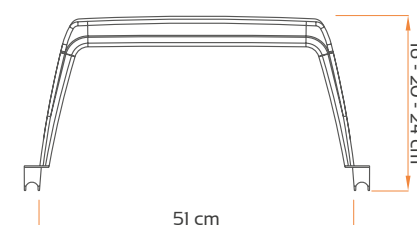
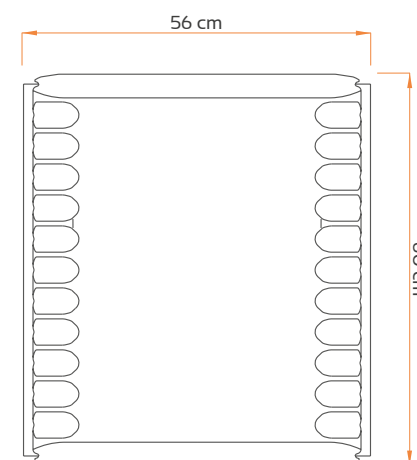
The empty which  
was created with the  
lightening of the structure, can  
be used as a technical room to  
place the pipes

## handling



The system's elements  
are very light and easy to  
handle, guaranteeing the  
workers safety

# SKYRAIL THE DOME



### SIZE

Base	60 x 56 cm
Heights	16 - 20 - 24 cm

### SKYRAIL MATERIAL

Acrylonitrile Butadiene Styrene	ABS
Coefficient of thermal expansion	0.05 mm/m/°C

## SKYBLOCK



THE CLOSURE ELEMENT THAT  
GUARANTEES THE SINGLE POUR OF BEAMS AND SLAB

Light and handling  
Walls compensation  
Resistant and reusable

MADE OF ABS, THEY CAN EASILY BE CLEANED WITH WATER BEFORE BEING REUSED

Elements e accessories

# DIMENSIONAL TABLES

Real size (cm)  
material  
weight (kg)  
Packaging size (cm)  
no. pcs. per pallet


<b>SKYRAIL H16</b>
56 x 60 x H16
ABS
2.45
110 x 125 x H230
208


<b>SKYRAIL H20</b>
56 x 60 x H20
ABS
2.69
110 x 125 x H232
204


<b>SKYRAIL H24</b>
56 x 60 x H24
ABS
2.92
110 x 125 x H235
200

Real size (cm)  
material  
weight (kg)  
Packaging size (cm)  
no. pcs. per pallet


<b>MINI SKYRAIL</b>
26 x 30 x H16
ABS
0.71
80 x 120 x H230
650


<b>MINI SKYBLOCK</b>
14.4 x 20.8 x H13
ABS
0.29
100 x 120 x H233
650

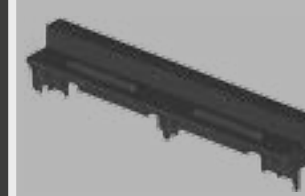
Real size (cm)  
material  
weight (kg)  
Packaging size (cm)  
no. pcs. per pallet



<b>SKYBLOCK H16</b>
50.4 x 37 x H13
ABS
1.15
100 x 120 x H230
420


<b>SKYBLOCK H20</b>
50.4 x 37 x H17
ABS
1.32
100 x 120 x H233
420


<b>SKYBLOCK H24</b>
50.4 x 37 x H21
ABS
1.51
100 x 120 x H235
420

Real size (cm)  
material  
weight (kg)  
Packaging size (cm)  
no. pcs. per pallet


<b>BEAM T</b>
16 x 60 x H12.4
ABS
1.06
100 x 120 x H220
300

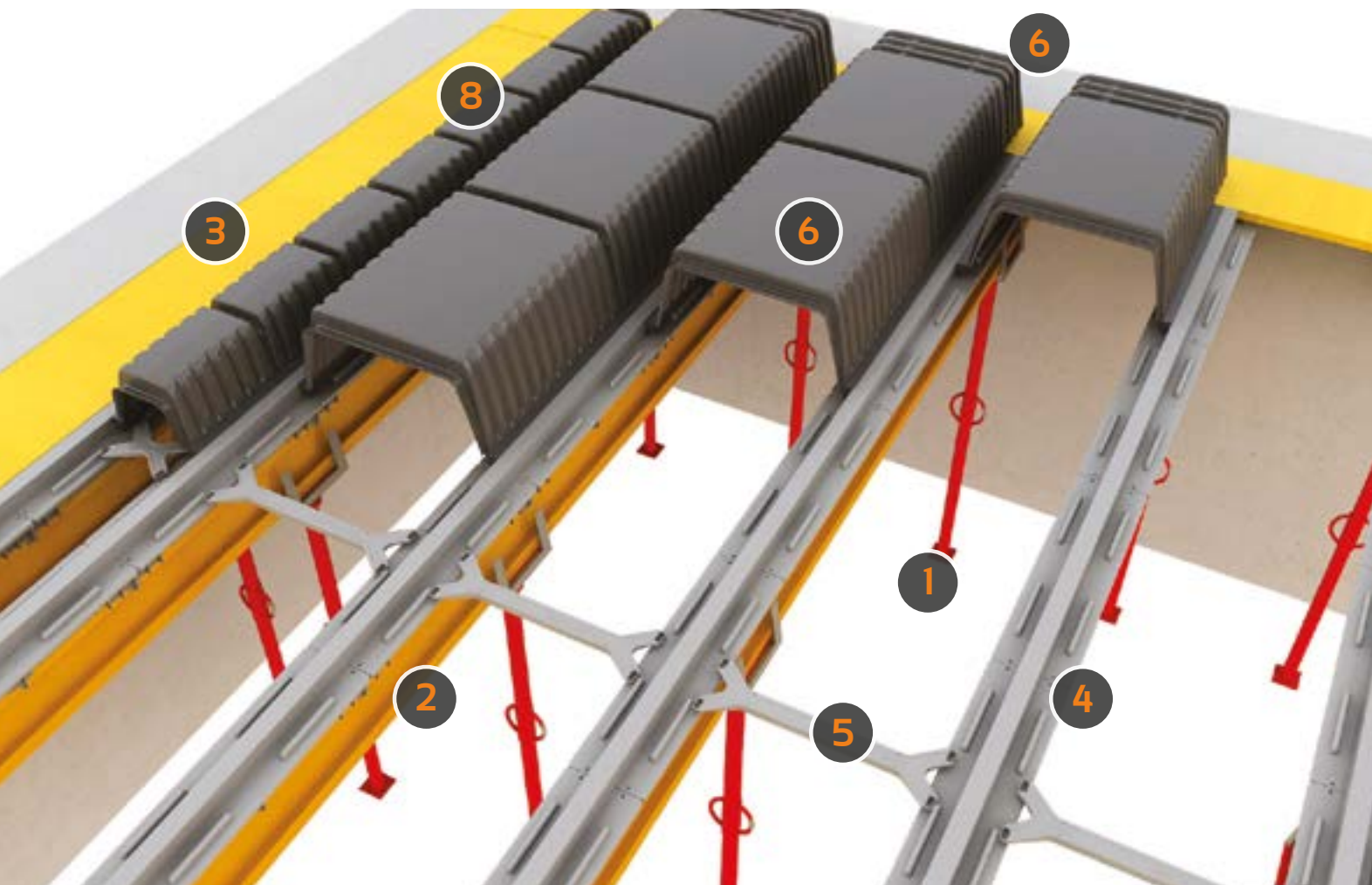

<b>SPACER SK30</b>
30
ABS
0.09
SACCO


<b>SPACER SK60</b>
60
ABS
0.18
SACCO



# COMPONENTS AND ACCESSORIES

**SKYRAIL** is a complete system that covers all the worksite needs. Thanks to its complete range of accessories, it allows both side and longitudinal compensations. The shoring is extremely easy using props and reinforced beams.



① SUPPORTING PROP

② WOODEN BEAM

③ WOODEN COMPENSATION

④ SKYRAIL BEAM IN ABS

⑤ SPACER

⑥ SKYRAIL DOME IN ABS

⑦ SKYBLOCK CAP

⑧ MINISKYRAIL + MINISKYBLOCK



## Reusable formwork for slabs

**SKYRAIL** is a reusable formwork system that allows the building of mono-directional slabs with many advantages: structural, weight reduction; on the worksite, easy and safe installation;

building advantages, creation of a technical empty between the slab's ribs. The system is completely walkable and guarantees the workers safety.

**Safe working**  
Creation of a technical room  
Reusable formwork







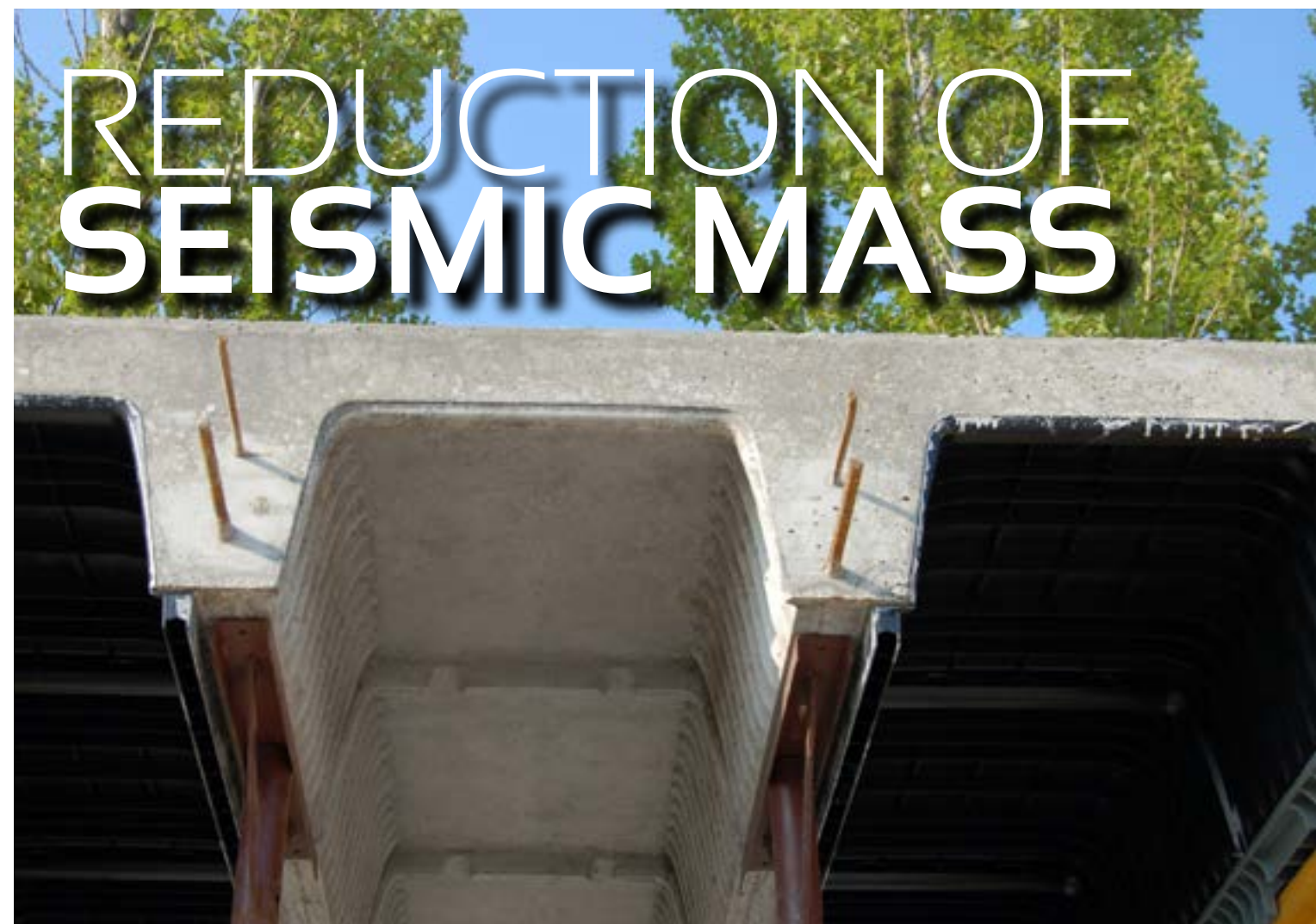
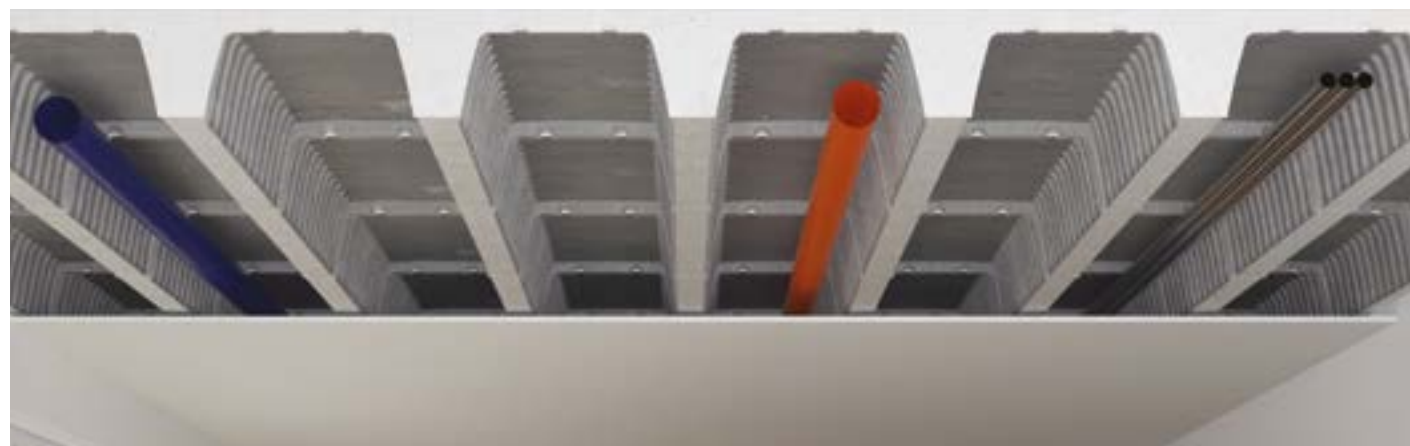
# TECHNICAL ROOM

## Pipes passage

In the technical empty of **SKYRAIL**, it is possible to place the pipes (plumbing and electrical systems). The intrados needs to be combined with a ceiling to have a flat finishing; the ceiling system allows the simplifi-

cation and the modification of the light spans location to make easier a potential maintenance and reparation of the systems.

**Technical room for pipes**  
**Creation of a ceiling system**  
**Easy management of light spans**



# REDUCTION OF SEISMIC MASS

## Seismic advantages

A fundamental advantage of the lightened slabs system **SKYRAIL**, is the reduction of the slab's weight of the 20%. This leads to the reduction of the seismic

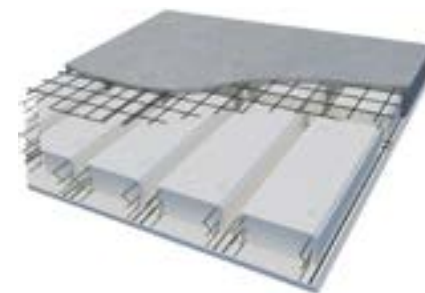
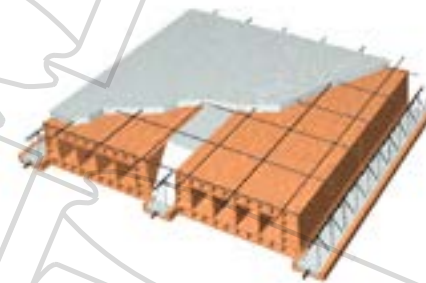
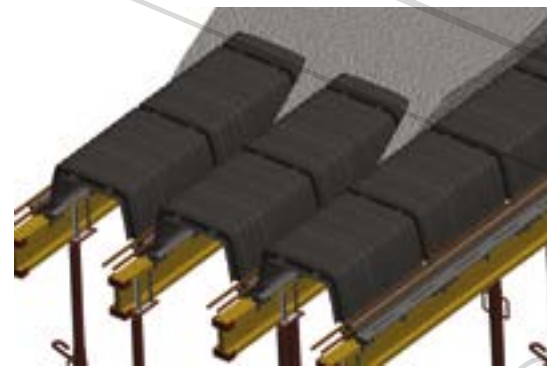
mass avoiding structural failures. Furthermore, it is also possible to non-invasively size the vertical structure of the building

**Seismic mass reduction**  
**Streamlining of the vertical structure**  
**Light and handy**





# COMPARISON WITH TRADITIONAL SYSTEMS



## STRUCTURE

## WORKSITE

## LOGISTICS

### SKYRAIL

SLABS WEIGHT REDUCTION  
LOWER LOAD ON BEAMS AND PILARS  
CREATION OF A TECHNICAL ROOM

LIGHTWEIGHT ELEMENTS  
PLACE FROM THE BOTTOM THROUGH  
ROLLING SCAFFOLDS  
EASY TO INSTALL  
DRY-WALKABLE SYSTEM  
NO RELEASING AGENTS NEEDED  
EASY TO CLEAN

REDUCED DIMENSIONS ON-SITE  
DO NOT FEAR BAD WEATHER  
FORMWORK STACKABILITY  
UP TO 100 TIMES REUSABLE FORMWORK

### BRICK CONCRETE

STATIONARY LIGHTENING  
30% HEAVIER  
TENDS TO BREAK IN CASE OF EARTHQUAKES  
POSSIBLE EXPLOSIONS IN CASE OF FIRE

DIFFICULT HANDLING OF THE PYLONS  
PLACE FROM THE TOP WITH MANY ISSUES  
HEAVY ELEMENTS TO MOVE  
FRAGILITY OF THE SYSTEM

NON-STACKABLE ELEMENTS  
MANY MACHINES ARE NEEDED FOR THE  
TRANSPORT  
LARGE VOLUMES ON-SITE

### POLYSTYRENE

STATIONARY LIGHTENING  
HIGH SOAKING ISSUES  
POSSIBLE EXPLOSIONS IN CASE OF FIRE

FRAGILE STRUCTURE-TRAMPLING NOT REC-  
OMMENDED  
HARD TO HANDLE  
FRAGILITY OF THE SYSTEM  
WATER RELEASE OVER TIME

NON-STACKABLE ELEMENTS  
MANY MACHINES ARE NEEDED FOR THE  
TRANSPORT  
VENTS NEEDED

### SOLID CEILING

40% HEAVIER  
HIGHER LOAD ON PILARS AND BEAMS  
LARGER FOUNDATIONS

HIGHER QUANTITY OF CONCRETE  
A FLAT DECK IS ALWAYS NEEDED  
LONG INSTALLATION TIMES

HIGH QUANTITY OF CONCRETE MIXERS  
MANY MACHINES ARE NEEDED FOR THE  
TRANSPORT  
CRANES NEEDED

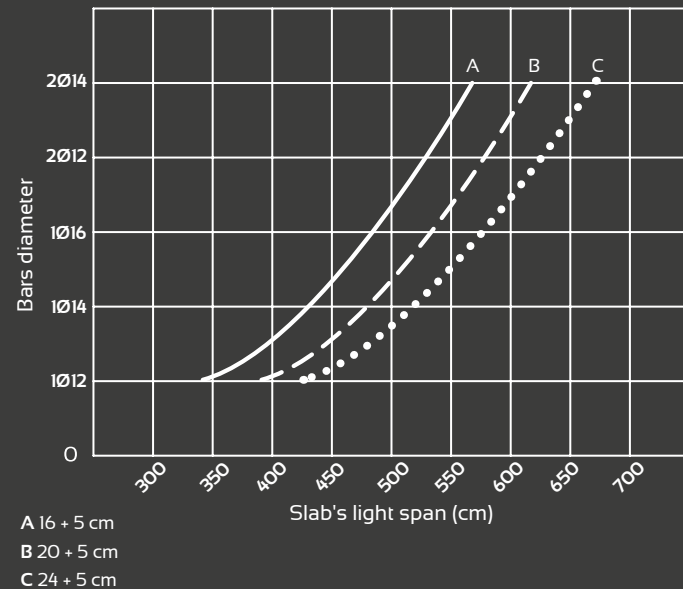
# PRE-DIMENSIONING ANALYSIS

## Thickness evaluation

From the adjacent table, it is possible to determine the thickness and the minimal reinforcement to insert in the beams according to the calculation and the loads over the slab.

## Example

For a load of 200+200 kg/m<sup>2</sup> (accidental + permanent) and light spans (distance between the beams) equal to 6m, the thickness will be of 24+5 cm (dome + slab) with a minimal reinforcement from 2Ø12. For particular loading conditions it is recommended to carry out ad-hoc modellings and contact Geoplast's technical unit.



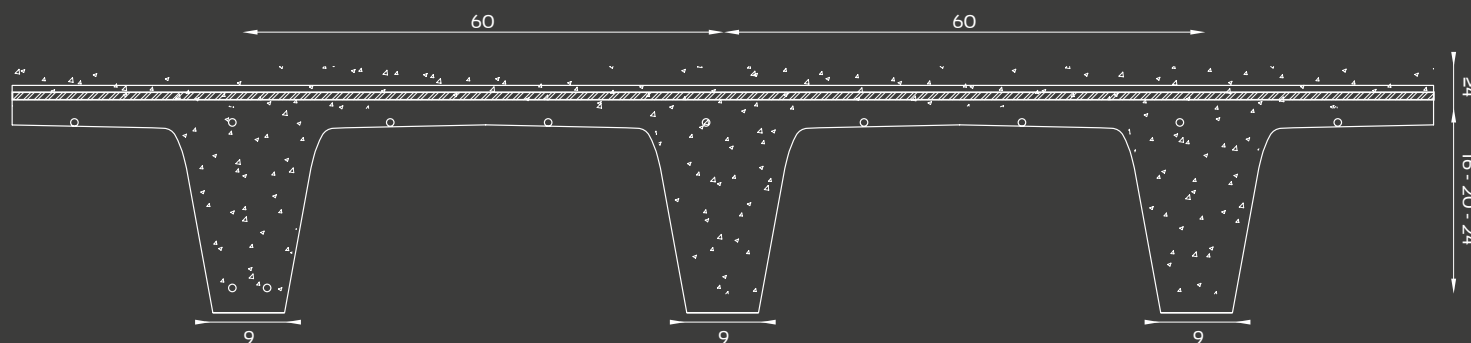
## Concrete consumption

PRODUCT	Edge filled concrete consumption m <sup>3</sup> /m <sup>2</sup>	Slab cm	Total concrete consumption m <sup>3</sup> /m <sup>2</sup>	Slab's weight kg/m <sup>2</sup>
SKYRAIL H16	0.037	4	0.077	192.50
		5	0.087	217.50
		6	0.097	242.50
SKYRAIL H20	0.055	4	0.092	230.00
		5	0.102	255.00
		6	0.112	280.00
SKYRAIL H24	0.064	4	0.104	260.00
		5	0.114	285.00
		6	0.124	310.00

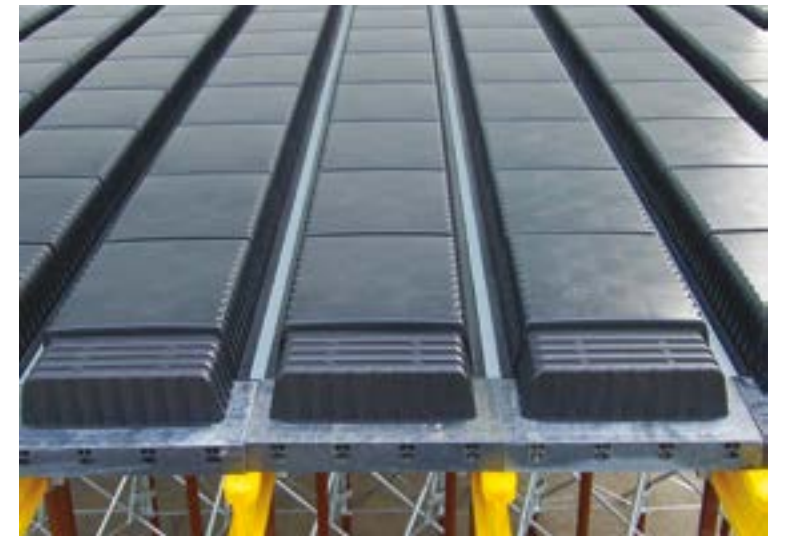
The adjacent table allows the calculation of the concrete consumption and consequently the slab's self-weight according to the dome's height and the thickness of the upper slab.

## Example

For a slab of 24 + 5 cm (24 cm dome + 5 cm upper slab) the concrete consumption will be equal to 0.114 m<sup>3</sup>/m<sup>2</sup> for a weight of 285 kg/m<sup>2</sup>.



# SKYRAIL FORMWORK INSTALLATION



**1** Once the supporting system is built (props+ yellow beams), place the beam elements made of ABS that create a regular support base for the domes.

**2** Starting from the bottom, SKYRAIL domes and SKYBLOCK closure accessories are placed. Once the installation is completed, the system is dry walkable.

# SKYRAIL FORMWORK REMOVAL



**1** 6-7 days after the pouring, it is possible to start SKYRAIL system's removal, removing the props, the yellow beams and the ABS beams in sequence. The operation starts always from the bottom.

**2** After the removal of the first two rows of ABS beams, it is possible to remove SKYRAIL and SKYBLOCK domes. When this operation is completed, the system should be shored again, in order to keep the shoring until 28 days after the concrete maturation.

## Geoplast technical assistance

Geoplast Technical Unit, with its staff of structural engineers, guarantees the needed support during all the stages in the worksite. After the analysis of the technical details and the possible restrictions of the construction, the technical staff defines the formwork system's configuration and develops the project, specifying the accessories. Prior agreement, when required, assistance in the worksite during the system's installation, the pouring stage and the removal, is provided.





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