ESSE TEAM
CONSTRUCTION SOLUTIONS
FOR BUILDING

TOP SOL®
TOP BRIDGE®

ESSE TEAM
EDILIZIA INDUSTRIALE

ESSE TEAM
DIVISIONE INFRASTRUTTURE

HIGH PERFORMANCE PRESTRESSED CONCRETE FLOORS

VERSION 2

TOP SOL® / TOP BRIDGE®

Conceived starting from the need to cover large spans in total self-bearing capacity, the **TOP SOL® / TOP BRIDGE®** prestressed concrete elements - completed with concrete casting in situ - have made possible to overcome the weight and height limits typical of hollow core floors and to build floors featured by high structural performances for industrial and infrastructural use.

The **TOP SOL® / TOP BRIDGE®** technology is based on the robustness concept, i.e. the intrinsic capacity of a floor to respond to exceptional loads considering not only the structural resources of each individual element, but also the structural resources of the entire floor as a whole, which are ensured by the interaction existing between the elements that compose it.

In this way, by designing correctly the supports (hereinafter the present document gives some indications and some constructive details on it) and by taking advantage of the load distribution capacity, the floor shall display a monolithic behavior.

MATERIALS

The **TOP SOL® / TOP BRIDGE®** elements consist of high strength concrete (minimum C45/55) reinforced with harmonic and ordinary steel according to current technical standards (strands with $f_{ptk} \geq 1870$ N / mm² and bars B450C and B450A, respectively).

PRODUCTION

The lower flange and the webs of **TOP SOL® / TOP BRIDGE®** elements are vibro-compacted in a single solution by a last generation dynamic formwork (**Slip Form** technology).

The pre-stretched strands and the horizontal and vertical reinforcement bars are inserted in the formworks; the EPS lightening elements are directly inserted at the factory.

The use of **Slip Form** production technology allows to increase the casting speed in the manufacture of elements with linear geometry and large dimensions.

The formwork moves semi continuously along the longitudinal profile of the element while the concrete is gradually cast and vibrated.

Machinability and speed of hardening are requirements strictly related to the way in which the product is made: the sliding formwork moves forward only if the previous casting portion is able to maintain the shape given by the formwork.

The increase in casting speed leads to a reduction in production times and costs.

The cut of the individual products on the production line is carried out with an air lance when the concrete is still fresh. This allows a more gradual distribution of prestressing at the cutting of strands and prevents the formation of cracks due to strong self-stresses in the area of anchorage and diffusion of prestressing (especially for strongly reinforced elements).

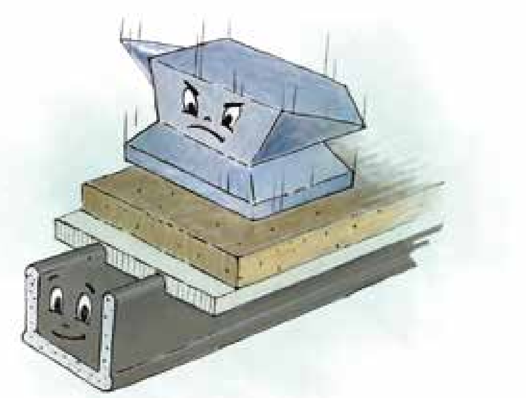
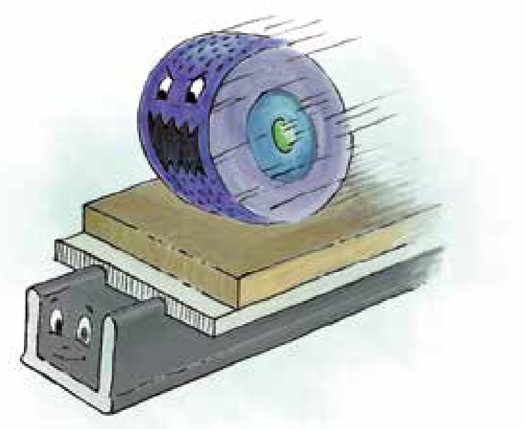
DURABILITY

The low water/cement ratio (up to 0.4) ensures an excellent behavior during maturity and a reduction of visco-elastic and shrinkage phenomena typical of concrete, with beneficial effects on the durability of the product by virtue of reduction of cracks and consequent limitation of carbonation and corrosion phenomena.

Also the high concrete cover thicknesses (better described below) and the high quality of the positioning control of the strands are favorable from the point of view of durability.

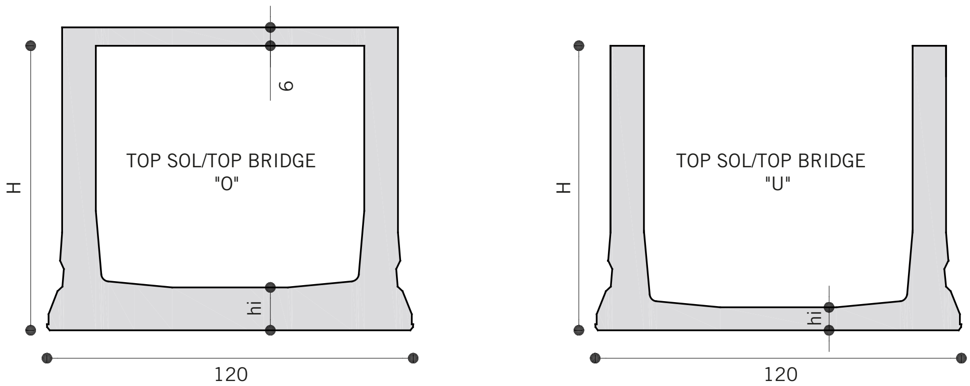
INTENDED USE

Although they can be generally included in the category of products for the construction of high performance floors, **TOP SOL® / TOP BRIDGE®** elements have two different uses, corresponding to two different reference product standards.

Floors for industrial use	TOP SOL®	(EN 13224 – Precast concrete products: Ribbed floor elements)	
Floors for infrastructural use	TOP BRIDGE®	(EN 15050 – Precast concrete products - Bridge elements)	

PRODUCTION RANGE

TOP SOL® and **TOP BRIDGE®** (hereinafter also called TS and TB, respectively) elements can be made with section "O" or "U", as depicted below.



The bottom flange can be 7,5 or 14 cm thick for both shapes.

The actual installation distance is 120,5 cm.

For each type of section, various heights of the artifact are available in the range between 35 cm and 90 cm, as shown in the following table.

Top Sol® and Top Bridge® production range			
Product	Shape	hi [cm]	H (incremental steps of 5 cm)
Top Sol/Top Bridge	O	7,5	35 cm → 90 cm
		14	
Top Sol/Top Bridge	U	7,5	35 cm → 90 cm
		14	

The following is an example of the nomenclature used for **TOP SOL®** and **TOP BRIDGE®** products.

Product Code: U 14 H 50

- U → Shape of section
- 14 → Thickness of bottom flange
- H 50 → Height of the element

The "U" type elements must be completed with a concrete cast carried out on site and they are featured by a special steel reinforcement protruding from the product, which allows a perfect adherence between the artifact and the concrete cast.

The box-shaped "O" type elements are featured by an upper flange of vibro-compacted concrete reinforced with an welded wire web and they can be completed or not with a concrete deck cast on site.

The second option can be used only in the case of roofing.

The protruding armature for the connection with the concrete casting is particularly indicated in presence of dynamic loads (e.g. vehicular traffic or vibrating machinery, for example).

The casting of the longitudinal joints allows the transverse connection between one panel and another.

The upper flange of the "O" type elements has a fixed thickness of 6 cm, regardless of the overall height of the product and its use and can be equipped with a protruding steel reinforcement to increase adherence with concrete cast in situ.

ADVANTAGES

TOP SOL® and **TOP BRIDGE®**

- can satisfy the need to cover large spans ensuring high bearing capacity in total self-bearing;
- have a flat intrados with a smooth fair face concrete finish and no fissures with a pleasant aesthetic value, typical of prefabricated elements;
- allow the insertion of lightening blocks in EPS, in this way minimizing the weights of the floor as a whole;
- allow the reduction of deflection during service, by virtue of the high inertia and prestressing;
- are featured by a very high durability due to the low water-cement ratio concrete and the careful management of the concrete covers, able to guarantee compliance with the requirements even in the most aggressive environments (as typically happens for infrastructures);
- have a shear resistant reinforcement in the webs;
- have a considerable flexibility in the management of shear strength by virtue of the possibility to easily manage the rearward displacement of lightening blocks;
- allow to insert during production or in situ additional reinforcement or anchoring to supplementary castings;
- have their strongest point in the great saving and in the great supply potentials thanks to the innovative application of the slip-form production technology;
- they are very simple and quick to move by virtue of their strength.

COMPLEMENTARY SERVICES

ESSE TEAM, industrial group born in 2016 from the synergy between two consolidated companies belonging to the prefabrication sector in northeastern Italy, has thirty years of experience in the design and production of reinforced and prestressed concrete floors.

The company makes available its design service and supports its clients in the design of complementary works by providing everything necessary to ensure that the best solution is achieved.

By virtue of the great experience gained over the years by its design team, **ESSE TEAM** is also able to provide for the modification and adaptation of projects conceived for the use of artifacts and conventional construction techniques, resorting to technology **TOP SOL® / TOP BRIDGE®** in order to optimize costs, performance and overall dimensions.

TOP SOL®

PRESTRESSED FLOORS FOR INDUSTRIAL BUILDINGS

By virtue of its high performances in terms of load bearing capacity, **TOP SOL®** can be used for the construction of floors capable of supporting large loads covering considerable spans, combining structural features with interesting thermal and acoustic characteristics.

In case of particular requirements in terms of durability or fire resistance, the thickness of the lower flange may be varied in order to achieve the expected performance.

Using **TOP SOL®** it is possible to create high performance floors such as:
- inter-floor and roof floors of industrial buildings featured by large spans and / or loads;
- basement floors with concentrated loads.

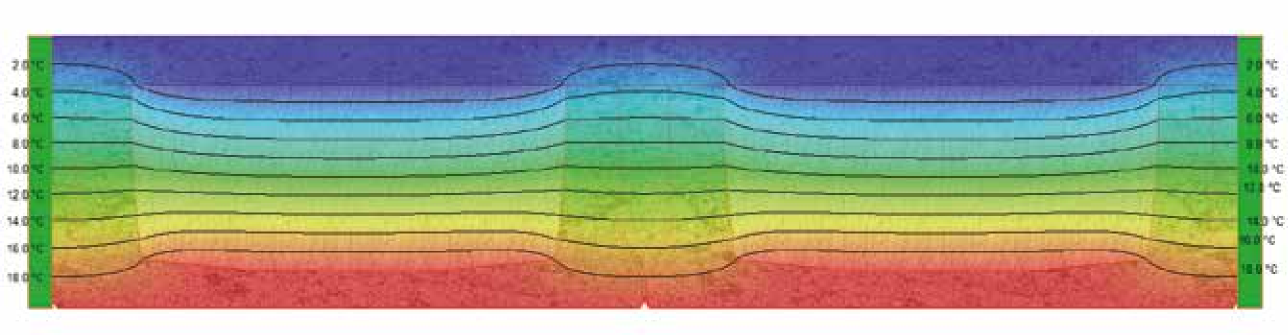
Below is a photograph taken during the laying of **TOP SOL®** elements for the construction of the roof floor of an underground building in Madonna di Campiglio (Trento, Italy).

THERMAL FEATURES

Considering the destination of **TOP SOL®**, which can be used in the field of industrial building for the construction of high-performance floors, the thermal features can be of great importance.

By virtue of the high thickness and the presence of lightening elements in EPS, **TOP SOL®** exhibits interesting characteristics of thermal transmittance.

Below is reported the thermal transmittance estimation obtained through the FEM modelization of a **TOP SOL® U7H45** section completed with concrete casting (thickness of 10 cm).



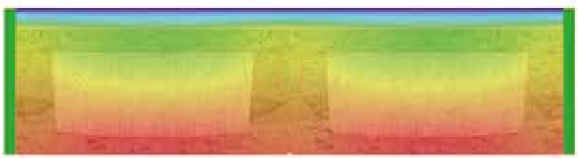
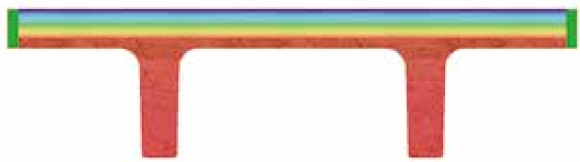
Thermal transmittance excluded surface resistance (C_T)	0,97 W/(m² K)
Thermal resistance excluded surface resistance (R)	1,03 (m² K)/W
Thermal conductivity (λ)	0,53 W/(m K)
Specific heat capacity ($C_{s,m}$)	1,05 kJ/(kg K)
Vapour resistance factor (μ)	102,9

All the sections of the production range have been mapped from the thermal and acoustic point of view and the results of this mapping, expressed through the parameters summarized in the table above, have been summarized and inserted in special tables at the end of this catalog.

Results are provided for the entire range of the available section heights, in combination with five different thicknesses (7, 10, 15, 20 and 25 cm) of the concrete deck cast in situ for the "U" products and with three different thicknesses (10, 15 and 20 cm) of the concrete deck for the "O" products.

The remarkable intrinsic thermal insulation features of **TOP SOL®**, combined with an insulating layer of reduced thickness, allow to make roofs featured by large spans and reduced thermal transmittance able to reduce energy consumption due to the heating of the internal environments.

Below the transmittance features of a roof floor made with **TOP SOL®** are compared with those of a traditional roof floor made with "TT" roofing beams.

Roof floor with TOP SOL® + insulation layer (8 cm) + waterproof coating	Roof floor with "TT" roofing beams + insulation layer (12 cm) + waterproof coating
	
Htot = 63 cm	Htot = 82 cm
Umedium = 0,30 W/(m² K)	Umedium = 0,32 W/(m² K)
Thermal lag= 19 h	Thermal lag = 13,5 h
Attenuation factor = 0,045	Attenuation factor = 0,015

From the results of the FEM calculation, it is possible to observe that a floor made with **TOP SOL®** insulated with a layer of insulating material having thickness of 8 cm allows to reach thermal transmittance performances slightly higher than an equivalent stratigraphy with "TT" roofing beams completed with a layer of insulating material having thickness 12 cm.

A roof made with **TOP SOL®** is able to show the same structural performance with reduced thickness compared to a roof made with "TT" roofing beams.

Furthermore **TOP SOL®** shows a higher basic thermal performance such that it is possible to lay a reduced thickness of insulating material in order obatin the same thermal transmittance.

ACOUSTICAL FEATURES

By virtue of the high mass, the floors made with **TOP SOL®** technology are featured by remarkable acoustic insulation performance against airborne noise (Rw parameter).

The results of an estimation of the Rw parameter carried out by applying the mass law Rw = 37.5 log (m') - 44 (being m' the the mass per unit of surface of the floor, CEN formula) have been reported in the summary tables of the technical characteristics of the manufactured articles at the end of this catalog.

If necessary, it is also possible to obtain relevant insulation performance over impact noise by inserting a suitably designed impact sound damper within the stratigraphy of the floor.

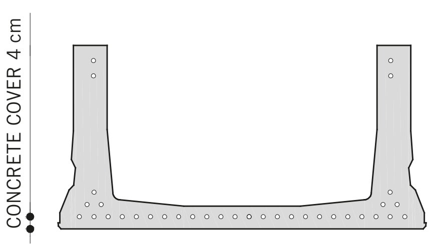
The results of the calculation of the parameter Ln, w, eq (see **EN 12354-2**), carried out by applying the formula Ln,w,eq = 164 - 35 log (m '), have been reported in the summary tables at the end of the catalog.

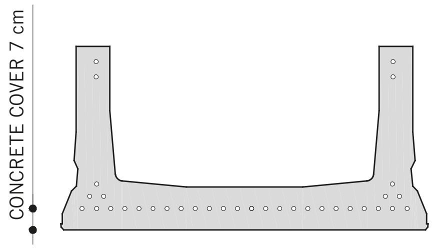
FIRE RESISTANCE

The "U" and "O" elements having a 14 cm thick base flange, in their standard configuration with a concrete cover equal to 7 cm and without particular precautions, achieve fire resistance performance REI 120 or - depending on the case and after further assessments - REI 180.

By increasing the cover of a further centimeter it is possible to obtain even higher performances, equal to REI 240 and 360, the latter depending on the specific cases and after carrying out further evaluations.

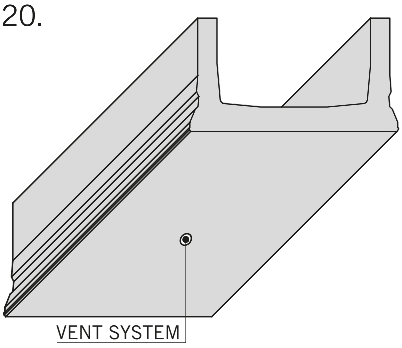
The "U" and "O" elements with a base slab of 7.5 cm thickness, in their standard configuration with a conrete cover of 4 cm and without particular precautions, achieve fire resistance performance REI 60.





By increasing the concrete cover of a further centimeter and bringing part of the reinforcement in the triangular areas it is possible to obtain even higher performances reaching REI 90 and, opportunely reviewing the distribution of the reinforcement even REI 120.

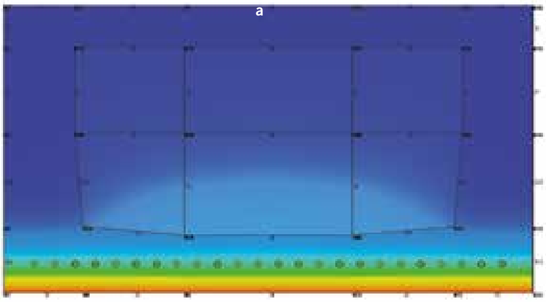
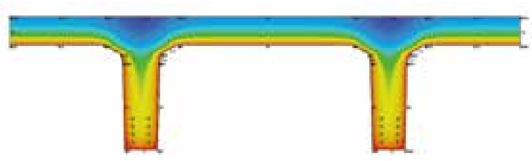
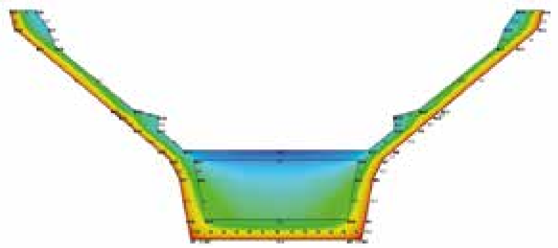
The EPS of which are constituted the lightening blocks, when subjected to high temperatures (as in event of fire), sublimates with the production of gas potentially able to induce cracking in the concrete or explosion risk.



For this reason **TOP SOL®** has a vent system through which the gases produced by the sublimation of EPS in event of fire can be conveyed to the external environment avoiding the possibility of cracks and breakages due to the thrust of the gas trapped inside of the artifact.

If **TOP SOL®** is used in such applications, the **ESSE TEAM** technical équipe remains at the disposal for further information and for the fire design of the structures.

The following is a comparison between the fire behavior of typical roofing elements such as a “TT” roofing beam and a wing shaped roofing beam with respect to **TOP SOL®**. The modeling of the three elements was performed by using a FEM software.

Top Sol®	
"TT" roofing beams	
Wing shaped roofing beams	

The FEM results show that **TOP SOL®**, compared to the “TT” roofing beams and wing shaped roofing beams, exhibits a better fire behavior by virtue of the flat intrados, of the consequent smaller exposed surface and of the major concrete cover

The reinforcement distributed inside the **TOP SOL®** results to be all positioned at the same distance from the intrados and therefore protected by the same thickness of the concrete cover: in this way it is possible to achieve remarkable fire performances by checking the concrete cover without the need to increase the reinforcement over static loads, which is already sufficient in itself in relation to the fire.

ADVANTAGES

- The use of **TOP SOL®** technology, compared to traditional systems ("TT" and wing shaped roofing beams), allows to make floors able to provide high structural performance with reduced thickness;

- By virtue of the intrinsic features (high mass, presence of lightening blocks), **TOP SOL®** combines high structural performance with a remarkable behavior from the point of view of thermal and acoustic insulation;

- **TOP SOL®** make possible to create insulated roofing floors by implementing layers of thermo-insulating material in reduced thickness compared to similar roofing floors made up of traditional prefabricated elements;

- **TOP SOL®** technology allows to create basement floors featured by such structural performance to support high concentrated loads (see below a snapshot taken during the construction phases of a building above a floors made with **TOP SOL®** technology in S. Anna d'Alfaedo, Verona - Italy);

- Compared to other types of prefabricated elements for floors, it is possible to apply hanging loads (also of high values , such as installations) to the intrados of the floor;

- By virtue of the high concrete cover and the high quality in the control of the positioning of the reinforcements, **TOP SOL®** has remarkable performances of fire resistance.

TOP BRIDGE®

PRESTRESSED FLOORS FOR INFRASTRUCTURE CONSTRUCTION

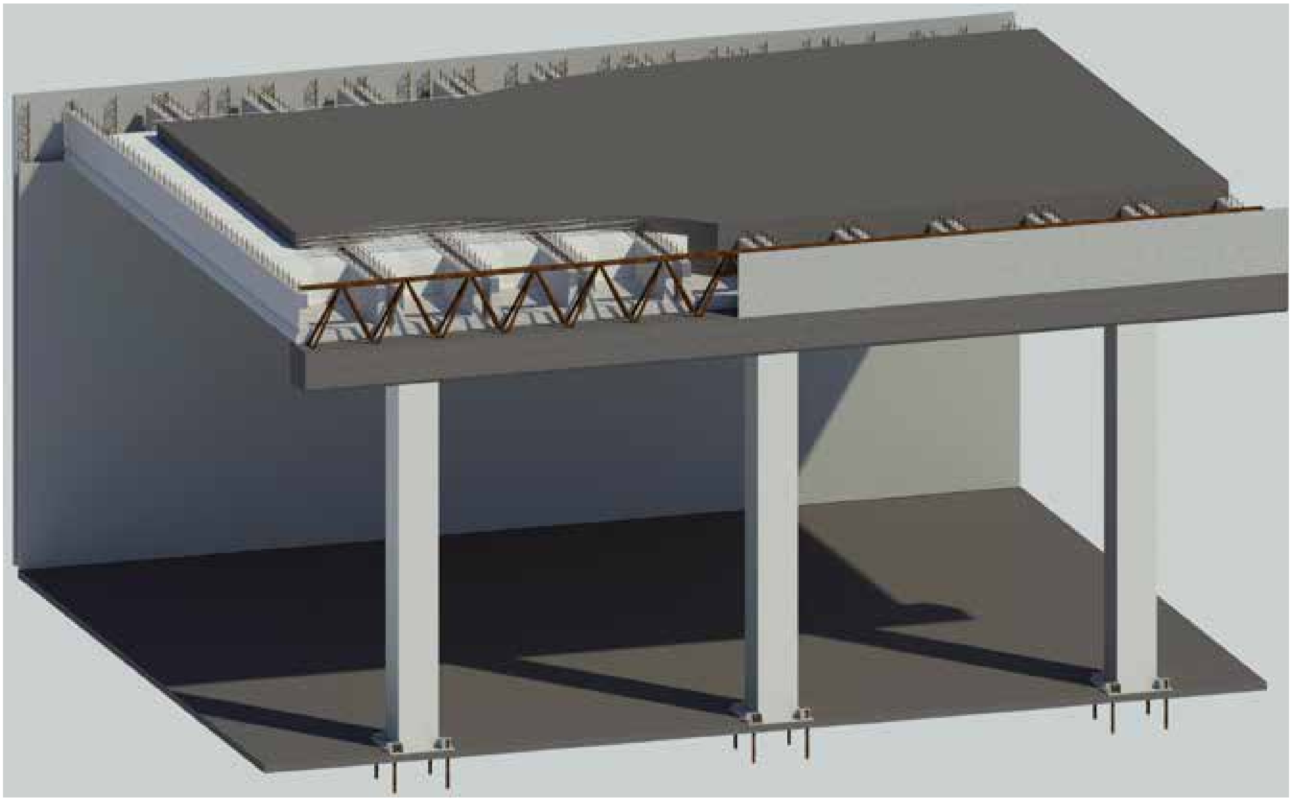
TOP BRIDGE®, by virtue of its high load bearing performances, can be used in the construction of infrastructures (roads, bridges, etc.).

From the point of view of geometry and materials, **TOP BRIDGE®** is similar to **TOP SOL®**; the substantial differences between the two products lie in the intended use and in the structural calculation method.

Using **TOP BRIDGE®** it is possible to create structures subject to dynamic and / or high loads such as:
- bridges / overpass;
- rockfall galleries;
- underpasses and road junctions.

In the case of bridge floors for road traffic, it is necessary to use elements with a flange thickness of 14 cm and we recommend casting a concrete deck with a thickness equal to 20 or 25 cm.

Below are some examples of the use of **TOP BRIDGE®** technology including a bridge in Mestre (Venice, Italy) and a study for a rockfall tunnel.



Through the use of **TOP BRIDGE®** elements placed side by side and resting on reinforced concrete abutment (which can be built using **BILASTRA®** double wall structures) it is also possible to realize box-shaped elements for motorway subways.

DESIGN AND CONSTRUCTION OF SUPPORTS CONSTRAINTS

The **TOP BRIDGE®** technology is particularly suitable for the creation of monolithic supports, with completion concrete casting in place between the abutment and the floor.

In this sense it is worth debunking the cliché according to which the simple support of the floors at the ends is usually considered as the technically optimal solution in order to take into account the effects of thermal expansion and relative movements.

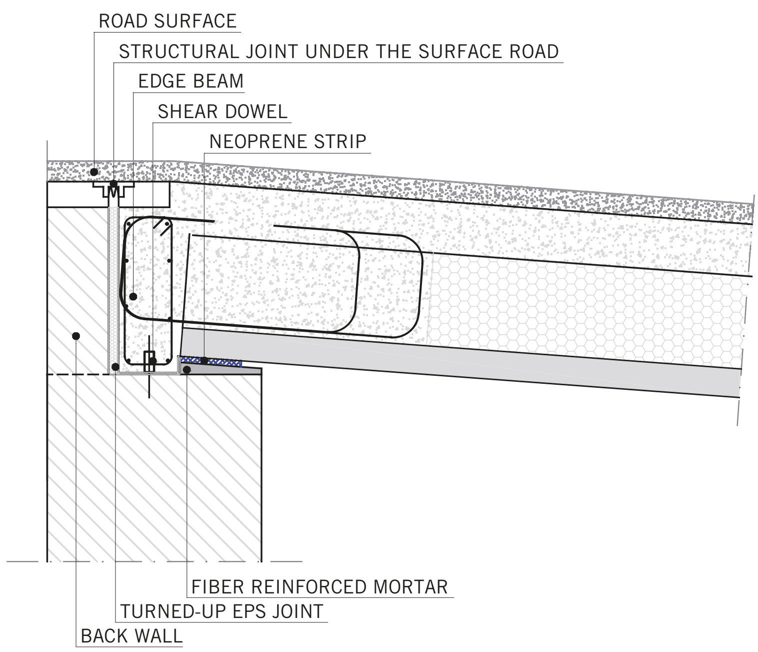
With **TOP BRIDGE®** it is possible to create three different types of supports, corresponding to as many degrees of constraint, of which some diagrams and some descriptive photos are shown below.

In none of the three cases, sophisticated or particular joints are required for which ten-year or twenty-year maintenance must be carried out.

1. Hinged constraint at the support

The hinged constraint is made by lying the elements on the bridge abutment with interposed neoprene strip (for the transfer of the vertical loads) and by inserting a series of steel dowels for the transfer of shear stress due to sliding between the bridge and the abutment.

The support constraint is completed with the insertion of a turned-up EPS joint and with the execution of a concrete cast in place aimed at making a monolithic structure with the creation of a edge beam cast in place between the back wall and the top Bridge element.



Graphic scheme of a typical hinged constraint on an existing abutment.

The following two images show an overall view and a detailed view of the steel dowels arranged in an existing bridge abutment before the concrete casting for the creation of a hinge constraint.

The thickness of the protection tube of the steel dowel can be designed to bear thermal expansions.

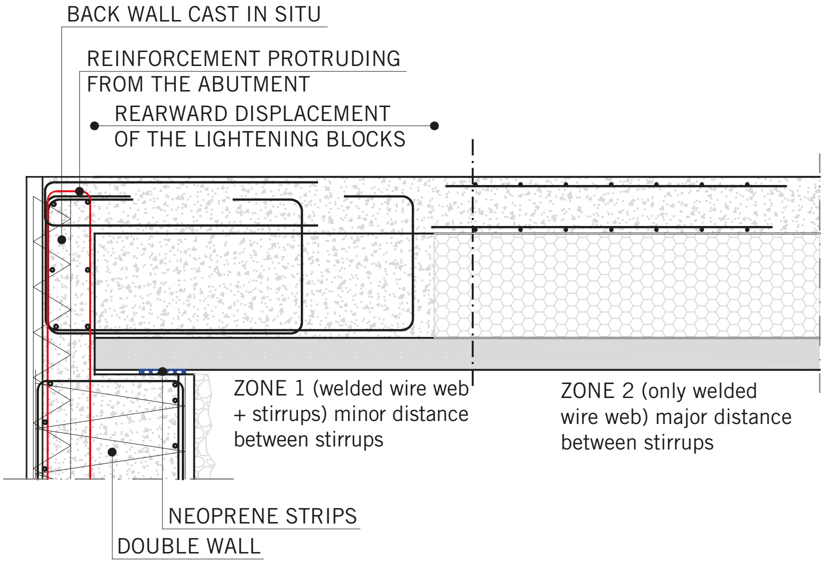
Following are some photographs of structural joints to the supports, taken respectively at the end of the works and at a distance of fifteen months from the opening of the bridge, which testify to the absence of cracks or fissures.

2. Plastic hinge constraint

The plastic hinge constraint is made by leaving reinforcements protruding from the abutment and making a concrete casting in order to create a monolithic structure.

Compared to the hinged link, the back wall cast in place and the reinforcement take charge of the shear stresses between the abutment and the floor.

However, its construction is simpler since it is not necessary to drill holes, prepare dowels in the abutment, or lay the structural joint in EPS seen previously.



The plastic hinge constraint provides greater robustness over horizontal loads and eliminates the road joint, guaranteeing in any case the protection of the support by virtue of the continuity of the concrete deck and the road surface.

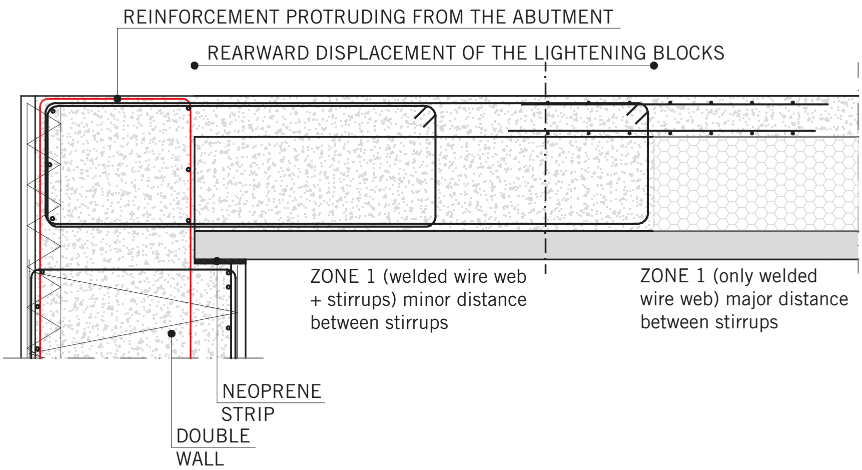
The plastic hinge constraint is suitable for floors having high flexural rigidity (i.e. low support rotations).

The presence of the armor protruding from the abutment tends is beneficial for the same abutment by limiting the rotational effect of the **TOP BRIDGE®** element with respect to it.

In the photograph just above, taken during the laying of the **TOP BRIDGE®** elements for the construction of a bridge in Affi (Verona, Italy), it is possible to see the bridge abutments made with double walls reinforced with protruding irons for the construction of the edge beam.

3. Encastre constraint at the support

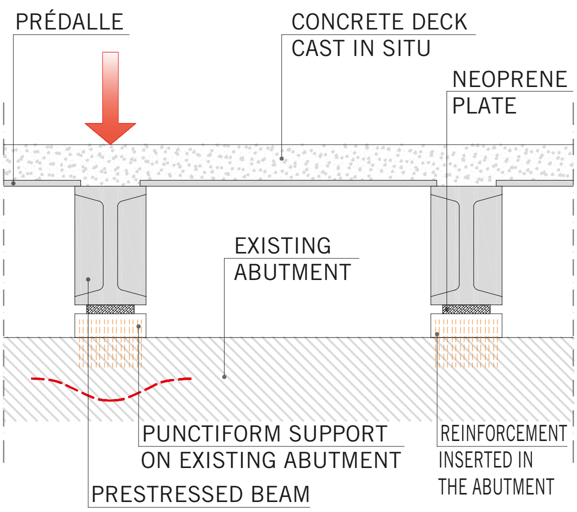
The encastre constraint is made by creating a edge beam having consistent size reinforced sufficiently to ensure the formation of this constraint.
The beneficial effects on the abutment are even more evident than in the case of the plastic hinge constraint since the the edge beam with the reinforcement connecting the abutment and the bridge ensures a much greater degree of constraint.

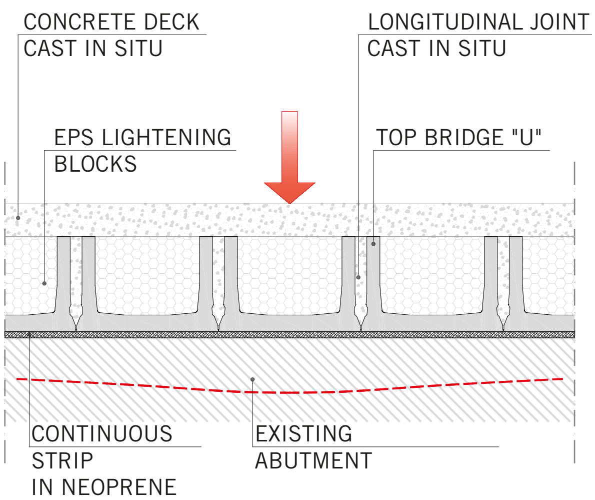


The incastre constraint materializes only in the second phase: there are no incastre degrees during the self-supporting phase.

The following is a photograph of an incastre constraint at the support taken during the construction of a box-shaped element for the junction between the A4 and A13 highways at Albignasego (Padua, Italy).

Following, a comparison is proposed between a bridge made with traditional technology (beams on punctiform supports, prédalle slabs and concrete casting completed on site) and a bridge made with **TOP BRIDGE®** technology (monolithic floor with **TOP BRIDGE®** "U" elements and concrete cast on site).





By using **TOP BRIDGE®** it is possible to avoid performing all the operations necessary for the creation of punctiform supports (drilling of the existing abutment, supply and installation of reinforcement to be inserted in the abutment) with consequent savings in costs and resources and safety advantages.

In fact, it is immediately possible to deduce how the **TOP BRIDGE®** technology, by virtue of the possibility of creating a continuous support, allows to eliminate many potential problems related to the induction of concentrated stresses on existing abutments, of which the quantity, disposition and type of reinforcement and the actual state of preservation or deterioration may be not known.

Compared to traditional construction systems, **TOP BRIDGE®** also allows the use of a single type of product, making unnecessary the presence of beams and closing elements between them such as predalles.

This entails, in addition to an obvious economic saving in terms of raw materials and time, also the possibility of creating bridge floors able to satisfy the same requirements in terms of bearing capacity and length of the spans of traditional systems in reduced thickness, to the benefit of the designer in situations in which it is not possible to make high thickness floors.

ESSE TEAM is also able to supply, where requested by the Customer, the neoprene strips necessary to preserve the integrity of the edges of the **TOP BRIDGE®** elements and of the supporting abutments.

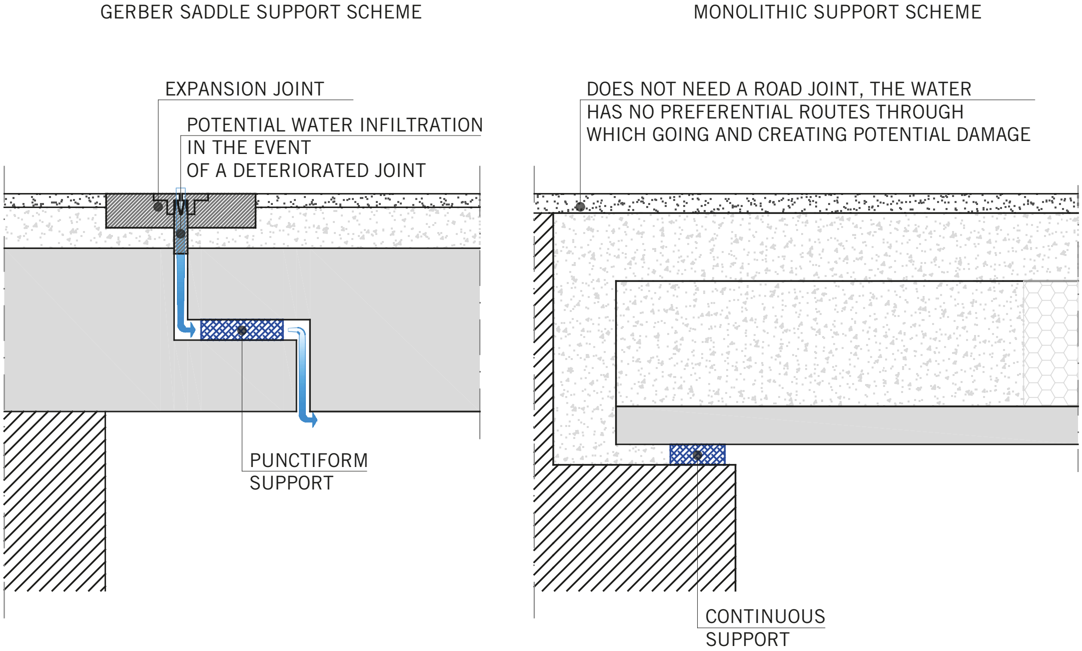
RENOVATION OF EXISTING BRIDGES

The use of **TOP BRIDGE®** innovative technology also constitutes a significant option of intervention in relation to the problems of deterioration and consequent danger of all bridges near the end of their service life, sadly risen to the fore in the news in recent times.

TOP BRIDGE® makes it possible to preserve the existing abutments and to replace the damaged bridge floor with a new floor simply laid on the existing shoulders and made integral with them by virtue of the execution of a concrete casting in place.

The "Gerber saddle" scheme, recurrent in the field of infrastructural road construction, appears to be potentially subject to water infiltration from the road surface in the event of lack of maintainance of the expansion joints damaged by the salt typically thrown on the roads to favor the melting of snow and ice during the winter months.

Compared to this, the constraint scheme at the ends of the **TOP BRIDGE®** products with monolithic concrete casting in situ, allows to effectively protect these sections by preventing the infiltration of water, chlorides and mineral salts.



In this way it is possible to avoid the onerous problem of the maintenance and replacement of the joints, which in fact are no longer present within the construction system.

INTEGRATION WITH OTHER PRODUCTS OF THE ESSE TEAM RANGE

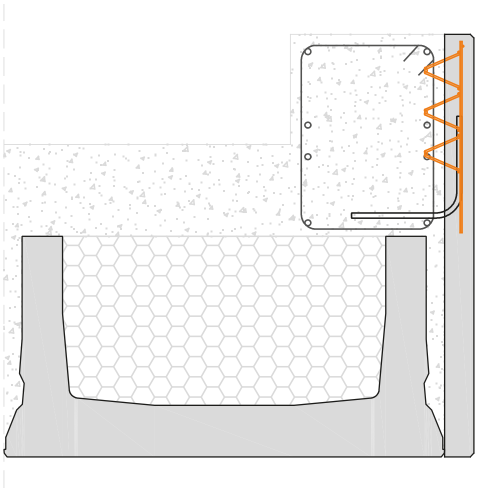
If it is a completely new construction, it is possible to use **BILASTRA®** double wall elements for the construction of the abutments on which to lie **TOP BRIDGE®**, obtaining an effective integration between the two construction technologies.

In the previous image you can see an example of a bridge lying on double-wall elements with a stone finish (**BILSTONE®**) suitably shaped to create the support space for **TOP BRIDGE®**. The photograph was taken during the testing phases of the bridge, located in Affi - Verona, Italia.

TOP BRIDGE® products can also be integrated with prefabricated concrete barrier rails and with prédalle slabs, as shown in the photograph on the right, taken during the phases of construction of a bridge over a stream in Piazzola sul Brenta (Padua, Italy).

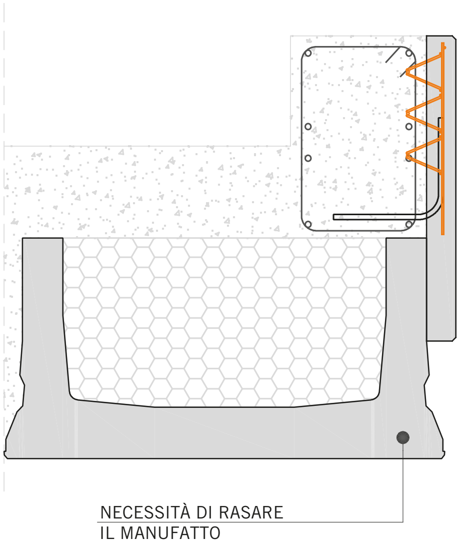
In particular, three different types of barrier rails are normally used:

1. Barrier rail for complete protection of the element



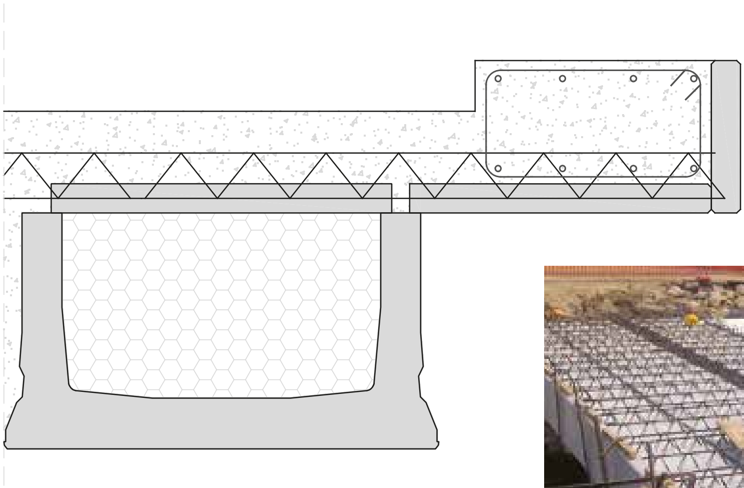
In the event that the barrier rail completely covers the external profile of the product, it is not necessary to refinish it.

2. Barrier rail for partial protection of the element



In the case in which the barrier rail leaves the outer profile of the **TOP BRIDGE®** element partially uncovered, it must be refinished as it is partially visible.

3. Cantilever barrier rails with prédalle slabs



The use of the solution with cantilever barrier rails anchored to prédalles, by appropriately shaping the barrier rails, allows to create connecting elements with particular geometric shapes, as shown in the following photograph taken during the phases of construction of a bridge over the Serina stream at Costa Serina (Bergamo, Italy).

EXPOSURE CLASSES

With reference to **ANNEX H** of the technical standard **EN 15050** (reported below), the floors made with **TOP BRIDGE®** can be considered as consisting of several elements subject to different environmental conditions, in their turn established by **ANNEX A** of the "Common Rules" **EN 13369**.

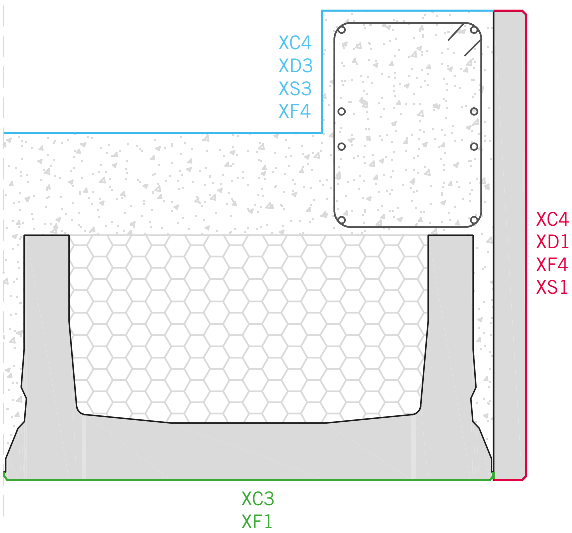
Ambient condition according to EN 13369:2004 Annex A	Description
C	• Internal face (box beam and box piers) or external face protected or not exposed to de-icing salts* and sea water or chemical environment;
	• Face of precast abutments in contact with non-aggressive soil;
	• Soffits and sides of bridge beams.
E	• External face not protected against de-icing salts;
	• Elements located in sea water environment;
	• Exposed side of edge beams
G	• Face of precast abutments in contact with non-aggressive soil;

* see 1992-2:2005 point 4.2 (106)

Considering that, in agreement with the table just reported:

- the extrados of the bridge falls within the cases referred in letter **G**;
- the intrados of the bridge falls within the cases referred in letter **C**;
- any lateral barrier rail falls within the cases referred in letter **E**;

in standard configuration and without further design adjustments, these elements make it possible to meet the requirements corresponding to the following exposure classes (which in turn are in line with the basic conditions reported in the **TABLE A.1** within the Appendix A of **EN 13369**).



With reference to the possibility of re-entering the higher classes of exposure to freeze/thaw cycles, the function of the air-entraining additives normally used for concrete consists in creating a suitable percentage of empty volume inside the concrete constituting the manufactured article, useful in order to bound the effects of the increase in water volume in the event of freeze.

However, the aerating additives are not suitable for prestressed concrete when added because they tend to reduce the adherence of the strands and with it the overall resistance of the product.

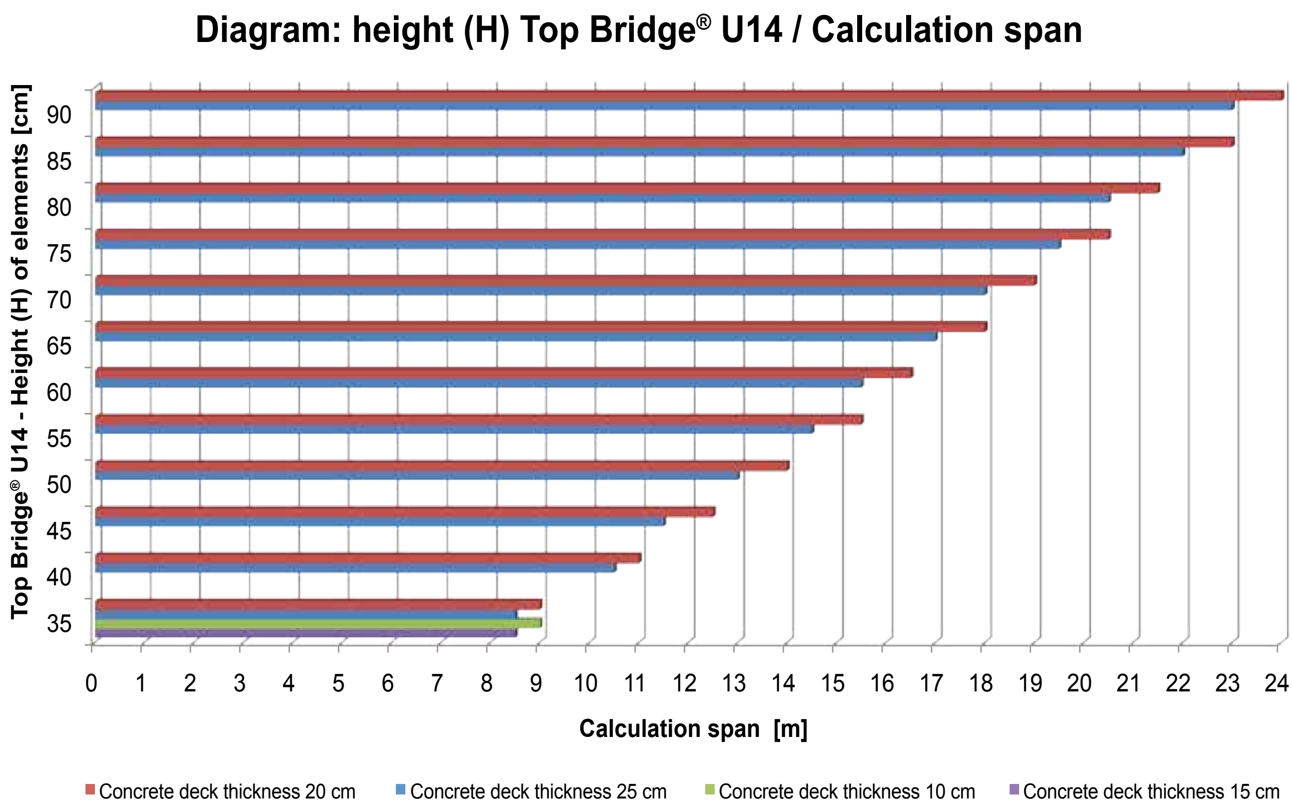
For this reason it is preferable to avoid using **TOP BRIDGE®** products in exposure classes higher than XF1.

On the other hand, based on the table shown in Annex H, the exposure classes XF2, XF3 and XF4 are environmental conditions that are not typical of the intrados of a road bridge.

The barrier rails and the predalles are normally considered in the XF4 exposure class and, since they are mild reinforced elements, they do not show particular complications from this point of view.

STRUCTURAL PERFORMANCES

Below is a diagram showing the correlation between the calculation light and the thickness of the **TOP BRIDGE® U14** product for the preliminary designing of bridge floors.



In the diagram the elements, in the various heights within the production range, are been combined with concrete decks in different thicknesses respectively equal to 10, 15 cm (only for H 35) and 20, 25 cm (for the entire productive range).

In cases where it is necessary to restrict the thicknesses (for example in the presence of river or stream beds having width approximately equal to 6-10 m) it is possible to use sections with a thickness of 35 cm without lightening blocks, to be completed with a concrete deck cast in situ. In this way a full slab is obtained.

FIRE BEHAVIOR

Regarding **TOP BRIDGE®**'s fire resistance performance, with the same section, thickness and cover, please refer to what has already been explained in the chapter dedicated to **TOP SOL®**.

TOP BRIDGE®, by virtue of its geometric characteristics, materials and high thickness concrete covers, shows in its standard configuration remarkable performances from the point of view of fire resistance.

Although they are not explicitly required by the current legislation regarding bridges and overpasses, they are a significant added value from the point of view of safety in the event of car crashes with fire formation.

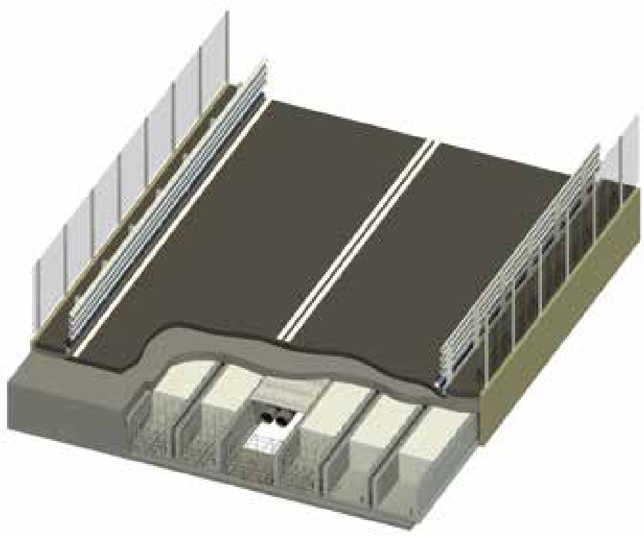
In relation to structures built in simple support or with a hinge constraint, the structures made with an incastre constraint also benefit from the greater overall robustness.

The incastre constraint in fact gives the structure as a whole the possibility of compensating for any "local" deficits (caused, for example, by fire) fielding all its resources of resistance.

ADVANTAGES

- Possibility of restoration of existing bridges in bad condition with recovering of the existing abutments;
- Exploitation of the empty portion of the section for the passage of pipes and sub-services (sewer pipes, electric lines, etc.);

On the side is shown a bridge layout made with **TOP BRIDGE®** elements and compensation plates for the passage of pipes and sub-services;



- Possibility of converting existing bridges from pedestrian to road traffic
- Construction of floors featured by a monolithic behavior able to make up for any localized structural deficits by virtue of the overall robustness;
- Possibility of providing adequate reinforcement for the connection with the concrete completion casting, essential for bridge floors;
- High load bearing capacity in relation to remarkable spans;
- High speed of assembly and completion of the work in situ, to the advantage of a rapid restoration of normal road conditions;
- Perfect integration with **TRIGON BRIDGE®** floor plates.

SUMMARY TABLE THERMO-ACOUSTIC CHARACTERISTICS

Section	Height of the element h_{el} [cm]	Thickness of the concrete deck h_c [cm]	Total weight per unit of surface $P_{SUP,tot}$ [kN/m²]	Apparent sound reduction index R_w [dB]	Equivalent impact sound pressure level of the bare floor Lnweq [dB]	Thermal conductance (no surface resistance) C_T [W/(m² K)]	Thermal resistance excluded surface resistance R [(m² K)/W]	Equivalent conductivity λ [W/(m K)]	Medium specific heat capacity CS [kJ/(kg K)]	Vapour resistance factor μ -
U7H35	35	7	5,00	57,2	69,5	1,20	0,83	0,50	1,05	107,30
		10	5,74	59,5	67,4	1,18	0,85	0,53	1,05	110,10
		15	6,97	62,6	64,5	1,15	0,87	0,58	1,05	114,10
		20	8,19	65,3	62,0	1,12	0,89	0,62	1,00	117,40
		25	9,42	67,5	59,9	1,09	0,91	0,66	1,00	120,10
U7H40	40	7	5,20	57,8	68,9	1,08	0,92	0,51	1,09	104,90
		10	5,93	60,0	66,9	1,07	0,94	0,53	1,05	107,60
		15	7,16	63,1	64,1	1,04	0,96	0,57	1,05	111,40
		20	8,39	65,6	61,7	1,02	0,98	0,61	1,05	114,70
		25	9,61	67,9	59,6	0,99	1,01	0,65	1,00	117,40
U7H45	45	7	5,42	58,5	68,3	0,98	1,02	0,51	1,09	102,90
		10	6,15	60,6	66,4	0,97	1,03	0,53	1,05	105,50
		15	7,38	63,6	63,6	0,95	1,05	0,57	1,05	109,20
		20	8,61	66,1	61,3	0,93	1,08	0,60	1,05	112,40
		25	9,83	68,2	59,3	0,91	1,10	0,64	1,00	115,00
U7H50	50	7	5,64	59,2	67,7	0,90	1,11	0,51	1,09	101,30
		10	6,37	61,2	65,8	0,89	1,12	0,54	1,09	103,80
		15	7,60	64,0	63,2	0,87	1,14	0,57	1,05	107,30
		20	8,83	66,5	60,9	0,86	1,17	0,60	1,05	110,40
		25	10,05	68,6	58,9	0,84	1,19	0,63	1,05	113,00
U7H55	55	7	5,86	59,8	67,1	0,83	1,20	0,52	1,09	100,00
		10	6,59	61,7	65,3	0,83	1,21	0,54	1,09	102,30
		15	7,82	64,5	62,7	0,81	1,23	0,57	1,05	105,70
		20	9,05	66,9	60,5	0,80	1,26	0,60	1,05	108,70
		25	10,27	68,9	58,6	0,78	1,28	0,63	1,05	111,30
U7H60	60	7	6,08	60,4	66,6	0,78	1,29	0,52	1,09	98,90
		10	6,81	62,2	64,8	0,77	1,30	0,54	1,09	101,10
		15	8,04	64,9	62,3	0,75	1,33	0,57	1,09	104,30
		20	9,27	67,3	60,2	0,74	1,35	0,59	1,05	107,20
		25	10,49	69,3	58,3	0,73	1,37	0,62	1,05	109,70
U7H65	65	7	6,30	61,0	66,0	0,73	1,38	0,52	1,09	97,90
		10	7,03	62,8	64,4	0,72	1,39	0,54	1,09	100,00
		15	8,26	65,4	61,9	0,71	1,42	0,56	1,09	103,10
		20	9,48	67,6	59,8	0,69	1,44	0,59	1,05	105,90
		25	10,71	69,6	58,0	0,68	1,46	0,62	1,05	108,30
U7H70	70	7	6,52	61,5	65,5	0,68	1,47	0,52	1,09	97,00
		10	7,25	63,3	63,9	0,67	1,48	0,54	1,09	99,00
		15	8,48	65,8	61,5	0,66	1,51	0,56	1,09	102,00
		20	9,70	68,0	59,5	0,65	1,53	0,59	1,09	104,70
		25	10,93	69,9	57,6	0,64	1,55	0,61	1,05	107,10

Section	Height of the element h_{el} [cm]	Thickness of the concrete deck h_c [cm]	Total weight per unit of surface $P_{SUP,tot}$ [kN/m²]	Apparent sound reduction index R_w [dB]	Equivalent impact sound pressure level of the bare floor Lnweq [dB]	Thermal conductance (no surface resistance) C_T [W/(m² K)]	Thermal resistance excluded surface resistance R [(m² K)/W]	Equivalent conductivity λ [W/(m K)]	Medium specific heat capacity CS [kJ/(kg K)]	Vapour resistance factor μ -
U7H75	75	7	6,74	62,1	65,0	0,64	1,56	0,53	1,09	96,30
		10	7,47	63,8	63,4	0,64	1,57	0,54	1,09	98,20
		15	8,70	66,2	61,1	0,63	1,60	0,56	1,09	101,10
		20	9,92	68,4	59,1	0,62	1,62	0,59	1,09	103,60
		25	11,15	70,3	57,3	0,61	1,64	0,61	1,05	106,00
U7H80	80	7	6,95	62,6	64,5	0,61	1,65	0,53	1,09	95,60
		10	7,69	64,2	63,0	0,60	1,66	0,54	1,09	97,40
		15	8,92	66,6	60,7	0,59	1,69	0,56	1,09	100,20
		20	10,14	68,7	58,8	0,58	1,71	0,58	1,09	102,70
		25	11,37	70,6	57,0	0,58	1,73	0,61	1,09	104,90
U7H85	85	7	7,17	63,1	64,0	0,57	1,74	0,53	1,09	95,00
		10	7,91	64,7	62,6	0,57	1,75	0,54	1,09	96,80
		15	9,14	67,0	60,4	0,56	1,78	0,56	1,09	99,40
		20	10,36	69,1	58,5	0,56	1,80	0,58	1,09	101,80
		25	11,59	70,9	56,8	0,55	1,82	0,60	1,09	104,00
U7H90	90	7	7,39	63,6	63,6	0,55	1,83	0,53	1,13	94,50
		10	8,13	65,1	62,1	0,54	1,84	0,54	1,09	96,20
		15	9,36	67,4	60,0	0,54	1,87	0,56	1,09	98,70
		20	10,58	69,4	58,1	0,53	1,89	0,58	1,09	101,10
		25	11,81	71,2	56,5	0,52	1,91	0,60	1,09	103,20

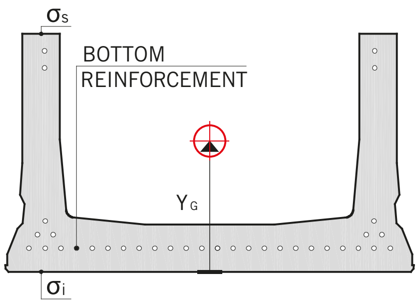
U14H35	35	7	6,12	60,5	66,5	1,31	0,76	0,55	1,00	117,40
		10	6,85	62,3	64,7	1,29	0,77	0,58	1,00	119,60
		15	8,08	65,0	62,2	1,25	0,80	0,63	1,00	122,60
		20	9,31	67,3	60,1	1,22	0,82	0,67	0,96	125,10
		25	10,53	69,3	58,2	1,19	0,84	0,71	0,96	127,20
U14H40	40	7	6,34	61,1	65,9	1,17	0,85	0,55	1,05	113,90
		10	7,08	62,9	64,3	1,15	0,87	0,58	1,00	116,10
		15	8,30	65,5	61,8	1,12	0,89	0,62	1,00	119,20
		20	9,53	67,7	59,7	1,09	0,92	0,66	1,00	121,70
		25	10,75	69,7	57,9	1,07	0,94	0,69	1,00	123,90
U14H45	45	7	6,56	61,6	65,4	1,06	0,95	0,55	1,05	111,10
		10	7,30	63,4	63,8	1,04	0,96	0,57	1,05	113,20
		15	8,52	65,9	61,4	1,02	0,98	0,61	1,00	116,30
		20	9,75	68,1	59,4	0,99	1,01	0,65	1,00	118,90
		25	10,97	70,0	57,6	0,97	1,03	0,68	1,00	121,10
U14H50	50	7	6,78	62,2	64,9	0,96	1,04	0,55	1,05	108,80
		10	7,51	63,8	63,3	0,95	1,05	0,57	1,05	110,90
		15	8,74	66,3	61,0	0,93	1,08	0,60	1,05	113,90
		20	9,97	68,4	59,0	0,91	1,10	0,64	1,00	116,40
		25	11,19	70,3	57,3	0,89	1,12	0,67	1,00	118,70

Section	Height of the element h_{el} [cm]	Thickness of the concrete deck h_c [cm]	Total weight per unit of surface $P_{SUP,tot}$ [kN/m²]	Apparent sound reduction index R_w [dB]	Equivalent impact sound pressure level of the bare floor Lnweq [dB]	Thermal conductance (no surface resistance) C_T [W/(m² K)]	Thermal resistance excluded surface resistance R [(m² K)/W]	Equivalent conductivity λ [W/(m K)]	Medium specific heat capacity CS [kJ/(kg K)]	Vapour resistance factor μ -
U14H55	55	7	6,98	62,6	64,5	0,88	1,13	0,55	1,05	106,90
		10	7,72	64,3	62,9	0,87	1,14	0,57	1,05	108,80
		15	8,94	66,7	60,7	0,86	1,17	0,60	1,05	111,80
		20	10,17	68,8	58,7	0,84	1,19	0,63	1,05	114,30
		25	11,39	70,6	57,0	0,82	1,21	0,66	1,00	116,60
U14H60	60	7	7,22	63,2	64,0	0,82	1,22	0,55	1,05	105,20
		10	7,95	64,8	62,5	0,81	1,24	0,57	1,05	107,10
		15	9,18	67,1	60,3	0,79	1,26	0,60	1,05	110,00
		20	10,41	69,1	58,4	0,78	1,28	0,62	1,05	112,50
		25	11,63	71,0	56,7	0,77	1,30	0,65	1,05	114,70
U14H65	65	7	7,44	63,7	63,5	0,76	1,31	0,55	1,09	103,80
		10	8,17	65,2	62,1	0,75	1,33	0,57	1,05	105,60
		15	9,40	67,5	59,9	0,74	1,35	0,59	1,05	108,40
		20	10,63	69,5	58,1	0,73	1,37	0,62	1,05	110,90
		25	11,85	71,3	56,4	0,72	1,39	0,65	1,05	113,00
U14H70	70	7	7,66	64,2	63,1	0,71	1,40	0,55	1,09	102,50
		10	8,39	65,6	61,7	0,71	1,42	0,56	1,09	104,30
		15	9,62	67,9	59,6	0,69	1,44	0,59	1,05	107,00
		20	10,85	69,8	57,8	0,68	1,46	0,62	1,05	109,40
		25	12,07	71,6	56,1	0,67	1,48	0,64	1,05	111,50
U14H75	75	7	7,88	64,6	62,6	0,67	1,49	0,55	1,09	101,50
		10	8,61	66,1	61,3	0,66	1,51	0,56	1,09	103,20
		15	9,84	68,2	59,2	0,65	1,53	0,59	1,05	105,80
		20	11,06	70,1	57,5	0,64	1,55	0,61	1,05	108,10
U14H80	80	7	8,10	65,1	62,2	0,63	1,58	0,55	1,09	100,50
		10	8,83	66,5	60,9	0,63	1,60	0,56	1,09	102,20
		15	10,06	68,6	58,9	0,62	1,62	0,59	1,09	104,70
		20	11,28	70,5	57,2	0,61	1,64	0,61	1,05	106,90
		25	12,51	72,1	55,6	0,60	1,67	0,63	1,05	109,00
U14H85	85	7	8,32	65,5	61,8	0,60	1,67	0,55	1,09	99,60
		10	9,05	66,9	60,5	0,59	1,69	0,56	1,09	101,20
		15	10,28	68,9	58,6	0,58	1,71	0,58	1,09	103,70
		20	11,50	70,8	56,9	0,58	1,73	0,61	1,05	105,90
		25	12,73	72,4	55,3	0,57	1,76	0,63	1,05	107,90
U14H90	90	7	8,53	65,9	61,4	0,57	1,76	0,55	1,09	98,90
		10	9,27	67,3	60,2	0,56	1,78	0,56	1,09	100,40
		15	10,50	69,3	58,3	0,56	1,80	0,58	1,09	102,80
		20	11,72	71,1	56,6	0,55	1,82	0,60	1,09	104,90
		25	12,95	72,7	55,1	0,54	1,84	0,62	1,05	106,90

Section	Height of the element h_{el} [cm]	Thickness of the concrete deck h_c [cm]	Total weight per unit of surface $P_{SUP,tot}$ [kN/m²]	Apparent sound reduction index R_w [dB]	Equivalent impact sound pressure level of the bare floor Lnweq [dB]	Thermal conductance (no surface resistance) C_T [W/(m² K)]	Thermal resistance excluded surface resistance R [(m² K)/W]	Equivalent conductivity λ [W/(m K)]	Medium specific heat capacity CS [kJ/(kg K)]	Vapour resistance factor μ -
O7H35	35	5	5,55	58,9	67,9	1,35	0,74	0,54	1,05	114,90
		10	6,78	62,2	64,9	1,31	0,76	0,59	1,00	118,80
		15	8,01	64,9	62,4	1,27	0,79	0,64	1,00	121,90
O7H40	40	5	5,76	59,5	67,4	1,20	0,83	0,54	1,05	111,60
		10	6,99	62,7	64,4	1,17	0,86	0,58	1,00	115,40
		15	8,21	65,3	62,0	1,14	0,88	0,63	1,00	118,60
O7H45	45	5	5,98	60,1	66,8	1,08	0,92	0,54	1,05	108,90
		10	7,21	63,2	64,0	1,05	0,95	0,58	1,05	112,60
		15	8,43	65,7	61,6	1,03	0,97	0,62	1,00	115,70
O7H50	50	5	6,20	60,7	66,3	0,98	1,02	0,54	1,05	106,70
		10	7,43	63,7	63,5	0,96	1,04	0,58	1,05	110,30
		15	8,65	66,1	61,2	0,94	1,06	0,61	1,05	113,40
O7H55	55	5	6,42	61,3	65,7	0,90	1,11	0,54	1,09	104,90
		10	7,65	64,1	63,1	0,88	1,13	0,57	1,05	108,30
		15	8,87	66,6	60,8	0,87	1,15	0,61	1,05	111,30
O7H60	60	5	6,64	61,8	65,2	0,83	1,20	0,54	1,09	103,30
		10	7,87	64,6	62,6	0,82	1,22	0,57	1,05	106,70
		15	9,09	67,0	60,4	0,80	1,24	0,60	1,05	109,50
O7H65	65	5	6,86	62,4	64,7	0,78	1,29	0,54	1,09	102,00
		10	8,09	65,0	62,2	0,76	1,31	0,57	1,05	105,20
		15	9,31	67,3	60,1	0,75	1,33	0,60	1,05	108,00
O7H70	70	5	7,08	62,9	64,3	0,73	1,38	0,54	1,09	100,80
		10	8,30	65,5	61,8	0,71	1,40	0,57	1,09	103,90
		15	9,53	67,7	59,7	0,70	1,43	0,60	1,05	106,60
O7H75	75	5	7,30	63,4	63,8	0,68	1,47	0,54	1,09	99,80
		10	8,52	65,9	61,4	0,67	1,49	0,57	1,09	102,80
		15	9,75	68,1	59,4	0,66	1,52	0,59	1,05	105,40
O7H80	80	5	7,52	63,9	63,3	0,64	1,56	0,54	1,09	99,00
		10	8,74	66,3	61,0	0,63	1,58	0,57	1,09	101,80
		15	9,97	68,5	59,0	0,62	1,61	0,59	1,09	104,30
O7H85	85	5	7,74	64,3	62,9	0,61	1,65	0,55	1,09	98,20
		10	8,96	66,7	60,7	0,60	1,67	0,57	1,09	100,90
		15	10,19	68,8	58,7	0,59	1,70	0,59	1,09	103,30
O7H90	90	5	7,96	64,8	62,5	0,57	1,74	0,55	1,09	97,50
		10	9,18	67,1	60,3	0,57	1,76	0,57	1,09	100,10
		15	10,41	69,2	58,4	0,56	1,79	0,59	1,09	102,50

Section	Height of the element h_{el} [cm]	Thickness of the concrete deck h_c [cm]	Total weight per unit of surface $P_{SUP,tot}$ [kN/m^2]	Apparent sound reduction index R_w [dB]	Equivalent impact sound pressure level of the bare floor Lnweq [dB]	Thermal conductance (no surface resistance) C_T [W/(m^2 K)]	Thermal resistance excluded surface resistance R [(m^2 K)/W]	Equivalent conductivity λ [W/(m K)]	Medium specific heat capacity CS [kJ/(kg K)]	Vapour resistance factor μ -
O14H35	35	5	6,67	61,9	65,2	1,51	0,66	0,60	0,96	125,50
		10	7,89	64,6	62,6	1,46	0,69	0,66	0,96	128,30
		15	9,12	67,0	60,4	1,41	0,71	0,70	0,96	130,40
O14H40	40	5	6,90	62,5	64,6	1,32	0,76	0,59	1,00	121,00
		10	8,12	65,1	62,2	1,28	0,78	0,64	1,00	123,90
		15	9,35	67,4	60,0	1,24	0,81	0,68	0,96	126,30
O14H45	45	5	7,12	63,0	64,2	1,17	0,85	0,59	1,00	117,40
		10	8,35	65,6	61,7	1,14	0,88	0,63	1,00	120,30
		15	9,58	67,8	59,7	1,11	0,90	0,67	1,00	122,80
O14H50	50	5	7,34	63,5	63,7	1,06	0,95	0,58	1,05	114,40
		10	8,57	66,0	61,3	1,03	0,97	0,62	1,00	117,40
		15	9,79	68,2	59,3	1,01	0,99	0,65	1,00	119,90
O14H55	55	5	7,54	63,9	63,3	0,96	1,04	0,58	1,05	111,90
		10	8,77	66,4	61,0	0,94	1,06	0,61	1,05	114,90
		15	10,00	68,5	59,0	0,92	1,09	0,64	1,00	117,40
O14H60	60	5	7,78	64,4	62,8	0,88	1,13	0,57	1,05	109,80
		10	9,01	66,8	60,6	0,87	1,15	0,61	1,05	112,70
		15	10,23	68,9	58,6	0,85	1,18	0,64	1,00	115,20
O14H65	65	5	8,00	64,9	62,4	0,82	1,22	0,57	1,05	108,10
		10	9,23	67,2	60,2	0,80	1,25	0,60	1,05	110,90
		15	10,45	69,2	58,3	0,79	1,27	0,63	1,05	113,30
O14H70	70	5	8,22	65,3	62,0	0,76	1,31	0,57	1,05	106,50
		10	9,45	67,6	59,9	0,75	1,34	0,60	1,05	109,20
		15	10,67	69,6	58,0	0,74	1,36	0,63	1,05	111,60
O14H75	75	5	8,44	65,7	61,6	0,71	1,40	0,57	1,05	105,10
		10	9,67	67,9	59,5	0,70	1,43	0,60	1,05	107,80
		15	10,89	69,9	57,7	0,69	1,45	0,62	1,05	110,10
O14H80	80	5	8,66	66,2	61,2	0,67	1,49	0,57	1,09	103,90
		10	9,88	68,3	59,2	0,66	1,52	0,59	1,05	106,50
		15	11,11	70,2	57,4	0,65	1,54	0,62	1,05	108,80
O14H85	85	5	8,88	66,6	60,8	0,63	1,58	0,57	1,09	102,90
		10	10,10	68,7	58,8	0,62	1,61	0,59	1,05	105,40
		15	11,33	70,5	57,1	0,61	1,63	0,61	1,05	107,60
O14H90	90	5	9,10	67,0	60,4	0,60	1,67	0,57	1,09	101,90
		10	10,32	69,0	58,5	0,59	1,70	0,59	1,09	104,30
		15	11,55	70,8	56,8	0,58	1,72	0,61	1,05	106,50

SUMMARY TABLE STRUCTURAL CHARACTERISTICS ELEMENT "U"



		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J $[mm^4]$	A $[mm^2]$	Y_G [mm]	σ_s $[N/mm^2]$	σ_i $[N/mm^2]$
U7H35 a	3,96	0	6/10"	6	1/2"	1,67E+09	1,70E+05	110	-1,23	-5,60
U7H35 b	3,96	2	6/10"	4	1/2"	1,67E+09	1,71E+05	109	-0,83	-6,61
U7H35 c	3,96	4	6/10"	2	1/2"	1,67E+09	1,72E+05	109	-0,44	-7,60
U7H35 d	3,96	6	6/10"	0	1/2"	1,68E+09	1,72E+05	109	-0,05	-8,57
U7H35 e	3,96	6	6/10"	2	1/2"	1,68E+09	1,74E+05	108	0,72	-10,51
U7H35 f	3,96	6	6/10"	4	1/2"	1,69E+09	1,75E+05	108	1,48	-12,40
U7H35 g	3,96	6	6/10"	6	1/2"	1,70E+09	1,77E+05	107	2,22	-14,25
U7H35 h	3,96	6	6/10"	8	1/2"	1,73E+09	1,79E+05	107	0,02	-15,47
U7H35 i	3,96	6	6/10"	10	1/2"	1,73E+09	1,80E+05	107	0,72	-17,23
U7H35 l	3,96	6	6/10"	12	1/2"	1,74E+09	1,82E+05	106	1,40	-18,95
U7H35 m	3,96	6	6/10"	14	1/2"	1,74E+09	1,83E+05	106	2,07	-20,62
U7H35 n	3,96	6	6/10"	16	1/2"	1,78E+09	1,86E+05	106	-0,88	-21,57
U7H35 o	3,96	6	6/10"	18	1/2"	1,79E+09	1,87E+05	105	-0,24	-23,17
U7H40 a	4,19	0	6/10"	6	1/2"	2,38E+09	1,80E+05	125	-0,98	-5,38
U7H40 b	4,19	2	6/10"	4	1/2"	2,39E+09	1,81E+05	125	-0,57	-6,34
U7H40 c	4,19	4	6/10"	2	1/2"	2,39E+09	1,81E+05	124	-0,17	-7,29
U7H40 d	4,19	6	6/10"	0	1/2"	2,40E+09	1,82E+05	124	0,23	-8,23
U7H40 e	4,19	6	6/10"	2	1/2"	2,41E+09	1,84E+05	123	1,02	-10,09
U7H40 f	4,19	6	6/10"	4	1/2"	2,42E+09	1,85E+05	123	1,79	-11,90
U7H40 g	4,19	6	6/10"	6	1/2"	2,43E+09	1,87E+05	122	2,55	-13,68
U7H40 h	4,19	6	6/10"	8	1/2"	2,47E+09	1,89E+05	122	0,51	-14,87
U7H40 i	4,19	6	6/10"	10	1/2"	2,48E+09	1,90E+05	122	1,22	-16,56
U7H40 l	4,19	6	6/10"	12	1/2"	2,49E+09	1,92E+05	121	1,92	-18,21
U7H40 m	4,19	6	6/10"	14	1/2"	2,50E+09	1,93E+05	120	2,61	-19,83
U7H40 n	4,19	6	6/10"	16	1/2"	2,55E+09	1,95E+05	121	-0,16	-20,75
U7H40 o	4,19	6	6/10"	18	1/2"	2,56E+09	1,97E+05	120	0,49	-22,30

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
U7H45 a	4,45	0	6/10"	6	1/2"	3,34E+09	1,91E+05	143	-0,72	-5,19
U7H45 b	4,45	2	6/10"	4	1/2"	3,34E+09	1,92E+05	142	-0,32	-6,11
U7H45 c	4,45	4	6/10"	2	1/2"	3,35E+09	1,92E+05	142	0,08	-7,03
U7H45 d	4,45	6	6/10"	0	1/2"	3,36E+09	1,93E+05	141	0,48	-7,93
U7H45 e	4,45	6	6/10"	2	1/2"	3,37E+09	1,95E+05	141	1,26	-9,72
U7H45 f	4,45	6	6/10"	4	1/2"	3,39E+09	1,96E+05	140	2,03	-11,47
U7H45 g	4,45	6	6/10"	6	1/2"	3,45E+09	1,98E+05	140	0,22	-12,68
U7H45 h	4,45	6	6/10"	8	1/2"	3,46E+09	2,00E+05	139	0,95	-14,34
U7H45 i	4,45	6	6/10"	10	1/2"	3,47E+09	2,01E+05	138	1,66	-15,97
U7H45 l	4,45	6	6/10"	12	1/2"	3,49E+09	2,03E+05	138	2,36	-17,57
U7H45 m	4,45	6	6/10"	14	1/2"	3,56E+09	2,05E+05	138	-0,13	-18,52
U7H45 n	4,45	6	6/10"	16	1/2"	3,57E+09	2,06E+05	137	0,53	-20,05
U7H45 o	4,45	6	6/10"	18	1/2"	3,58E+09	2,08E+05	137	1,17	-21,54
U7H50 a	4,72	0	6/10"	6	1/2"	4,51E+09	2,02E+05	161	-0,51	-5,02
U7H50 b	4,72	2	6/10"	4	1/2"	4,52E+09	2,03E+05	160	-0,11	-5,91
U7H50 c	4,72	4	6/10"	2	1/2"	4,53E+09	2,03E+05	160	0,28	-6,79
U7H50 d	4,72	6	6/10"	0	1/2"	4,54E+09	2,04E+05	160	0,67	-7,66
U7H50 e	4,72	6	6/10"	2	1/2"	4,56E+09	2,06E+05	159	1,44	-9,39
U7H50 f	4,72	6	6/10"	4	1/2"	4,58E+09	2,07E+05	158	2,20	-11,08
U7H50 g	4,72	6	6/10"	6	1/2"	4,66E+09	2,09E+05	158	0,57	-12,26
U7H50 h	4,72	6	6/10"	8	1/2"	4,68E+09	2,11E+05	157	1,29	-13,87
U7H50 i	4,72	6	6/10"	10	1/2"	4,69E+09	2,12E+05	156	1,99	-15,45
U7H50 l	4,72	6	6/10"	12	1/2"	4,71E+09	2,14E+05	155	2,68	-16,99
U7H50 m	4,72	6	6/10"	14	1/2"	4,81E+09	2,16E+05	156	0,41	-17,94
U7H50 n	4,72	6	6/10"	16	1/2"	4,82E+09	2,17E+05	155	1,06	-19,42
U7H50 o	4,72	6	6/10"	18	1/2"	4,84E+09	2,19E+05	154	1,70	-20,87
U7H55 a	4,98	0	6/10"	6	1/2"	5,92E+09	2,13E+05	180	-0,34	-4,86
U7H55 b	4,98	2	6/10"	4	1/2"	5,93E+09	2,14E+05	179	0,05	-5,73
U7H55 c	4,98	4	6/10"	2	1/2"	5,95E+09	2,14E+05	179	0,44	-6,58
U7H55 d	4,98	6	6/10"	0	1/2"	5,96E+09	2,15E+05	178	0,82	-7,42
U7H55 e	4,98	6	6/10"	2	1/2"	5,99E+09	2,17E+05	178	1,58	-9,09
U7H55 f	4,98	6	6/10"	4	1/2"	6,01E+09	2,18E+05	177	2,32	-10,72
U7H55 g	4,98	6	6/10"	6	1/2"	6,11E+09	2,20E+05	177	0,85	-11,89
U7H55 h	4,98	6	6/10"	8	1/2"	6,14E+09	2,22E+05	176	1,55	-13,45
U7H55 i	4,98	6	6/10"	10	1/2"	6,16E+09	2,23E+05	175	2,24	-14,98
U7H55 l	4,98	6	6/10"	12	1/2"	6,28E+09	2,25E+05	175	0,19	-15,95
U7H55 m	4,98	6	6/10"	14	1/2"	6,30E+09	2,27E+05	174	0,84	-17,41
U7H55 n	4,98	6	6/10"	16	1/2"	6,33E+09	2,28E+05	173	1,48	-18,85
U7H55 o	4,98	6	6/10"	18	1/2"	6,35E+09	2,30E+05	172	2,11	-20,25

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	$σ_S$ [N/mm²]	$σ_I$ [N/mm²]
U7H60 a	5,25	0	6/10"	6	1/2"	7,58E+09	2,24E+05	200	-0,20	-4,72
U7H60 b	5,25	2	6/10"	4	1/2"	7,60E+09	2,25E+05	199	0,18	-5,56
U7H60 c	5,25	4	6/10"	2	1/2"	7,62E+09	2,25E+05	198	0,56	-6,38
U7H60 d	5,25	6	6/10"	0	1/2"	7,64E+09	2,26E+05	198	0,93	-7,20
U7H60 e	5,25	6	6/10"	2	1/2"	7,75E+09	2,28E+05	198	-0,36	-8,41
U7H60 f	5,25	6	6/10"	4	1/2"	7,79E+09	2,30E+05	197	0,36	-9,99
U7H60 g	5,25	6	6/10"	6	1/2"	7,82E+09	2,31E+05	196	1,07	-11,54
U7H60 h	5,25	6	6/10"	8	1/2"	7,86E+09	2,33E+05	195	1,76	-13,06
U7H60 i	5,25	6	6/10"	10	1/2"	7,89E+09	2,34E+05	194	2,44	-14,55
U7H60 l	5,25	6	6/10"	12	1/2"	8,03E+09	2,36E+05	194	0,55	-15,50
U7H60 m	5,25	6	6/10"	14	1/2"	8,06E+09	2,38E+05	193	1,20	-16,93
U7H60 n	5,25	6	6/10"	16	1/2"	8,09E+09	2,39E+05	192	1,83	-18,33
U7H60 o	5,25	6	6/10"	18	1/2"	8,12E+09	2,41E+05	191	2,45	-19,70
U7H65 a	5,51	0	6/10"	6	1/2"	9,51E+09	2,35E+05	220	-0,08	-4,59
U7H65 b	5,51	2	6/10"	4	1/2"	9,53E+09	2,36E+05	219	0,29	-5,40
U7H65 c	5,51	4	6/10"	2	1/2"	9,56E+09	2,36E+05	218	0,66	-6,20
U7H65 d	5,51	6	6/10"	0	1/2"	9,58E+09	2,37E+05	218	1,03	-6,99
U7H65 e	5,51	6	6/10"	2	1/2"	9,62E+09	2,39E+05	217	1,75	-8,57
U7H65 f	5,51	6	6/10"	4	1/2"	9,67E+09	2,40E+05	216	2,47	-10,11
U7H65 g	5,51	6	6/10"	6	1/2"	9,94E+09	2,43E+05	217	-1,11	-10,75
U7H65 h	5,51	6	6/10"	8	1/2"	9,98E+09	2,44E+05	216	-0,45	-12,23
U7H65 i	5,51	6	6/10"	10	1/2"	1,00E+10	2,46E+05	215	0,21	-13,67
U7H65 l	5,51	6	6/10"	12	1/2"	1,01E+10	2,47E+05	214	0,85	-15,09
U7H65 m	5,51	6	6/10"	14	1/2"	1,01E+10	2,49E+05	213	1,48	-16,48
U7H65 n	5,51	6	6/10"	16	1/2"	1,01E+10	2,50E+05	212	2,11	-17,85
U7H65 o	5,51	6	6/10"	18	1/2"	1,03E+10	2,53E+05	212	0,87	-18,82
U7H70 a	5,77	0	6/10"	6	1/2"	1,17E+10	2,46E+05	240	0,02	-4,47
U7H70 b	5,77	2	6/10"	4	1/2"	1,18E+10	2,47E+05	240	0,38	-5,26
U7H70 c	5,77	4	6/10"	2	1/2"	1,18E+10	2,47E+05	239	0,74	-6,04
U7H70 d	5,77	6	6/10"	0	1/2"	1,18E+10	2,48E+05	238	1,10	-6,81
U7H70 e	5,77	6	6/10"	2	1/2"	1,19E+10	2,50E+05	237	1,81	-8,34
U7H70 f	5,77	6	6/10"	4	1/2"	1,19E+10	2,51E+05	236	2,51	-9,84
U7H70 g	5,77	6	6/10"	6	1/2"	1,22E+10	2,54E+05	237	-0,83	-10,47
U7H70 h	5,77	6	6/10"	8	1/2"	1,23E+10	2,55E+05	236	-0,17	-11,92
U7H70 i	5,77	6	6/10"	10	1/2"	1,23E+10	2,57E+05	235	0,47	-13,33
U7H70 l	5,77	6	6/10"	12	1/2"	1,24E+10	2,58E+05	234	1,10	-14,71
U7H70 m	5,77	6	6/10"	14	1/2"	1,24E+10	2,60E+05	233	1,72	-16,07
U7H70 n	5,77	6	6/10"	16	1/2"	1,25E+10	2,61E+05	232	2,33	-17,40
U7H70 o	5,77	6	6/10"	18	1/2"	1,27E+10	2,64E+05	232	1,19	-18,36

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	$σ_s$ [N/mm²]	$σ_i$ [N/mm²]
U7H75 a	6,04	0	6/10"	6	1/2"	1,42E+10	2,57E+05	261	0,10	-4,35
U7H75 b	6,04	2	6/10"	4	1/2"	1,43E+10	2,58E+05	260	0,46	-5,12
U7H75 c	6,04	4	6/10"	2	1/2"	1,43E+10	2,58E+05	260	0,81	-5,88
U7H75 d	6,04	6	6/10"	0	1/2"	1,43E+10	2,59E+05	259	1,16	-6,63
U7H75 e	6,04	6	6/10"	2	1/2"	1,44E+10	2,61E+05	258	1,86	-8,13
U7H75 f	6,04	6	6/10"	4	1/2"	1,45E+10	2,62E+05	257	2,54	-9,59
U7H75 g	6,04	6	6/10"	6	1/2"	1,47E+10	2,64E+05	257	1,51	-10,67
U7H75 h	6,04	6	6/10"	8	1/2"	1,47E+10	2,66E+05	255	2,17	-12,07
U7H75 i	6,04	6	6/10"	10	1/2"	1,50E+10	2,68E+05	256	0,69	-13,01
U7H75 l	6,04	6	6/10"	12	1/2"	1,50E+10	2,69E+05	254	1,31	-14,36
U7H75 m	6,04	6	6/10"	14	1/2"	1,51E+10	2,71E+05	253	1,92	-15,69
U7H75 n	6,04	6	6/10"	16	1/2"	1,52E+10	2,72E+05	252	2,52	-16,99
U7H75 o	6,04	6	6/10"	18	1/2"	1,54E+10	2,75E+05	252	1,46	-17,93
U7H80 a	6,30	0	6/10"	6	1/2"	1,71E+10	2,68E+05	282	0,17	-4,25
U7H80 b	6,30	2	6/10"	4	1/2"	1,71E+10	2,69E+05	282	0,52	-5,00
U7H80 c	6,30	4	6/10"	2	1/2"	1,71E+10	2,69E+05	281	0,87	-5,74
U7H80 d	6,30	6	6/10"	0	1/2"	1,72E+10	2,70E+05	280	1,21	-6,47
U7H80 e	6,30	6	6/10"	2	1/2"	1,73E+10	2,72E+05	279	1,89	-7,93
U7H80 f	6,30	6	6/10"	4	1/2"	1,73E+10	2,73E+05	278	2,56	-9,36
U7H80 g	6,30	6	6/10"	6	1/2"	1,76E+10	2,75E+05	278	1,61	-10,41
U7H80 h	6,30	6	6/10"	8	1/2"	1,77E+10	2,77E+05	276	2,25	-11,79
U7H80 i	6,30	6	6/10"	10	1/2"	1,79E+10	2,79E+05	276	0,88	-12,71
U7H80 l	6,30	6	6/10"	12	1/2"	1,80E+10	2,80E+05	275	1,49	-14,03
U7H80 m	6,30	6	6/10"	14	1/2"	1,81E+10	2,82E+05	274	2,09	-15,33
U7H80 n	6,30	6	6/10"	16	1/2"	1,82E+10	2,83E+05	273	2,68	-16,60
U7H80 o	6,30	6	6/10"	18	1/2"	1,84E+10	2,86E+05	273	1,70	-17,52
U7H85 a	6,57	0	6/10"	6	1/2"	2,02E+10	2,79E+05	304	0,23	-4,15
U7H85 b	6,57	2	6/10"	4	1/2"	2,03E+10	2,80E+05	303	0,57	-4,88
U7H85 c	6,57	4	6/10"	2	1/2"	2,03E+10	2,80E+05	303	0,91	-5,60
U7H85 d	6,57	6	6/10"	0	1/2"	2,04E+10	2,81E+05	302	1,25	-6,32
U7H85 e	6,57	6	6/10"	2	1/2"	2,06E+10	2,83E+05	302	0,40	-7,40
U7H85 f	6,57	6	6/10"	4	1/2"	2,07E+10	2,85E+05	300	1,06	-8,80
U7H85 g	6,57	6	6/10"	6	1/2"	2,10E+10	2,87E+05	300	-0,19	-9,76
U7H85 h	6,57	6	6/10"	8	1/2"	2,11E+10	2,88E+05	299	0,43	-11,10
U7H85 i	6,57	6	6/10"	10	1/2"	2,12E+10	2,90E+05	298	1,04	-12,42
U7H85 l	6,57	6	6/10"	12	1/2"	2,15E+10	2,92E+05	297	0,17	-13,40
U7H85 m	6,57	6	6/10"	14	1/2"	2,16E+10	2,94E+05	296	0,75	-14,67
U7H85 n	6,57	6	6/10"	16	1/2"	2,17E+10	2,95E+05	295	1,33	-15,91
U7H85 o	6,57	6	6/10"	18	1/2"	2,18E+10	2,97E+05	294	1,89	-17,14

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
U7H90 a	6,83	0	6/10"	6	1/2"	2,37E+10	2,90E+05	326	0,28	-4,05
U7H90 b	6,83	2	6/10"	4	1/2"	2,38E+10	2,91E+05	325	0,62	-4,77
U7H90 c	6,83	4	6/10"	2	1/2"	2,38E+10	2,91E+05	324	0,95	-5,47
U7H90 d	6,83	6	6/10"	0	1/2"	2,39E+10	2,92E+05	324	1,28	-6,17
U7H90 e	6,83	6	6/10"	2	1/2"	2,40E+10	2,94E+05	322	1,94	-7,57
U7H90 f	6,83	6	6/10"	4	1/2"	2,41E+10	2,95E+05	321	2,58	-8,93
U7H90 g	6,83	6	6/10"	6	1/2"	2,44E+10	2,97E+05	320	1,76	-9,95
U7H90 h	6,83	6	6/10"	8	1/2"	2,45E+10	2,99E+05	319	2,38	-11,26
U7H90 i	6,83	6	6/10"	10	1/2"	2,49E+10	3,01E+05	319	1,18	-12,15
U7H90 l	6,83	6	6/10"	12	1/2"	2,50E+10	3,02E+05	318	1,77	-13,42
U7H90 m	6,83	6	6/10"	14	1/2"	2,51E+10	3,04E+05	316	2,35	-14,66
U7H90 n	6,83	6	6/10"	16	1/2"	2,56E+10	3,07E+05	318	-0,24	-15,20
U7H90 o	6,83	6	6/10"	18	1/2"	2,57E+10	3,08E+05	316	0,31	-16,40
U14H35 a	5,29	6	6/10"	0	1/2"	1,69E+09	2,28E+05	111	-2,19	-5,54
U14H35 b	5,29	6	6/10"	2	1/2"	1,69E+09	2,30E+05	111	-1,91	-6,92
U14H35 c	5,29	8	6/10"	0	1/2"	1,70E+09	2,30E+05	111	-1,77	-7,59
U14H35 d	5,29	8	6/10"	2	1/2"	1,70E+09	2,32E+05	111	-1,50	-8,93
U14H35 e	5,29	10	6/10"	0	1/2"	1,70E+09	2,33E+05	111	-1,36	-9,59
U14H35 f	5,29	10	6/10"	2	1/2"	1,70E+09	2,34E+05	110	-1,09	-10,90
U14H35 g	5,29	12	6/10"	0	1/2"	1,70E+09	2,35E+05	110	-0,96	-11,54
U14H35 h	5,29	12	6/10"	2	1/2"	1,70E+09	2,36E+05	110	-0,70	-12,82
U14H35 i	5,29	14	6/10"	0	1/2"	1,71E+09	2,37E+05	110	-0,57	-13,45
U14H35 l	5,29	14	6/10"	2	1/2"	1,71E+09	2,38E+05	110	-0,31	-14,71
U14H35 m	5,29	16	6/10"	0	1/2"	1,71E+09	2,39E+05	109	-0,19	-15,32
U14H35 n	5,29	16	6/10"	2	1/2"	1,71E+09	2,41E+05	109	0,07	-16,55
U14H35 o	5,29	18	6/10"	0	1/2"	1,71E+09	2,41E+05	109	0,19	-17,14
U14H35 p	5,29	18	6/10"	2	1/2"	1,71E+09	2,43E+05	109	0,44	-18,34
U14H35 q	5,29	20	6/10"	0	1/2"	1,71E+09	2,44E+05	109	0,56	-18,93
U14H35 r	5,29	20	6/10"	2	1/2"	1,71E+09	2,45E+05	108	1,23	-20,29
U14H35 s	5,29	22	6/10"	0	1/2"	1,71E+09	2,46E+05	108	1,35	-20,86
U14H35 t	5,29	22	6/10"	2	1/2"	1,71E+09	2,47E+05	108	1,59	-22,01
U14H35 u	5,29	24	6/10"	0	1/2"	1,71E+09	2,48E+05	108	1,71	-22,57

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_i [N/mm²]
U14H40 a	5,56	6	6/10"	0	1/2"	2,45E+09	2,39E+05	124	-1,64	-5,44
U14H40 b	5,56	6	6/10"	2	1/2"	2,45E+09	2,41E+05	123	-1,28	-6,78
U14H40 c	5,56	8	6/10"	0	1/2"	2,45E+09	2,41E+05	123	-1,10	-7,43
U14H40 d	5,56	8	6/10"	2	1/2"	2,46E+09	2,43E+05	123	-0,74	-8,74
U14H40 e	5,56	10	6/10"	0	1/2"	2,46E+09	2,44E+05	123	-0,57	-9,38
U14H40 f	5,56	10	6/10"	2	1/2"	2,46E+09	2,45E+05	123	-0,22	-10,65
U14H40 g	5,56	12	6/10"	0	1/2"	2,47E+09	2,46E+05	122	-0,04	-11,27
U14H40 h	5,56	12	6/10"	2	1/2"	2,47E+09	2,47E+05	122	0,30	-12,52
U14H40 i	5,56	14	6/10"	0	1/2"	2,47E+09	2,48E+05	122	0,47	-13,13
U14H40 l	5,56	14	6/10"	2	1/2"	2,48E+09	2,50E+05	122	0,80	-14,35
U14H40 m	5,56	16	6/10"	0	1/2"	2,48E+09	2,50E+05	121	0,97	-14,95
U14H40 n	5,56	16	6/10"	2	1/2"	2,48E+09	2,52E+05	121	1,30	-16,14
U14H40 o	5,56	18	6/10"	0	1/2"	2,48E+09	2,53E+05	121	1,46	-16,72
U14H40 p	5,56	18	6/10"	2	1/2"	2,49E+09	2,54E+05	121	1,78	-17,89
U14H40 q	5,56	20	6/10"	0	1/2"	2,49E+09	2,55E+05	121	1,94	-18,46
U14H40 r	5,56	20	6/10"	2	1/2"	2,48E+09	2,56E+05	120	2,61	-19,75
U14H40 s	5,56	22	6/10"	0	1/2"	2,51E+09	2,58E+05	121	0,41	-19,78
U14H40 t	5,56	22	6/10"	2	1/2"	2,51E+09	2,59E+05	120	0,72	-20,90
U14H40 u	5,56	24	6/10"	0	1/2"	2,52E+09	2,60E+05	120	0,87	-21,44
U14H45 a	5,83	6	6/10"	0	1/2"	3,42E+09	2,50E+05	137	-1,22	-5,33
U14H45 b	5,83	6	6/10"	2	1/2"	3,43E+09	2,52E+05	137	-0,81	-6,63
U14H45 c	5,83	8	6/10"	0	1/2"	3,43E+09	2,52E+05	137	-0,60	-7,26
U14H45 d	5,83	8	6/10"	2	1/2"	3,44E+09	2,54E+05	136	-0,20	-8,53
U14H45 e	5,83	10	6/10"	0	1/2"	3,44E+09	2,55E+05	136	0,00	-9,15
U14H45 f	5,83	10	6/10"	2	1/2"	3,45E+09	2,56E+05	136	0,40	-10,39
U14H45 g	5,83	12	6/10"	0	1/2"	3,45E+09	2,57E+05	135	0,59	-10,99
U14H45 h	5,83	12	6/10"	2	1/2"	3,46E+09	2,58E+05	135	0,98	-12,20
U14H45 i	5,83	14	6/10"	0	1/2"	3,46E+09	2,59E+05	135	1,18	-12,80
U14H45 l	5,83	14	6/10"	2	1/2"	3,51E+09	2,61E+05	135	-0,90	-13,41
U14H45 m	5,83	16	6/10"	0	1/2"	3,52E+09	2,62E+05	135	-0,72	-13,99
U14H45 n	5,83	16	6/10"	2	1/2"	3,52E+09	2,64E+05	135	-0,35	-15,15
U14H45 o	5,83	18	6/10"	0	1/2"	3,53E+09	2,64E+05	134	-0,17	-15,71
U14H45 p	5,83	18	6/10"	2	1/2"	3,53E+09	2,66E+05	134	0,20	-16,85
U14H45 q	5,83	20	6/10"	0	1/2"	3,53E+09	2,66E+05	134	0,37	-17,40
U14H45 r	5,83	20	6/10"	2	1/2"	3,57E+09	2,69E+05	134	-1,57	-18,11
U14H45 s	5,83	22	6/10"	0	1/2"	3,57E+09	2,70E+05	134	-1,40	-18,65
U14H45 t	5,83	22	6/10"	2	1/2"	3,58E+09	2,71E+05	134	-1,05	-19,74
U14H45 u	5,83	24	6/10"	0	1/2"	3,58E+09	2,72E+05	133	-0,88	-20,27

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
U14H50 a	6,09	6	6/10"	0	1/2"	4,65E+09	2,61E+05	152	-0,89	-5,22
U14H50 b	6,09	6	6/10"	2	1/2"	4,66E+09	2,63E+05	151	-0,45	-6,48
U14H50 c	6,09	8	6/10"	0	1/2"	4,67E+09	2,63E+05	151	-0,23	-7,09
U14H50 d	6,09	8	6/10"	2	1/2"	4,67E+09	2,65E+05	150	0,20	-8,32
U14H50 e	6,09	10	6/10"	0	1/2"	4,68E+09	2,66E+05	150	0,42	-8,92
U14H50 f	6,09	10	6/10"	2	1/2"	4,69E+09	2,67E+05	150	0,84	-10,13
U14H50 g	6,09	12	6/10"	0	1/2"	4,69E+09	2,68E+05	150	1,05	-10,71
U14H50 h	6,09	12	6/10"	2	1/2"	4,70E+09	2,69E+05	149	1,46	-11,89
U14H50 i	6,09	14	6/10"	0	1/2"	4,71E+09	2,70E+05	149	1,67	-12,47
U14H50 l	6,09	14	6/10"	2	1/2"	4,77E+09	2,72E+05	149	-0,24	-13,10
U14H50 m	6,09	16	6/10"	0	1/2"	4,78E+09	2,73E+05	149	-0,04	-13,66
U14H50 n	6,09	16	6/10"	2	1/2"	4,79E+09	2,75E+05	149	0,36	-14,79
U14H50 o	6,09	18	6/10"	0	1/2"	4,79E+09	2,75E+05	148	0,55	-15,34
U14H50 p	6,09	18	6/10"	2	1/2"	4,80E+09	2,77E+05	148	0,94	-16,44
U14H50 q	6,09	20	6/10"	0	1/2"	4,80E+09	2,77E+05	148	1,13	-16,98
U14H50 r	6,09	20	6/10"	2	1/2"	4,79E+09	2,79E+05	147	1,91	-18,22
U14H50 s	6,09	22	6/10"	0	1/2"	4,79E+09	2,80E+05	147	2,10	-18,75
U14H50 t	6,09	22	6/10"	2	1/2"	4,80E+09	2,81E+05	147	2,48	-19,80
U14H50 u	6,09	24	6/10"	0	1/2"	4,80E+09	2,82E+05	146	2,66	-20,32
U14H55 a	6,33	6	6/10"	0	1/2"	6,13E+09	2,71E+05	166	-0,65	-5,11
U14H55 b	6,33	6	6/10"	2	1/2"	6,15E+09	2,73E+05	166	-0,20	-6,33
U14H55 c	6,33	8	6/10"	0	1/2"	6,15E+09	2,74E+05	166	0,03	-6,93
U14H55 d	6,33	8	6/10"	2	1/2"	6,16E+09	2,75E+05	165	0,47	-8,13
U14H55 e	6,33	10	6/10"	0	1/2"	6,17E+09	2,76E+05	165	0,69	-8,71
U14H55 f	6,33	10	6/10"	2	1/2"	6,18E+09	2,77E+05	164	1,13	-9,88
U14H55 g	6,33	12	6/10"	0	1/2"	6,19E+09	2,78E+05	164	1,34	-10,45
U14H55 h	6,33	12	6/10"	2	1/2"	6,20E+09	2,80E+05	164	1,77	-11,60
U14H55 i	6,33	14	6/10"	0	1/2"	6,21E+09	2,80E+05	163	1,98	-12,16
U14H55 l	6,33	14	6/10"	2	1/2"	6,30E+09	2,82E+05	164	0,22	-12,81
U14H55 m	6,33	16	6/10"	0	1/2"	6,30E+09	2,83E+05	163	0,42	-13,35
U14H55 n	6,33	16	6/10"	2	1/2"	6,31E+09	2,85E+05	163	0,83	-14,45
U14H55 o	6,33	18	6/10"	0	1/2"	6,32E+09	2,85E+05	163	1,03	-14,98
U14H55 p	6,33	18	6/10"	2	1/2"	6,33E+09	2,87E+05	162	1,42	-16,05
U14H55 q	6,33	20	6/10"	0	1/2"	6,34E+09	2,88E+05	162	1,62	-16,58
U14H55 r	6,33	20	6/10"	2	1/2"	6,32E+09	2,89E+05	161	2,35	-17,76
U14H55 s	6,33	22	6/10"	0	1/2"	6,33E+09	2,90E+05	161	2,54	-18,28
U14H55 t	6,33	22	6/10"	2	1/2"	6,42E+09	2,92E+05	162	0,39	-18,80
U14H55 u	6,33	24	6/10"	0	1/2"	6,43E+09	2,93E+05	161	0,58	-19,30

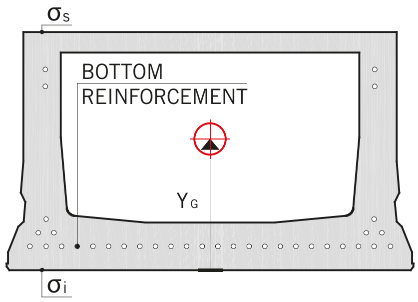
		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
U14H60 a	6,62	6	6/10"	0	1/2"	7,94E+09	2,83E+05	183	-0,41	-5,00
U14H60 b	6,62	6	6/10"	2	1/2"	7,96E+09	2,85E+05	182	0,06	-6,19
U14H60 c	6,62	8	6/10"	0	1/2"	7,97E+09	2,85E+05	182	0,29	-6,78
U14H60 d	6,62	8	6/10"	2	1/2"	7,99E+09	2,87E+05	181	0,74	-7,94
U14H60 e	6,62	10	6/10"	0	1/2"	8,00E+09	2,88E+05	181	0,96	-8,51
U14H60 f	6,62	10	6/10"	2	1/2"	8,01E+09	2,89E+05	181	1,41	-9,65
U14H60 g	6,62	12	6/10"	0	1/2"	8,02E+09	2,90E+05	180	1,63	-10,20
U14H60 h	6,62	12	6/10"	2	1/2"	8,04E+09	2,91E+05	180	2,07	-11,32
U14H60 i	6,62	14	6/10"	0	1/2"	8,05E+09	2,92E+05	179	2,28	-11,86
U14H60 l	6,62	14	6/10"	2	1/2"	8,16E+09	2,94E+05	180	0,68	-12,52
U14H60 m	6,62	16	6/10"	0	1/2"	8,16E+09	2,95E+05	179	0,89	-13,06
U14H60 n	6,62	16	6/10"	2	1/2"	8,18E+09	2,97E+05	179	1,30	-14,12
U14H60 o	6,62	18	6/10"	0	1/2"	8,19E+09	2,97E+05	179	1,51	-14,65
U14H60 p	6,62	18	6/10"	2	1/2"	8,20E+09	2,99E+05	178	1,91	-15,69
U14H60 q	6,62	20	6/10"	0	1/2"	8,21E+09	2,99E+05	178	2,11	-16,20
U14H60 r	6,62	20	6/10"	2	1/2"	8,30E+09	3,02E+05	178	0,42	-16,87
U14H60 s	6,62	22	6/10"	0	1/2"	8,31E+09	3,03E+05	178	0,62	-17,37
U14H60 t	6,62	22	6/10"	2	1/2"	8,33E+09	3,04E+05	177	1,01	-18,37
U14H60 u	6,62	24	6/10"	0	1/2"	8,33E+09	3,05E+05	177	1,20	-18,87
U14H65 a	6,88	6	6/10"	0	1/2"	1,00E+10	2,94E+05	200	-0,23	-4,90
U14H65 b	6,88	6	6/10"	2	1/2"	1,01E+10	2,96E+05	199	0,24	-6,06
U14H65 c	6,88	8	6/10"	0	1/2"	1,01E+10	2,96E+05	199	0,47	-6,63
U14H65 d	6,88	8	6/10"	2	1/2"	1,01E+10	2,98E+05	198	0,93	-7,77
U14H65 e	6,88	10	6/10"	0	1/2"	1,01E+10	2,99E+05	198	1,15	-8,32
U14H65 f	6,88	10	6/10"	2	1/2"	1,01E+10	3,00E+05	197	1,60	-9,43
U14H65 g	6,88	12	6/10"	0	1/2"	1,02E+10	3,01E+05	197	1,82	-9,97
U14H65 h	6,88	12	6/10"	2	1/2"	1,02E+10	3,02E+05	196	2,26	-11,06
U14H65 i	6,88	14	6/10"	0	1/2"	1,02E+10	3,03E+05	196	2,48	-11,59
U14H65 l	6,88	14	6/10"	2	1/2"	1,03E+10	3,05E+05	196	1,00	-12,26
U14H65 m	6,88	16	6/10"	0	1/2"	1,03E+10	3,06E+05	196	1,21	-12,78
U14H65 n	6,88	16	6/10"	2	1/2"	1,03E+10	3,08E+05	195	1,63	-13,82
U14H65 o	6,88	18	6/10"	0	1/2"	1,04E+10	3,08E+05	195	1,84	-14,33
U14H65 p	6,88	18	6/10"	2	1/2"	1,04E+10	3,10E+05	194	2,25	-15,35
U14H65 q	6,88	20	6/10"	0	1/2"	1,04E+10	3,10E+05	194	2,45	-15,85
U14H65 r	6,88	20	6/10"	2	1/2"	1,05E+10	3,13E+05	194	0,85	-16,51
U14H65 s	6,88	22	6/10"	0	1/2"	1,05E+10	3,14E+05	194	1,05	-17,00
U14H65 t	6,88	22	6/10"	2	1/2"	1,05E+10	3,15E+05	193	1,44	-17,98
U14H65 u	6,88	24	6/10"	0	1/2"	1,05E+10	3,16E+05	193	1,63	-18,46

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
U14H70 a	7,15	6	6/10"	0	1/2"	1,25E+10	3,05E+05	217	-0,08	-4,81
U14H70 b	7,15	6	6/10"	2	1/2"	1,25E+10	3,07E+05	216	0,38	-5,94
U14H70 c	7,15	8	6/10"	0	1/2"	1,25E+10	3,07E+05	216	0,61	-6,49
U14H70 d	7,15	8	6/10"	2	1/2"	1,26E+10	3,09E+05	215	1,07	-7,60
U14H70 e	7,15	10	6/10"	0	1/2"	1,26E+10	3,10E+05	215	1,30	-8,14
U14H70 f	7,15	10	6/10"	2	1/2"	1,26E+10	3,11E+05	214	1,75	-9,23
U14H70 g	7,15	12	6/10"	0	1/2"	1,26E+10	3,12E+05	214	1,97	-9,76
U14H70 h	7,15	12	6/10"	2	1/2"	1,26E+10	3,13E+05	213	2,41	-10,82
U14H70 i	7,15	14	6/10"	0	1/2"	1,27E+10	3,14E+05	213	2,62	-11,34
U14H70 l	7,15	14	6/10"	2	1/2"	1,28E+10	3,16E+05	213	1,26	-12,01
U14H70 m	7,15	16	6/10"	0	1/2"	1,28E+10	3,17E+05	213	1,47	-12,52
U14H70 n	7,15	16	6/10"	2	1/2"	1,29E+10	3,19E+05	212	1,89	-13,54
U14H70 o	7,15	18	6/10"	0	1/2"	1,29E+10	3,19E+05	212	2,10	-14,04
U14H70 p	7,15	18	6/10"	2	1/2"	1,29E+10	3,21E+05	211	2,51	-15,03
U14H70 q	7,15	20	6/10"	0	1/2"	1,31E+10	3,22E+05	212	0,48	-15,06
U14H70 r	7,15	20	6/10"	2	1/2"	1,30E+10	3,24E+05	211	1,20	-16,17
U14H70 s	7,15	22	6/10"	0	1/2"	1,31E+10	3,25E+05	211	1,40	-16,65
U14H70 t	7,15	22	6/10"	2	1/2"	1,31E+10	3,26E+05	210	1,79	-17,61
U14H70 u	7,15	24	6/10"	0	1/2"	1,31E+10	3,27E+05	210	1,99	-18,08
U14H75 a	7,41	6	6/10"	0	1/2"	1,53E+10	3,16E+05	235	0,04	-4,71
U14H75 b	7,41	6	6/10"	2	1/2"	1,53E+10	3,18E+05	234	0,51	-5,82
U14H75 c	7,41	8	6/10"	0	1/2"	1,53E+10	3,18E+05	233	0,73	-6,36
U14H75 d	7,41	8	6/10"	2	1/2"	1,54E+10	3,20E+05	233	1,19	-7,45
U14H75 e	7,41	10	6/10"	0	1/2"	1,54E+10	3,21E+05	232	1,41	-7,98
U14H75 f	7,41	10	6/10"	2	1/2"	1,54E+10	3,22E+05	232	1,86	-9,04
U14H75 g	7,41	12	6/10"	0	1/2"	1,54E+10	3,23E+05	231	2,08	-9,56
U14H75 h	7,41	12	6/10"	2	1/2"	1,55E+10	3,24E+05	230	2,52	-10,60
U14H75 i	7,41	14	6/10"	0	1/2"	1,56E+10	3,26E+05	231	1,05	-10,76
U14H75 l	7,41	14	6/10"	2	1/2"	1,57E+10	3,27E+05	230	1,48	-11,77
U14H75 m	7,41	16	6/10"	0	1/2"	1,57E+10	3,28E+05	230	1,69	-12,27
U14H75 n	7,41	16	6/10"	2	1/2"	1,57E+10	3,30E+05	229	2,10	-13,27
U14H75 o	7,41	18	6/10"	0	1/2"	1,57E+10	3,30E+05	229	2,31	-13,76
U14H75 p	7,41	18	6/10"	2	1/2"	1,60E+10	3,33E+05	229	0,61	-14,30
U14H75 q	7,41	20	6/10"	0	1/2"	1,60E+10	3,33E+05	229	0,81	-14,78
U14H75 r	7,41	20	6/10"	2	1/2"	1,60E+10	3,35E+05	228	1,49	-15,86
U14H75 s	7,41	22	6/10"	0	1/2"	1,60E+10	3,36E+05	228	1,69	-16,33
U14H75 t	7,41	22	6/10"	2	1/2"	1,60E+10	3,37E+05	227	2,08	-17,27
U14H75 u	7,41	24	6/10"	0	1/2"	1,60E+10	3,38E+05	227	2,28	-17,73

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	$σ_s$ [N/mm²]	$σ_i$ [N/mm²]
U14H80 a	7,67	6	6/10"	0	1/2"	1,84E+10	3,27E+05	253	0,14	-4,63
U14H80 b	7,67	6	6/10"	2	1/2"	1,85E+10	3,29E+05	252	0,61	-5,71
U14H80 c	7,67	8	6/10"	0	1/2"	1,85E+10	3,29E+05	252	0,83	-6,24
U14H80 d	7,67	8	6/10"	2	1/2"	1,85E+10	3,31E+05	251	1,29	-7,30
U14H80 e	7,67	10	6/10"	0	1/2"	1,85E+10	3,32E+05	250	1,51	-7,82
U14H80 f	7,67	10	6/10"	2	1/2"	1,86E+10	3,33E+05	250	1,96	-8,86
U14H80 g	7,67	12	6/10"	0	1/2"	1,86E+10	3,34E+05	249	2,17	-9,37
U14H80 h	7,67	12	6/10"	2	1/2"	1,87E+10	3,35E+05	248	2,61	-10,39
U14H80 i	7,67	14	6/10"	0	1/2"	1,88E+10	3,37E+05	249	1,23	-10,55
U14H80 l	7,67	14	6/10"	2	1/2"	1,89E+10	3,38E+05	248	1,65	-11,55
U14H80 m	7,67	16	6/10"	0	1/2"	1,89E+10	3,39E+05	248	1,86	-12,04
U14H80 n	7,67	16	6/10"	2	1/2"	1,90E+10	3,41E+05	247	2,28	-13,02
U14H80 o	7,67	18	6/10"	0	1/2"	1,90E+10	3,41E+05	247	2,48	-13,50
U14H80 p	7,67	18	6/10"	2	1/2"	1,92E+10	3,44E+05	247	0,90	-14,05
U14H80 q	7,67	20	6/10"	0	1/2"	1,93E+10	3,44E+05	247	1,10	-14,52
U14H80 r	7,67	20	6/10"	2	1/2"	1,92E+10	3,46E+05	246	1,74	-15,56
U14H80 s	7,67	22	6/10"	0	1/2"	1,93E+10	3,47E+05	245	1,94	-16,02
U14H80 t	7,67	22	6/10"	2	1/2"	1,93E+10	3,48E+05	245	2,33	-16,94
U14H80 u	7,67	24	6/10"	0	1/2"	1,93E+10	3,49E+05	244	2,52	-17,39
U14H85 a	7,94	6	6/10"	0	1/2"	2,19E+10	3,38E+05	272	0,23	-4,54
U14H85 b	7,94	6	6/10"	2	1/2"	2,20E+10	3,40E+05	271	0,69	-5,60
U14H85 c	7,94	8	6/10"	0	1/2"	2,20E+10	3,40E+05	270	0,92	-6,12
U14H85 d	7,94	8	6/10"	2	1/2"	2,21E+10	3,42E+05	269	1,37	-7,16
U14H85 e	7,94	10	6/10"	0	1/2"	2,21E+10	3,43E+05	269	1,59	-7,67
U14H85 f	7,94	10	6/10"	2	1/2"	2,22E+10	3,44E+05	268	2,03	-8,69
U14H85 g	7,94	12	6/10"	0	1/2"	2,22E+10	3,45E+05	268	2,25	-9,19
U14H85 h	7,94	12	6/10"	2	1/2"	2,22E+10	3,46E+05	267	2,68	-10,19
U14H85 i	7,94	14	6/10"	0	1/2"	2,25E+10	3,48E+05	267	1,38	-10,36
U14H85 l	7,94	14	6/10"	2	1/2"	2,25E+10	3,49E+05	267	1,80	-11,34
U14H85 m	7,94	16	6/10"	0	1/2"	2,25E+10	3,50E+05	266	2,01	-11,82
U14H85 n	7,94	16	6/10"	2	1/2"	2,26E+10	3,52E+05	265	2,42	-12,78
U14H85 o	7,94	18	6/10"	0	1/2"	2,26E+10	3,52E+05	265	2,62	-13,25
U14H85 p	7,94	18	6/10"	2	1/2"	2,29E+10	3,55E+05	265	1,14	-13,80
U14H85 q	7,94	20	6/10"	0	1/2"	2,29E+10	3,55E+05	265	1,33	-14,26
U14H85 r	7,94	20	6/10"	2	1/2"	2,29E+10	3,57E+05	264	1,95	-15,28
U14H85 s	7,94	22	6/10"	0	1/2"	2,30E+10	3,58E+05	264	2,15	-15,73
U14H85 t	7,94	22	6/10"	2	1/2"	2,30E+10	3,59E+05	263	2,54	-16,64
U14H85 u	7,94	24	6/10"	0	1/2"	2,32E+10	3,60E+05	263	1,31	-16,81

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	$σ_s$ [N/mm²]	$σ_I$ [N/mm²]
U14H90 a	8,20	6	6/10"	0	1/2"	2,59E+10	3,49E+05	291	0,31	-4,46
U14H90 b	8,20	6	6/10"	2	1/2"	2,59E+10	3,51E+05	290	0,76	-5,50
U14H90 c	8,20	8	6/10"	0	1/2"	2,60E+10	3,51E+05	289	0,99	-6,01
U14H90 d	8,20	8	6/10"	2	1/2"	2,60E+10	3,53E+05	288	1,43	-7,03
U14H90 e	8,20	10	6/10"	0	1/2"	2,61E+10	3,54E+05	288	1,65	-7,53
U14H90 f	8,20	10	6/10"	2	1/2"	2,61E+10	3,55E+05	287	2,09	-8,53
U14H90 g	8,20	12	6/10"	0	1/2"	2,62E+10	3,56E+05	287	2,30	-9,02
U14H90 h	8,20	12	6/10"	2	1/2"	2,64E+10	3,58E+05	287	1,30	-9,70
U14H90 i	8,20	14	6/10"	0	1/2"	2,65E+10	3,59E+05	286	1,51	-10,18
U14H90 l	8,20	14	6/10"	2	1/2"	2,65E+10	3,60E+05	285	1,92	-11,14
U14H90 m	8,20	16	6/10"	0	1/2"	2,66E+10	3,61E+05	285	2,13	-11,61
U14H90 n	8,20	16	6/10"	2	1/2"	2,66E+10	3,63E+05	284	2,54	-12,56
U14H90 o	8,20	18	6/10"	0	1/2"	2,69E+10	3,64E+05	285	0,94	-12,65
U14H90 p	8,20	18	6/10"	2	1/2"	2,70E+10	3,66E+05	284	1,34	-13,57
U14H90 q	8,20	20	6/10"	0	1/2"	2,70E+10	3,66E+05	284	1,54	-14,02
U14H90 r	8,20	20	6/10"	2	1/2"	2,70E+10	3,68E+05	283	2,13	-15,02
U14H90 s	8,20	22	6/10"	0	1/2"	2,71E+10	3,69E+05	282	2,32	-15,46
U14H90 t	8,20	22	6/10"	2	1/2"	2,73E+10	3,71E+05	282	1,36	-16,09
U14H90 u	8,20	24	6/10"	0	1/2"	2,73E+10	3,71E+05	282	1,55	-16,52

SUMMARY TABLE STRUCTURAL CHARACTERISTICS ELEMENT “O”



		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm^4]	A [mm^2]	Y_G [mm]	σ_s [N/mm^2]	σ_i [N/mm^2]
07H35 a	5,21	0	6/10"	6	1/2"	3,45E+09	2,22E+05	159	-0,12	-5,84
07H35 b	5,21	2	6/10"	4	1/2"	3,46E+09	2,23E+05	159	0,08	-6,80
07H35 c	5,21	4	6/10"	2	1/2"	3,47E+09	2,24E+05	158	0,28	-7,74
07H35 d	5,21	6	6/10"	0	1/2"	3,48E+09	2,24E+05	158	0,48	-8,68
07H35 e	5,21	6	6/10"	2	1/2"	3,50E+09	2,26E+05	157	0,87	-10,53
07H35 f	5,21	6	6/10"	4	1/2"	3,52E+09	2,27E+05	156	1,25	-12,34
07H35 g	5,21	6	6/10"	6	1/2"	3,53E+09	2,29E+05	156	1,62	-14,10
07H35 h	5,21	6	6/10"	8	1/2"	3,55E+09	2,30E+05	155	1,99	-15,83
07H35 i	5,21	6	6/10"	10	1/2"	3,57E+09	2,32E+05	154	2,35	-17,51
07H35 l	5,21	6	6/10"	12	1/2"	3,60E+09	2,34E+05	154	1,61	-18,98
07H35 m	5,21	6	6/10"	14	1/2"	3,62E+09	2,36E+05	153	1,96	-20,59
07H35 n	5,21	6	6/10"	16	1/2"	3,63E+09	2,37E+05	152	2,30	-22,16
07H35 o	5,21	6	6/10"	18	1/2"	3,65E+09	2,39E+05	152	2,64	-23,70
07H35 p	5,21	8	6/10"	18	1/2"	3,69E+09	2,42E+05	151	1,75	-25,72
07H35 q	5,21	10	6/10"	18	1/2"	3,72E+09	2,44E+05	150	2,23	-27,89
07H35 r	5,21	12	6/10"	18	1/2"	3,73E+09	2,47E+05	149	2,24	-30,23
07H40 a	5,46	0	6/10"	6	1/2"	4,85E+09	2,33E+05	181	-0,10	-5,56
07H40 b	5,46	2	6/10"	4	1/2"	4,86E+09	2,33E+05	180	0,10	-6,48
07H40 c	5,46	4	6/10"	2	1/2"	4,87E+09	2,34E+05	180	0,30	-7,38
07H40 d	5,46	6	6/10"	0	1/2"	4,89E+09	2,35E+05	179	0,49	-8,28
07H40 e	5,46	6	6/10"	2	1/2"	4,92E+09	2,36E+05	178	0,88	-10,05
07H40 f	5,46	6	6/10"	4	1/2"	4,94E+09	2,38E+05	178	1,25	-11,78
07H40 g	5,46	6	6/10"	6	1/2"	4,97E+09	2,39E+05	177	1,63	-13,47
07H40 h	5,46	6	6/10"	8	1/2"	4,99E+09	2,41E+05	176	1,99	-15,12
07H40 i	5,46	6	6/10"	10	1/2"	5,02E+09	2,42E+05	175	2,35	-16,74
07H40 l	5,46	6	6/10"	12	1/2"	5,06E+09	2,44E+05	175	1,63	-18,14
07H40 m	5,46	6	6/10"	14	1/2"	5,09E+09	2,46E+05	174	1,97	-19,69
07H40 n	5,46	6	6/10"	16	1/2"	5,11E+09	2,47E+05	173	2,31	-21,20
07H40 o	5,46	6	6/10"	18	1/2"	5,13E+09	2,49E+05	172	2,64	-22,69
07H40 p	5,46	8	6/10"	18	1/2"	5,17E+09	2,51E+05	171	3,13	-24,84
07H40 q	5,46	10	6/10"	18	1/2"	5,20E+09	2,53E+05	170	3,61	-26,94
07H40 r	5,46	12	6/10"	18	1/2"	5,21E+09	2,56E+05	169	4,34	-29,14

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_i [N/mm²]
O7H45 a	5,72	0	6/10"	6	1/2"	6,53E+09	2,44E+05	203	-0,06	-5,33
O7H45 b	5,72	2	6/10"	4	1/2"	6,55E+09	2,44E+05	202	0,13	-6,21
O7H45 c	5,72	4	6/10"	2	1/2"	6,57E+09	2,45E+05	202	0,33	-7,07
O7H45 d	5,72	6	6/10"	0	1/2"	6,59E+09	2,46E+05	201	0,52	-7,93
O7H45 e	5,72	6	6/10"	2	1/2"	6,63E+09	2,47E+05	200	0,91	-9,64
O7H45 f	5,72	6	6/10"	4	1/2"	6,66E+09	2,49E+05	199	1,28	-11,30
O7H45 g	5,72	6	6/10"	6	1/2"	6,70E+09	2,50E+05	198	1,65	-12,93
O7H45 h	5,72	6	6/10"	8	1/2"	6,73E+09	2,52E+05	197	2,01	-14,52
O7H45 i	5,72	6	6/10"	10	1/2"	6,76E+09	2,53E+05	196	2,37	-16,08
O7H45 l	5,72	6	6/10"	12	1/2"	6,83E+09	2,55E+05	196	1,69	-17,43
O7H45 m	5,72	6	6/10"	14	1/2"	6,86E+09	2,57E+05	195	2,03	-18,92
O7H45 n	5,72	6	6/10"	16	1/2"	6,89E+09	2,58E+05	194	2,36	-20,38
O7H45 o	5,72	6	6/10"	18	1/2"	6,92E+09	2,60E+05	193	2,69	-21,81
O7H45 p	5,72	8	6/10"	18	1/2"	7,00E+09	2,63E+05	193	1,88	-23,67
O7H45 q	5,72	10	6/10"	18	1/2"	7,05E+09	2,65E+05	192	2,35	-25,70
O7H45 r	5,72	12	6/10"	18	1/2"	7,09E+09	2,68E+05	190	2,22	-27,77
O7H50 a	5,98	0	6/10"	6	1/2"	8,52E+09	2,55E+05	225	-0,03	-5,12
O7H50 b	5,98	2	6/10"	4	1/2"	8,55E+09	2,55E+05	224	0,17	-5,97
O7H50 c	5,98	4	6/10"	2	1/2"	8,57E+09	2,56E+05	224	0,36	-6,80
O7H50 d	5,98	6	6/10"	0	1/2"	8,60E+09	2,57E+05	223	0,56	-7,63
O7H50 e	5,98	6	6/10"	2	1/2"	8,64E+09	2,58E+05	222	0,94	-9,28
O7H50 f	5,98	6	6/10"	4	1/2"	8,69E+09	2,60E+05	221	1,31	-10,88
O7H50 g	5,98	6	6/10"	6	1/2"	8,73E+09	2,61E+05	220	1,68	-12,46
O7H50 h	5,98	6	6/10"	8	1/2"	8,78E+09	2,63E+05	219	2,04	-14,00
O7H50 i	5,98	6	6/10"	10	1/2"	8,82E+09	2,64E+05	218	2,40	-15,50
O7H50 l	5,98	6	6/10"	12	1/2"	8,90E+09	2,66E+05	218	1,75	-16,80
O7H50 m	5,98	6	6/10"	14	1/2"	8,94E+09	2,68E+05	217	2,09	-18,25
O7H50 n	5,98	6	6/10"	16	1/2"	8,98E+09	2,69E+05	216	2,42	-19,66
O7H50 o	5,98	6	6/10"	18	1/2"	9,07E+09	2,72E+05	216	1,50	-20,83
O7H50 p	5,98	8	6/10"	18	1/2"	9,13E+09	2,74E+05	214	1,98	-22,85
O7H50 q	5,98	10	6/10"	18	1/2"	9,19E+09	2,76E+05	213	2,45	-24,81
O7H50 r	5,98	12	6/10"	18	1/2"	9,25E+09	2,79E+05	212	2,28	-26,79

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_i [N/mm²]
07H55 a	6,25	0	6/10"	6	1/2"	1,08E+10	2,66E+05	248	0,01	-4,94
07H55 b	6,25	2	6/10"	4	1/2"	1,09E+10	2,66E+05	247	0,21	-5,76
07H55 c	6,25	4	6/10"	2	1/2"	1,09E+10	2,67E+05	246	0,40	-6,57
07H55 d	6,25	6	6/10"	0	1/2"	1,09E+10	2,68E+05	246	0,59	-7,37
07H55 e	6,25	6	6/10"	2	1/2"	1,10E+10	2,69E+05	245	0,97	-8,96
07H55 f	6,25	6	6/10"	4	1/2"	1,10E+10	2,71E+05	244	1,35	-10,52
07H55 g	6,25	6	6/10"	6	1/2"	1,11E+10	2,72E+05	242	1,71	-12,04
07H55 h	6,25	6	6/10"	8	1/2"	1,11E+10	2,74E+05	241	2,08	-13,53
07H55 i	6,25	6	6/10"	10	1/2"	1,12E+10	2,75E+05	240	2,43	-14,99
07H55 l	6,25	6	6/10"	12	1/2"	1,13E+10	2,77E+05	240	1,81	-16,25
07H55 m	6,25	6	6/10"	14	1/2"	1,14E+10	2,79E+05	239	2,15	-17,65
07H55 n	6,25	6	6/10"	16	1/2"	1,14E+10	2,80E+05	238	2,48	-19,03
07H55 o	6,25	6	6/10"	18	1/2"	1,15E+10	2,83E+05	237	1,60	-20,15
07H55 p	6,25	8	6/10"	18	1/2"	1,16E+10	2,85E+05	236	2,08	-22,12
07H55 q	6,25	10	6/10"	18	1/2"	1,17E+10	2,87E+05	234	2,55	-24,03
07H55 r	6,25	12	6/10"	18	1/2"	1,18E+10	2,90E+05	233	2,36	-25,92
07H60 a	6,51	0	6/10"	6	1/2"	1,35E+10	2,77E+05	270	0,05	-4,77
07H60 b	6,51	2	6/10"	4	1/2"	1,35E+10	2,77E+05	270	0,24	-5,57
07H60 c	6,51	4	6/10"	2	1/2"	1,35E+10	2,78E+05	269	0,43	-6,35
07H60 d	6,51	6	6/10"	0	1/2"	1,36E+10	2,79E+05	268	0,63	-7,13
07H60 e	6,51	6	6/10"	2	1/2"	1,36E+10	2,80E+05	267	1,01	-8,67
07H60 f	6,51	6	6/10"	4	1/2"	1,37E+10	2,82E+05	266	1,38	-10,18
07H60 g	6,51	6	6/10"	6	1/2"	1,38E+10	2,83E+05	265	1,75	-11,66
07H60 h	6,51	6	6/10"	8	1/2"	1,39E+10	2,85E+05	264	2,11	-13,11
07H60 i	6,51	6	6/10"	10	1/2"	1,39E+10	2,86E+05	262	2,46	-14,53
07H60 l	6,51	6	6/10"	12	1/2"	1,41E+10	2,88E+05	262	1,87	-15,75
07H60 m	6,51	6	6/10"	14	1/2"	1,41E+10	2,90E+05	261	2,21	-17,11
07H60 n	6,51	6	6/10"	16	1/2"	1,42E+10	2,91E+05	260	2,55	-18,45
07H60 o	6,51	6	6/10"	18	1/2"	1,43E+10	2,94E+05	259	1,69	-19,55
07H60 p	6,51	8	6/10"	18	1/2"	1,44E+10	2,96E+05	258	2,18	-21,46
07H60 q	6,51	10	6/10"	18	1/2"	1,45E+10	2,98E+05	256	2,65	-23,32
07H60 r	6,51	12	6/10"	18	1/2"	1,46E+10	3,01E+05	255	2,45	-25,15

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	$σ_s$ [N/mm²]	$σ_i$ [N/mm²]
07H65 a	6,78	0	6/10"	6	1/2"	1,64E+10	2,88E+05	293	0,08	-4,62
07H65 b	6,78	2	6/10"	4	1/2"	1,65E+10	2,88E+05	292	0,27	-5,40
07H65 c	6,78	4	6/10"	2	1/2"	1,65E+10	2,89E+05	292	0,47	-6,16
07H65 d	6,78	6	6/10"	0	1/2"	1,66E+10	2,90E+05	291	0,66	-6,91
07H65 e	6,78	6	6/10"	2	1/2"	1,67E+10	2,91E+05	290	1,04	-8,41
07H65 f	6,78	6	6/10"	4	1/2"	1,67E+10	2,93E+05	289	1,41	-9,88
07H65 g	6,78	6	6/10"	6	1/2"	1,68E+10	2,94E+05	287	1,78	-11,32
07H65 h	6,78	6	6/10"	8	1/2"	1,69E+10	2,96E+05	286	2,14	-12,73
07H65 i	6,78	6	6/10"	10	1/2"	1,70E+10	2,97E+05	285	2,49	-14,12
07H65 l	6,78	6	6/10"	12	1/2"	1,72E+10	2,99E+05	284	1,93	-15,30
07H65 m	6,78	6	6/10"	14	1/2"	1,72E+10	3,01E+05	283	2,27	-16,63
07H65 n	6,78	6	6/10"	16	1/2"	1,73E+10	3,02E+05	282	2,61	-17,93
07H65 o	6,78	6	6/10"	18	1/2"	1,75E+10	3,05E+05	282	1,79	-19,00
07H65 p	6,78	8	6/10"	18	1/2"	1,76E+10	3,07E+05	280	2,27	-20,87
07H65 q	6,78	10	6/10"	18	1/2"	1,78E+10	3,10E+05	279	1,84	-22,52
07H65 r	6,78	12	6/10"	18	1/2"	1,78E+10	3,12E+05	277	2,55	-24,45
07H70 a	7,04	0	6/10"	6	1/2"	1,98E+10	2,99E+05	316	0,11	-4,49
07H70 b	7,04	2	6/10"	4	1/2"	1,98E+10	2,99E+05	315	0,30	-5,24
07H70 c	7,04	4	6/10"	2	1/2"	1,99E+10	3,00E+05	315	0,50	-5,98
07H70 d	7,04	6	6/10"	0	1/2"	1,99E+10	3,01E+05	314	0,69	-6,71
07H70 e	7,04	6	6/10"	2	1/2"	2,00E+10	3,02E+05	313	1,07	-8,17
07H70 f	7,04	6	6/10"	4	1/2"	2,01E+10	3,04E+05	311	1,44	-9,61
07H70 g	7,04	6	6/10"	6	1/2"	2,02E+10	3,05E+05	310	1,81	-11,01
07H70 h	7,04	6	6/10"	8	1/2"	2,03E+10	3,07E+05	309	2,17	-12,38
07H70 i	7,04	6	6/10"	10	1/2"	2,04E+10	3,08E+05	308	2,52	-13,73
07H70 l	7,04	6	6/10"	12	1/2"	2,06E+10	3,10E+05	307	1,98	-14,88
07H70 m	7,04	6	6/10"	14	1/2"	2,07E+10	3,12E+05	306	2,33	-16,18
07H70 n	7,04	6	6/10"	16	1/2"	2,08E+10	3,13E+05	304	2,66	-17,45
07H70 o	7,04	6	6/10"	18	1/2"	2,10E+10	3,16E+05	304	1,88	-18,49
07H70 p	7,04	8	6/10"	18	1/2"	2,11E+10	3,18E+05	302	2,36	-20,32
07H70 q	7,04	10	6/10"	18	1/2"	2,14E+10	3,21E+05	301	1,96	-21,93
07H70 r	7,04	12	6/10"	18	1/2"	2,14E+10	3,23E+05	299	2,64	-23,81

ESSE TEAM

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
07H75 a	7,30	0	6/10"	6	1/2"	2,35E+10	3,10E+05	339	0,14	-4,36
07H75 b	7,30	2	6/10"	4	1/2"	2,35E+10	3,10E+05	339	0,33	-5,09
07H75 c	7,30	4	6/10"	2	1/2"	2,36E+10	3,11E+05	338	0,53	-5,82
07H75 d	7,30	6	6/10"	0	1/2"	2,37E+10	3,12E+05	337	0,72	-6,53
07H75 e	7,30	6	6/10"	2	1/2"	2,38E+10	3,13E+05	336	1,10	-7,95
07H75 f	7,30	6	6/10"	4	1/2"	2,39E+10	3,15E+05	334	1,47	-9,35
07H75 g	7,30	6	6/10"	6	1/2"	2,40E+10	3,16E+05	333	1,83	-10,72
07H75 h	7,30	6	6/10"	8	1/2"	2,42E+10	3,18E+05	332	2,19	-12,06
07H75 i	7,30	6	6/10"	10	1/2"	2,43E+10	3,19E+05	330	2,55	-13,38
07H75 l	7,30	6	6/10"	12	1/2"	2,45E+10	3,21E+05	330	2,04	-14,50
07H75 m	7,30	6	6/10"	14	1/2"	2,46E+10	3,23E+05	328	2,38	-15,77
07H75 n	7,30	6	6/10"	16	1/2"	2,48E+10	3,25E+05	328	1,63	-16,80
07H75 o	7,30	6	6/10"	18	1/2"	2,49E+10	3,27E+05	327	1,96	-18,02
07H75 p	7,30	8	6/10"	18	1/2"	2,51E+10	3,29E+05	325	2,44	-19,81
07H75 q	7,30	10	6/10"	18	1/2"	2,54E+10	3,32E+05	324	2,07	-21,38
07H80 a	7,57	0	6/10"	6	1/2"	2,76E+10	3,21E+05	363	0,17	-4,25
07H80 b	7,57	2	6/10"	4	1/2"	2,76E+10	3,21E+05	362	0,36	-4,96
07H80 c	7,57	4	6/10"	2	1/2"	2,77E+10	3,22E+05	361	0,55	-5,66
07H80 d	7,57	6	6/10"	0	1/2"	2,78E+10	3,23E+05	360	0,74	-6,36
07H80 e	7,57	6	6/10"	2	1/2"	2,79E+10	3,24E+05	359	1,12	-7,75
07H80 f	7,57	6	6/10"	4	1/2"	2,81E+10	3,26E+05	358	1,49	-9,11
07H80 g	7,57	6	6/10"	6	1/2"	2,82E+10	3,27E+05	356	1,86	-10,45
07H80 h	7,57	6	6/10"	8	1/2"	2,84E+10	3,29E+05	355	2,22	-11,76
07H80 i	7,57	6	6/10"	10	1/2"	2,85E+10	3,30E+05	353	2,57	-13,05
07H80 l	7,57	6	6/10"	12	1/2"	2,89E+10	3,33E+05	354	1,04	-13,93
07H80 m	7,57	6	6/10"	14	1/2"	2,90E+10	3,35E+05	352	1,38	-15,17
07H80 n	7,57	6	6/10"	16	1/2"	2,91E+10	3,36E+05	351	1,71	-16,39
07H80 o	7,57	6	6/10"	18	1/2"	2,93E+10	3,38E+05	349	2,04	-17,59
07H80 p	7,57	8	6/10"	18	1/2"	2,95E+10	3,40E+05	347	2,52	-19,34
07H80 q	7,57	10	6/10"	18	1/2"	2,98E+10	3,43E+05	346	2,17	-20,88

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	$σ_s$ [N/mm²]	$σ_i$ [N/mm²]
07H85 a	7,83	0	6/10"	6	1/2"	3,21E+10	3,32E+05	386	0,19	-4,14
07H85 b	7,83	2	6/10"	4	1/2"	3,21E+10	3,32E+05	385	0,38	-4,83
07H85 c	7,83	4	6/10"	2	1/2"	3,22E+10	3,33E+05	385	0,58	-5,52
07H85 d	7,83	6	6/10"	0	1/2"	3,23E+10	3,34E+05	384	0,77	-6,20
07H85 e	7,83	6	6/10"	2	1/2"	3,25E+10	3,35E+05	382	1,14	-7,56
07H85 f	7,83	6	6/10"	4	1/2"	3,26E+10	3,37E+05	381	1,51	-8,89
07H85 g	7,83	6	6/10"	6	1/2"	3,28E+10	3,38E+05	379	1,88	-10,20
07H85 h	7,83	6	6/10"	8	1/2"	3,30E+10	3,40E+05	378	2,24	-11,48
07H85 i	7,83	6	6/10"	10	1/2"	3,31E+10	3,41E+05	376	2,59	-12,74
07H85 l	7,83	6	6/10"	12	1/2"	3,34E+10	3,43E+05	376	2,13	-13,81
07H85 m	7,83	6	6/10"	14	1/2"	3,36E+10	3,45E+05	374	2,47	-15,02
07H85 n	7,83	6	6/10"	16	1/2"	3,39E+10	3,47E+05	374	1,78	-16,01
07H85 o	7,83	6	6/10"	18	1/2"	3,40E+10	3,49E+05	372	2,11	-17,18
07H85 p	7,83	8	6/10"	18	1/2"	3,42E+10	3,51E+05	370	2,59	-18,90
07H85 q	7,83	10	6/10"	18	1/2"	3,46E+10	3,54E+05	369	2,26	-20,41
07H90 a	8,10	0	6/10"	6	1/2"	3,70E+10	3,43E+05	410	0,21	-4,04
07H90 b	8,10	2	6/10"	4	1/2"	3,71E+10	3,43E+05	409	0,41	-4,72
07H90 c	8,10	4	6/10"	2	1/2"	3,71E+10	3,44E+05	408	0,60	-5,39
07H90 d	8,10	6	6/10"	0	1/2"	3,72E+10	3,45E+05	407	0,79	-6,05
07H90 e	8,10	6	6/10"	2	1/2"	3,74E+10	3,46E+05	406	1,16	-7,38
07H90 f	8,10	6	6/10"	4	1/2"	3,76E+10	3,48E+05	404	1,53	-8,69
07H90 g	8,10	6	6/10"	6	1/2"	3,78E+10	3,49E+05	403	1,90	-9,97
07H90 h	8,10	6	6/10"	8	1/2"	3,80E+10	3,51E+05	401	2,26	-11,22
07H90 i	8,10	6	6/10"	10	1/2"	3,82E+10	3,52E+05	399	2,61	-12,45
07H90 l	8,10	6	6/10"	12	1/2"	3,85E+10	3,54E+05	399	2,17	-13,50
07H90 m	8,10	6	6/10"	14	1/2"	3,87E+10	3,56E+05	397	2,51	-14,69
07H90 n	8,10	6	6/10"	16	1/2"	3,90E+10	3,58E+05	397	1,85	-15,65
07H90 o	8,10	6	6/10"	18	1/2"	3,92E+10	3,60E+05	395	2,18	-16,80
07H90 p	8,10	8	6/10"	18	1/2"	3,94E+10	3,62E+05	393	2,66	-18,48
07H90 q	8,10	10	6/10"	18	1/2"	3,98E+10	3,65E+05	392	2,35	-19,96

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_i [N/mm²]
014H35 a	6,54	6	6/10"	0	1/2"	3,55E+09	2,80E+05	150	-0,51	-6,00
014H35 b	6,54	6	6/10"	2	1/2"	3,56E+09	2,82E+05	150	-0,32	-7,35
014H35 c	6,54	8	6/10"	0	1/2"	3,57E+09	2,82E+05	150	-0,23	-8,00
014H35 d	6,54	8	6/10"	2	1/2"	3,58E+09	2,84E+05	149	-0,06	-9,32
014H35 e	6,54	10	6/10"	0	1/2"	3,58E+09	2,85E+05	149	0,03	-9,96
014H35 f	6,54	10	6/10"	2	1/2"	3,59E+09	2,86E+05	148	0,21	-11,25
014H35 g	6,54	12	6/10"	0	1/2"	3,59E+09	2,87E+05	148	0,29	-11,88
014H35 h	6,54	12	6/10"	2	1/2"	3,60E+09	2,88E+05	148	0,46	-13,13
014H35 i	6,54	14	6/10"	0	1/2"	3,60E+09	2,89E+05	148	0,55	-13,75
014H35 l	6,54	14	6/10"	2	1/2"	3,61E+09	2,91E+05	147	0,72	-14,98
014H35 m	6,54	16	6/10"	0	1/2"	3,62E+09	2,91E+05	147	0,80	-15,58
014H35 n	6,54	16	6/10"	2	1/2"	3,62E+09	2,93E+05	147	0,97	-16,78
014H35 o	6,54	18	6/10"	0	1/2"	3,63E+09	2,94E+05	147	1,05	-17,37
014H35 p	6,54	18	6/10"	2	1/2"	3,64E+09	2,95E+05	146	1,21	-18,54
014H35 q	6,54	20	6/10"	0	1/2"	3,64E+09	2,96E+05	146	1,29	-19,12
014H35 r	6,54	20	6/10"	2	1/2"	3,64E+09	2,97E+05	145	1,62	-20,39
014H35 s	6,54	22	6/10"	0	1/2"	3,64E+09	2,98E+05	145	1,70	-20,95
014H35 t	6,54	22	6/10"	2	1/2"	3,65E+09	2,99E+05	145	1,86	-22,08
014H35 u	6,54	24	6/10"	0	1/2"	3,65E+09	3,00E+05	145	1,94	-22,63
014H40 a	6,82	6	6/10"	0	1/2"	5,08E+09	2,92E+05	168	-0,37	-5,77
014H40 b	6,82	6	6/10"	2	1/2"	5,09E+09	2,93E+05	168	-0,16	-7,06
014H40 c	6,82	8	6/10"	0	1/2"	5,10E+09	2,94E+05	167	-0,06	-7,69
014H40 d	6,82	8	6/10"	2	1/2"	5,11E+09	2,96E+05	167	0,14	-8,96
014H40 e	6,82	10	6/10"	0	1/2"	5,12E+09	2,96E+05	167	0,24	-9,57
014H40 f	6,82	10	6/10"	2	1/2"	5,13E+09	2,98E+05	166	0,43	-10,81
014H40 g	6,82	12	6/10"	0	1/2"	5,14E+09	2,99E+05	166	0,53	-11,41
014H40 h	6,82	12	6/10"	2	1/2"	5,15E+09	3,00E+05	166	0,72	-12,62
014H40 i	6,82	14	6/10"	0	1/2"	5,16E+09	3,01E+05	165	0,82	-13,21
014H40 l	6,82	14	6/10"	2	1/2"	5,19E+09	3,03E+05	165	-0,03	-14,17
014H40 m	6,82	16	6/10"	0	1/2"	5,20E+09	3,04E+05	165	0,06	-14,74
014H40 n	6,82	16	6/10"	2	1/2"	5,21E+09	3,05E+05	165	0,25	-15,90
014H40 o	6,82	18	6/10"	0	1/2"	5,21E+09	3,06E+05	164	0,34	-16,46
014H40 p	6,82	18	6/10"	2	1/2"	5,23E+09	3,07E+05	164	0,52	-17,60
014H40 q	6,82	20	6/10"	0	1/2"	5,23E+09	3,08E+05	164	0,61	-18,15
014H40 r	6,82	20	6/10"	2	1/2"	5,23E+09	3,10E+05	163	1,04	-19,42
014H40 s	6,82	22	6/10"	0	1/2"	5,24E+09	3,10E+05	163	1,13	-19,96
014H40 t	6,82	22	6/10"	2	1/2"	5,25E+09	3,12E+05	162	1,31	-21,04
014H40 u	6,82	24	6/10"	0	1/2"	5,25E+09	3,13E+05	162	1,39	-21,57

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm^4]	A [mm^2]	Y_G [mm]	σ_s [N/mm^2]	σ_i [N/mm^2]
O14H45 a	7,09	6	6/10"	0	1/2"	6,93E+09	3,03E+05	186	-0,27	-5,56
O14H45 b	7,09	6	6/10"	2	1/2"	6,95E+09	3,05E+05	186	-0,05	-6,81
O14H45 c	7,09	8	6/10"	0	1/2"	6,95E+09	3,05E+05	186	0,06	-7,42
O14H45 d	7,09	8	6/10"	2	1/2"	6,97E+09	3,07E+05	185	0,28	-8,64
O14H45 e	7,09	10	6/10"	0	1/2"	6,98E+09	3,08E+05	185	0,38	-9,24
O14H45 f	7,09	10	6/10"	2	1/2"	7,00E+09	3,09E+05	184	0,59	-10,43
O14H45 g	7,09	12	6/10"	0	1/2"	7,01E+09	3,10E+05	184	0,70	-11,01
O14H45 h	7,09	12	6/10"	2	1/2"	7,03E+09	3,11E+05	183	0,90	-12,18
O14H45 i	7,09	14	6/10"	0	1/2"	7,04E+09	3,12E+05	183	1,01	-12,75
O14H45 l	7,09	14	6/10"	2	1/2"	7,09E+09	3,14E+05	183	0,20	-13,67
O14H45 m	7,09	16	6/10"	0	1/2"	7,09E+09	3,15E+05	183	0,30	-14,23
O14H45 n	7,09	16	6/10"	2	1/2"	7,11E+09	3,16E+05	182	0,50	-15,35
O14H45 o	7,09	18	6/10"	0	1/2"	7,12E+09	3,17E+05	182	0,59	-15,89
O14H45 p	7,09	18	6/10"	2	1/2"	7,14E+09	3,19E+05	182	0,79	-16,99
O14H45 q	7,09	20	6/10"	0	1/2"	7,14E+09	3,19E+05	181	0,89	-17,52
O14H45 r	7,09	20	6/10"	2	1/2"	7,14E+09	3,21E+05	181	1,29	-18,72
O14H45 s	7,09	22	6/10"	0	1/2"	7,15E+09	3,22E+05	180	1,38	-19,24
O14H45 t	7,09	22	6/10"	2	1/2"	7,17E+09	3,23E+05	180	1,57	-20,29
O14H45 u	7,09	24	6/10"	0	1/2"	7,17E+09	3,24E+05	180	1,67	-20,81
O14H50 a	7,36	6	6/10"	0	1/2"	9,12E+09	3,14E+05	205	-0,18	-5,38
O14H50 b	7,36	6	6/10"	2	1/2"	9,15E+09	3,16E+05	204	0,05	-6,59
O14H50 c	7,36	8	6/10"	0	1/2"	9,16E+09	3,16E+05	204	0,16	-7,18
O14H50 d	7,36	8	6/10"	2	1/2"	9,18E+09	3,18E+05	204	0,39	-8,36
O14H50 e	7,36	10	6/10"	0	1/2"	9,20E+09	3,19E+05	203	0,50	-8,94
O14H50 f	7,36	10	6/10"	2	1/2"	9,22E+09	3,20E+05	203	0,72	-10,09
O14H50 g	7,36	12	6/10"	0	1/2"	9,23E+09	3,21E+05	202	0,83	-10,66
O14H50 h	7,36	12	6/10"	2	1/2"	9,26E+09	3,22E+05	202	1,05	-11,79
O14H50 i	7,36	14	6/10"	0	1/2"	9,27E+09	3,23E+05	201	1,15	-12,34
O14H50 l	7,36	14	6/10"	2	1/2"	9,29E+09	3,24E+05	201	1,36	-13,45
O14H50 m	7,36	16	6/10"	0	1/2"	9,30E+09	3,25E+05	201	1,47	-13,99
O14H50 n	7,36	16	6/10"	2	1/2"	9,32E+09	3,27E+05	200	1,68	-15,07
O14H50 o	7,36	18	6/10"	0	1/2"	9,34E+09	3,27E+05	200	1,78	-15,60
O14H50 p	7,36	18	6/10"	2	1/2"	9,36E+09	3,29E+05	199	1,99	-16,66
O14H50 q	7,36	20	6/10"	0	1/2"	9,37E+09	3,30E+05	199	2,09	-17,18
O14H50 r	7,36	20	6/10"	2	1/2"	9,38E+09	3,31E+05	198	2,39	-18,28
O14H50 s	7,36	22	6/10"	0	1/2"	9,43E+09	3,33E+05	198	1,58	-18,63
O14H50 t	7,36	22	6/10"	2	1/2"	9,45E+09	3,34E+05	198	1,78	-19,64
O14H50 u	7,36	24	6/10"	0	1/2"	9,46E+09	3,35E+05	197	1,87	-20,14

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_i [N/mm²]
014H55 a	7,60	6	6/10"	0	1/2"	1,16E+10	3,24E+05	205	-0,50	-4,73
014H55 b	7,60	6	6/10"	2	1/2"	1,17E+10	3,26E+05	205	-0,32	-5,79
014H55 c	7,60	8	6/10"	0	1/2"	1,17E+10	3,26E+05	204	-0,23	-6,31
014H55 d	7,60	8	6/10"	2	1/2"	1,17E+10	3,28E+05	204	-0,06	-7,36
014H55 e	7,60	10	6/10"	0	1/2"	1,17E+10	3,29E+05	203	0,03	-7,87
014H55 f	7,60	10	6/10"	2	1/2"	1,17E+10	3,30E+05	203	0,20	-8,89
014H55 g	7,60	12	6/10"	0	1/2"	1,18E+10	3,31E+05	203	0,29	-9,39
014H55 h	7,60	12	6/10"	2	1/2"	1,18E+10	3,32E+05	202	0,46	-10,40
014H55 i	7,60	14	6/10"	0	1/2"	1,18E+10	3,33E+05	202	0,54	-10,89
014H55 l	7,60	14	6/10"	2	1/2"	1,18E+10	3,35E+05	201	0,71	-11,87
014H55 m	7,60	16	6/10"	0	1/2"	1,18E+10	3,35E+05	201	0,79	-12,35
014H55 n	7,60	16	6/10"	2	1/2"	1,19E+10	3,37E+05	200	0,95	-13,32
014H55 o	7,60	18	6/10"	0	1/2"	1,19E+10	3,37E+05	200	1,04	-13,79
014H55 p	7,60	18	6/10"	2	1/2"	1,19E+10	3,39E+05	199	1,20	-14,74
014H55 q	7,60	20	6/10"	0	1/2"	1,19E+10	3,40E+05	199	1,28	-15,20
014H55 r	7,60	20	6/10"	2	1/2"	1,19E+10	3,41E+05	199	1,53	-16,18
014H55 s	7,60	22	6/10"	0	1/2"	1,19E+10	3,42E+05	198	1,61	-16,64
014H55 t	7,60	22	6/10"	2	1/2"	1,19E+10	3,43E+05	198	1,77	-17,55
014H55 u	7,60	24	6/10"	0	1/2"	1,19E+10	3,44E+05	197	1,84	-18,00
014H60 a	7,89	6	6/10"	0	1/2"	1,46E+10	3,36E+05	244	-0,04	-5,08
014H60 b	7,89	6	6/10"	2	1/2"	1,47E+10	3,38E+05	243	0,20	-6,22
014H60 c	7,89	8	6/10"	0	1/2"	1,47E+10	3,38E+05	243	0,32	-6,78
014H60 d	7,89	8	6/10"	2	1/2"	1,47E+10	3,40E+05	242	0,56	-7,90
014H60 e	7,89	10	6/10"	0	1/2"	1,48E+10	3,41E+05	241	0,68	-8,44
014H60 f	7,89	10	6/10"	2	1/2"	1,48E+10	3,42E+05	241	0,91	-9,53
014H60 g	7,89	12	6/10"	0	1/2"	1,48E+10	3,43E+05	240	1,03	-10,07
014H60 h	7,89	12	6/10"	2	1/2"	1,49E+10	3,44E+05	240	1,26	-11,14
014H60 i	7,89	14	6/10"	0	1/2"	1,49E+10	3,45E+05	239	1,37	-11,66
014H60 l	7,89	14	6/10"	2	1/2"	1,49E+10	3,46E+05	238	1,60	-12,71
014H60 m	7,89	16	6/10"	0	1/2"	1,49E+10	3,47E+05	238	1,71	-13,22
014H60 n	7,89	16	6/10"	2	1/2"	1,50E+10	3,49E+05	237	1,93	-14,24
014H60 o	7,89	18	6/10"	0	1/2"	1,50E+10	3,49E+05	237	2,04	-14,75
014H60 p	7,89	18	6/10"	2	1/2"	1,50E+10	3,51E+05	236	2,26	-15,75
014H60 q	7,89	20	6/10"	0	1/2"	1,50E+10	3,52E+05	236	2,36	-16,24
014H60 r	7,89	20	6/10"	2	1/2"	1,51E+10	3,53E+05	235	2,66	-17,27
014H60 s	7,89	22	6/10"	0	1/2"	1,51E+10	3,55E+05	235	1,88	-17,60
014H60 t	7,89	22	6/10"	2	1/2"	1,52E+10	3,56E+05	235	2,09	-18,57
014H60 u	7,89	24	6/10"	0	1/2"	1,52E+10	3,57E+05	234	2,20	-19,04

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
O14H65 a	8,15	6	6/10"	0	1/2"	1,80E+10	3,47E+05	263	0,02	-4,96
O14H65 b	8,15	6	6/10"	2	1/2"	1,80E+10	3,49E+05	263	0,26	-6,07
O14H65 c	8,15	8	6/10"	0	1/2"	1,81E+10	3,49E+05	262	0,39	-6,61
O14H65 d	8,15	8	6/10"	2	1/2"	1,81E+10	3,51E+05	261	0,63	-7,70
O14H65 e	8,15	10	6/10"	0	1/2"	1,81E+10	3,52E+05	261	0,75	-8,23
O14H65 f	8,15	10	6/10"	2	1/2"	1,82E+10	3,53E+05	260	0,99	-9,30
O14H65 g	8,15	12	6/10"	0	1/2"	1,82E+10	3,54E+05	260	1,11	-9,82
O14H65 h	8,15	12	6/10"	2	1/2"	1,83E+10	3,55E+05	259	1,34	-10,86
O14H65 i	8,15	14	6/10"	0	1/2"	1,83E+10	3,56E+05	259	1,46	-11,37
O14H65 l	8,15	14	6/10"	2	1/2"	1,84E+10	3,58E+05	258	0,78	-12,21
O14H65 m	8,15	16	6/10"	0	1/2"	1,84E+10	3,59E+05	258	0,90	-12,71
O14H65 n	8,15	16	6/10"	2	1/2"	1,85E+10	3,60E+05	257	1,12	-13,71
O14H65 o	8,15	18	6/10"	0	1/2"	1,85E+10	3,61E+05	257	1,23	-14,20
O14H65 p	8,15	18	6/10"	2	1/2"	1,86E+10	3,63E+05	256	1,46	-15,18
O14H65 q	8,15	20	6/10"	0	1/2"	1,86E+10	3,63E+05	256	1,56	-15,66
O14H65 r	8,15	20	6/10"	2	1/2"	1,86E+10	3,65E+05	255	1,90	-16,70
O14H65 s	8,15	22	6/10"	0	1/2"	1,86E+10	3,66E+05	255	2,01	-17,17
O14H65 t	8,15	22	6/10"	2	1/2"	1,87E+10	3,67E+05	254	2,22	-18,11
O14H65 u	8,15	24	6/10"	0	1/2"	1,87E+10	3,68E+05	253	2,33	-18,57
O14H70 a	8,41	6	6/10"	0	1/2"	2,17E+10	3,58E+05	284	0,07	-4,84
O14H70 b	8,41	6	6/10"	2	1/2"	2,18E+10	3,60E+05	283	0,32	-5,92
O14H70 c	8,41	8	6/10"	0	1/2"	2,18E+10	3,60E+05	282	0,45	-6,45
O14H70 d	8,41	8	6/10"	2	1/2"	2,19E+10	3,62E+05	281	0,69	-7,52
O14H70 e	8,41	10	6/10"	0	1/2"	2,19E+10	3,63E+05	281	0,81	-8,04
O14H70 f	8,41	10	6/10"	2	1/2"	2,20E+10	3,64E+05	280	1,06	-9,08
O14H70 g	8,41	12	6/10"	0	1/2"	2,20E+10	3,65E+05	280	1,18	-9,59
O14H70 h	8,41	12	6/10"	2	1/2"	2,21E+10	3,66E+05	279	1,42	-10,61
O14H70 i	8,41	14	6/10"	0	1/2"	2,21E+10	3,67E+05	278	1,53	-11,11
O14H70 l	8,41	14	6/10"	2	1/2"	2,22E+10	3,68E+05	278	1,77	-12,10
O14H70 m	8,41	16	6/10"	0	1/2"	2,22E+10	3,69E+05	277	1,88	-12,59
O14H70 n	8,41	16	6/10"	2	1/2"	2,23E+10	3,71E+05	276	2,11	-13,57
O14H70 o	8,41	18	6/10"	0	1/2"	2,23E+10	3,71E+05	276	2,23	-14,05
O14H70 p	8,41	18	6/10"	2	1/2"	2,23E+10	3,73E+05	275	2,45	-15,01
O14H70 q	8,41	20	6/10"	0	1/2"	2,25E+10	3,74E+05	275	1,68	-15,31
O14H70 r	8,41	20	6/10"	2	1/2"	2,25E+10	3,76E+05	274	2,01	-16,31
O14H70 s	8,41	22	6/10"	0	1/2"	2,25E+10	3,77E+05	274	2,12	-16,77
O14H70 t	8,41	22	6/10"	2	1/2"	2,26E+10	3,78E+05	273	2,34	-17,69
O14H70 u	8,41	24	6/10"	0	1/2"	2,26E+10	3,79E+05	273	2,45	-18,15

ESSE TEAM

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
O14H75 a	8,68	6	6/10"	0	1/2"	2,59E+10	3,69E+05	304	0,12	-4,73
O14H75 b	8,68	6	6/10"	2	1/2"	2,60E+10	3,71E+05	303	0,37	-5,79
O14H75 c	8,68	8	6/10"	0	1/2"	2,61E+10	3,71E+05	303	0,50	-6,31
O14H75 d	8,68	8	6/10"	2	1/2"	2,61E+10	3,73E+05	302	0,75	-7,35
O14H75 e	8,68	10	6/10"	0	1/2"	2,62E+10	3,74E+05	301	0,87	-7,86
O14H75 f	8,68	10	6/10"	2	1/2"	2,62E+10	3,75E+05	300	1,12	-8,88
O14H75 g	8,68	12	6/10"	0	1/2"	2,63E+10	3,76E+05	300	1,24	-9,38
O14H75 h	8,68	12	6/10"	2	1/2"	2,64E+10	3,77E+05	299	1,48	-10,37
O14H75 i	8,68	14	6/10"	0	1/2"	2,64E+10	3,78E+05	299	1,60	-10,86
O14H75 l	8,68	14	6/10"	2	1/2"	2,65E+10	3,79E+05	298	1,84	-11,84
O14H75 m	8,68	16	6/10"	0	1/2"	2,65E+10	3,80E+05	297	1,95	-12,32
O14H75 n	8,68	16	6/10"	2	1/2"	2,66E+10	3,82E+05	296	2,19	-13,28
O14H75 o	8,68	18	6/10"	0	1/2"	2,66E+10	3,82E+05	296	2,30	-13,75
O14H75 p	8,68	18	6/10"	2	1/2"	2,67E+10	3,84E+05	295	2,53	-14,69
O14H75 q	8,68	20	6/10"	0	1/2"	2,68E+10	3,85E+05	295	1,79	-14,98
O14H75 r	8,68	20	6/10"	2	1/2"	2,68E+10	3,87E+05	294	2,11	-15,96
O14H75 s	8,68	22	6/10"	0	1/2"	2,69E+10	3,88E+05	294	2,22	-16,41
O14H75 t	8,68	22	6/10"	2	1/2"	2,69E+10	3,89E+05	293	2,44	-17,31
O14H75 u	8,68	24	6/10"	0	1/2"	2,70E+10	3,90E+05	293	2,55	-17,75
O14H80 a	8,94	6	6/10"	0	1/2"	3,06E+10	3,80E+05	325	0,16	-4,63
O14H80 b	8,94	6	6/10"	2	1/2"	3,07E+10	3,82E+05	324	0,42	-5,67
O14H80 c	8,94	8	6/10"	0	1/2"	3,07E+10	3,82E+05	323	0,55	-6,18
O14H80 d	8,94	8	6/10"	2	1/2"	3,08E+10	3,84E+05	322	0,80	-7,20
O14H80 e	8,94	10	6/10"	0	1/2"	3,09E+10	3,85E+05	322	0,92	-7,69
O14H80 f	8,94	10	6/10"	2	1/2"	3,09E+10	3,86E+05	321	1,17	-8,69
O14H80 g	8,94	12	6/10"	0	1/2"	3,10E+10	3,87E+05	320	1,30	-9,18
O14H80 h	8,94	12	6/10"	2	1/2"	3,11E+10	3,88E+05	319	1,54	-10,16
O14H80 i	8,94	14	6/10"	0	1/2"	3,11E+10	3,89E+05	319	1,66	-10,64
O14H80 l	8,94	14	6/10"	2	1/2"	3,12E+10	3,90E+05	318	1,90	-11,59
O14H80 m	8,94	16	6/10"	0	1/2"	3,12E+10	3,91E+05	317	2,02	-12,06
O14H80 n	8,94	16	6/10"	2	1/2"	3,13E+10	3,93E+05	317	2,26	-13,00
O14H80 o	8,94	18	6/10"	0	1/2"	3,14E+10	3,93E+05	316	2,37	-13,46
O14H80 p	8,94	18	6/10"	2	1/2"	3,14E+10	3,95E+05	315	2,60	-14,39
O14H80 q	8,94	20	6/10"	0	1/2"	3,16E+10	3,96E+05	315	1,89	-14,67
O14H80 r	8,94	20	6/10"	2	1/2"	3,17E+10	3,98E+05	314	2,20	-15,63
O14H80 s	8,94	22	6/10"	0	1/2"	3,17E+10	3,99E+05	314	2,31	-16,07
O14H80 t	8,94	22	6/10"	2	1/2"	3,18E+10	4,00E+05	313	2,54	-16,96
O14H80 u	8,94	24	6/10"	0	1/2"	3,18E+10	4,01E+05	313	2,65	-17,39

		Bottom reinforcement				Properties of the transformed section			Stresses after fall of strength	
Product code	Weight per unit length P_L [kN/m]	n	φ	n	φ	J [mm⁴]	A [mm²]	Y_G [mm]	σ_s [N/mm²]	σ_I [N/mm²]
O14H85 a	9,21	6	6/10"	0	1/2"	3,57E+10	3,91E+05	346	0,20	-4,53
O14H85 b	9,21	6	6/10"	2	1/2"	3,58E+10	3,93E+05	345	0,46	-5,55
O14H85 c	9,21	8	6/10"	0	1/2"	3,58E+10	3,93E+05	344	0,59	-6,05
O14H85 d	9,21	8	6/10"	2	1/2"	3,60E+10	3,95E+05	343	0,84	-7,05
O14H85 e	9,21	10	6/10"	0	1/2"	3,60E+10	3,96E+05	343	0,97	-7,54
O14H85 f	9,21	10	6/10"	2	1/2"	3,61E+10	3,97E+05	342	1,22	-8,52
O14H85 g	9,21	12	6/10"	0	1/2"	3,62E+10	3,98E+05	341	1,35	-9,00
O14H85 h	9,21	12	6/10"	2	1/2"	3,63E+10	3,99E+05	340	1,59	-9,96
O14H85 i	9,21	14	6/10"	0	1/2"	3,63E+10	4,00E+05	340	1,71	-10,43
O14H85 l	9,21	14	6/10"	2	1/2"	3,64E+10	4,01E+05	339	1,96	-11,37
O14H85 m	9,21	16	6/10"	0	1/2"	3,65E+10	4,02E+05	338	2,08	-11,83
O14H85 n	9,21	16	6/10"	2	1/2"	3,66E+10	4,04E+05	337	2,31	-12,75
O14H85 o	9,21	18	6/10"	0	1/2"	3,66E+10	4,04E+05	337	2,43	-13,20
O14H85 p	9,21	18	6/10"	2	1/2"	3,67E+10	4,06E+05	336	2,67	-14,11
O14H85 q	9,21	20	6/10"	0	1/2"	3,69E+10	4,07E+05	336	1,97	-14,39
O14H85 r	9,21	20	6/10"	2	1/2"	3,70E+10	4,09E+05	335	2,28	-15,32
O14H85 s	9,21	22	6/10"	0	1/2"	3,70E+10	4,10E+05	334	2,39	-15,76
O14H85 t	9,21	22	6/10"	2	1/2"	3,71E+10	4,11E+05	333	2,62	-16,63
O14H85 u	9,21	24	6/10"	0	1/2"	3,73E+10	4,13E+05	334	1,76	-16,88
O14H90 a	9,47	6	6/10"	0	1/2"	4,13E+10	4,02E+05	367	0,24	-4,45
O14H90 b	9,47	6	6/10"	2	1/2"	4,14E+10	4,04E+05	366	0,50	-5,45
O14H90 c	9,47	8	6/10"	0	1/2"	4,15E+10	4,04E+05	365	0,63	-5,94
O14H90 d	9,47	8	6/10"	2	1/2"	4,16E+10	4,06E+05	364	0,89	-6,91
O14H90 e	9,47	10	6/10"	0	1/2"	4,16E+10	4,07E+05	364	1,01	-7,39
O14H90 f	9,47	10	6/10"	2	1/2"	4,18E+10	4,08E+05	362	1,27	-8,36
O14H90 g	9,47	12	6/10"	0	1/2"	4,18E+10	4,09E+05	362	1,39	-8,83
O14H90 h	9,47	12	6/10"	2	1/2"	4,19E+10	4,10E+05	361	1,64	-9,77
O14H90 i	9,47	14	6/10"	0	1/2"	4,20E+10	4,11E+05	360	1,76	-10,23
O14H90 l	9,47	14	6/10"	2	1/2"	4,21E+10	4,12E+05	359	2,01	-11,15
O14H90 m	9,47	16	6/10"	0	1/2"	4,22E+10	4,13E+05	359	2,13	-11,60
O14H90 n	9,47	16	6/10"	2	1/2"	4,23E+10	4,15E+05	358	2,37	-12,51
O14H90 o	9,47	18	6/10"	0	1/2"	4,23E+10	4,15E+05	357	2,49	-12,95
O14H90 p	9,47	18	6/10"	2	1/2"	4,26E+10	4,18E+05	357	1,94	-13,69
O14H90 q	9,47	20	6/10"	0	1/2"	4,27E+10	4,18E+05	357	2,05	-14,12
O14H90 r	9,47	20	6/10"	2	1/2"	4,27E+10	4,20E+05	355	2,35	-15,04
O14H90 s	9,47	22	6/10"	0	1/2"	4,28E+10	4,21E+05	355	2,47	-15,47
O14H90 t	9,47	22	6/10"	2	1/2"	4,29E+10	4,22E+05	354	2,70	-16,32
O14H90 u	9,47	24	6/10"	0	1/2"	4,32E+10	4,24E+05	354	1,86	-16,57

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