



MECANO



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COMPANY

- UNI EN 1993-1-1 – Eurocode 3

STANDARD REFERENCE

- UNI EN 1993-1-1 - Eurocode 3 Part 1-1: General rules and rules for buildings
 - UNI EN 1993-1-3 - Eurocode 3 Part 1-3: General rules - Supplementary rules for the use of folded sheet metal sections and cold
- D. Decree No. 81, 09/04/2008
- Consolidated Security
- D. Decree No. 172 of 21.05.2004
- Implementation of Directive 2001/95/EC on general product safety;

INSTALLATION N° _____ YEAR OF COSTRUCTION _____
(delivery note n° /year)

MEZZANINE OPERATING LIMITS

Do not place on the mezzanine horizontal loads or dynamic loads either vertical or horizontal.

It is not allowed to bump or lean on the mezzanine with trolleys or other means.

It is not allowed to use the mezzanine for different purpose other than those described in this manual.

The mezzanine is designed for a specific use. Any alterations to the geometry can be made only upon authorization of our Technical Office.

NOTICE

The instructions stated herein are indicative for some details.

These particular information are aimed to be extensive for the purposes of the present manual: **correct installation of the mezzanine.**

The exact dimensions are listed in the accompanying documentation.

The drawings shown in this manual are presented solely for trade didactic purposes.

In case customer will take care of the assembly directly, Rosss will decline any responsibility of damaged to people and materials.

Our production is covered by insurance guarantees with Assicurazioni Generali Insurance with No 989455770 - "Risk Products" and "Liability" with maximum amount of € 1,549,370.

BEFORE STARTING ASSEMBLY

- 1)) Check the capacity of the floor and its capacityability to support loads.
- 2) Check the leveling of the floor surface.
- 3) Check if there are any interference with existing structures.
- 4) Check that the available spaces are adequate to ensure the assembly operations can be conducted in safety.
- 5) The flooring and lighting of the environment should be correct so as to enable staff to work in good conditions.

TOOLS FOR ASSEMBLY



Key sets
Screwdriver
Rubber hammer
Pliers
Drill
Dynamometrical key

Level
Crowbar
Plumb string
Optical level
Safety belts

CAUTION

The assembly team should be trained on such activities and related risks. Assembly team must also be equipped with devices to prevent accidents and provided with personal protection in relation to the specific assembly (helmet, gloves, safety shoes, safety belts, etc.)..

HANDLING

For the handling of columns and beams during installation you should use only appropriate mechanical means, such as small cranes, winches or other.

For columns with less significant lengths, the handling can be done manually with an appropriate number of people.

For all shelves heights, a lift truck must be used to move the material with adequate capacity and for structure assembly a platform with adequate capacity and lift height will be required.



RECOMMENDATION ON THE MAINTENANCE ACTIVITIES TO BE PERFORMED ON THE BOLTED CONNECTIONS INTENDED FOR ROSSS MEZZANINE

BOLTS WITHOUT CONTROLLED TIGHTENING

The MECANO mezzanine is characterized by structural joints obtained from SB bolts, or bolts not preloaded, characterized by a shear operation. The potential loss of friction of the screw, therefore, does not cause a significant change to the static behavior of the mezzanine.

The specifications of UNI EN 1090 for "TIGHTENING OF BOLT ASSEMBLIES NOT PRELOADED" are shown below.

For the purposes of correct installation of the assembly, the screw protrudes with at least one complete thread from the face of the nut.

Although the connections do not include preload, these must be tightened well and this is achieved with the condition that it can be achieved by applying the effort of an operator with a standard size standard wrench without extension.

The tightening operations must be such as to follow a predefined procedure:

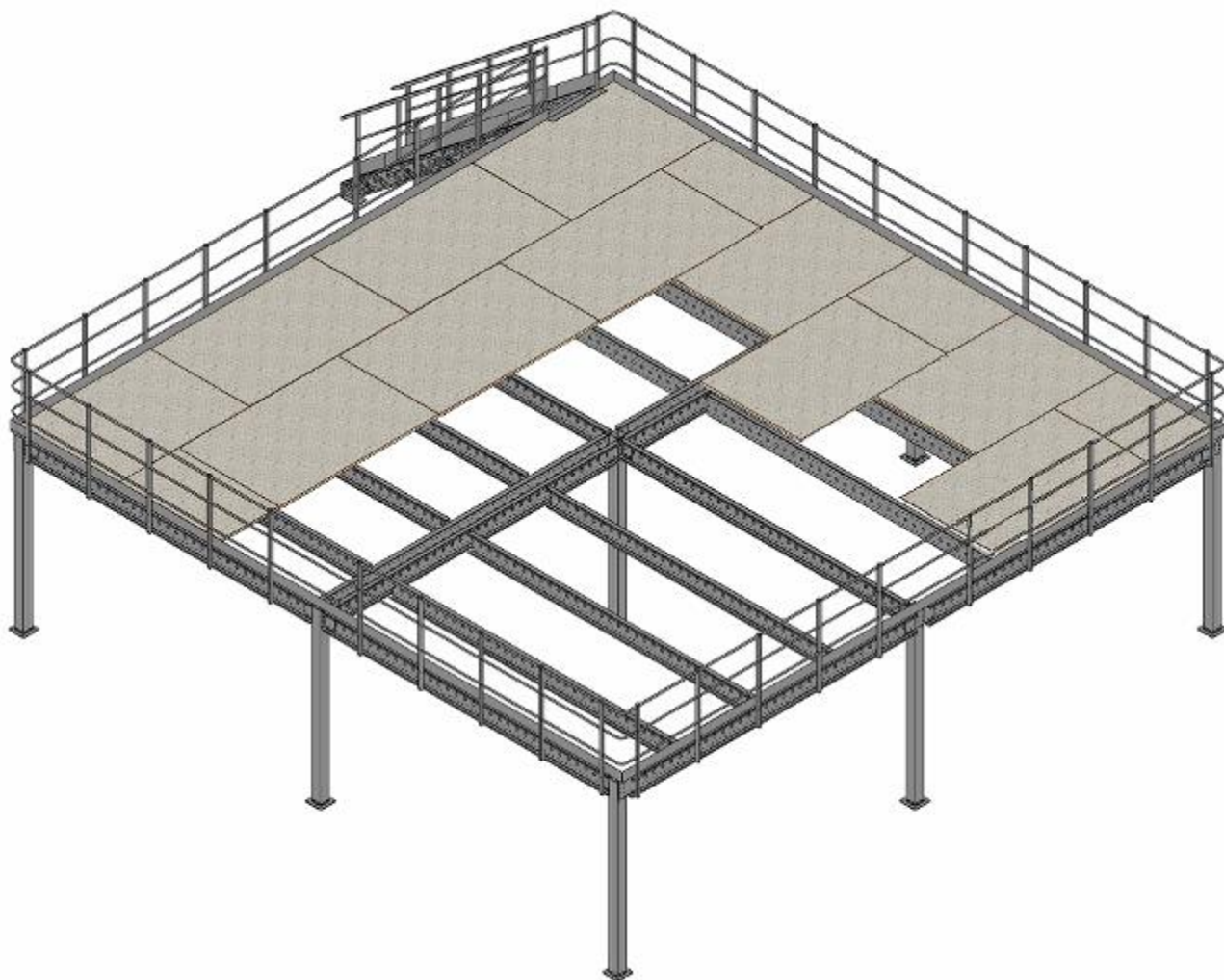
- Start by tightening the most rigid parts of the connection
- Conclude tightening with the less rigid parts

TIGHTENING CHECK FREQUENCY

Based on the conditions of use of the metal mezzanines, it is necessary to carry out periodic checks on a significant quantity for the different types present.

The recommended frequency of checks is ANNUAL.

ASSEMBLY SEQUENCE



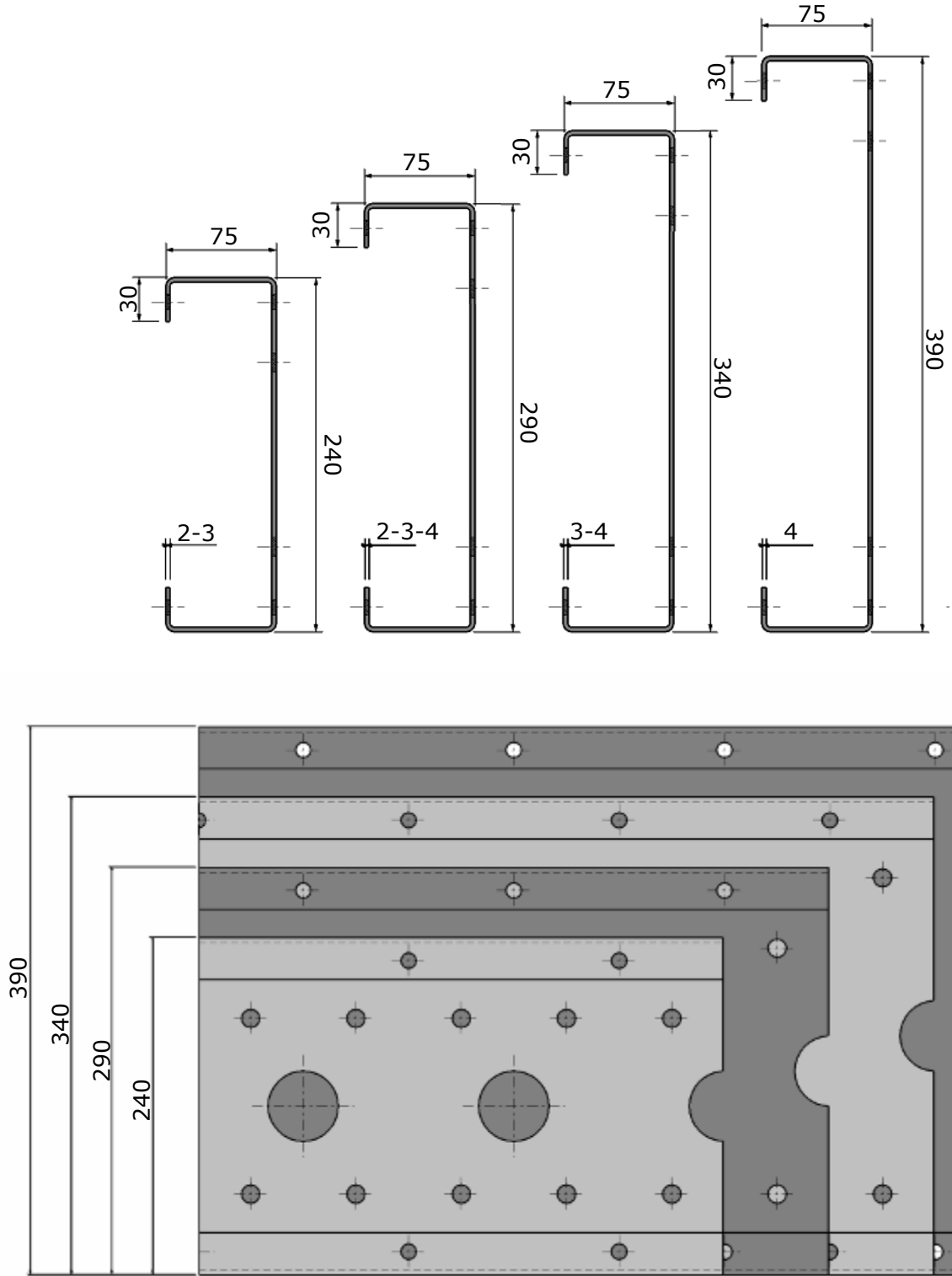
To assemble the structure we advise you to follow the steps below:

- mounting footplates, main and secondary brackets on the columns
- assemble major and minor secondary beams on columns
- assemble secondary beams with major beams
- assemble flooring and railings
- assemble stairs and landings
- assemble cross bracings, supporting strut and stiffening elements
- assembling of columns and balusters on ground

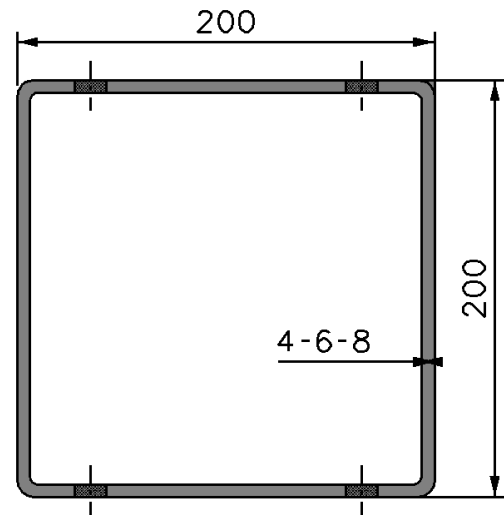
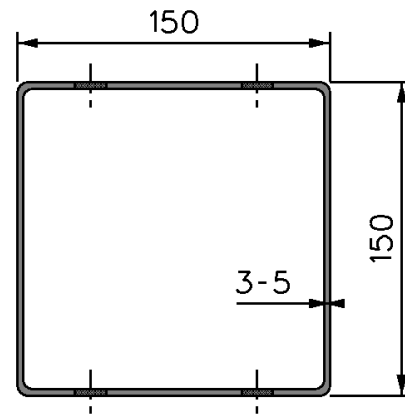
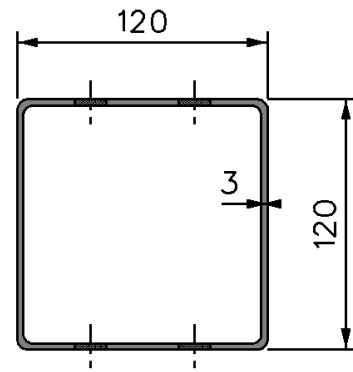
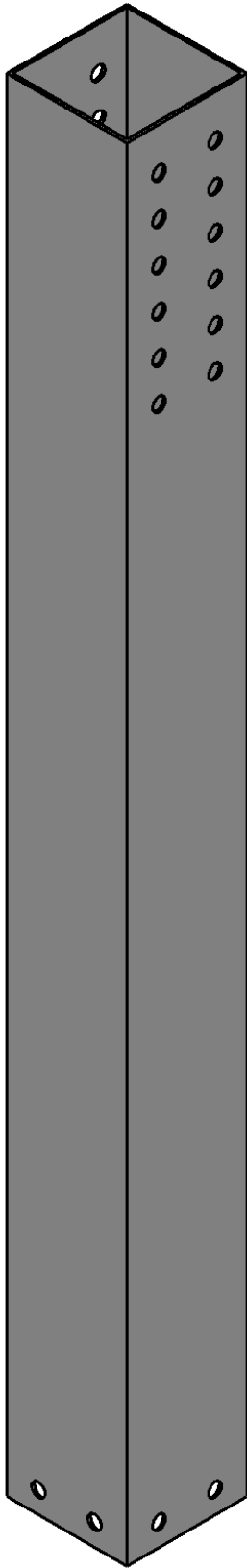
We advise to tighten the bolts at the end of each steps

It is recommended to read carefully the present instruction before starting the assembly.

BEAMS

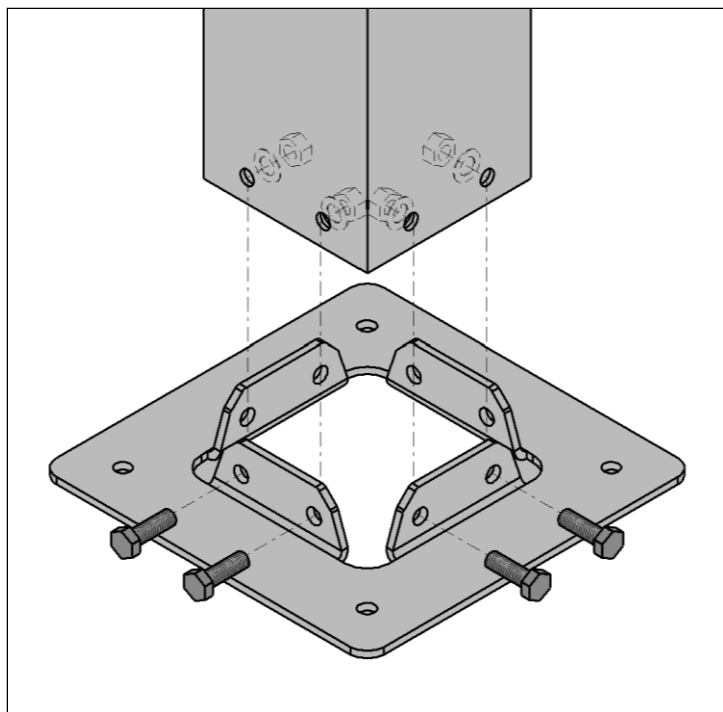


COLUMNS

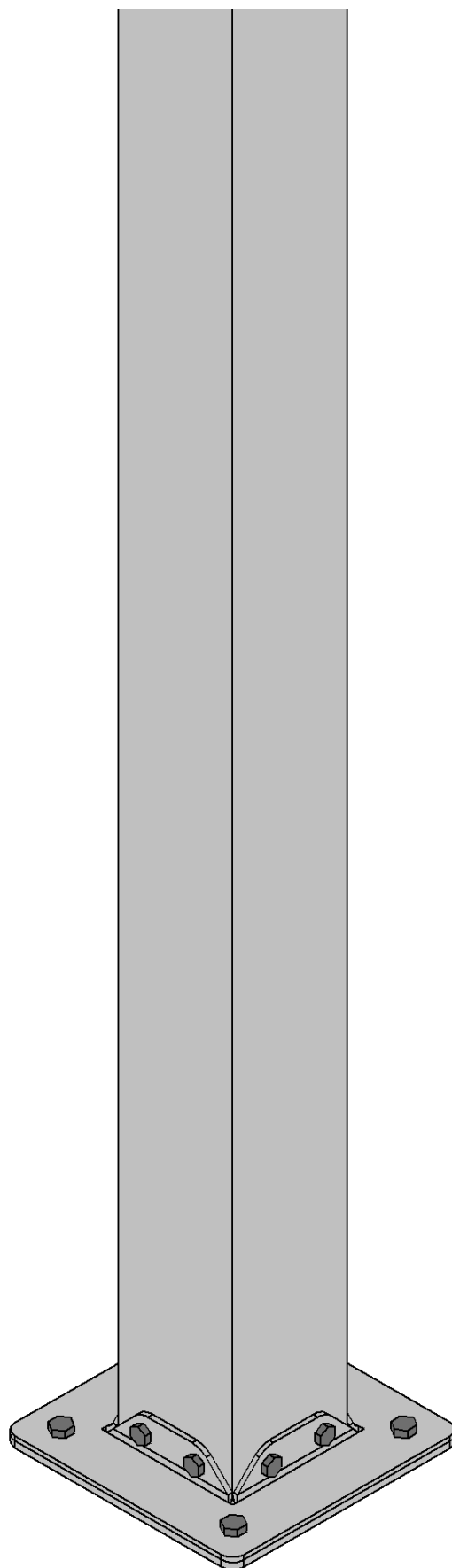
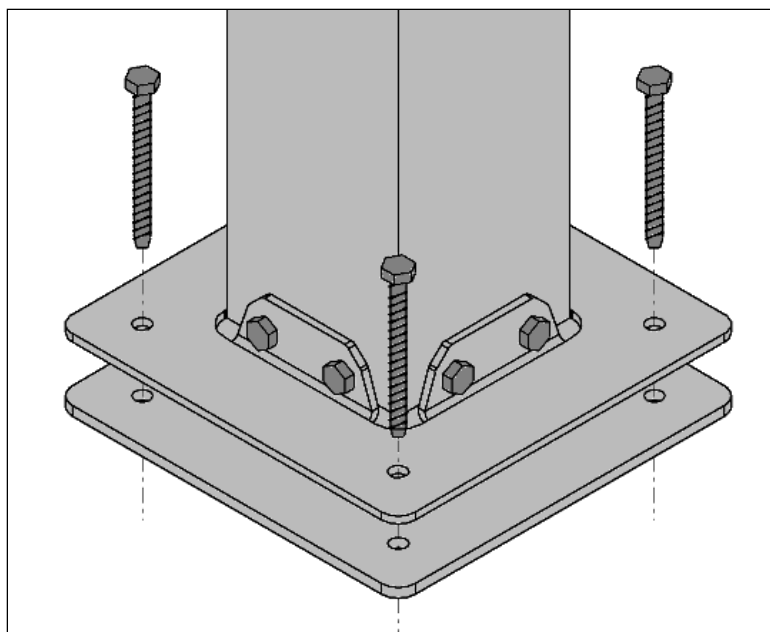


FOOTPLATE ASSEMBLY

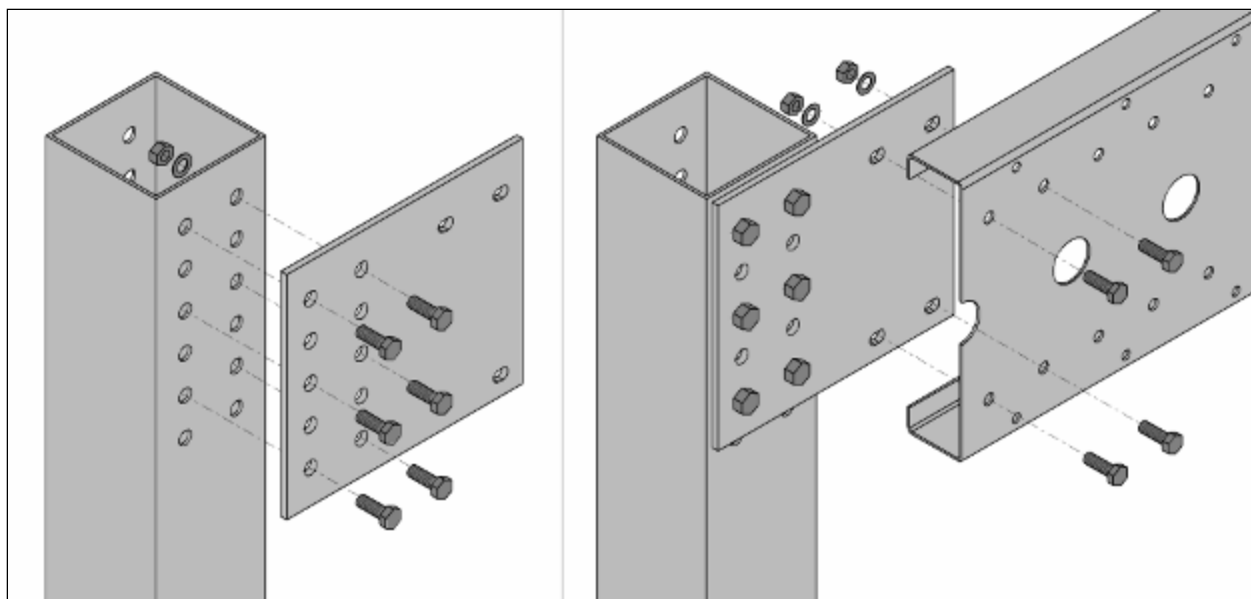
Fix the footplate to the column with 8 screws M12x30



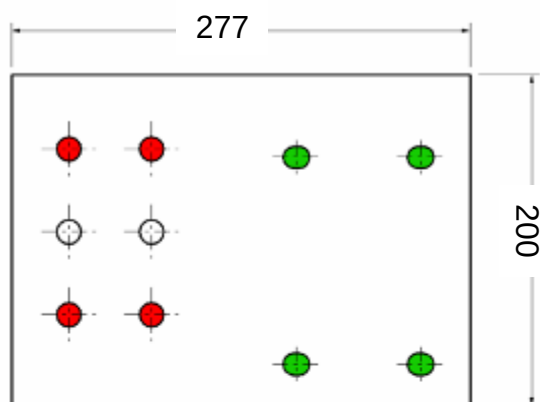
Place the metal plate under the footplate, and then screwing into the floor after the assembling of the structure.



MAJOR PLATES ASSEMBLY



COLUMN 120x120



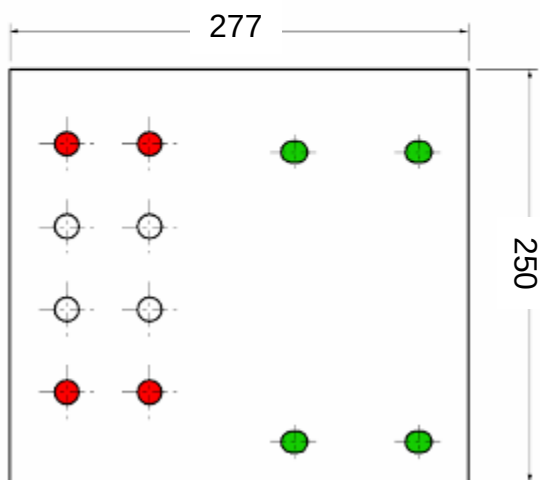
FOR EACH BEAM OF 240 mm

The major plates have to be joined to the column with bolts **M14x40** + nuts and washer; the screwhead must be placed external to the columns.

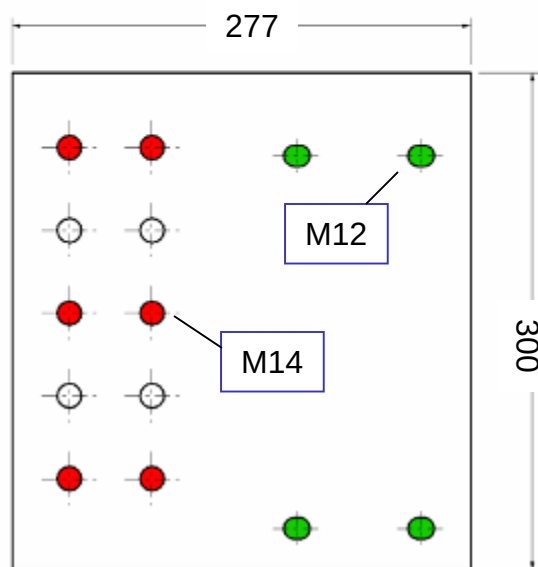
To join beams to major plates use screws **M12x35** + nuts and washer.

Quantities and placing are shown in this page drawings: red perforations for screws M14, and green ones with screw M12.

Note: for the major double plates use screws M14 as above mentioned, but screws M12 have to be doubled.



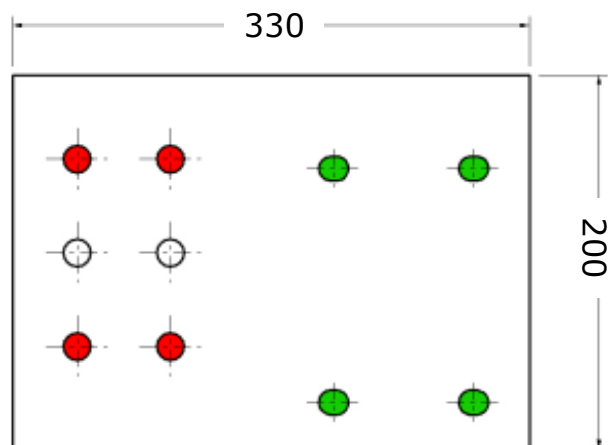
FOR EACH BEAM OF 290 mm



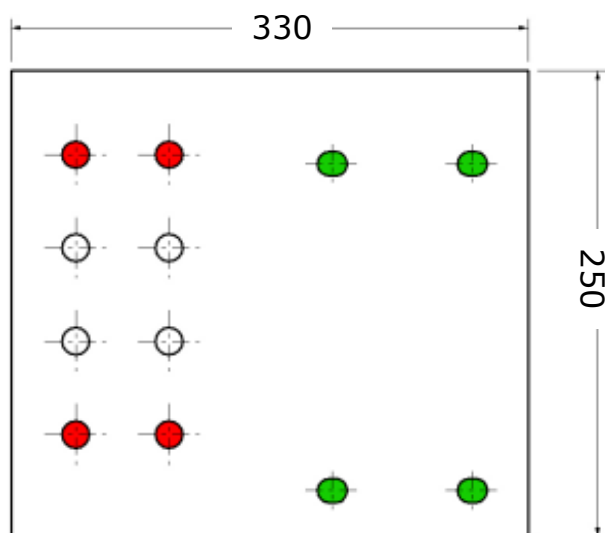
FOR EACH BEAM OF 340 mm

MAJOR PLATES ASSEMBLY

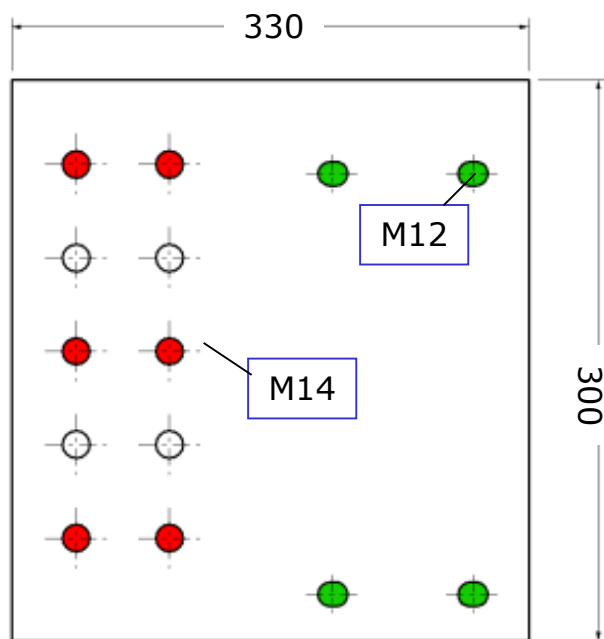
COLUMN 150x150



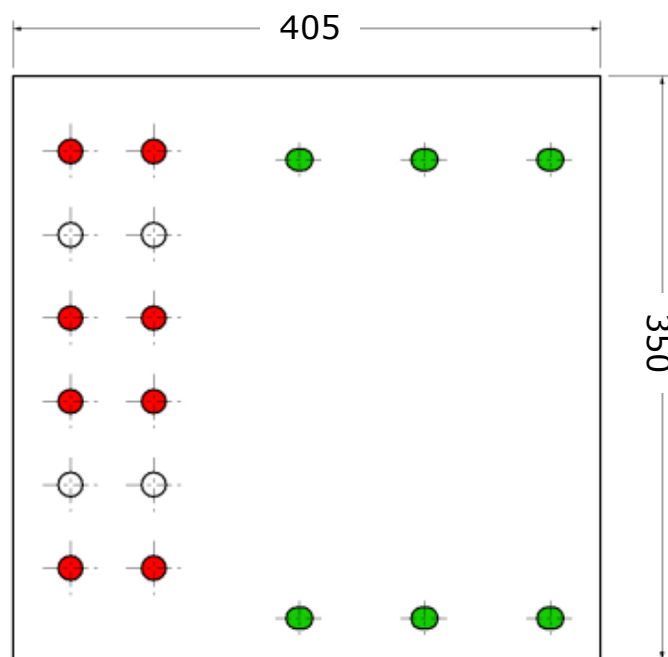
FOR EACH BEAM OF 240 mm



FOR EACH BEAM OF 290 mm



FOR EACH BEAM OF 340 mm



FOR EACH BEAM OF 390 mm

The major plates have to be joined to the column with bolts **M14x40** + nuts and washer; the screwhead must be placed external to the columns.

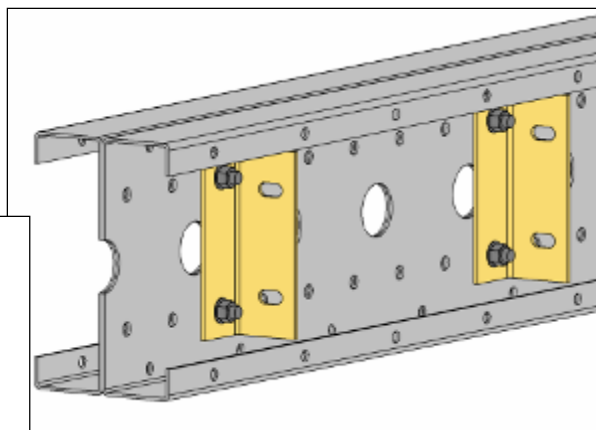
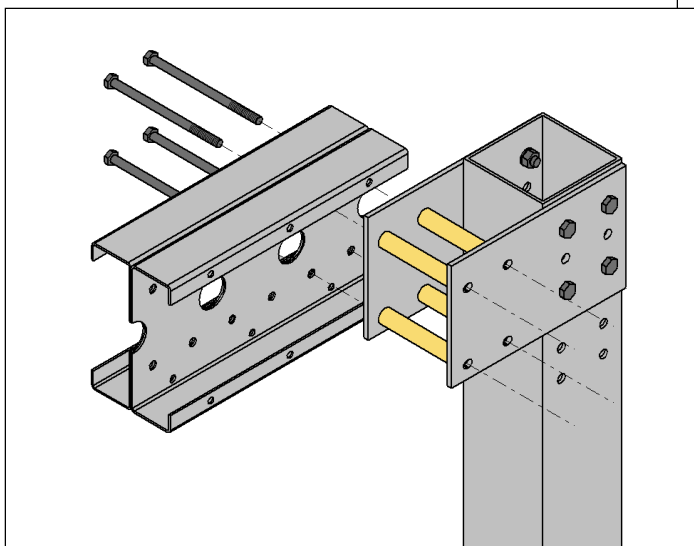
To join beams to major plates use screws **M12x35** + nuts and washer.

Quantities and placing are shown in this page drawings: red perforations for screws M14, and green ones with screw M12.

Note: for the major double plates use screws M14 as above mentioned, but screws M12 have to be doubled.

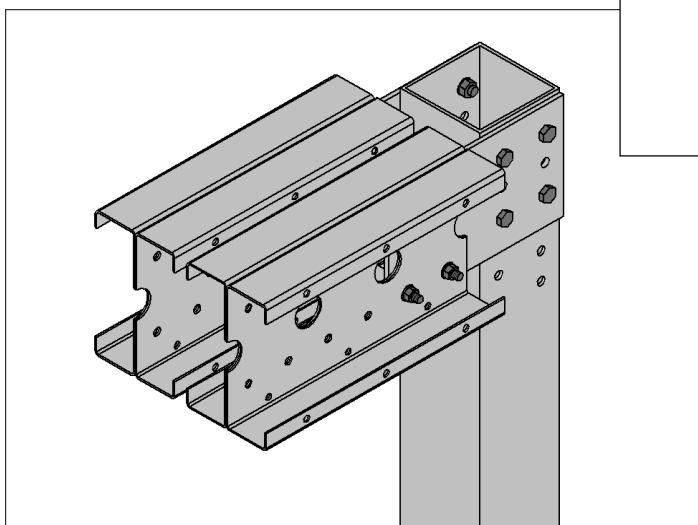
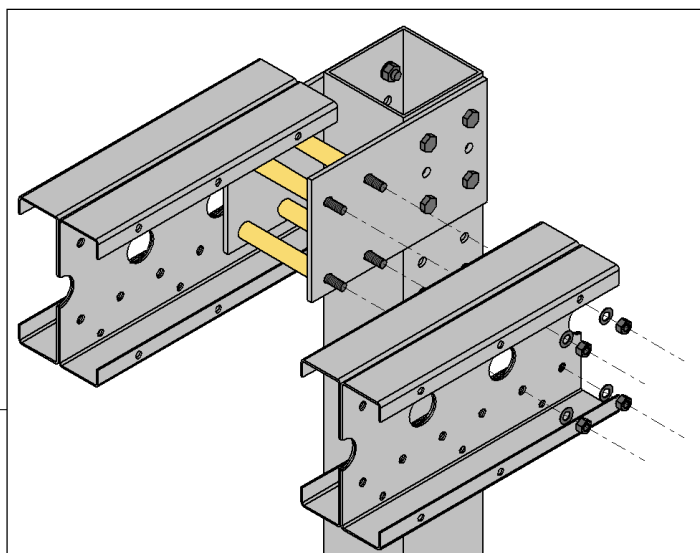
MAJOR PLATES ASSEMBLY

Column 150x150 with 2
major double beam



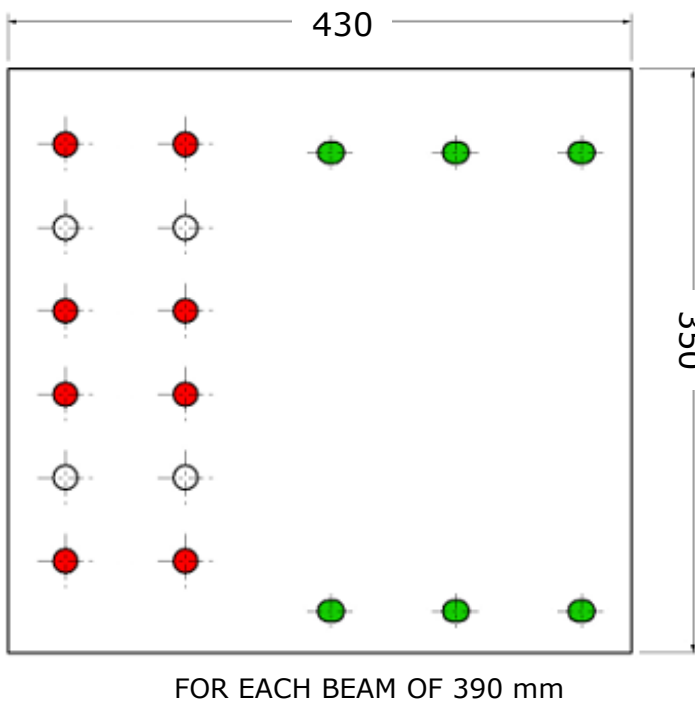
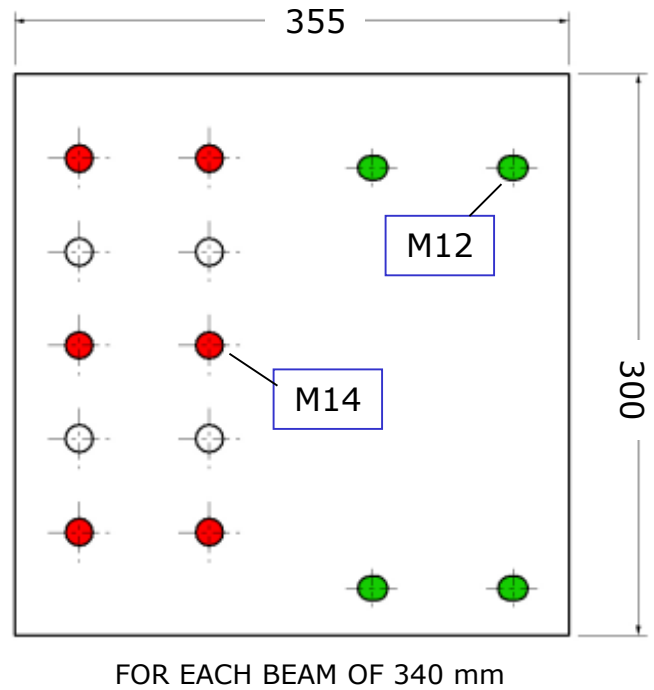
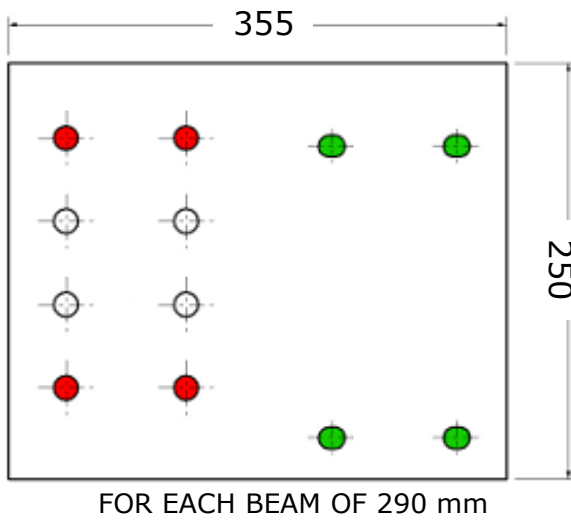
N.B. Brackets for secondary beams (see following pages) have to be assembled on double beams before assembling them on the column.

After having assembled the 2 double beams with the brackets for secondary beams, join beams to the column: to do this insert the screws **M12x200**, interposing between the 2 brackets the tube **Ø25** mm; then assemble the second double beams and fix with nuts washer.



MAJOR PLATES ASSEMBLY

COLUMN 200x200

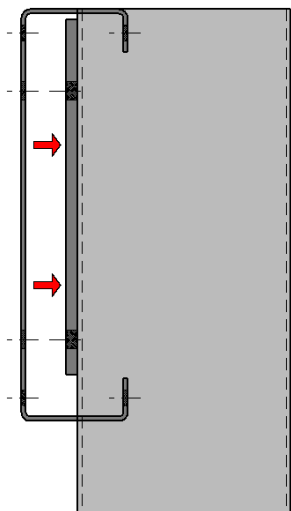


The major plates have to be joined to the column with bolts **M14x40** + nuts and washer; the screwhead must be placed external to the columns.

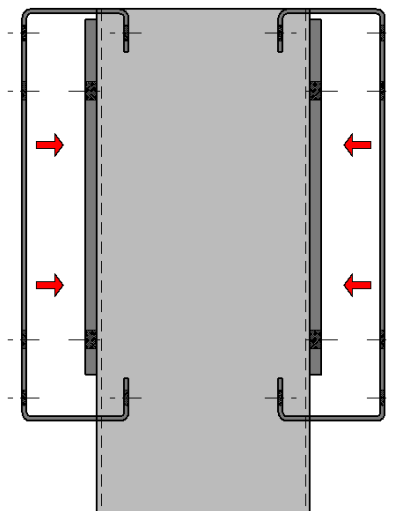
To join beams to major plates use screws **M12x35** + nuts and washer. Quantities and placing are shown in this page drawings: red perforations for screws M14, and green ones with screw M12.

Note: for the major double plates use screws M14 as above mentioned, but screws M12 have to be doubled.

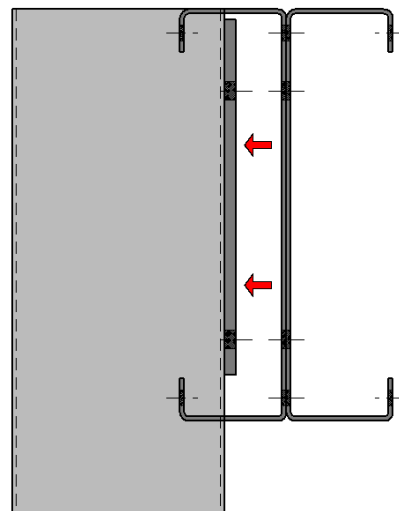
POSITIONING OF MAJOR BEAMS



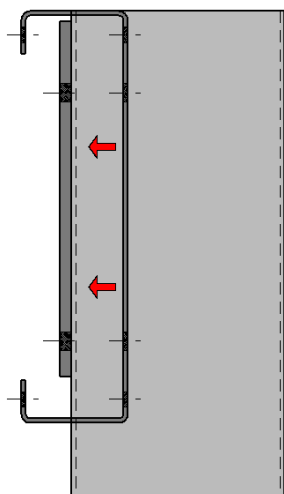
CLOSED SINGLE BEAM



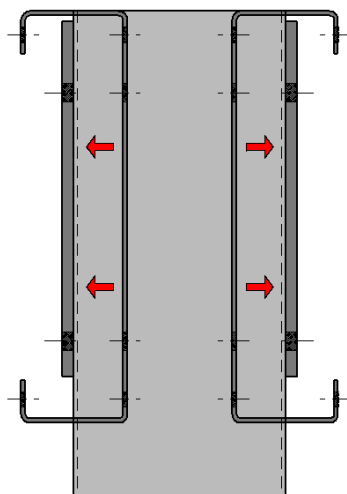
2 CLOSED SINGLE BEAMS (col. 200)



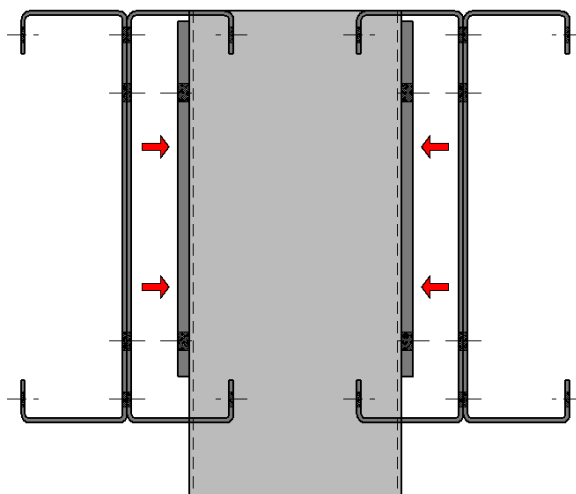
DOUBLE BEAMS



OPEN SINGLE BEAM

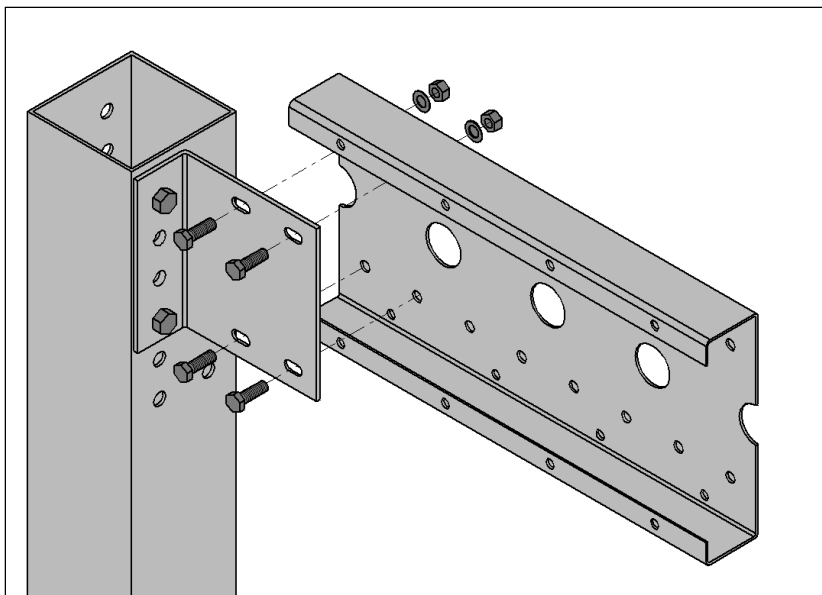


2 OPEN SINGLE BEAM

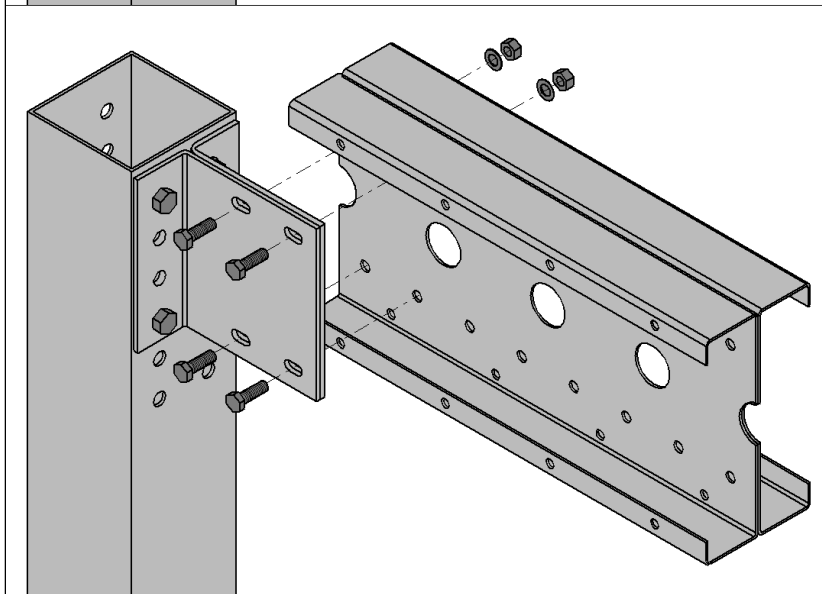


2 DOUBLE BEAMS
(col. 150- 200)

BRACKETS FOR SECONDARY BEAMS ON COLUMN

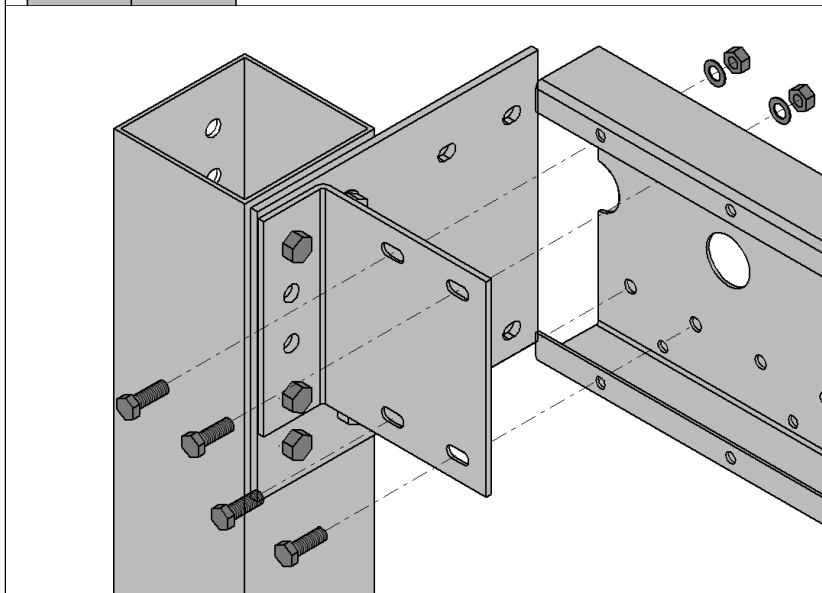


Brackets for secondary beams have to be fixed to the column with screw **M14x40** + nuts and washer, the screwhead must be placed external to the columns. The secondary beam has to be fixed to the bracket with screw **M12x35** + nuts and washer.



In case of double secondary beams, 2 brackets are needed, with the beams joined on one side.

N.B. On the column 200x200, also in case of single beam, two secondary bracket are always needed.

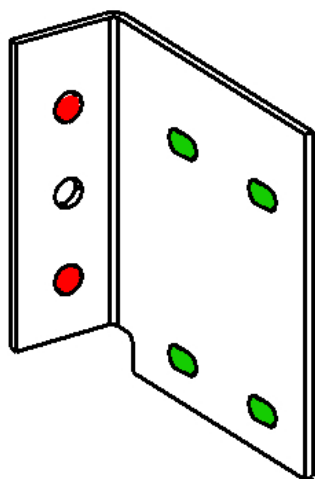


In case on the column you have a major plate, the bracket (single or double) has to be fixed on the major plate, using the bolts of the major plate.

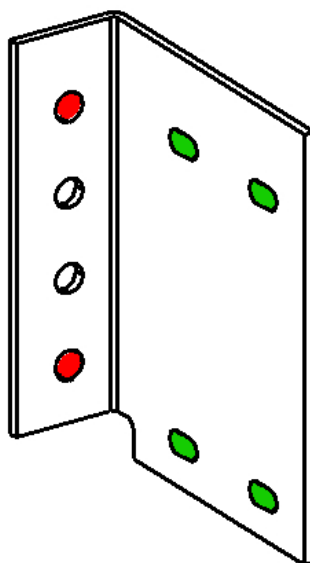
BRACKETS FOR SECONDARY BEAMS ON COLUMN

Quantities and placing are shown in this page drawings: red perforations for screws **M14**, and green ones with screw **M12**.

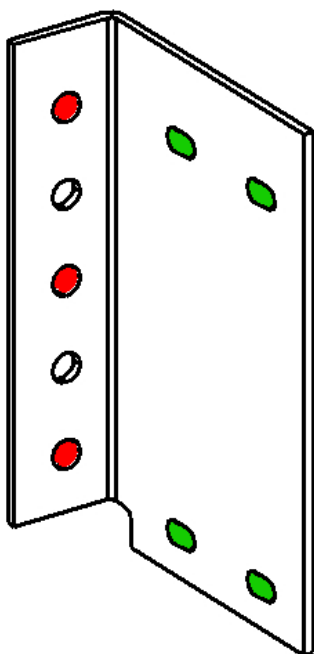
N.B. if the secondary brackets are double, the screws M14 have to be doubled, while the screws M12 remain unchanged.



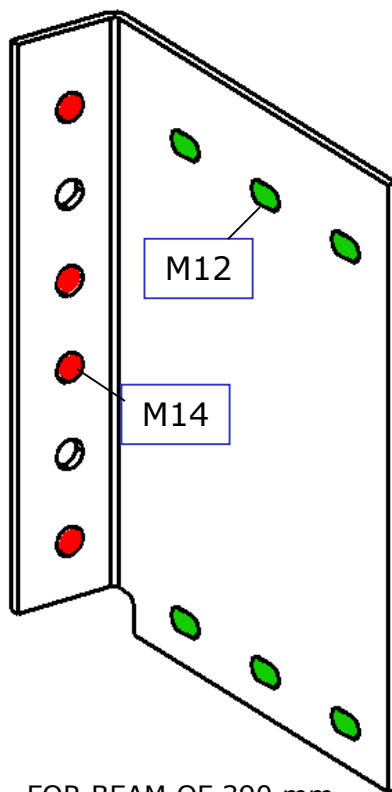
FOR BEAM OF 240 mm



FOR BEAM OF 290 mm



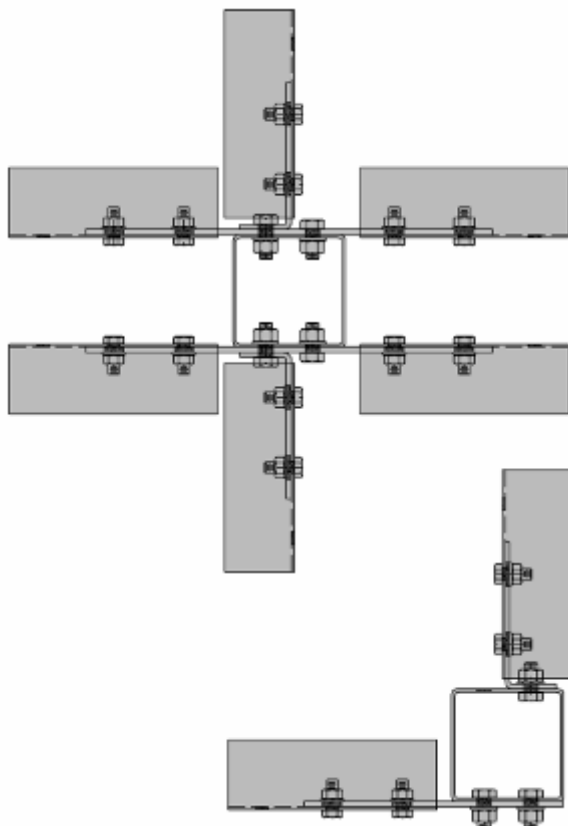
FOR BEAM OF 340 mm



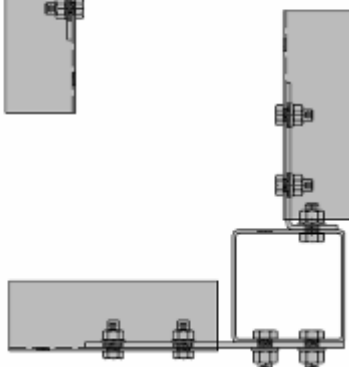
FOR BEAM OF 390 mm

JOINING COLUMNS-BEAMS

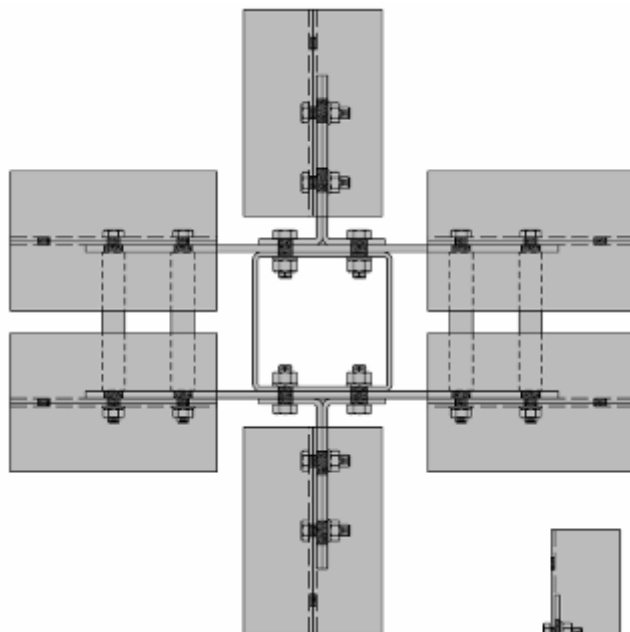
COLUMN 120X120 – 6 BEAMS



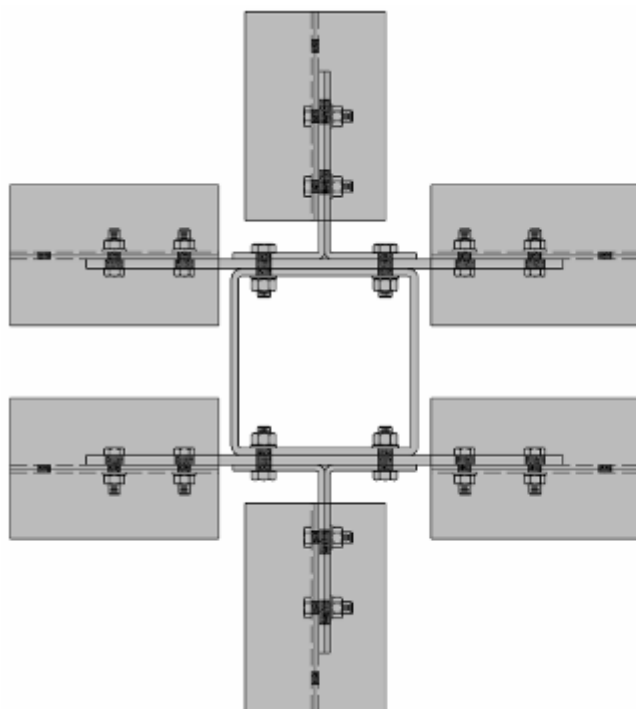
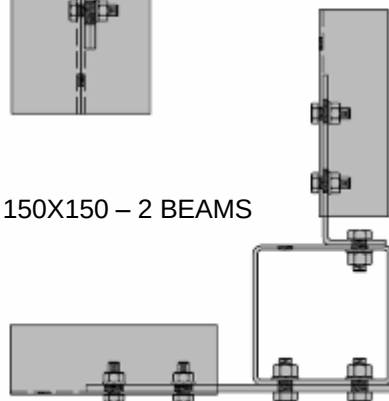
COLUMN 120X120 – 2 BEAMS



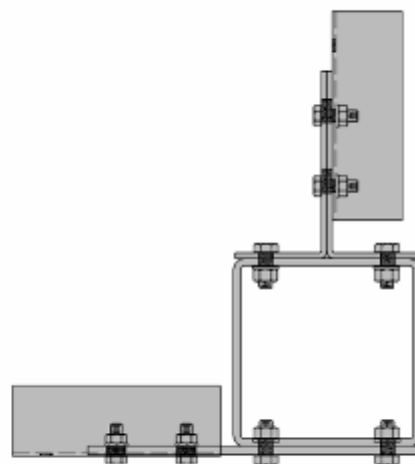
COLUMN 150X150 – 8 BEAMS



COLUMN 150X150 – 2 BEAMS

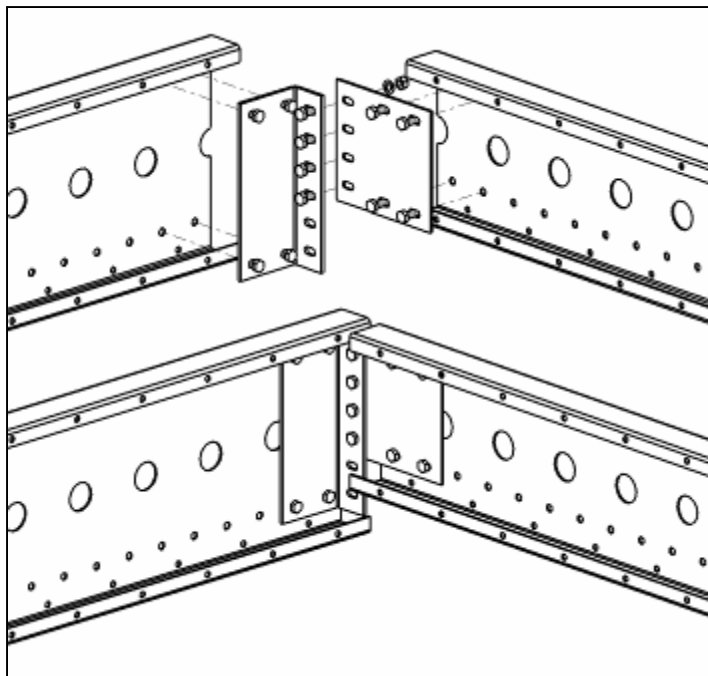


COLUMN 200X200 – 8 BEAMS



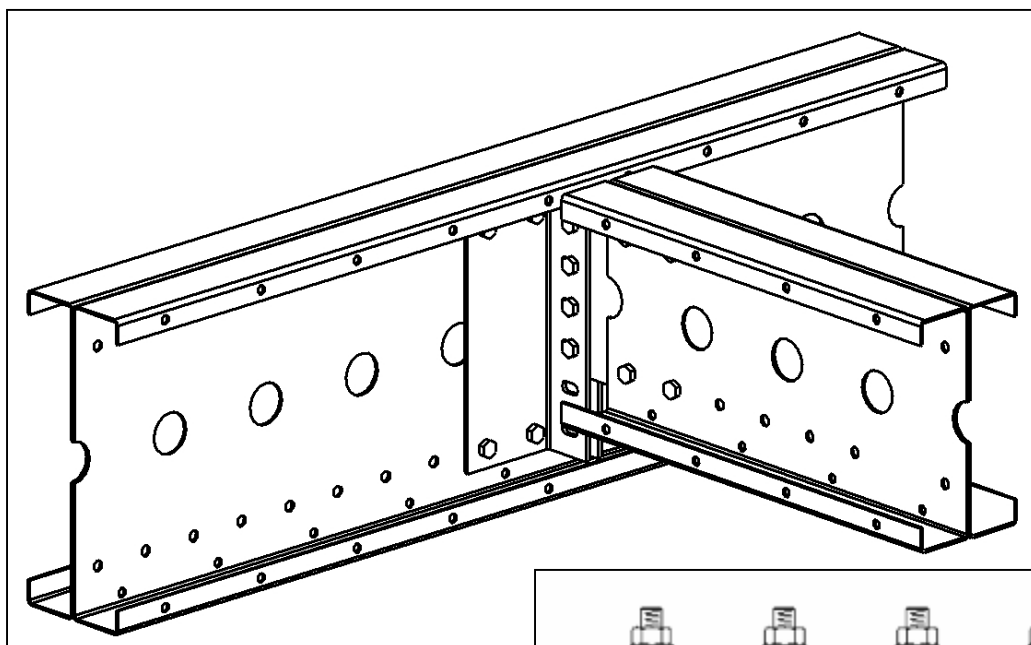
COLUMN 200X200 – 2 BEAMS

BRACKETS FOR SECONDARY BEAMS ON MAJOR BEAM



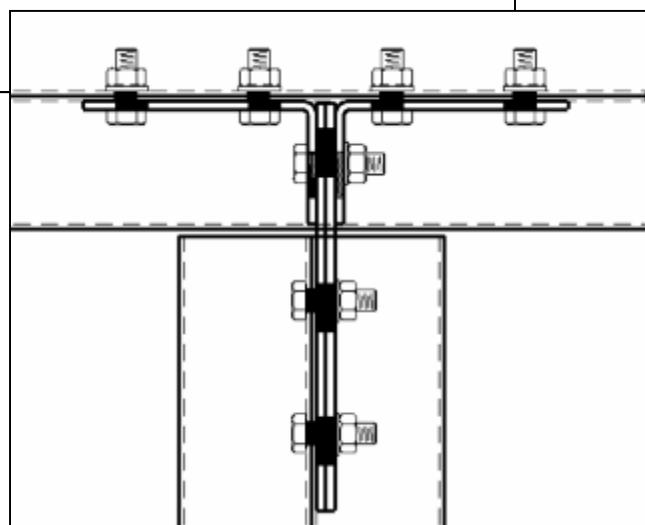
Fix the bracket to the major beam and the plate to the secondary beam. Then fix the plate to the bracket.

Use screw **M12x35** + nuts and washer.

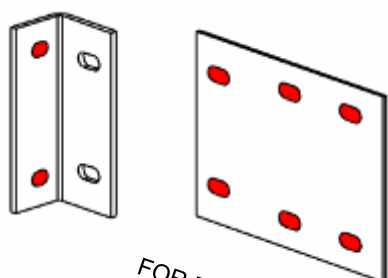


In case of secondary double beams two brackets and two plates are needed. The two plates have to be fixed inside the two brackets.

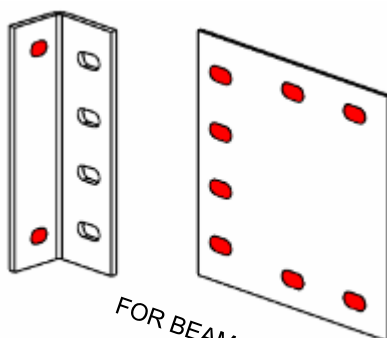
The two secondary beams have to be positioned on the same side.



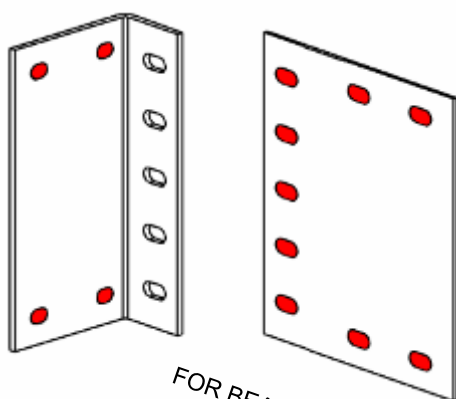
BRACKETS FOR SECONDARY BEAMS ON MAJOR BEAM



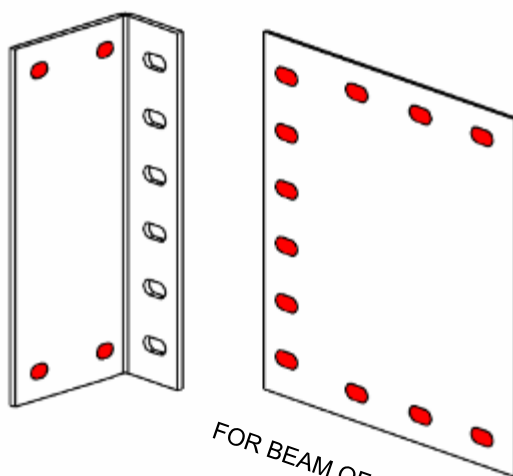
FOR BEAM OF 240 mm



FOR BEAM OF 290 mm



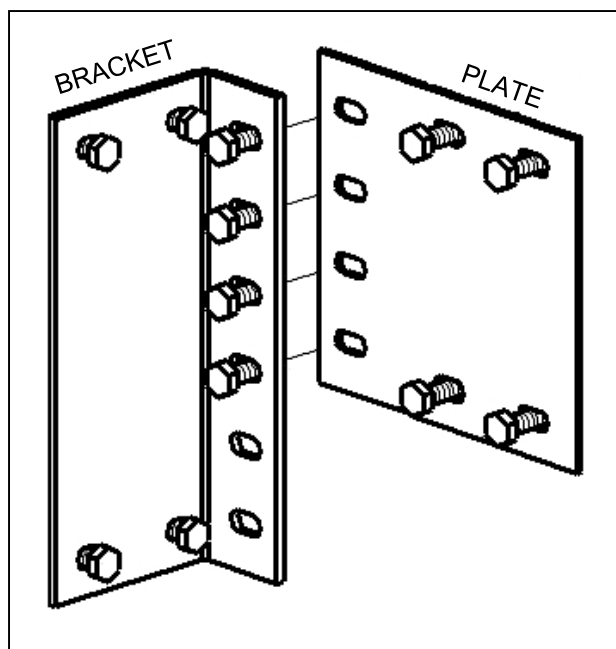
FOR BEAM OF 340 mm



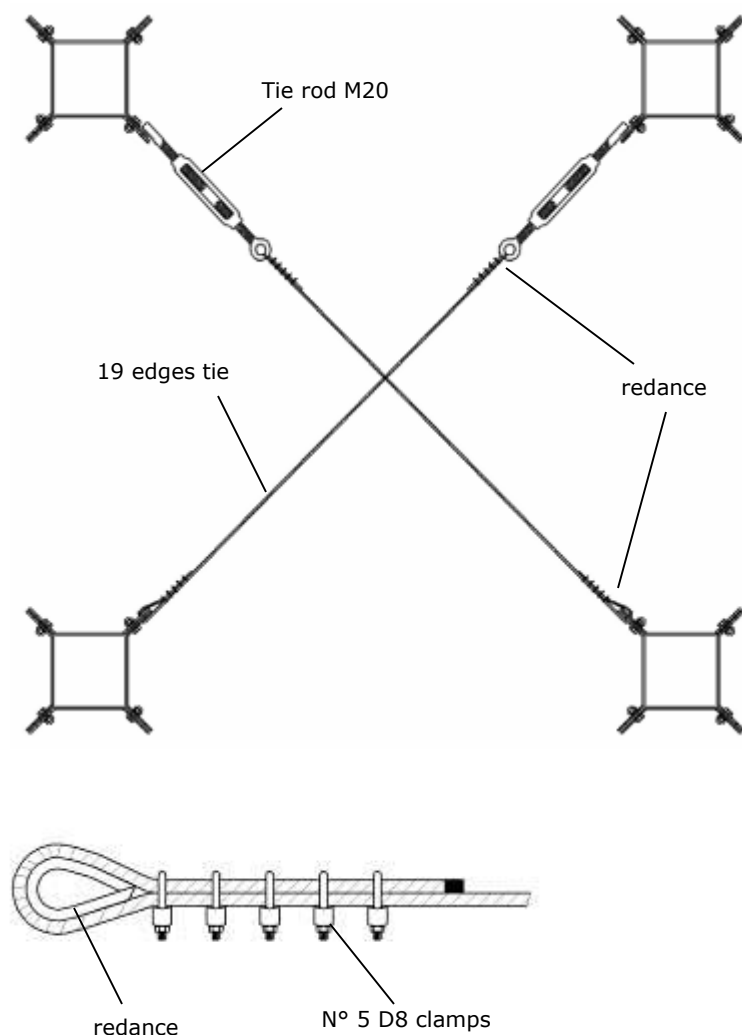
FOR BEAM OF 390 mm

Quantities and placing of screws M12 are shown in this page drawings.

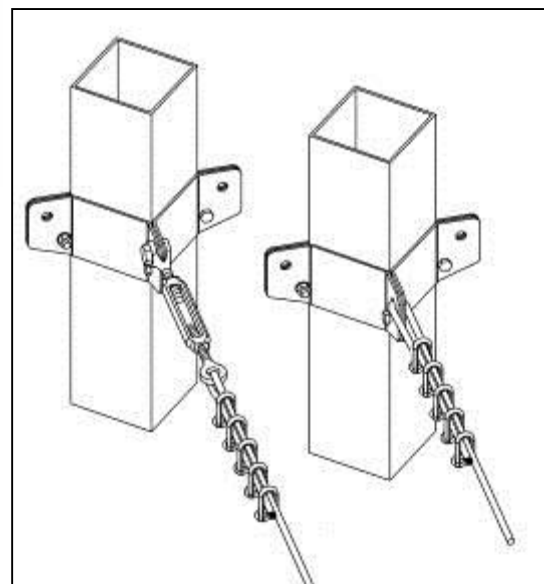
When using a secondary beam smaller than the major one, quantities and placing of screws needed for joining are indicated by the number of holes on the plate.



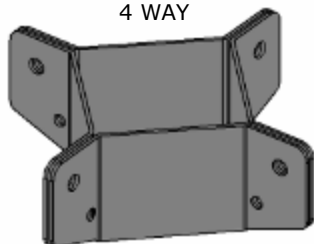
VERTICAL CROSS-BRACINGS



Fix the 4-way plate for horizontal cross-bracings at the columns with M12x30 screws, then fix the tie rod; at last pass the tie in the hole of the tie rod and plate and then fix it with 5 D8 clamps.

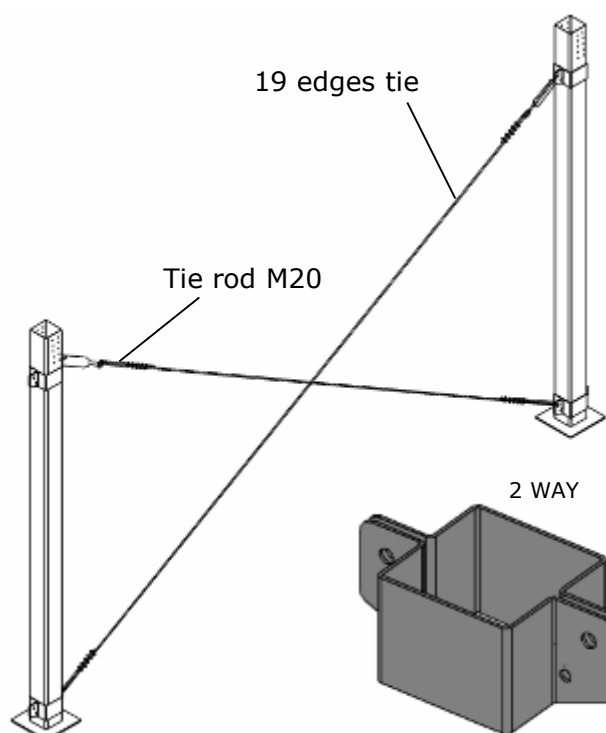


PLATES FOR
HORIZONTAL
CROSS-
BRACINGS
4 WAY



N.B. Check every 12 months the state of rope cross-bracing, making sure that there were no tension dips; if this has occurred, it should be restored to the original situation.

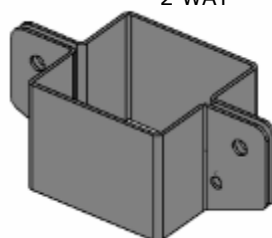
VERTICAL CROSS-BRACINGS



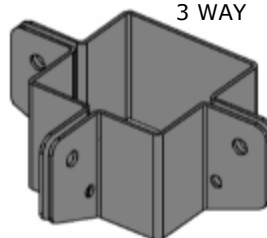
Fix the plates for vertical cross-bracings at the columns with M12x30 screws; then fix the tie rod; at last pass the tie in the hole of the tie rod and plate and then fix it with 5 D8 clamps.

The plates have to be fixed on a level of about 150 mm from the foot and from the brackets for beams.

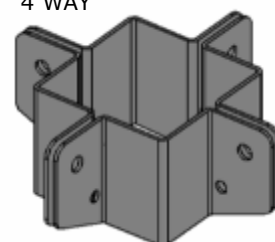
2 WAY



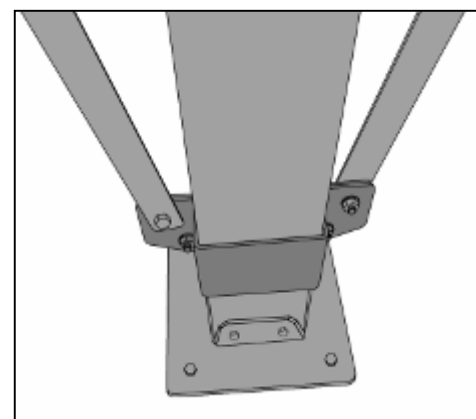
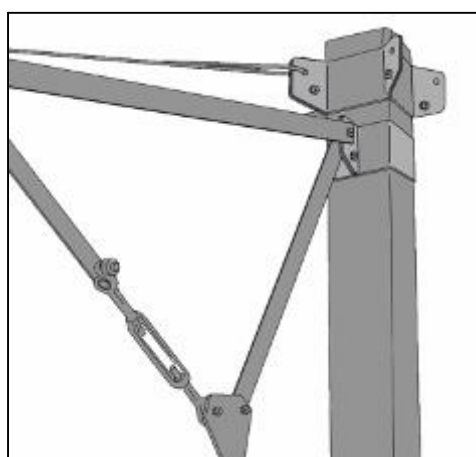
3 WAY



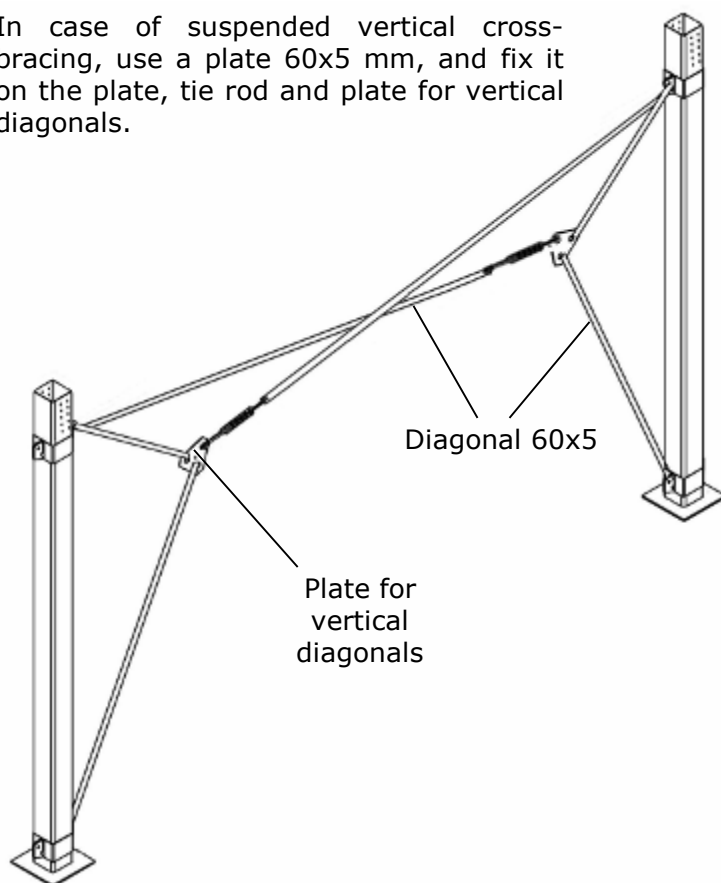
4 WAY



SUSPENDED VERTICAL CROSS-BRACINGS

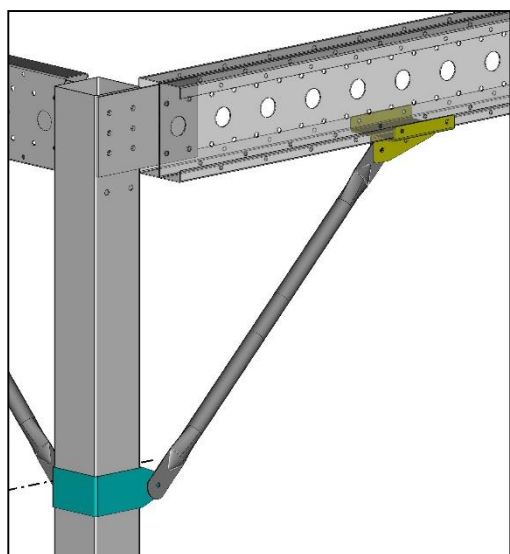


In case of suspended vertical cross-bracing, use a plate 60x5 mm, and fix it on the plate, tie rod and plate for vertical diagonals.

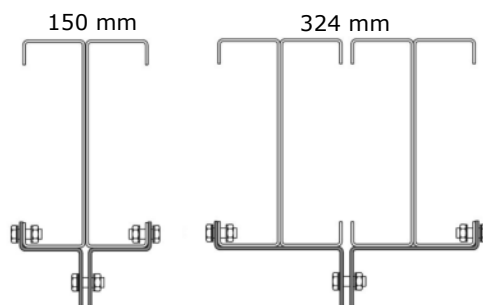


Example of use of 4 way plate for horizontal diagonals and suspended vertical cross-bracings

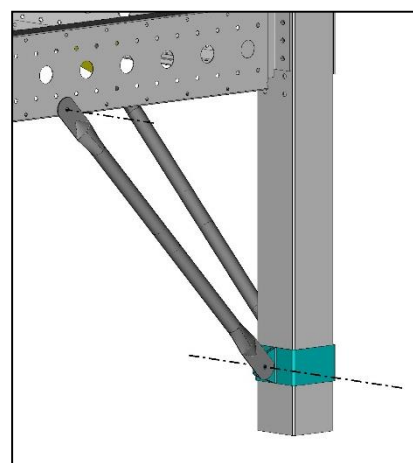
TIE-RODS



STAFFE ATTACCO SAETTA



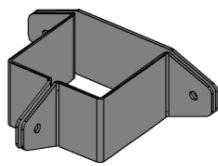
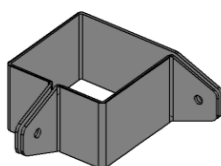
Fix the plate at the upright, then fix the right and left joining brackets at the principal beam. At last fix the tie rod with 2 M12x30 screws.



CIAPPE PER SAETTE

2 WAY

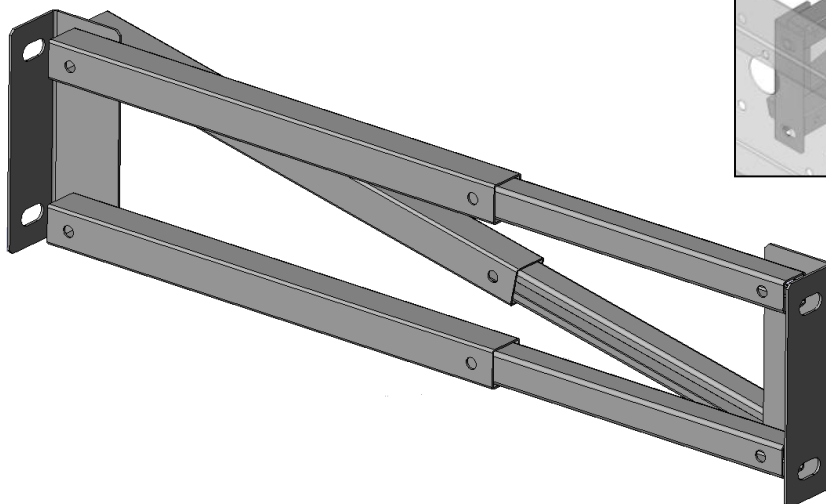
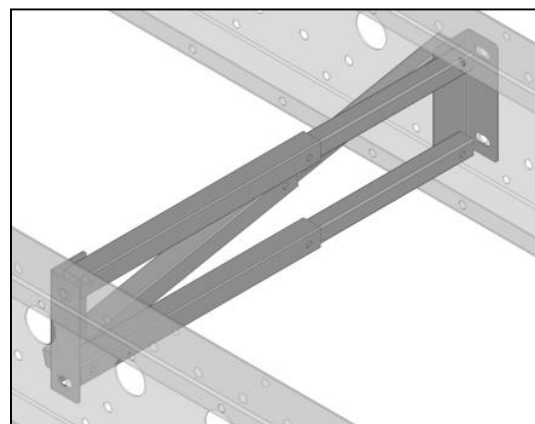
3 WAY



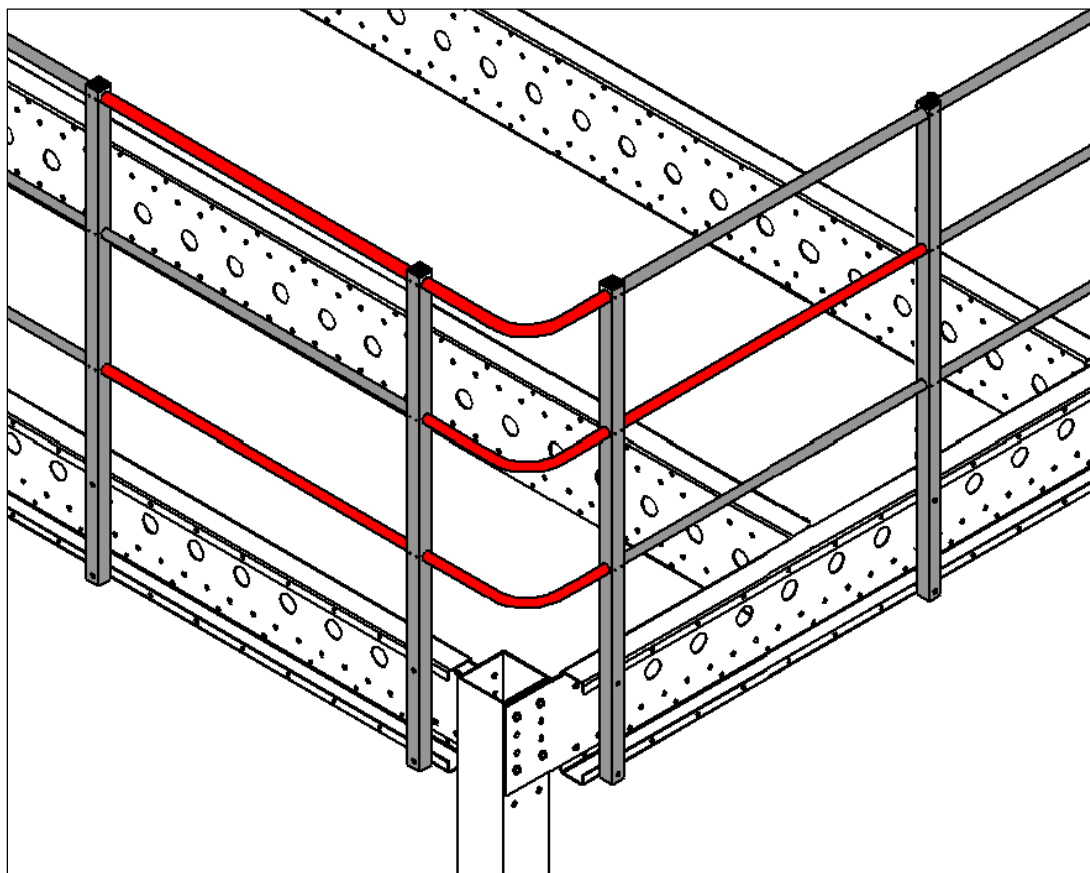
On a single beam, the tie-rod has to fix directly on the beam.

RETICULATE FOR BEAM STIFFENING

Fix the two L-shaped squares on the secondary beams with M12x25 screws, nuts and washer. Then fix to the little squares the beams and the C-shaped profiles with M8x45/80 screws, nuts and 2 washers. At last drill into the C-shaped profiles in the holes on the beams and fix with M8x45 bolts, nuts and 2 washers.



PARAPET RAILING



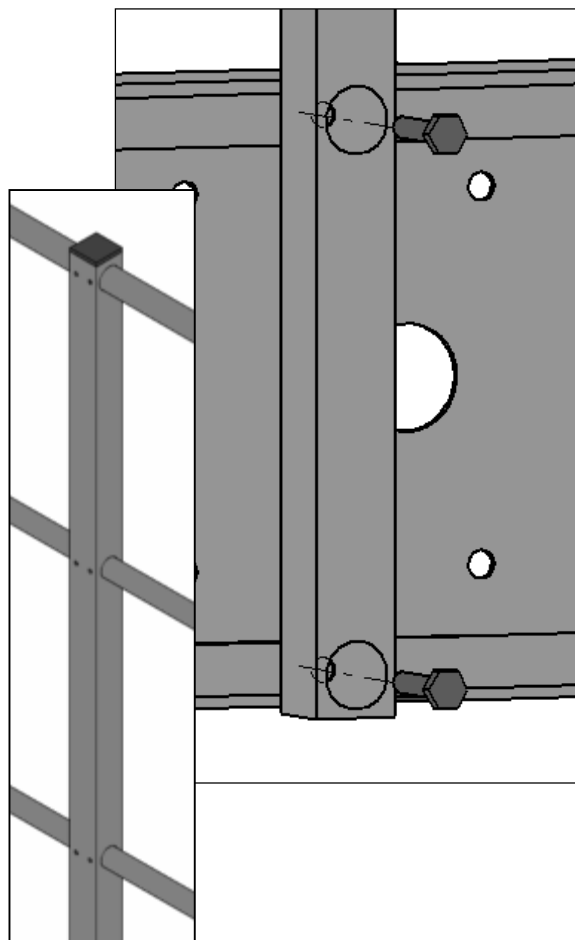
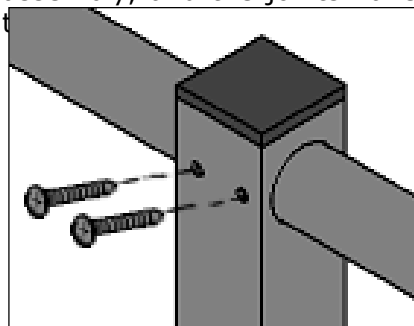
Fix the columns on the beams with 2 M10x25 screws.

Then insert the tubes, $\varnothing 25$ mm below and $\varnothing 30$ mm at the top, then fix them from the inner side with selfscrewing screws M4,2x22.

On the angles use curved tubes; these must be fixed on three columns, two on one side and one on the orthogonal side. The curved tubes have to be assembled staggered, in order to have at least one profile fixed on two columns in both ways of the angle.

In the picture above you can see the placing of the three elements (in red) which form the angle.

All the tubes must be cut on scale during assembly, and the joints have to be calculated in



KICKPLATE

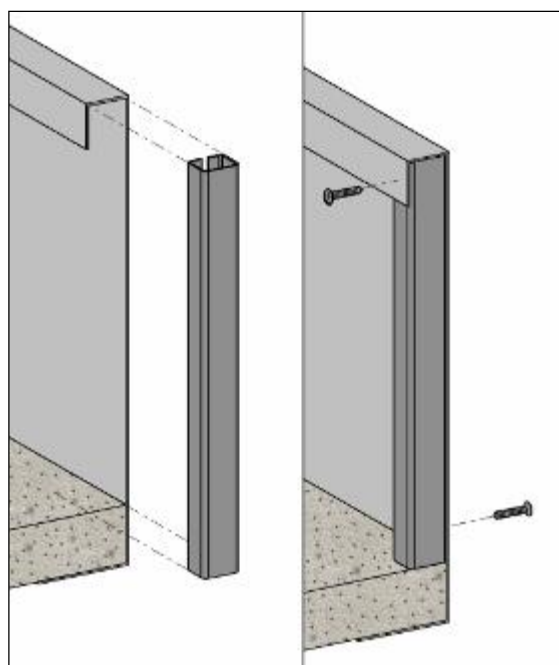
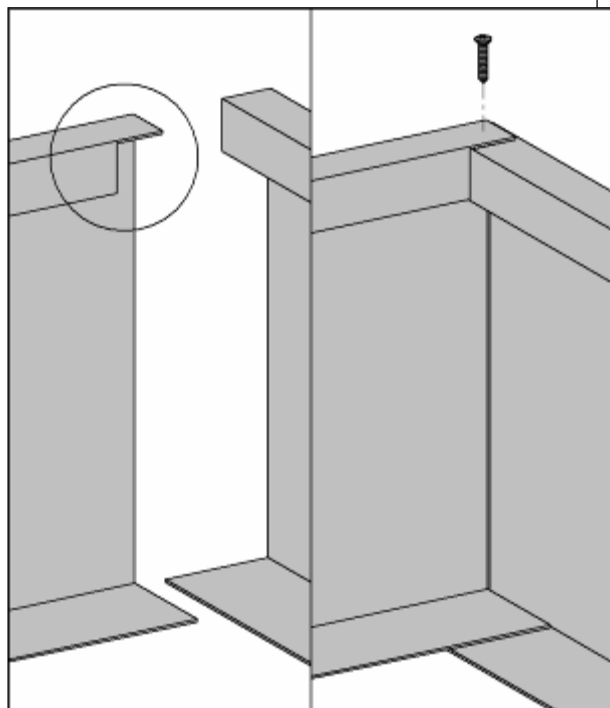
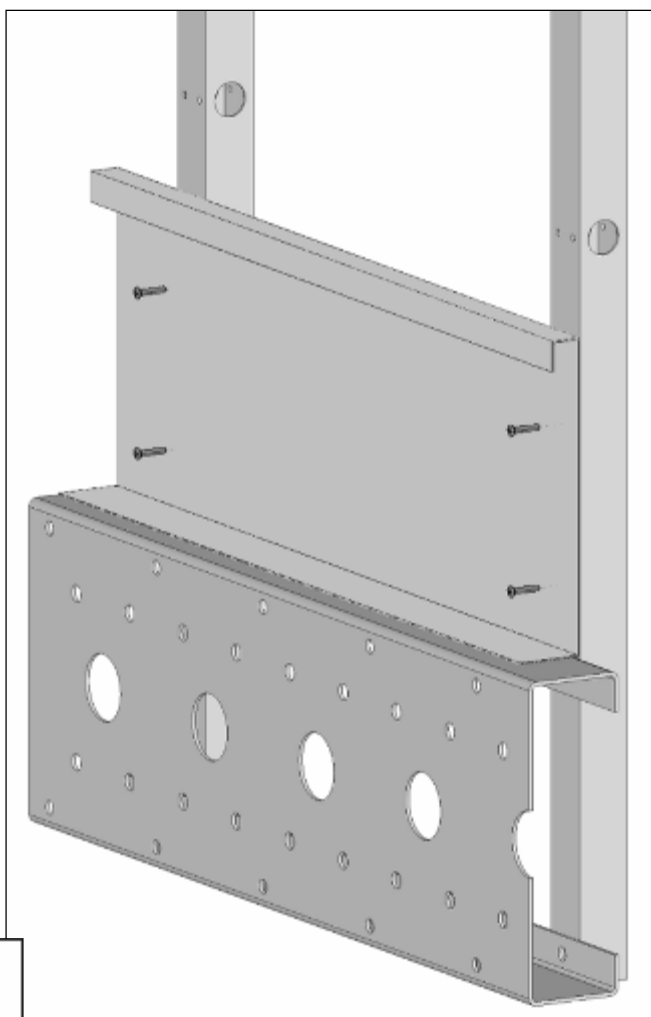
Put the kickplate on the beam and on the columns, then fix it to all columns with 2 selfscrewing screws M4,2x22.

For the finishing of the angle trim one profile during assembly, as showed in the picture below; then lay the two profiles one upon the other and fix them with one selfscrewing screw M4,2x22.

After having assembled the flooring, finish off eventual protrusions of the kickplate, in order to remove possible cutting borders.

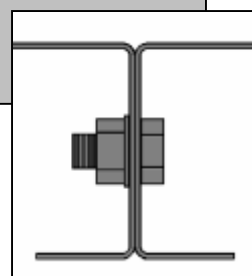
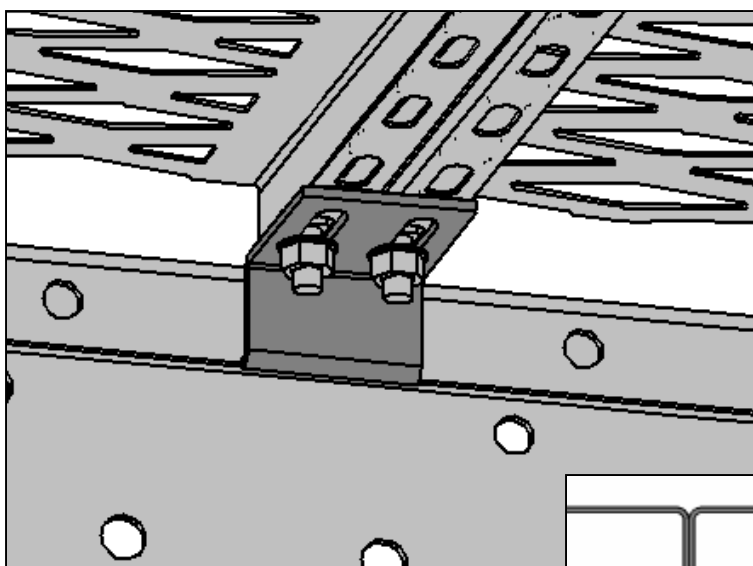
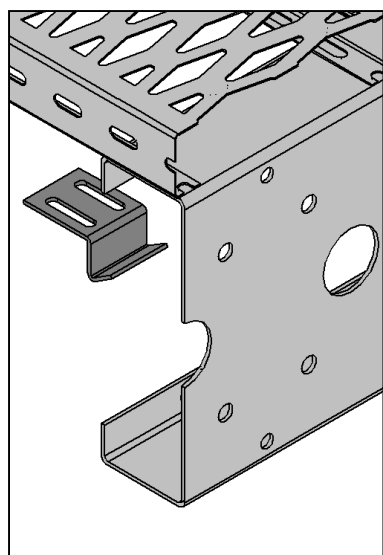
Insert the finishing profile inside the kickplate, then fix it with 2 selfscrewing screws M4,2x22.

N.B. Every possible corner has to be finished off in order to avoid possible cutting borders.



FLOORING

OPEN/CLOSED PLANK

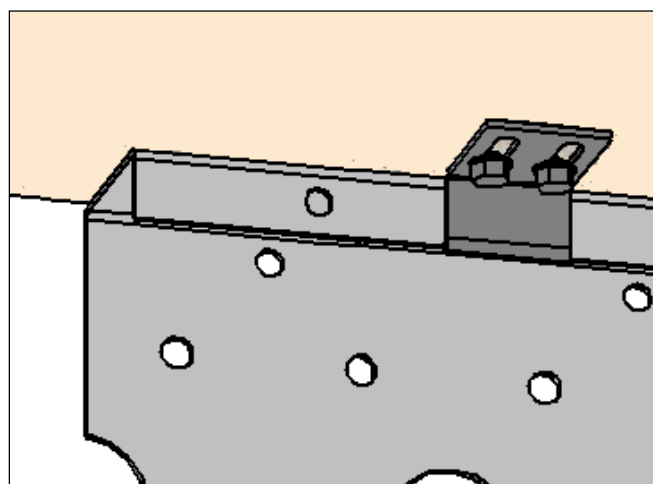
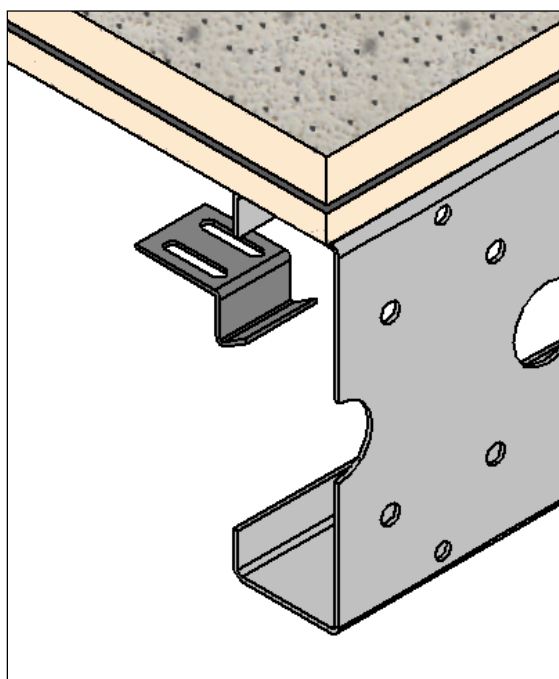


Fix the floor planks to every beam with the bracket and screws M8x20, nuts and washer. The open/closed plank has to be fixed on every beam.

Use 1 bracket per 3 planks.

The planks have to be joint together with M8x20 screws, nuts and washer, placing one bolt per meter.

WOOD PANELS



Fix the panels on the beams with the bracket and 2 screws for wood; use two brackets for every cross beam-panel.

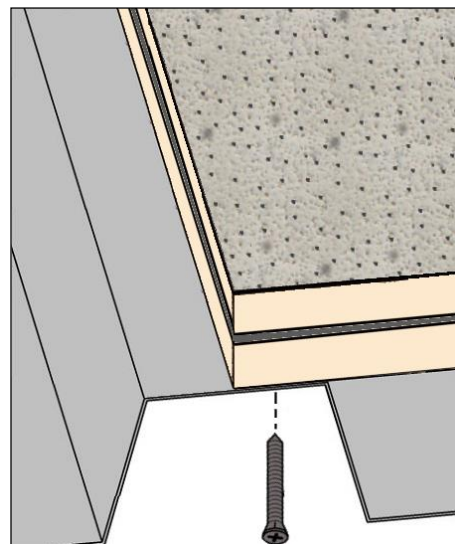
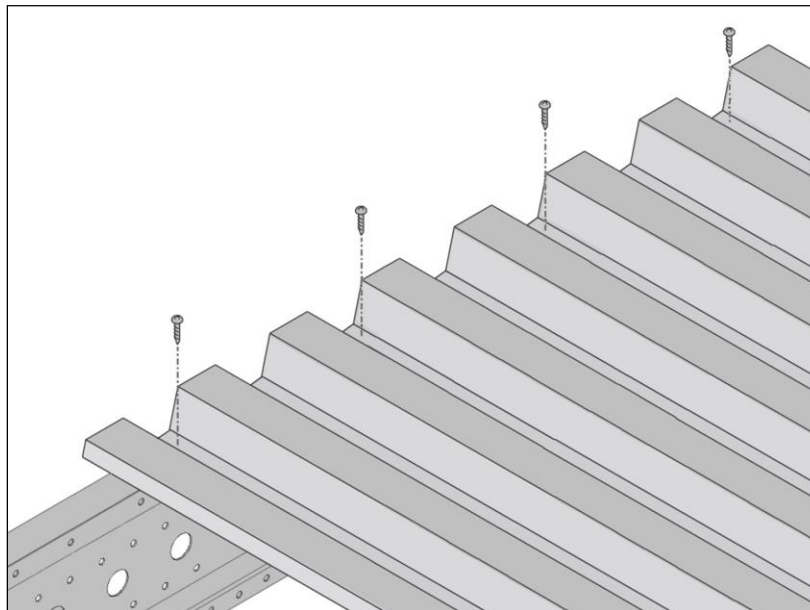
Ex: if the panel crosses 3 beams, will be necessary 6 brackets.

OPEN/CLOSED PLANK + WOOD PANEL

Fix the floor plank to every beam as described above, then fix the wood panel to the open/closed plank with screws for wood.

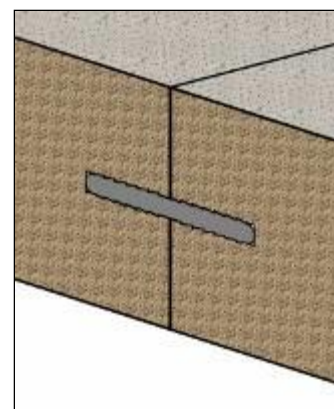
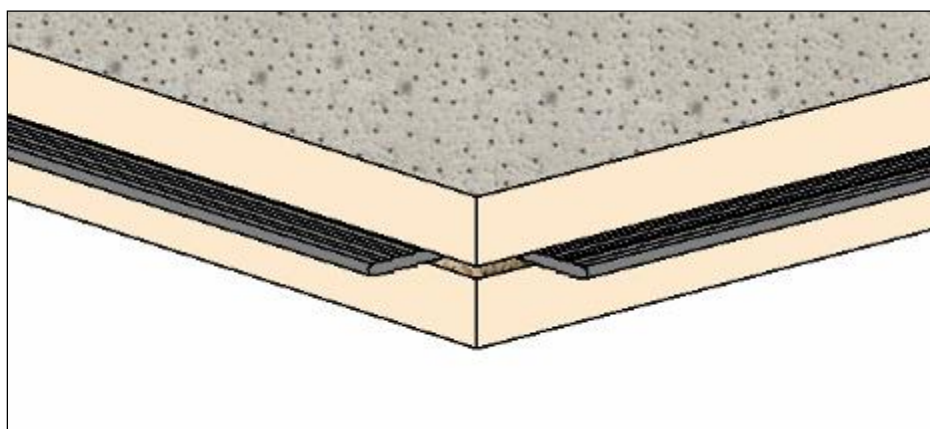
FLOORING

SHAPED SHEET + WOOD PANEL



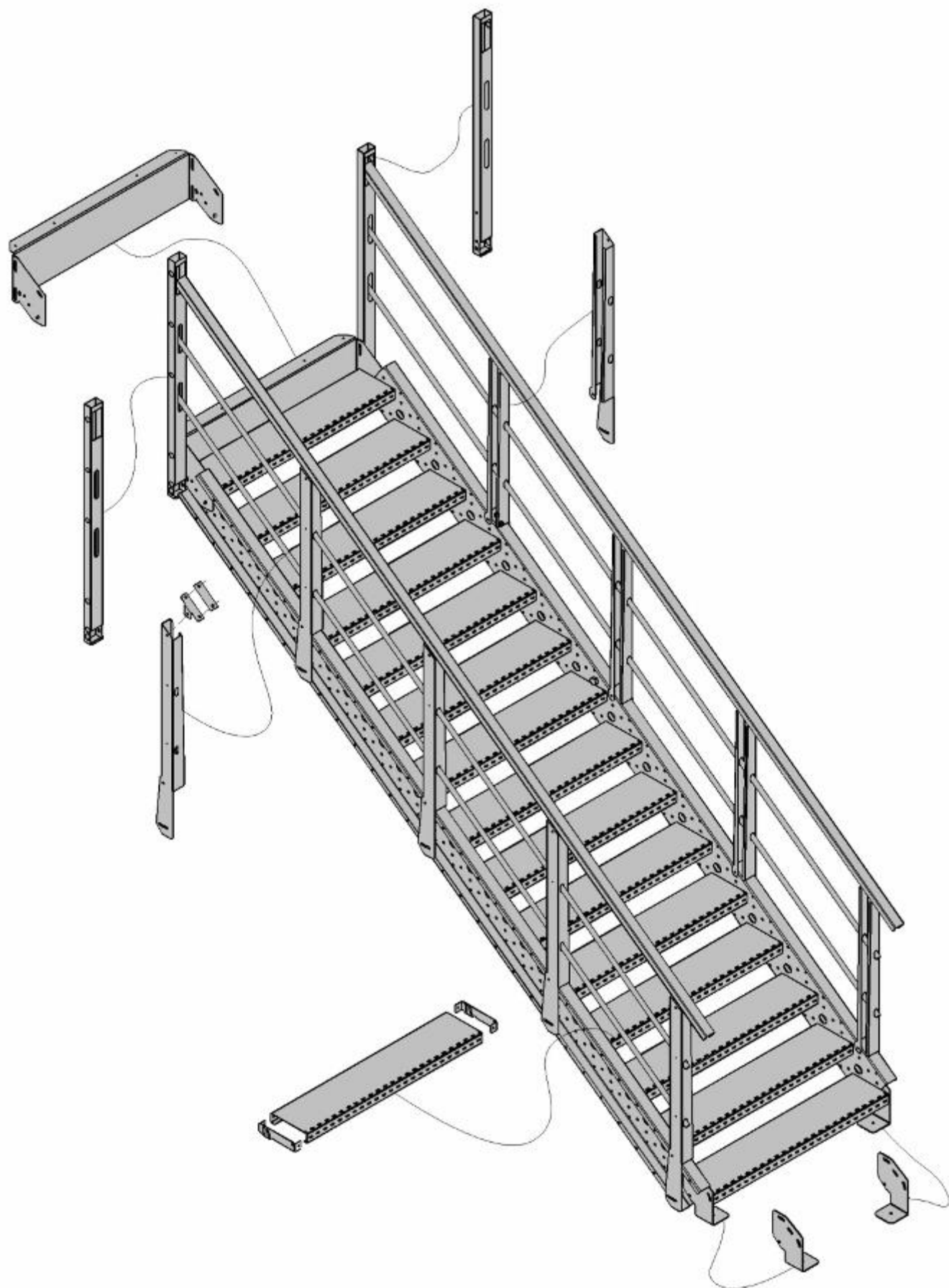
Fix the shaped sheet on the beam with selfscrewing screws. For each beams, as in figure.
Then fix the wood panels with selfscrewing screws on the top of the panel, with 6 screw.

CONNECTION OF WOOD PANELS

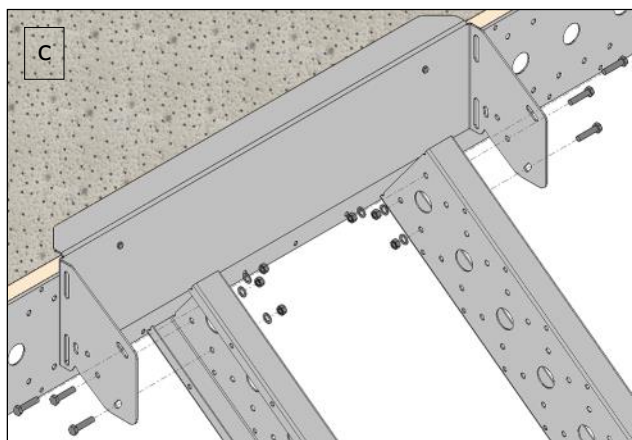
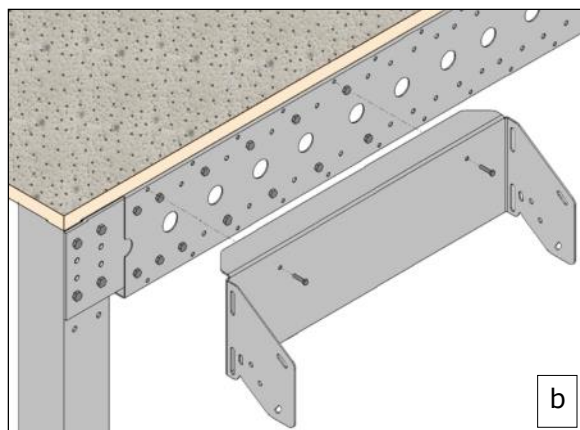
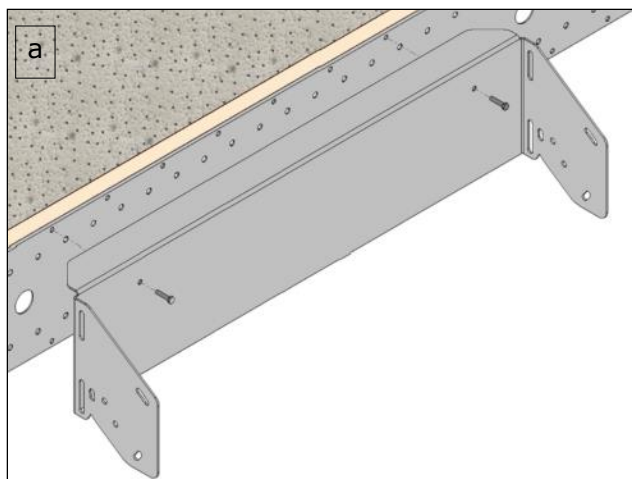


For joining together the wood panels use the plastic profile. This profile has to be inserted in the relevant tapping on every side of the panel.
The cross-section on this side shows the typical connection between two panels.

STAIRWAY

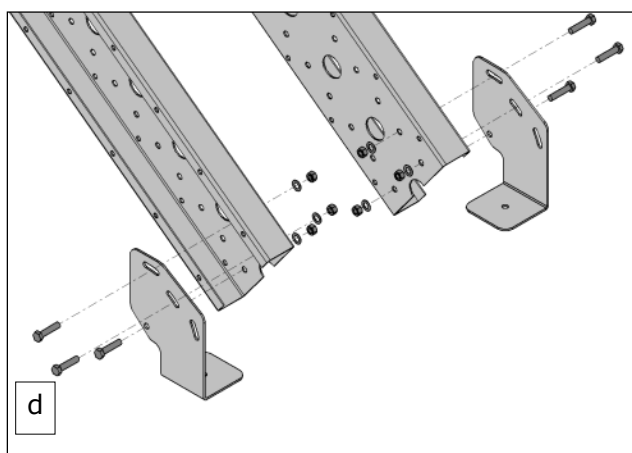


STAIRWAY landing



Position the upper bracket on the flooring, then fix it on the beam using holes $\varnothing 11$ mm on the upper part of the beam. The holes on the bracket have to be made during assembly. For fixing use screws M10x40, nuts and washer (a); in case of screws on the beam (b), add more screws M12 to get thickness.

Fix the side stair profile on the upper bracket with 6 screws M12x25, nuts and washer (c). Then fix on the side stair profile the two feet with 6 screws M12x25, nuts and washer (d).

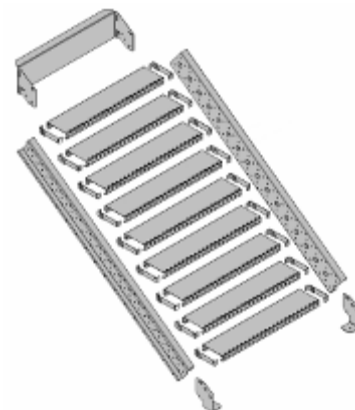
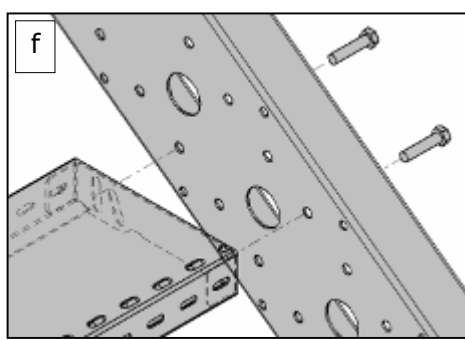
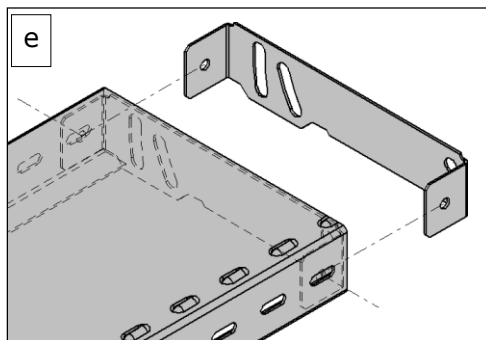


Assemble the steps by fixing on the profile the two brackets for step support with 4 screws M8x16, nuts and washer (e).

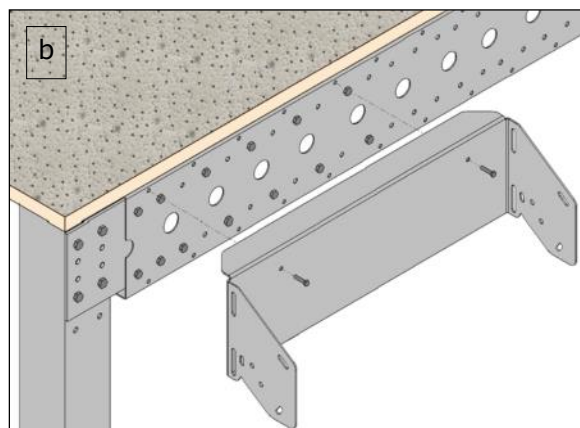
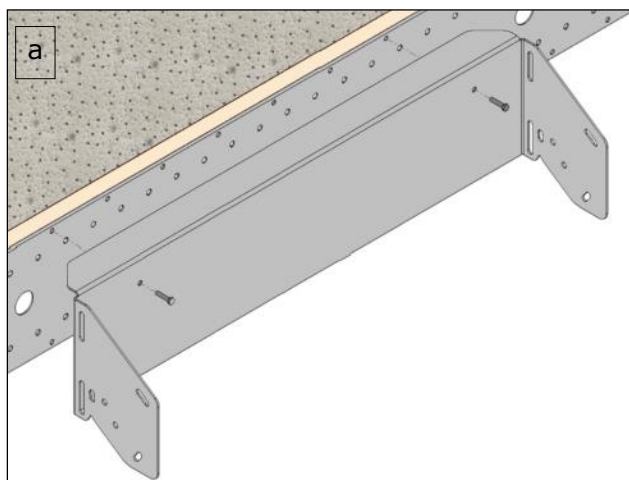
At last fix the steps on the side stair profile, starting from the step on the top and downwards.

The steps have to be fixed on the side stair profile with 4 screws M12x25, nuts and washer; the buttonhole for adjusting the inclination must be positioned on the back side of the step (f).

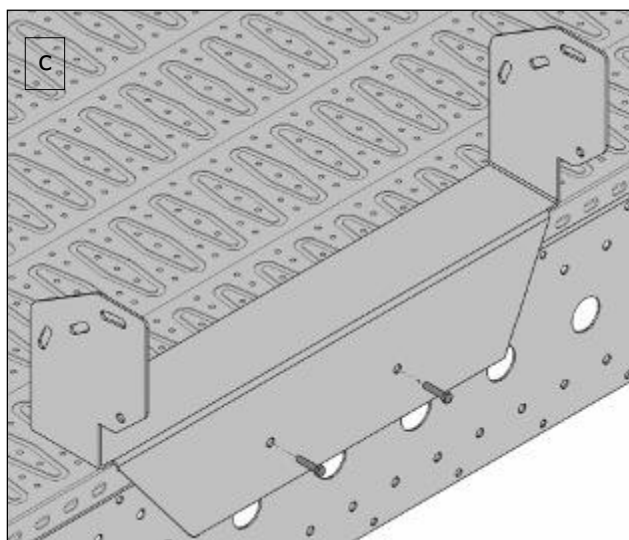
The number and the pitch of steps is specified in the assembly drawings provided by ROSSS Technical Department.



STAIRWAY ramp



Position the lower and upper brackets on the respective flooring, then fix them on the beam using holes $\varnothing 11$ mm on the upper part of the beam. The holes on the brackets have to be made during assembly. For fixing use screws M10x40, nuts and washer (a); in case of screws on the beam (b), add more screws M12 to get thickness.

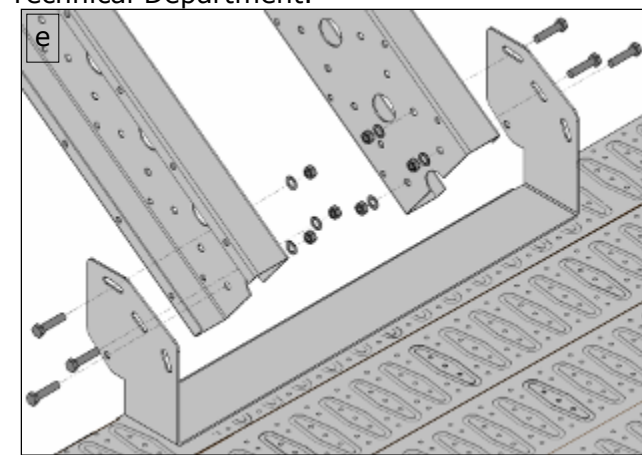
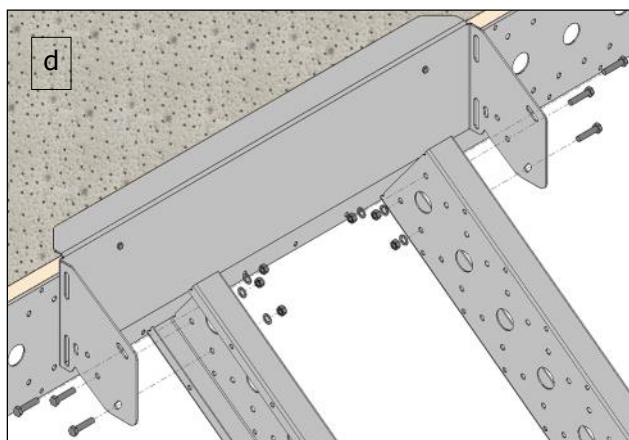


Fix the side stair profile on the upper bracket with 6 screws M12x25, nuts and washer (c). Then fix the pillars on the lower bracket with 6 screws M12x25, nuts and washer (d).

Assemble the steps by fixing on the profile the two brackets for step support with 4 screws M8x16, nuts and washer (e).

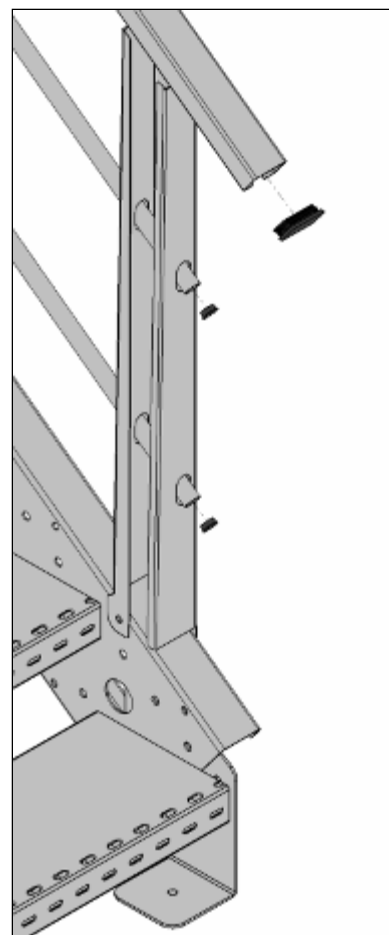
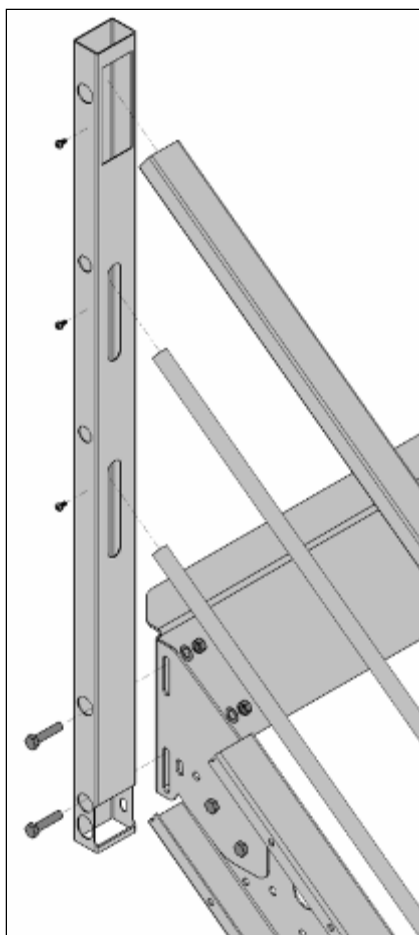
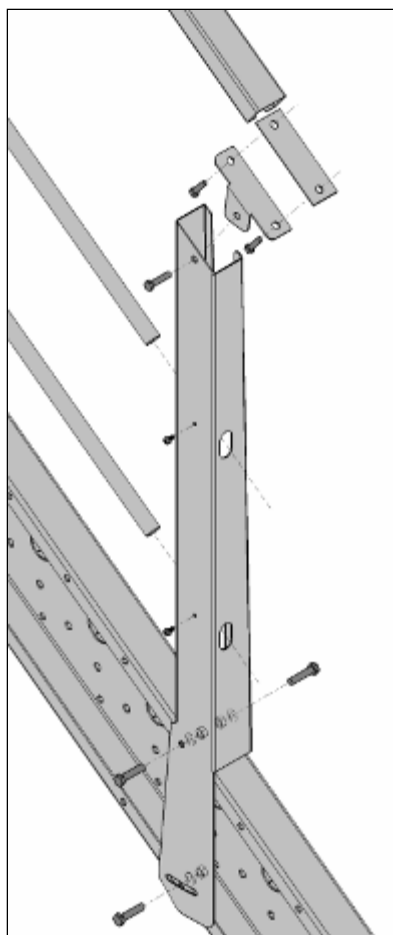
At last fix the steps on the side stair profile, starting from the step on the top and downwards.

The steps have to be fixed on the side stair profile with 4 screws M12x25, nuts and washer; the buttonhole for adjusting the inclination must be positioned on the back side of the step (f).



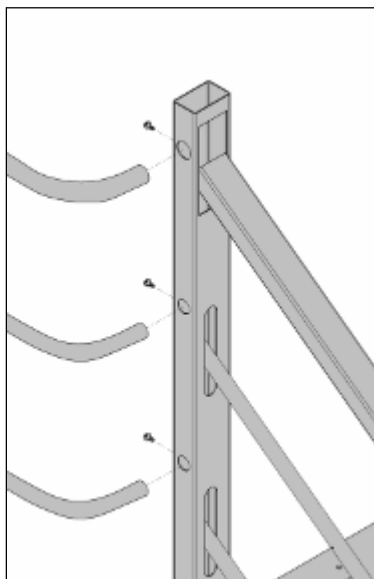
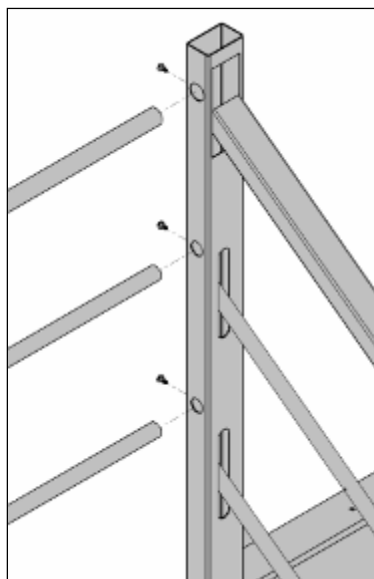
The number and the pitch of steps is specified in the assembly drawings provided by ROSSS Technical Department.

STAIRWAY HANDRAIL



Fix the columns to the side stair profile with 3 screws M10x25, nuts and washer. Then fix the final column on the upper bracket of the stairway with 2 screws M12x30, nuts and washer. Then insert the tubes in the holes of columns and let them slide till they come inside the final column; fix them on every column with selfscrewing screws M M4,2x22. **N.B.** the tubes must come out about 20 mm from the last column.

Fix the handrail on the columns with the threaded backplate placed inside; fix it on the last column with a selfscrewing screw M4,2x22. The handrail must come out of about 250 mm from the last column. At last insert the plastic caps in the tubes and in the handrail.

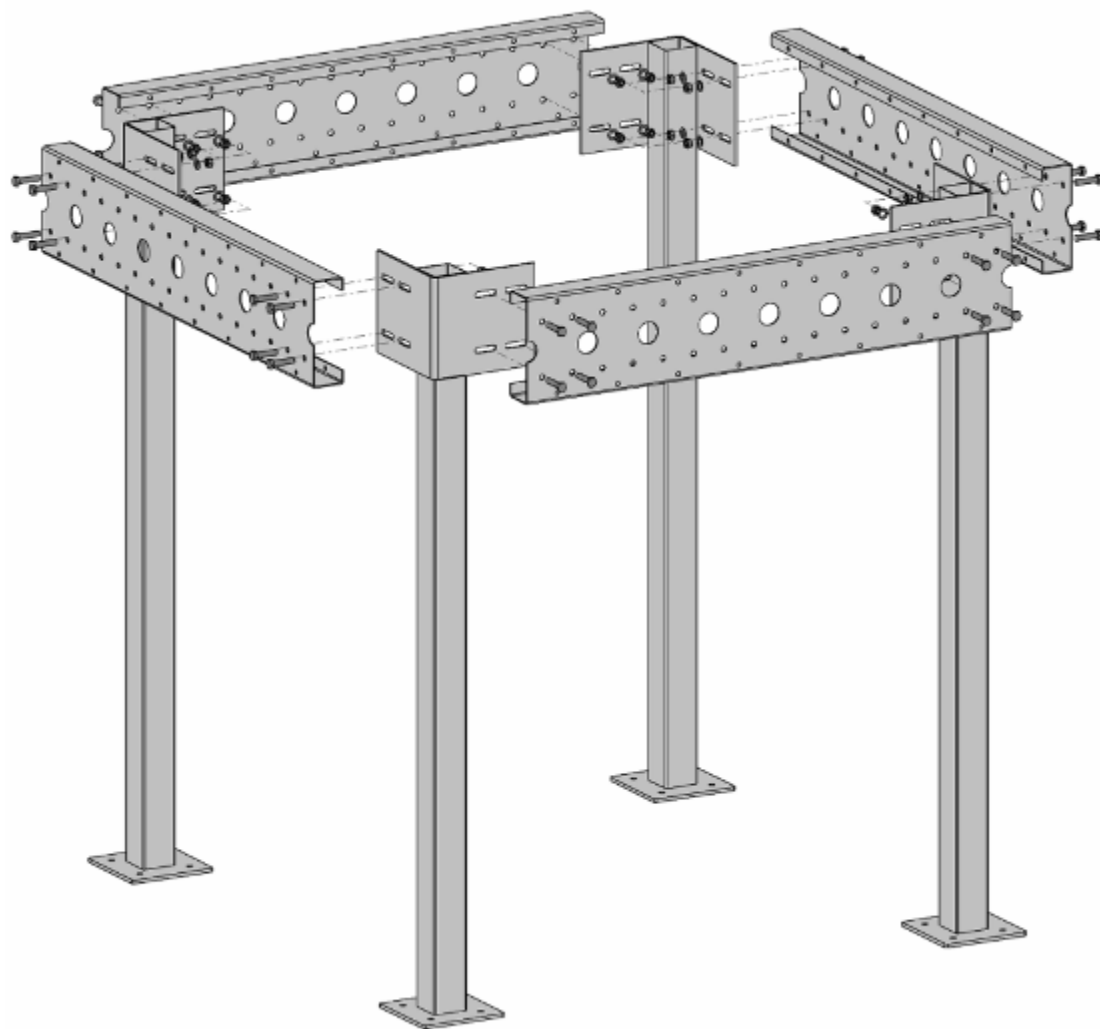


For joining the stairway with the banisters, use the holes on the final column, inserting the tubes of Ø25 and Ø30 mm; then fix them with selfscrewing screws M4,2x22.

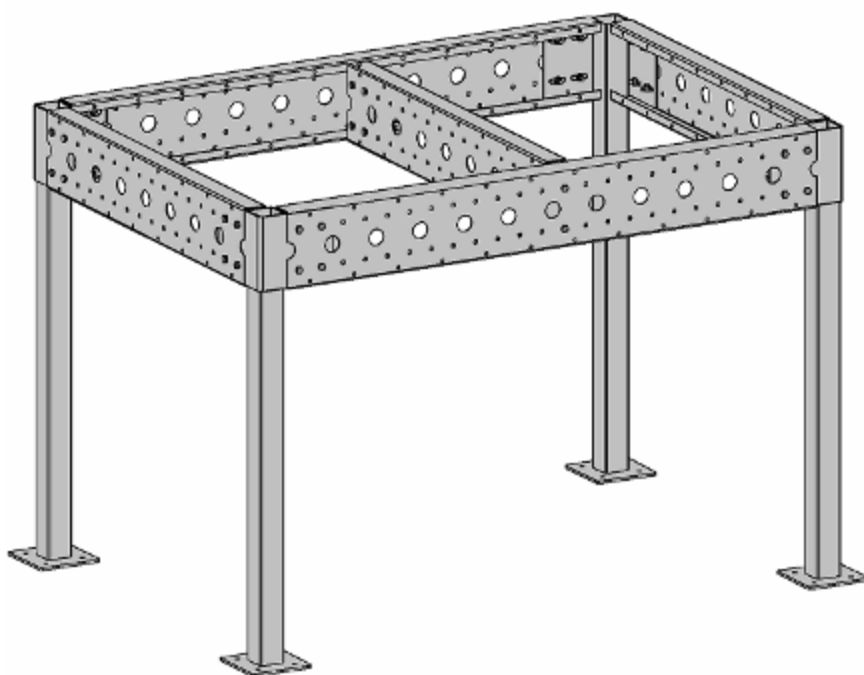
N.B. Both the handrail and the tubes must be cut off during assembly.

The positioning of columns will be specified by the assembly drawings provided by ROSSS Technical Department.

STAIR LANDING



Fix each beam on the brackets with 4 screws M12x25, nuts and washer; in case of double stair landing, assemble the intermediate beam as well with the brackets for secondary beam; then assemble the studded open/closed plank, the stairway and the banisters.



TESTING OF THE MEZZANINE

The test must be executed by personnel with adequate preparation and experience in this field.

In case the test is executed by Rosss, the employed personnel will have been instructed for the specific case.

For the purpose of the test and following the directions related in this manual the following points must be checked:

- 1) Lay-out of the installation in conformity with Rosss drawing. (if existing)
- 2) Inspection of columns and beams integrity.
- 3) Inspection of verticality, alignment and levelling of the mezzanine.
- 4) Check that the positioning of the banister and/or stairway is as provided.
- 5) Check of right assembly of the main and secondary brackets.
- 6) Check of right assembly of cross-bracings and tie rods.
- 7) Check of right fixing of stair landing.
- 8) Check of right assembly of the accessory equipment.
- 9) Check the right application of the capacity labels.

TESTING OF THE MEZZANINE

	REPORT OF ASSEMBLY END	COPY FOR THE ROSSS
		DATE _____

Customer Corporate Name _____

Address _____

Resort _____

Referring to the delivery note n° _____ of _____

WE DECLARE

- that the materials supplied by your company are in conformity with our requirements;
- that the entire system is totally practical;
- that the assembly has been properly done and at our complete satisfaction.

Condition of the assembly: COMPLETE PARTIAL (specify the unassembled parts) _____

The staff of the customer has been correctly trained : _____

Remarks: _____

Note: _____

The lack of compilation and signature from the customer side of this report of assembly end, in absence of contentions, excludes from the warranty rights.

Assembly carried out by the company:

Customer:

Stamp

Stamp

Person responsible Mr. _____

Mr. _____**Function** _____

Signature _____

Signature _____

PERIODICAL CHECKS AND MAINTENANCE

INSPECTIONS

Provide for inspections to single out abnormalities not encountered during normal use of the structure.

Performing scheduled maintenance on the installation, you can avoid dangerous situations that can cause accidents and injuries. Also this will prevent interruptions of activity optimizing the use of the mezzanine.

Planned inspections avoid:

- 1) Accidents to persons
- 2) Damages to materials
- 3) Interruption of production
- 4) Loss of functionality and consequent economic losses
- 5) Criminal proceedings against the buyer for not having carried out proper maintenance.

MAINTENANCE AND CONTROL MODALITY

Kind of control	Periodicity
Columns integrity	Yearly
Beams integrity	Yearly
Brackets integrity	Yearly
Vertical ranging of structure	Yearly
Horizontal ranging of structure	Yearly
Rope cross-bracings tension	Yearly
Excessive loads	Monthly
Disposition of loads	Monthly
Painting	Yearly

If these controls reveals anomalies, the total integrity of the mezzanine must be restored as soon as possible, unloading excessive loads or replacing damaged parts.

When a situation of immediate danger in the installation is found out, it is advisable to unload the material from the mezzanine in the danger area to avoid accidents to personnel.

The specialized technicians of ROSSS, will start, on request, to examine the problem determining the corrective action to restore the installation in the shortest possible time and with the minimal interruption of activity.

In the operations of maintenance and repair only original spare parts must be used.

It is possible, if you request it, to draw up a maintenance contract so that the controls are carried out by specialized personnel of ROSSS. This will ensure to you maximum utilization of the warranty period and optimal use of the structure while avoiding the dangers caused by occasional interventions performed by unskilled personnel.

[illegible]

REGISTER OF MAINTENANCE INTERVENTIONS

[illegible]