A Member of the Constructor Group

HEAVY DUTY CANTILEVER – R10

Installation Manual

English

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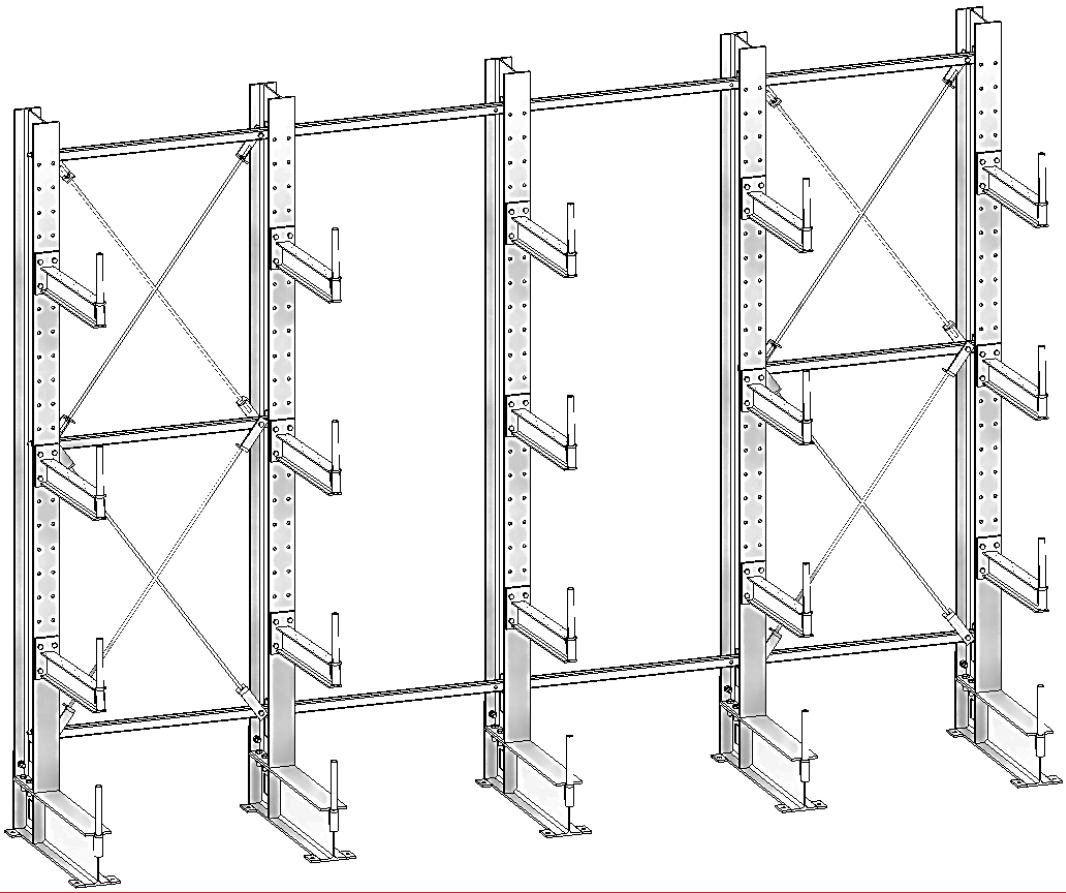


FOREWORD:

This manual contains:

- Assembly and installation information.

Correct assembly and installation are very important for safe operation of the storage rack system.

Read the Installation Manual carefuly before starting the assambly/installation.

Keep the manual close, when assambly/install the rack. Fallow all the steps presented in this Manual for quick and correct assambly/installation!

The installation tolerances should be according to FEM 10.2.09 draft version v.023 / May 2015.

Version: June 2015

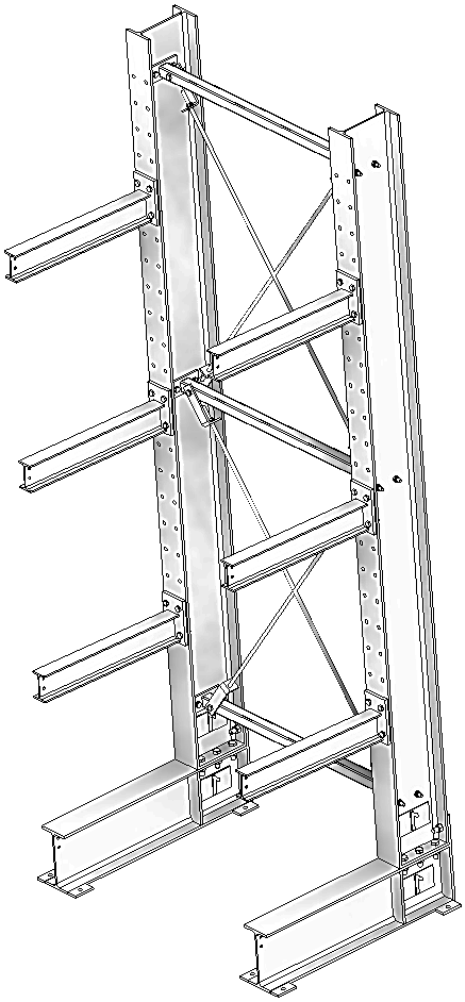
Changes since the last release (July 2014) are highlighted as follows:

Revised text within an existing page: Amendments are highlighted

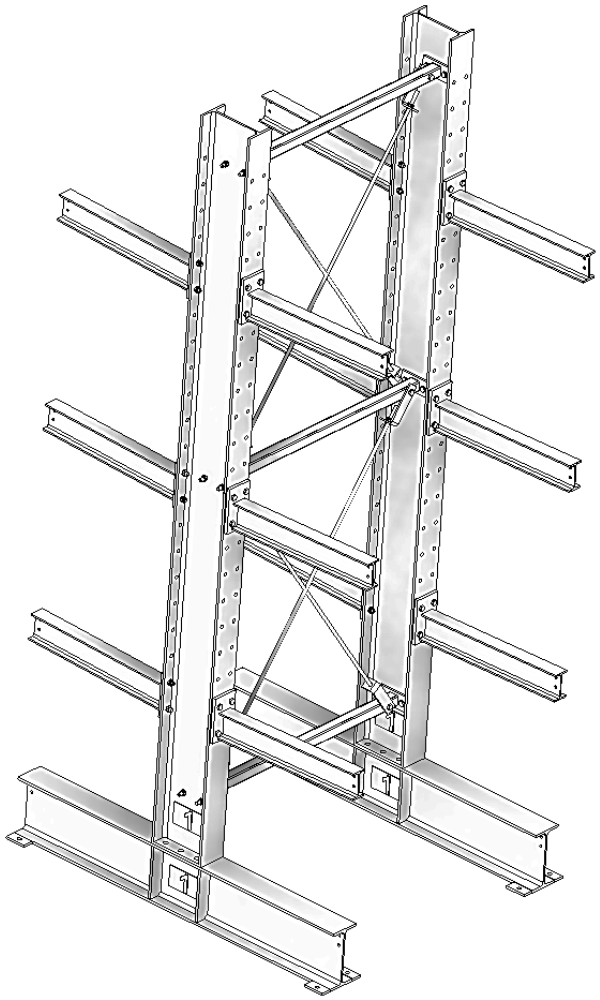
Table of content:

1 Product Introduction

Can be configured either as single sided or double sided:

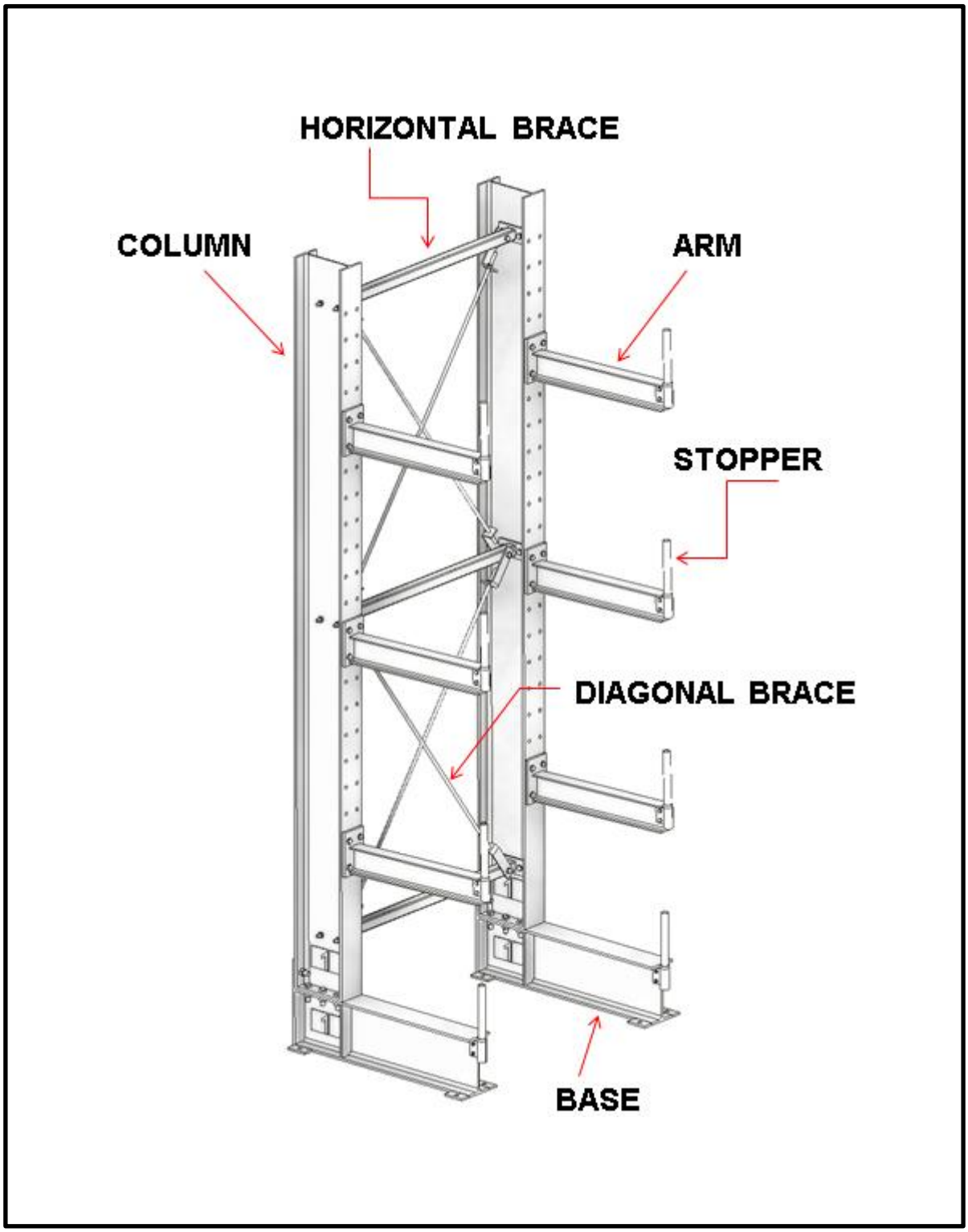


Single Sided



Double Sided

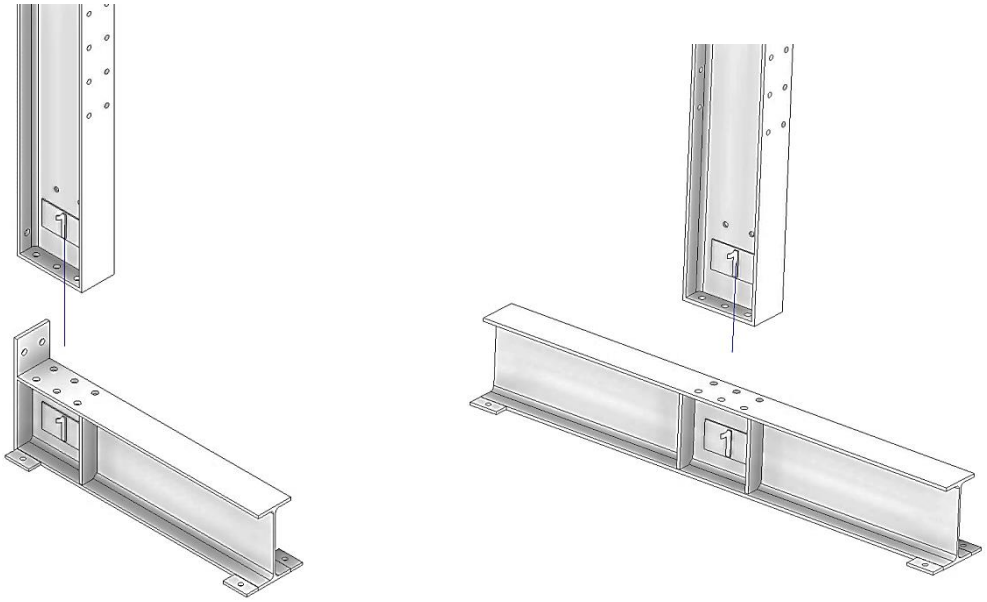
The main components are:



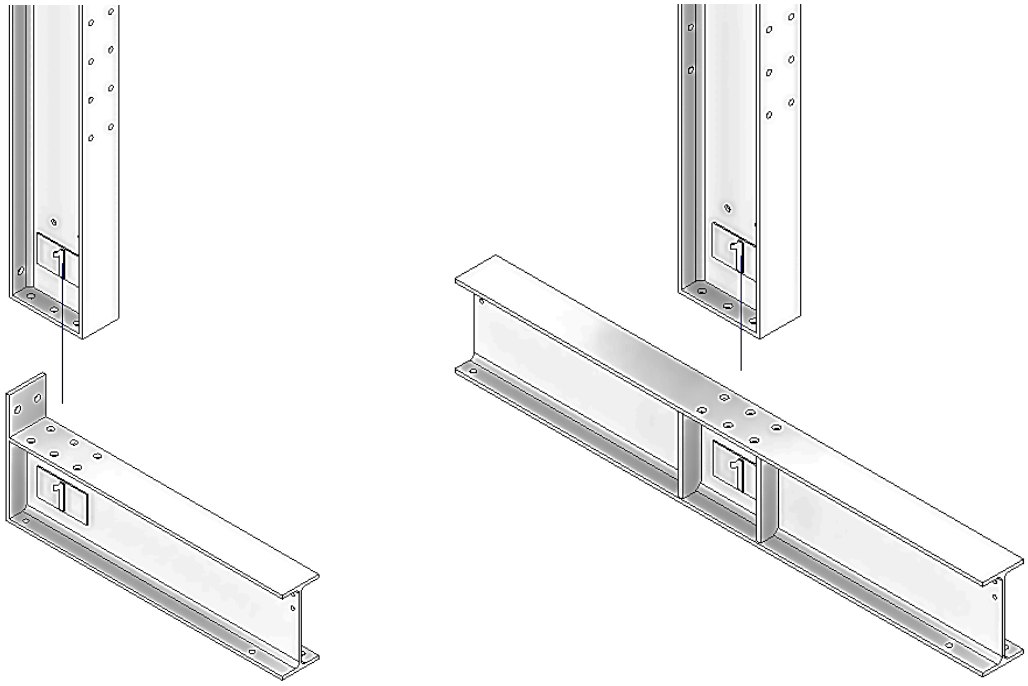
2 Installation steps

2.1 Assembly Column with Base:

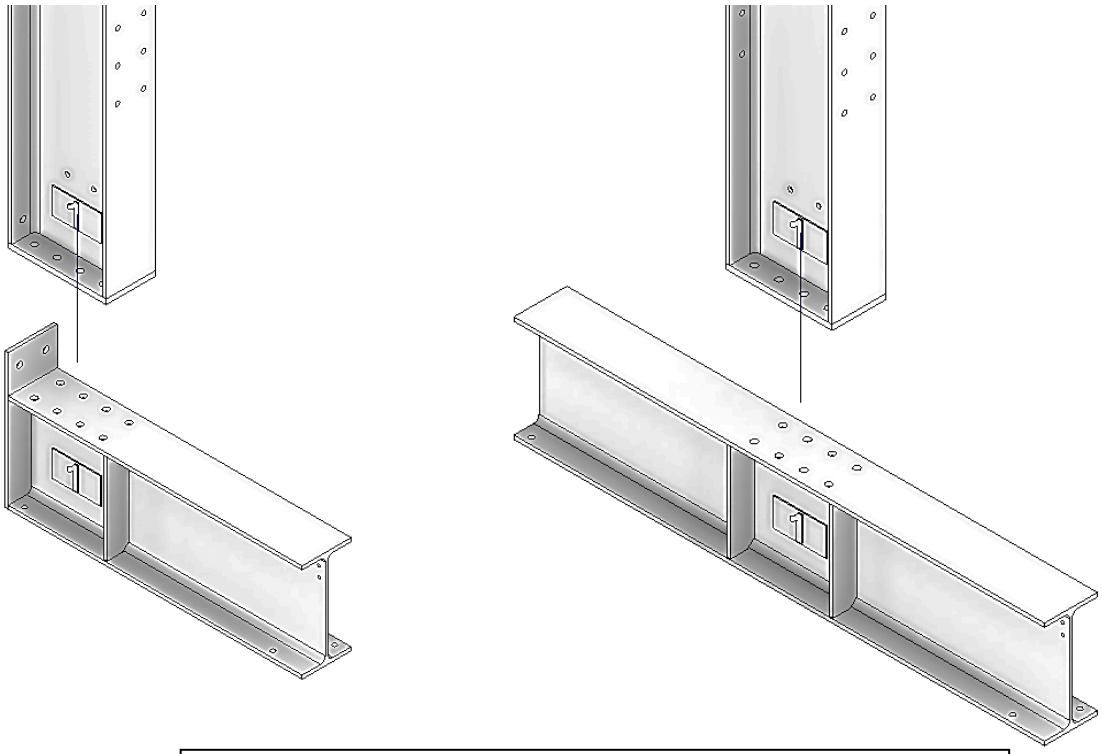
2.1.1 Match Column with Base



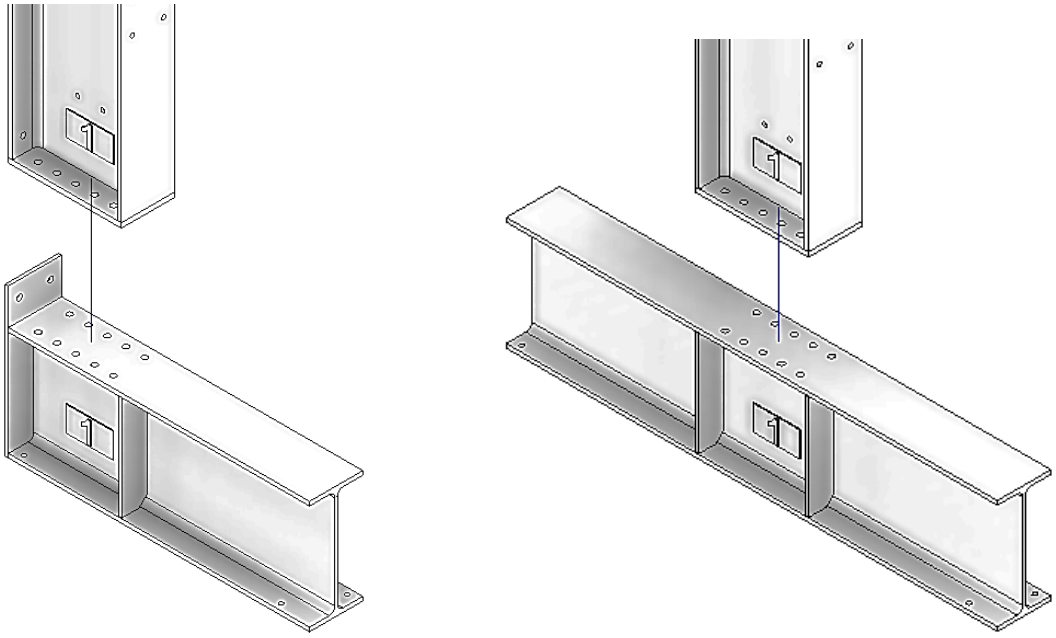
Column-Base IPE160 to IPE220 – Single and Double Sided



Column-Base IPE240 – Single and Double Sided

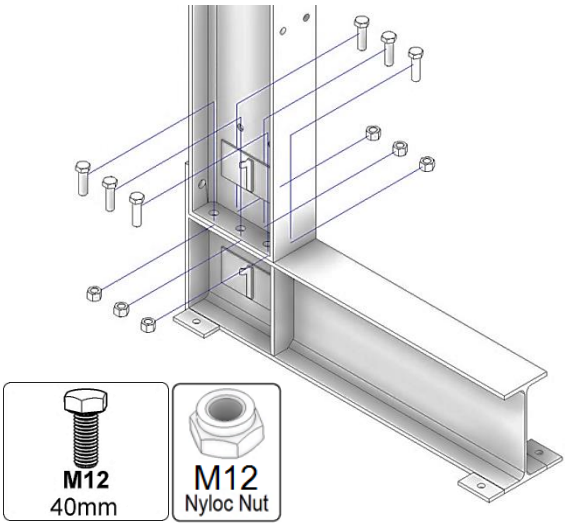


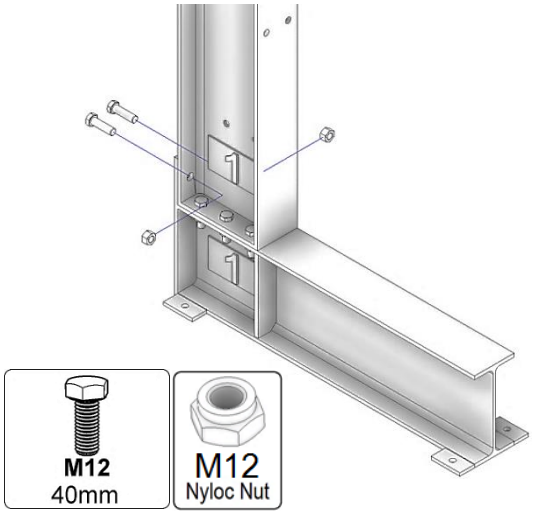
Column-Base IPE270 to IPE300 – Single and Double Sided

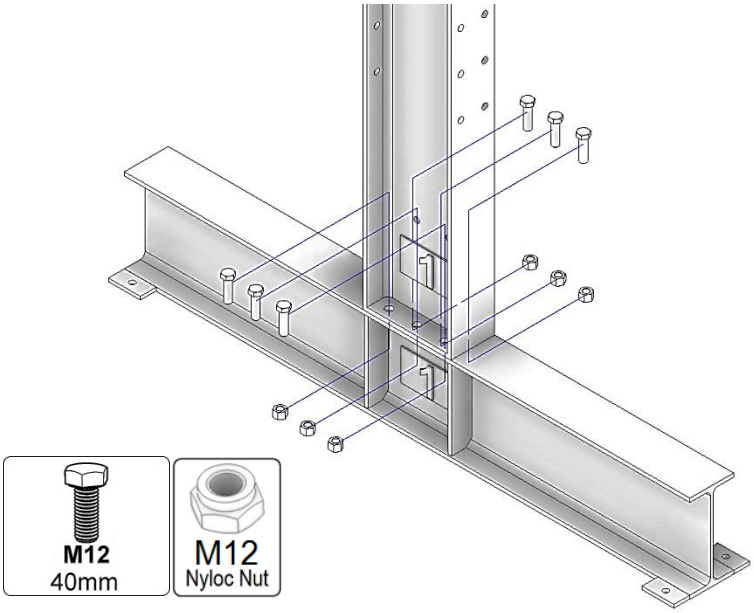


Column-Base IPE330 to IPE400 – Single and Double Sided

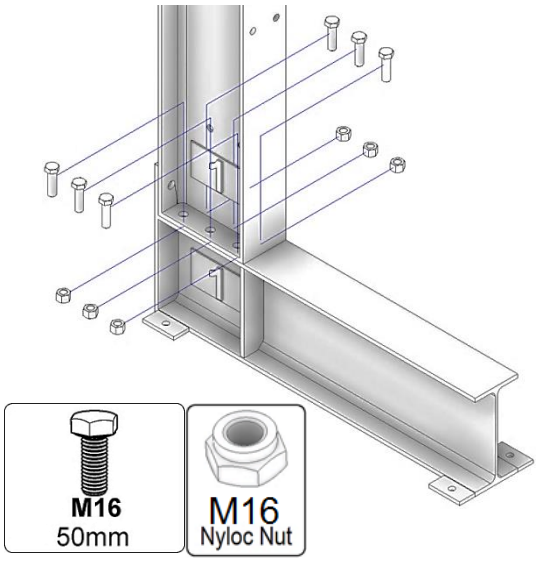
2.1.2 Tighten the bolts and nuts

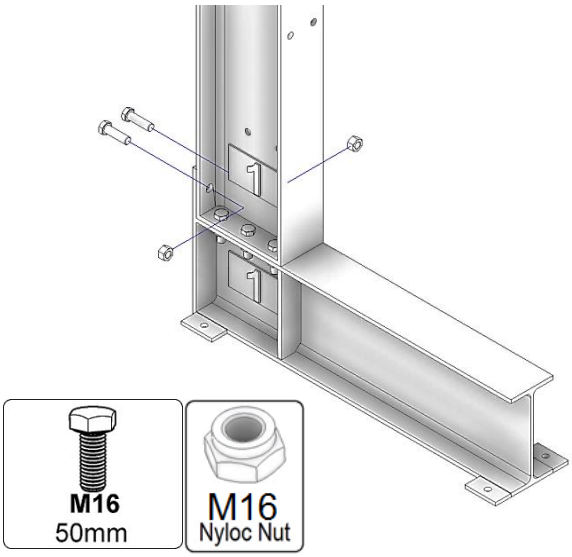


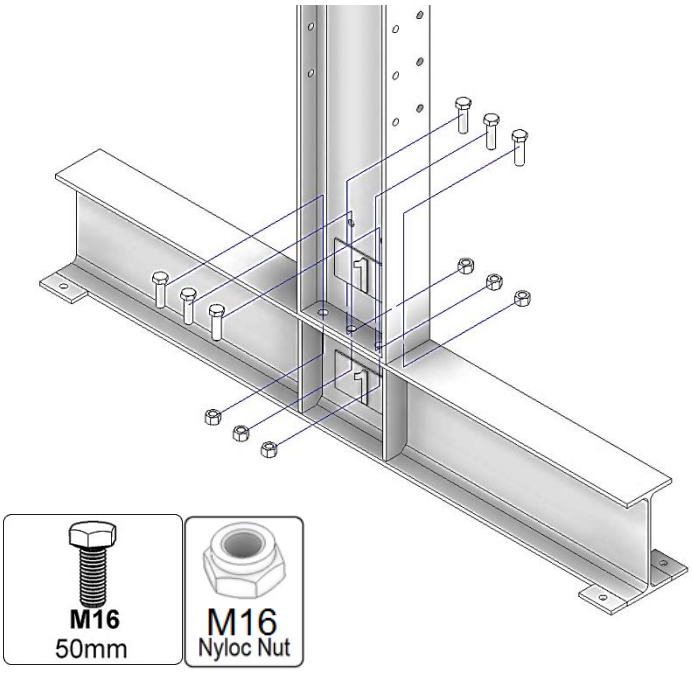




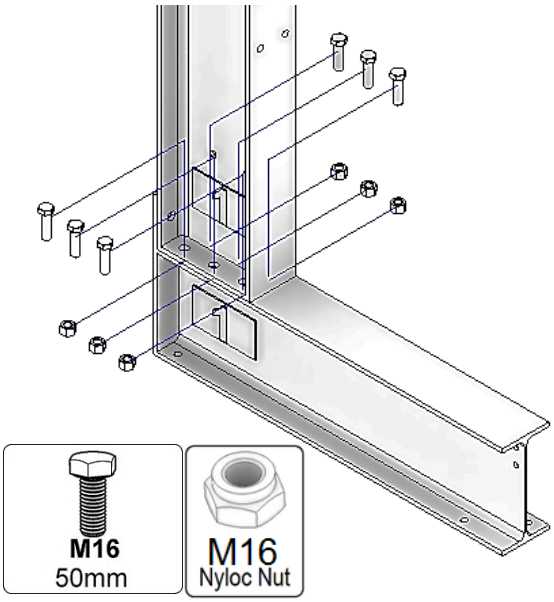
Column-Base IPE160 to IPE200 – Single and Double Sided

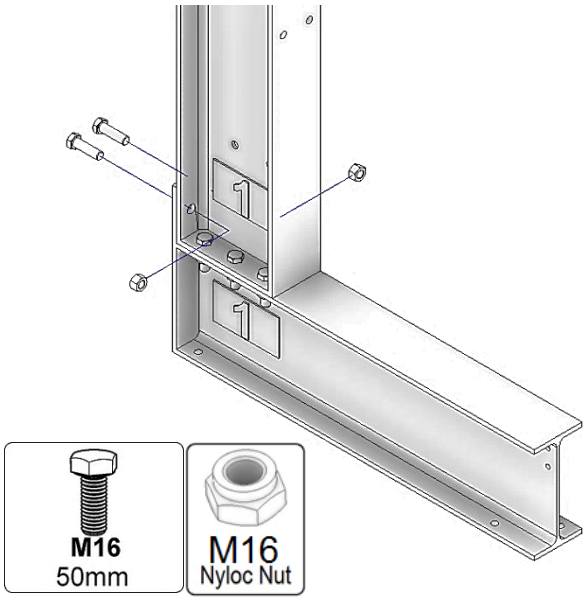


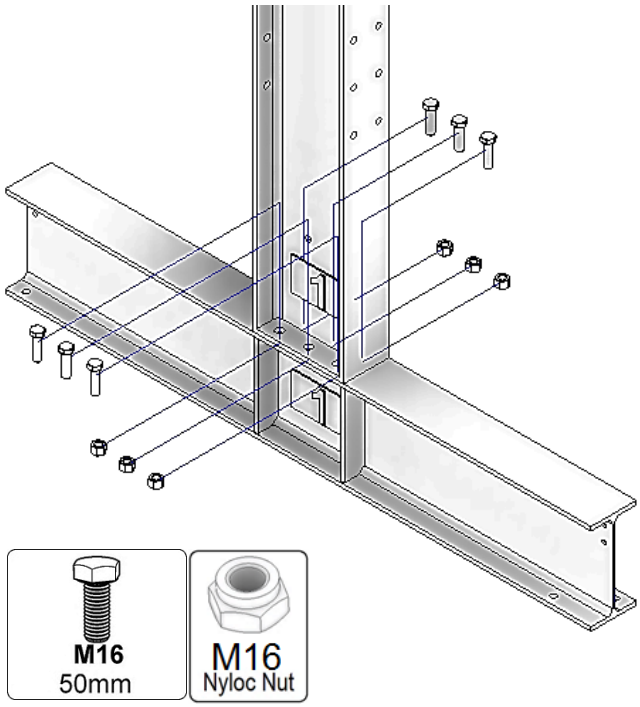




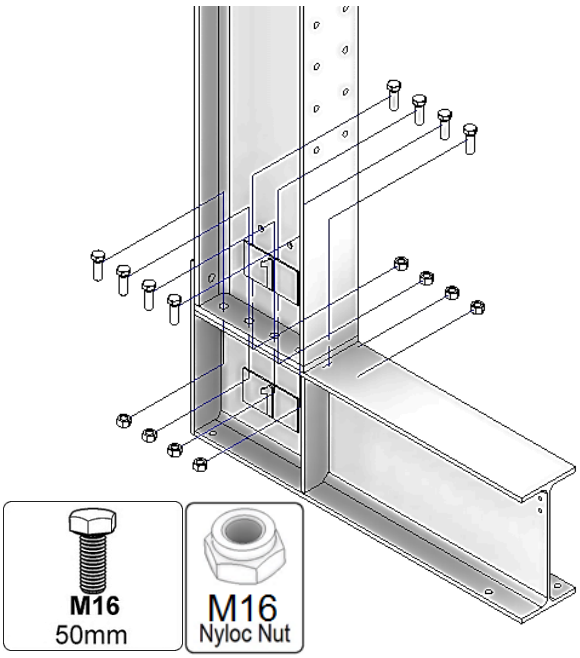
Column-Base IPE220 – Single and Double Sided

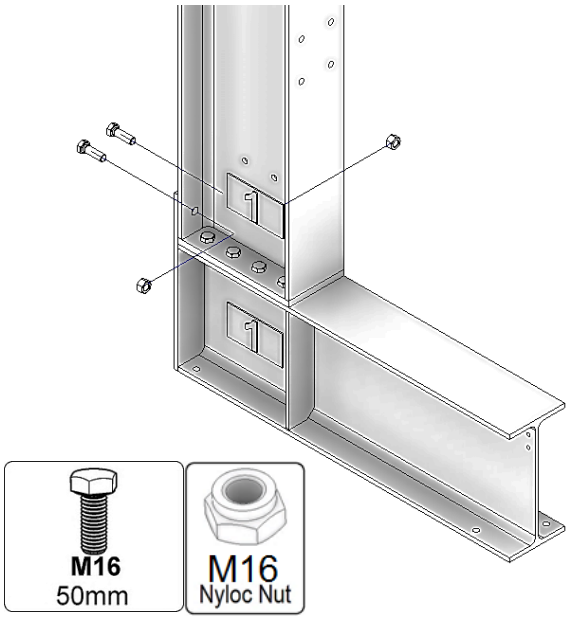


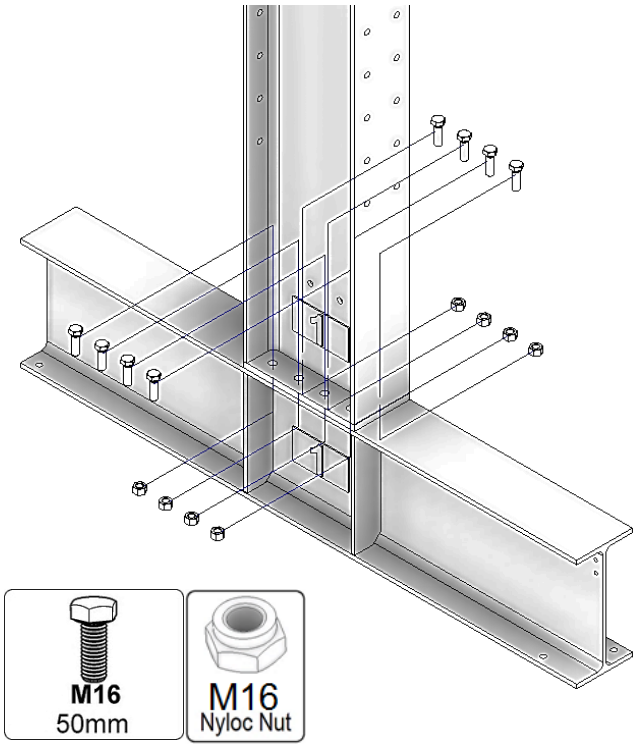




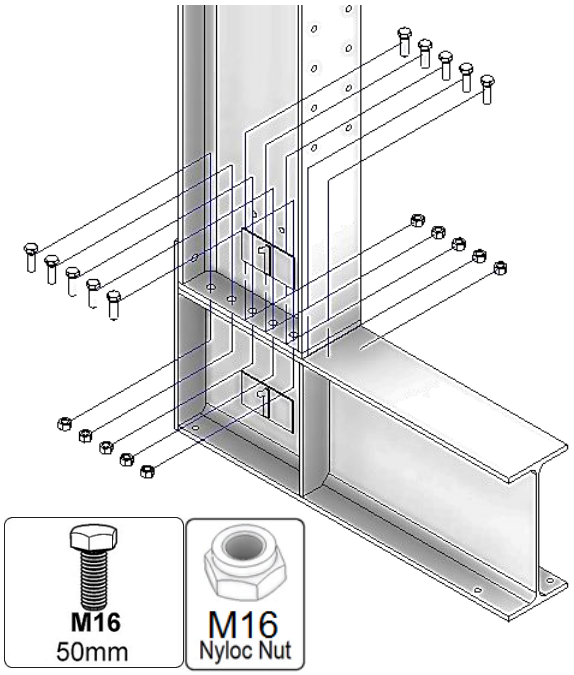
Column-Base IPE240 – Single and Double Sided

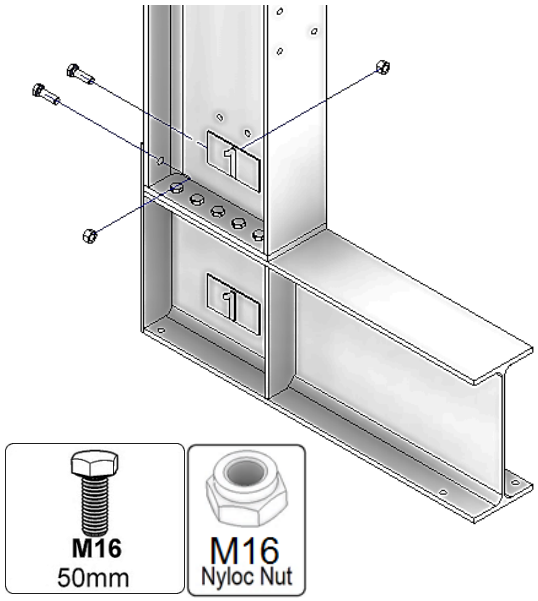


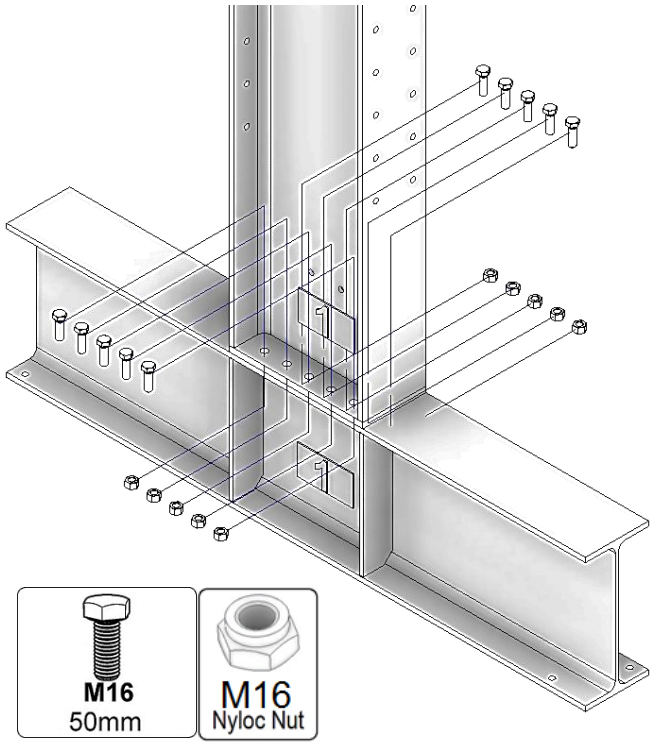




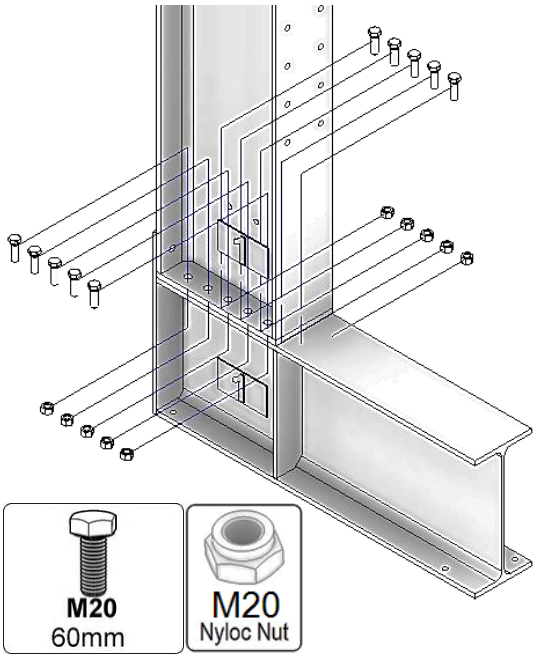
Column-Base IPE270 to IPE300 – Single and Double Sided

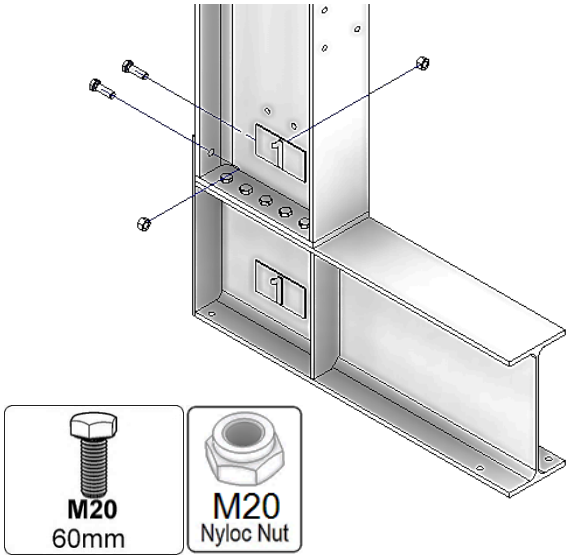


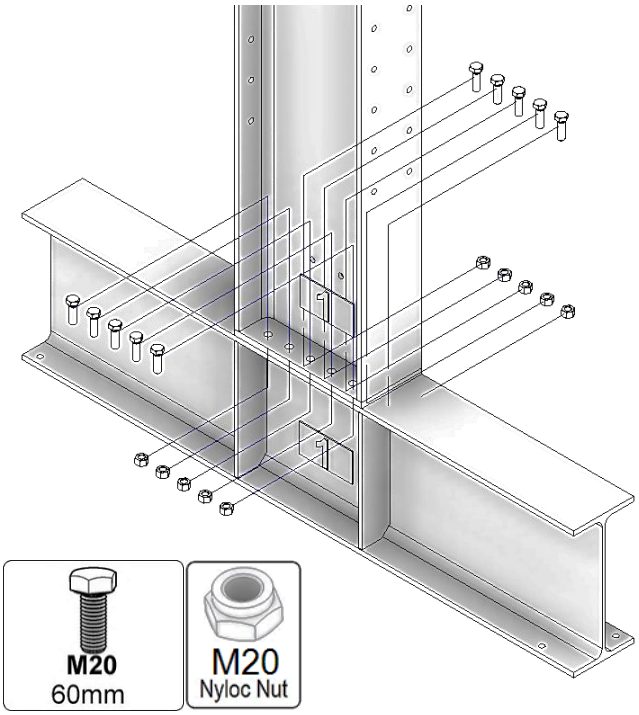




Column-Base IPE330 to IPE360 – Single and Double Sided







Column-Base IPE400 – Single and Double Sided

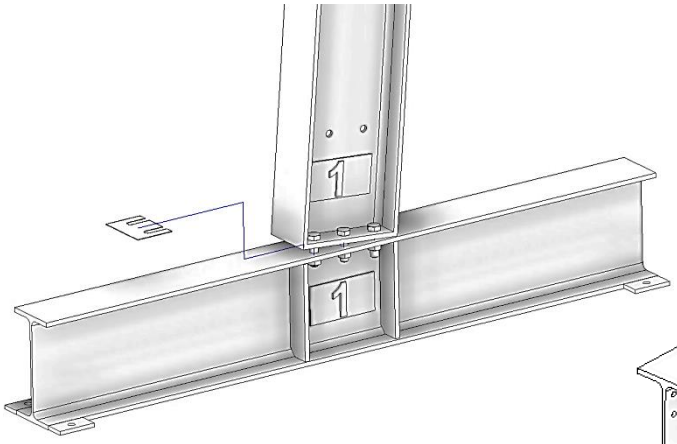
2.1.3 Shims

After mounting the right Column with the right Base check if this are installed in a square condition and are respecting the FEM 10.2.09 Installation Guidelines.

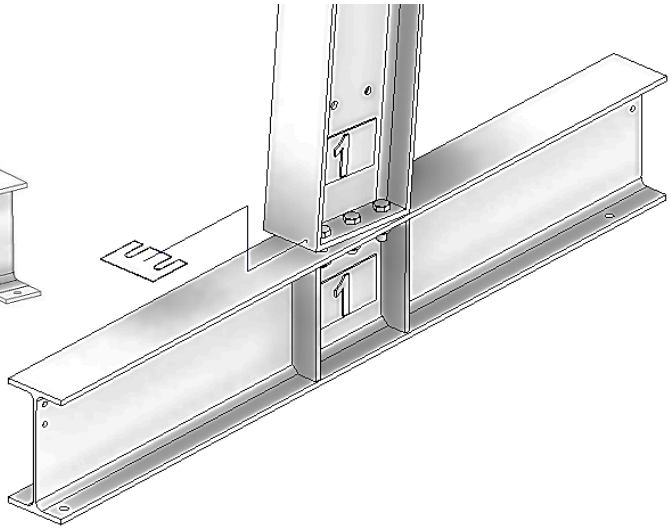
If the Column and Base are not installed in a square condition and not respecting the FEM 10.2.09 Installation Guidelines than you need to use one or more Adjustment shims or Side Shims between Column and Base to fix this (maximum 10mm high stacking of shims is accepted – In this case you might need longer Bolts then the delivered ones - but keeping the same diameter and grade as the initial ones).

For inserting shims between Column and Base you need to:

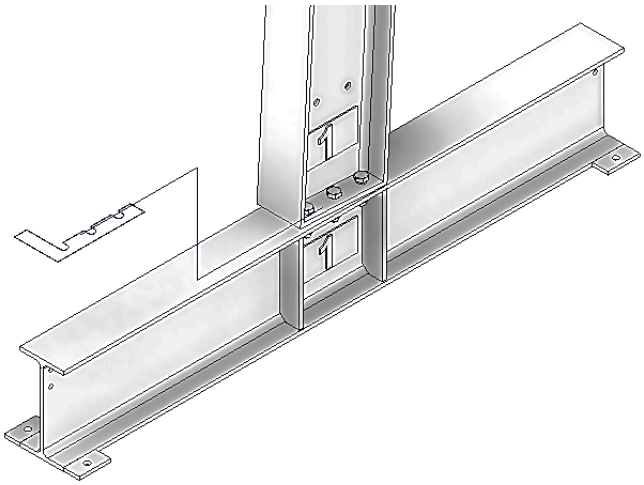
1. Untighten the bolts
2. Insert the required number of shims between Column and Base.



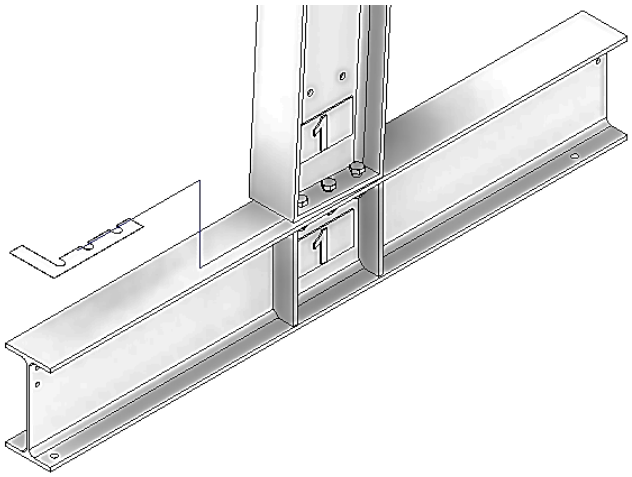
Column Adjustment Shim IPE160 – IPE220



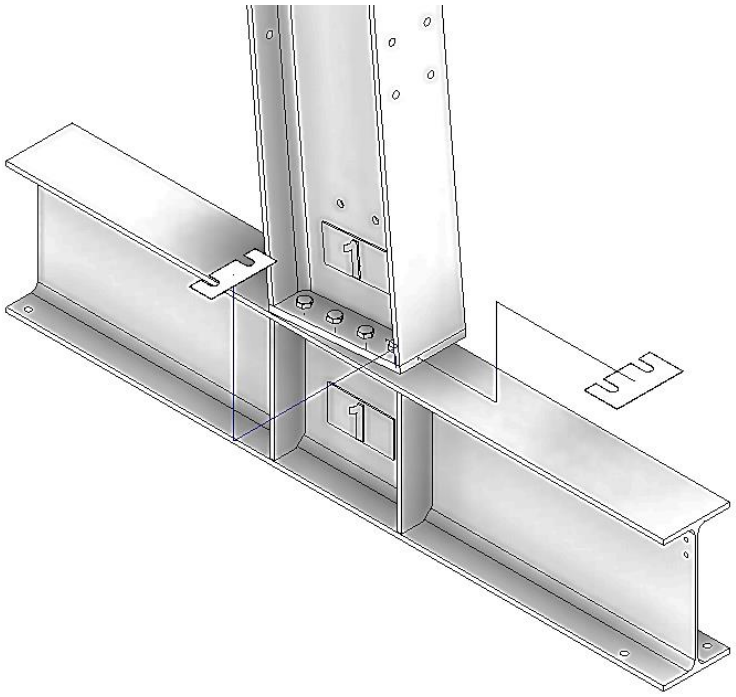
Column Adjustment Shim IPE240



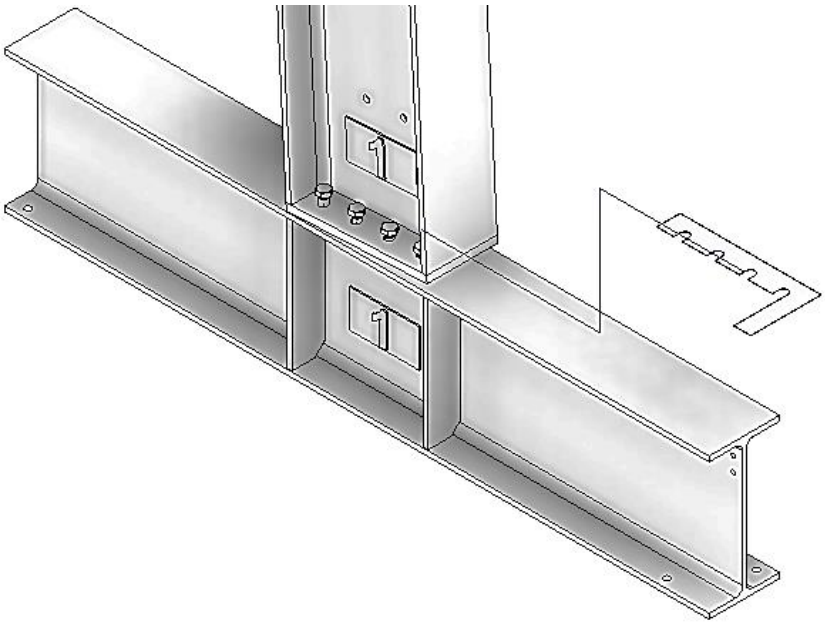
Column Side Shim IPE160 – IPE220



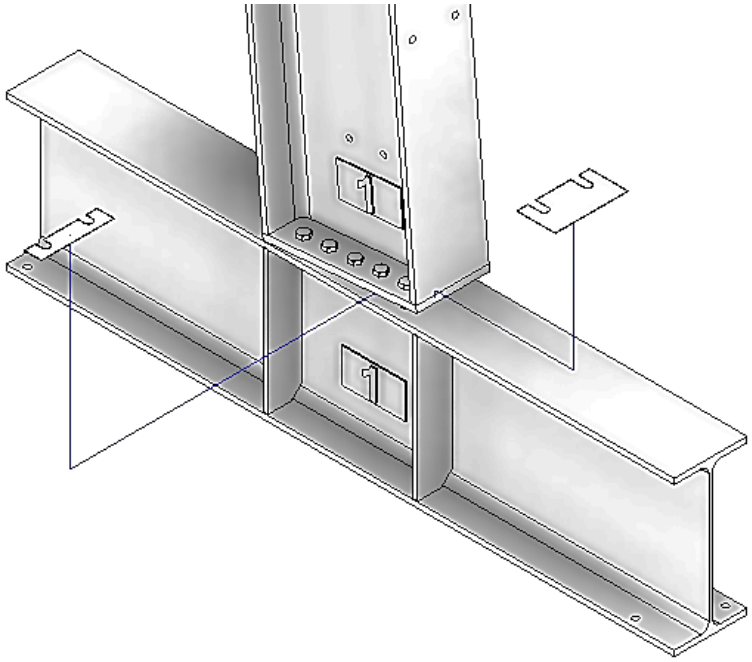
Column Side Shim IPE240



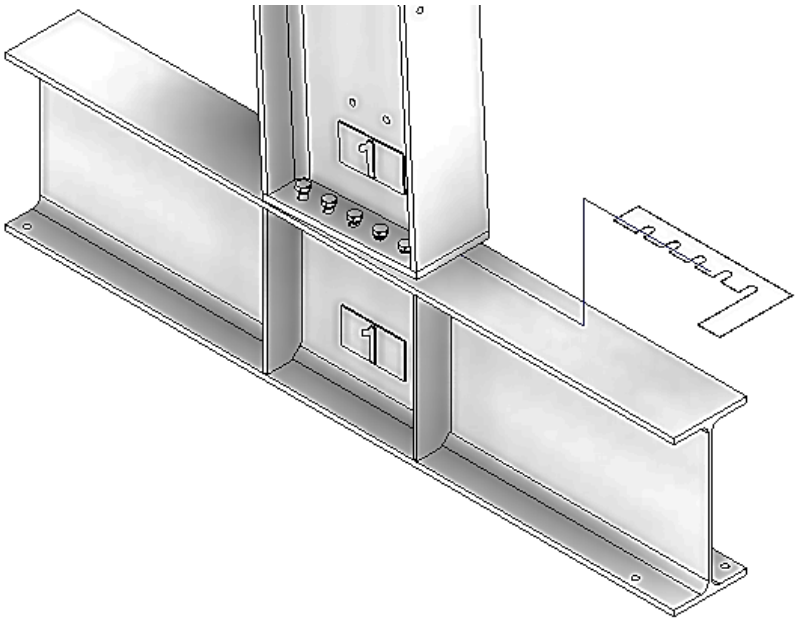
Column Adjustment Shim IPE270 – IPE300



Column Side Shim IPE270 – IPE300

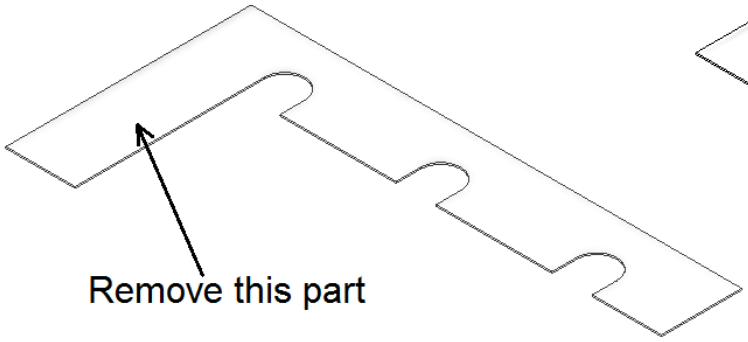


Column Adjustment Shim IPE330 – IPE400

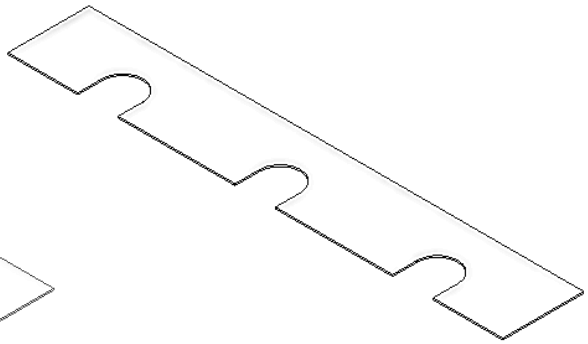


Column Side Shim IPE330 – IPE400

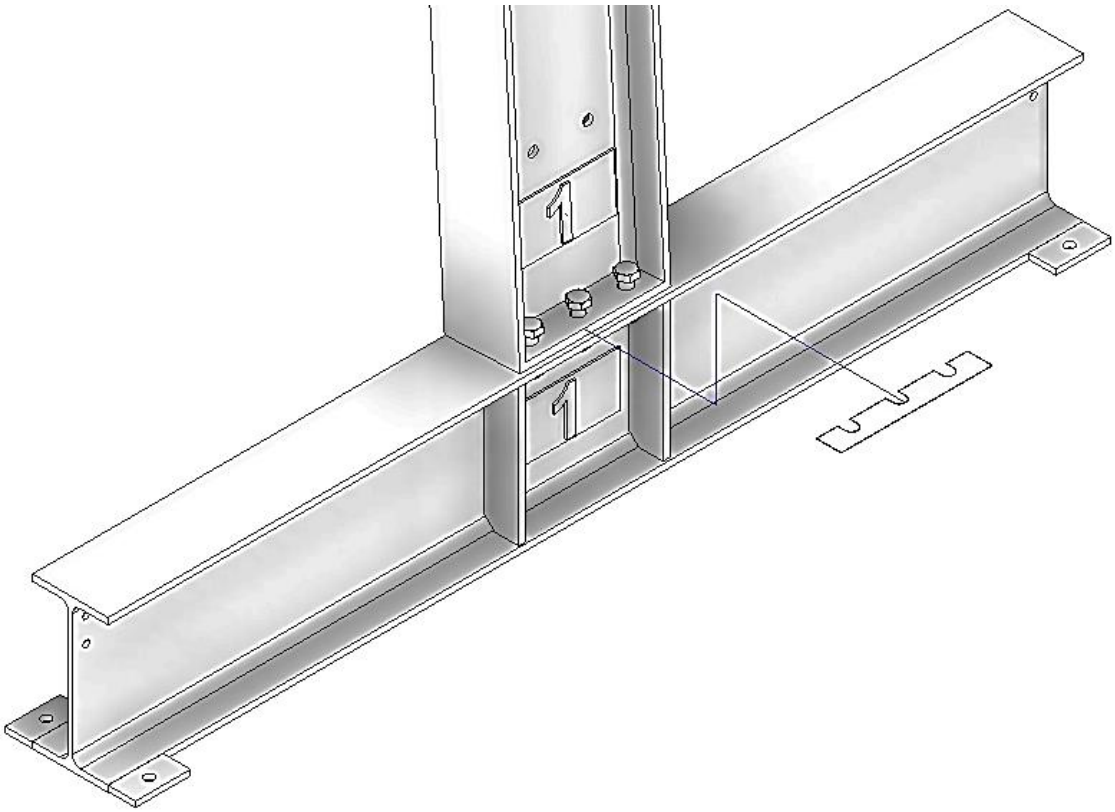
If the Column needs to be adjusted only left – right without front – back, the Side Shim can be cut on site to remove the short piece of the L



Side Shim Original Shape



Side Shim modified on Site



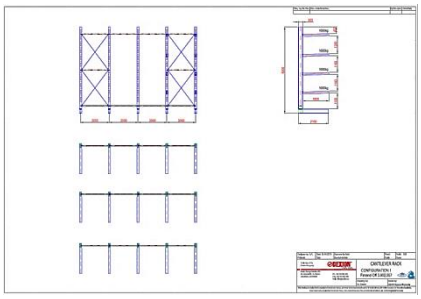
Adjusting the Column only left – right with a Side Shim modified on Site

All this installation details are for the standard configurations. It is possible that for special configurations the Technical Department to define new fixing conditions. In this case the special conditions from Technical Department will overcome the notes from this Manual!

2.2 Assembly the Arms

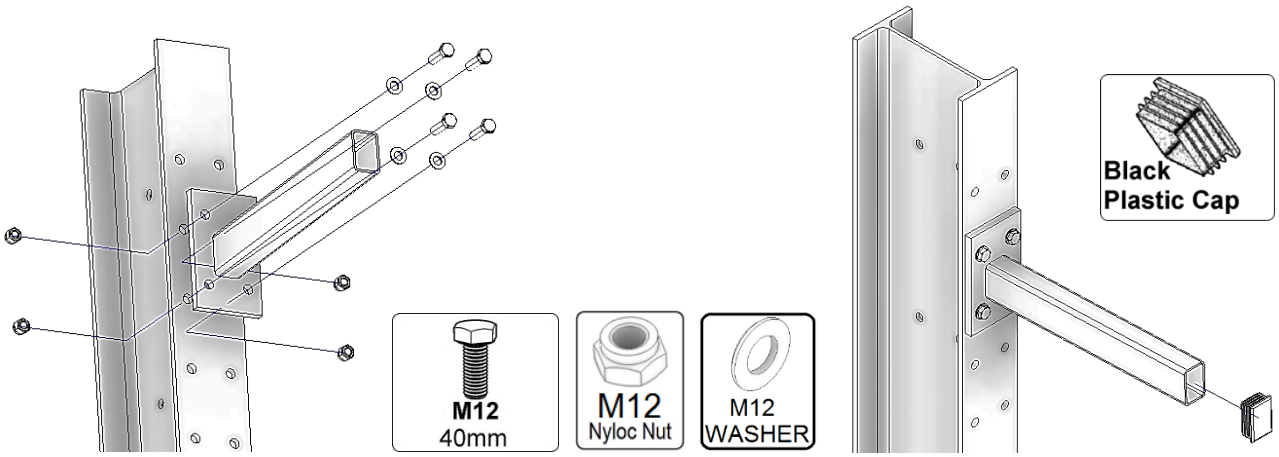
2.2.1 General Guide Lines

Always use the Layout received from the Technical Department for the correct position of the Arms.

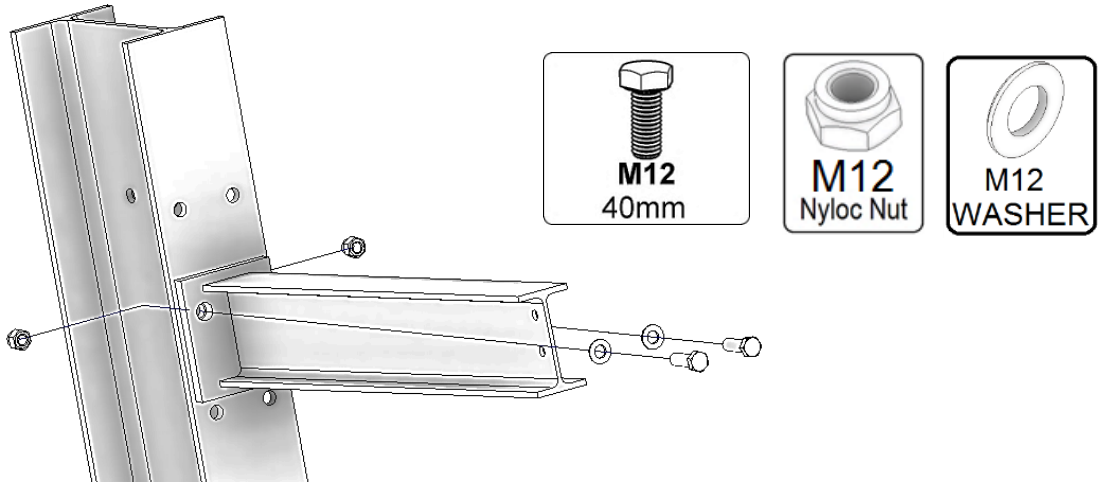


The dimension of the Arm plate varies depending on the IPE section of the Column where the Arm will be installed!

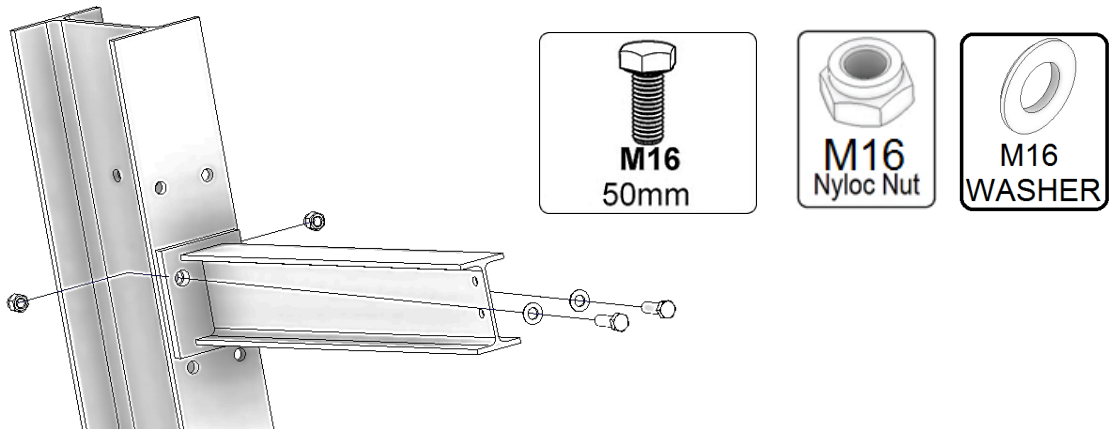
2.2.2 Arms with RHS



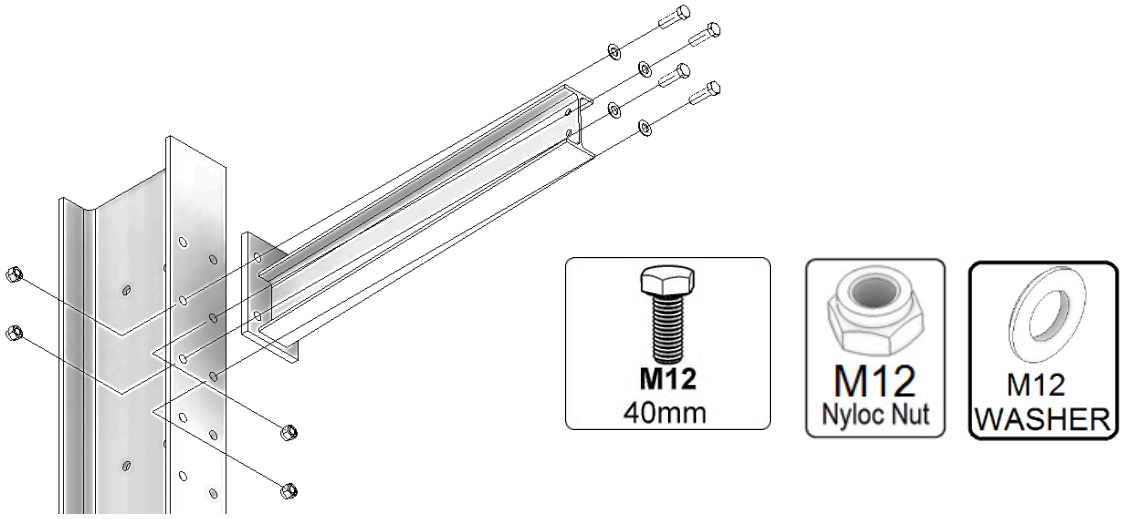
2.2.3 Arms IPE80 / 2x Bolt Connection / to Columns IPE160 & IPE180



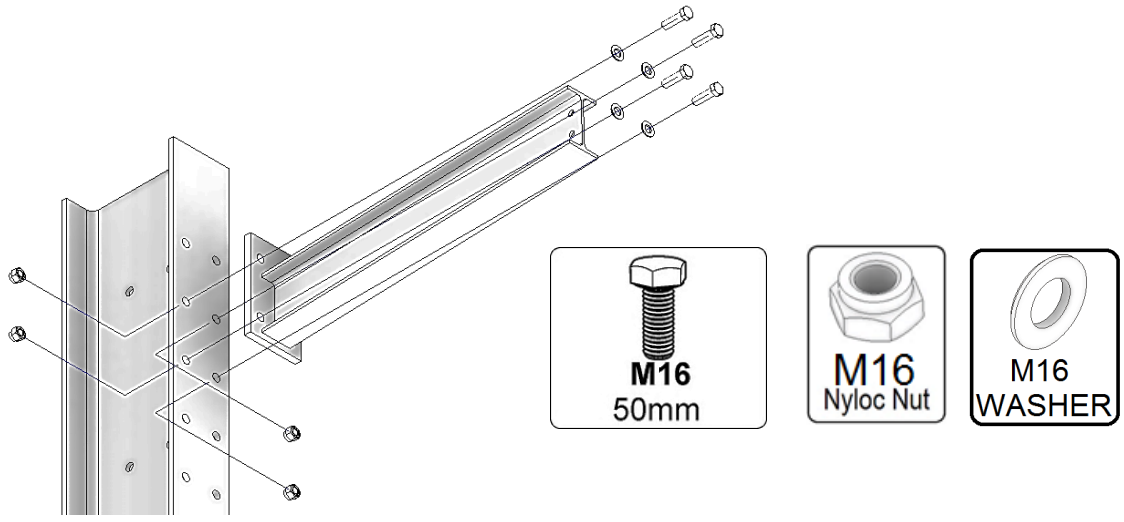
2.2.4 Arms IPE80 & IPE100 / 2x Bolt Connection / to Columns IPE200 to IPE360



2.2.5 Arms IPE80 & IPE100 / 4x Bolt Connection / to Columns IPE160 & IPE180



2.2.6 Arms IPE80 to IPE160 / 4x Bolt Connection / to Columns IPE200 to IPE360



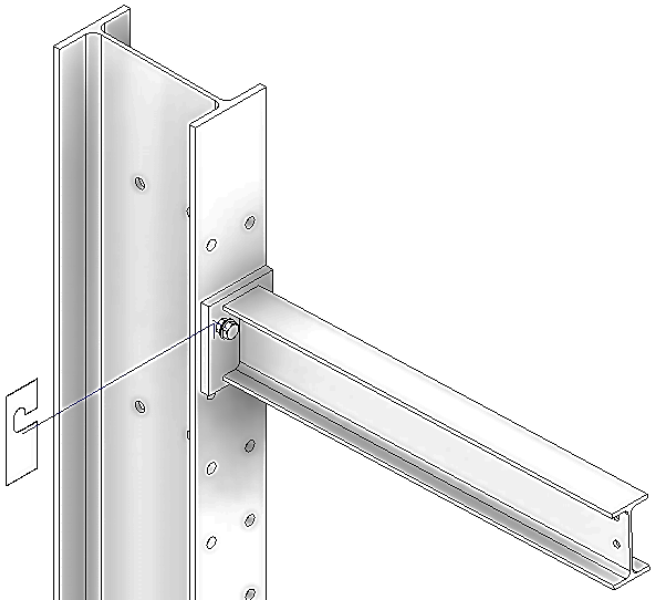
After mounting the Arms on the right Column check if this are installed according to FEM 10.2.09 Installation Guidelines.

If the Arms are not installed according to FEM 10.2.09 Installation Guidelines than you need to use one or more Adjustment shims between Arm and Column to fix this.

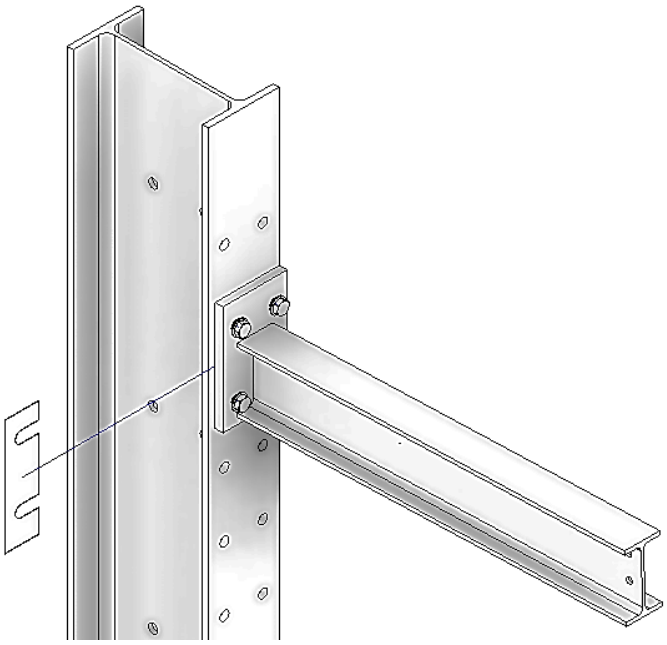
For using the Arm Adjustment shims you need to:

1. Untighten the bolts
2. Insert the required number of shims between Arm and Column.

2.2.7 Shims for Arms with 2x Bolt Connection



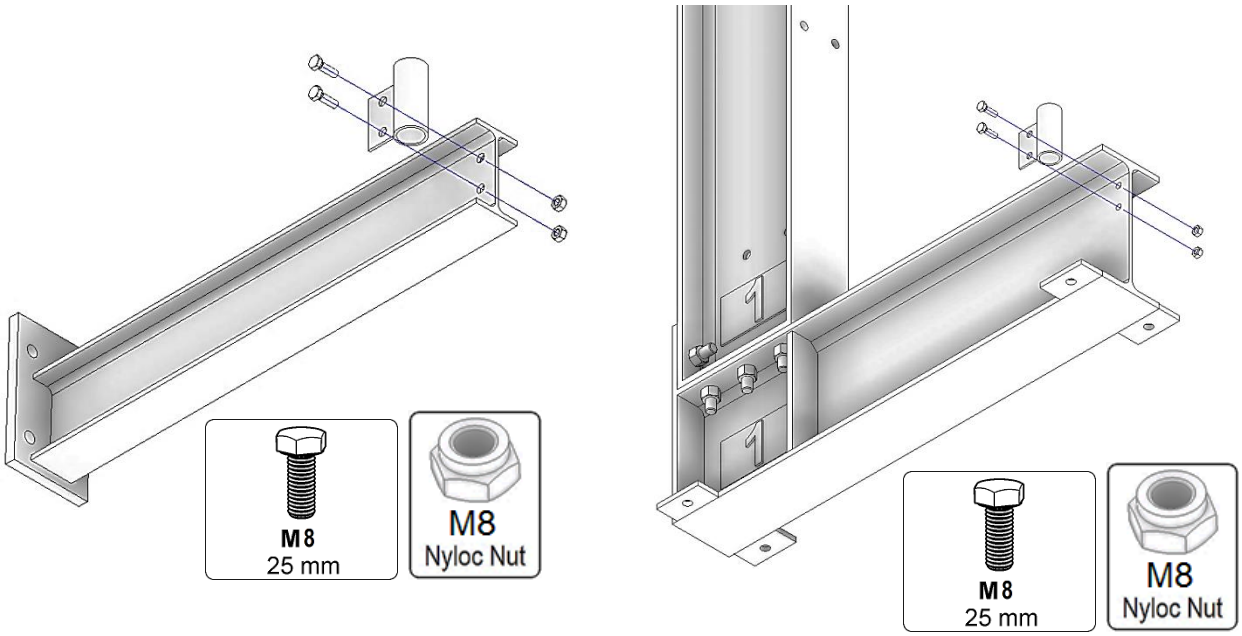
2.2.8 Shims for Arms with 4x Bolt Connection



2.3 Mounting the accessories

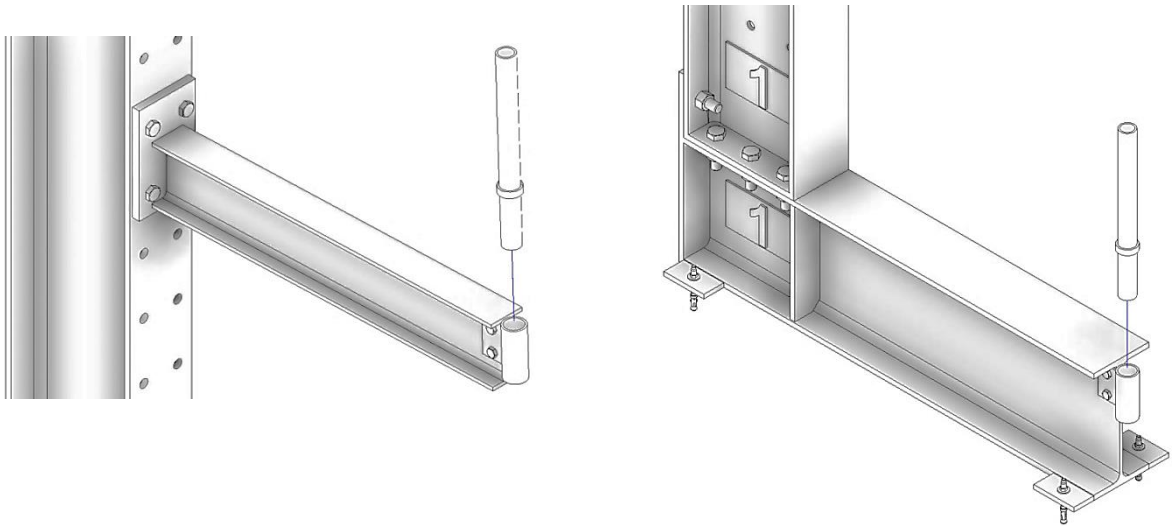
2.3.1 Mounting the Stopper Support

In case Stoppers needs to be installed than prior fixing the Arms to the Column you need to mount the Stopper Supports on the Arms (the stopper supports on the bases can be installed at the end).

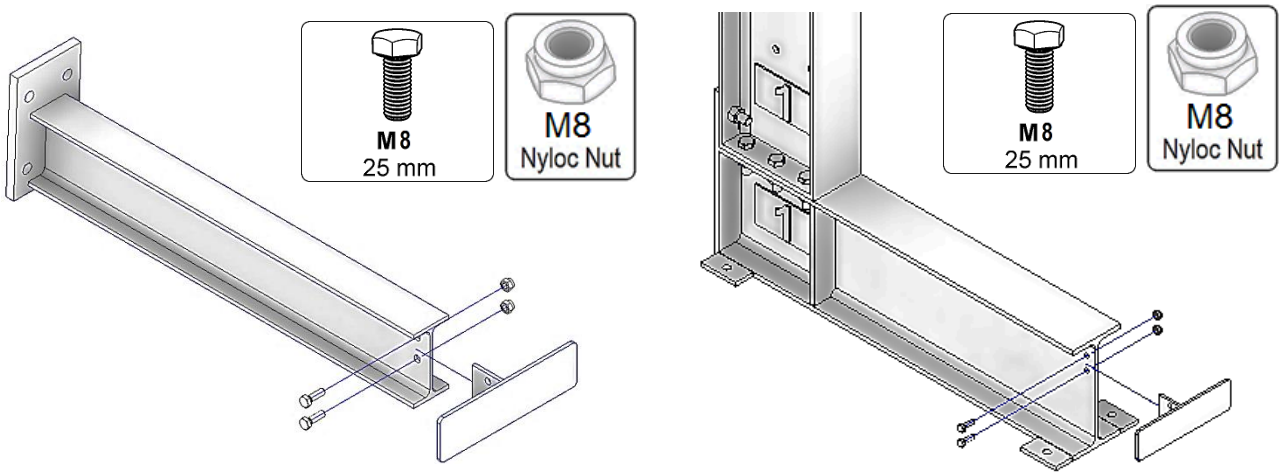


2.3.2 Placing the Stoppers

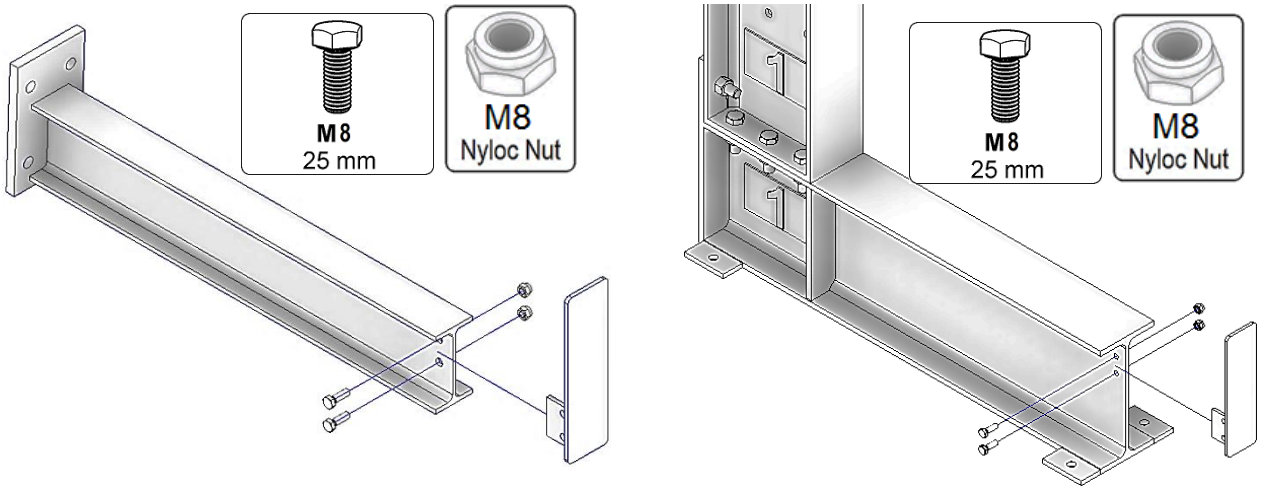
In case stoppers are included, after anchoring the rack, insert the stoppers in the mounted pockets.



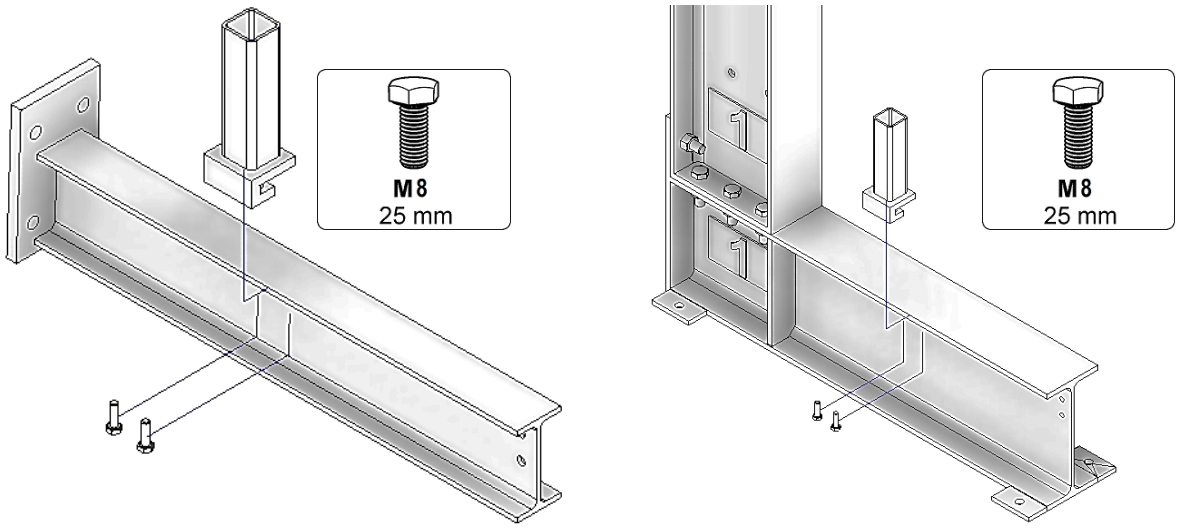
2.3.3 Mounting the Horizontal Label Support



2.3.4 Mounting the Vertical Flat Stopper / Label Support



2.3.5 Mounting the Dividers



In case dividers are included, after anchoring the rack, position the dividers.

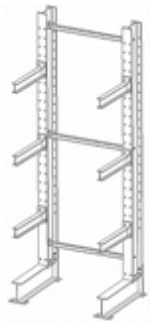
2.4 Assembly the braces (Horizontal + Diagonal)

2.4.1 Standard Design Rules

2.4.1.1 Determine the Bracing Pattern

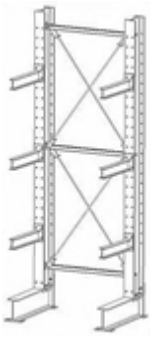
The diagonal braces are always installed in “X” pairs and in full height.

When designing the Cantilever, for the brace configuration use the following pattern:



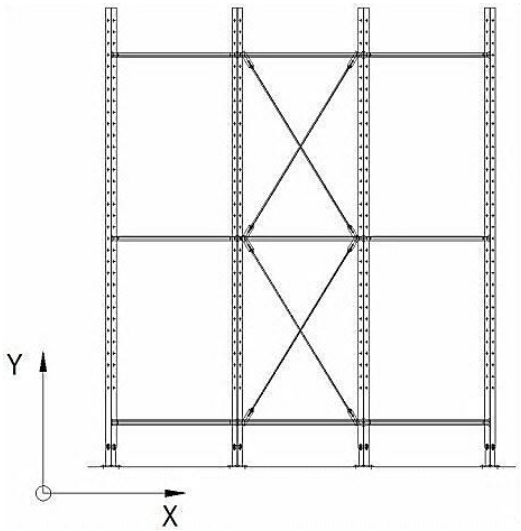
Bay with horizontal braces only

(the used symbol is „I I”)



Bay with horizontal and diagonal braces

(the used symbol is „IXI”)

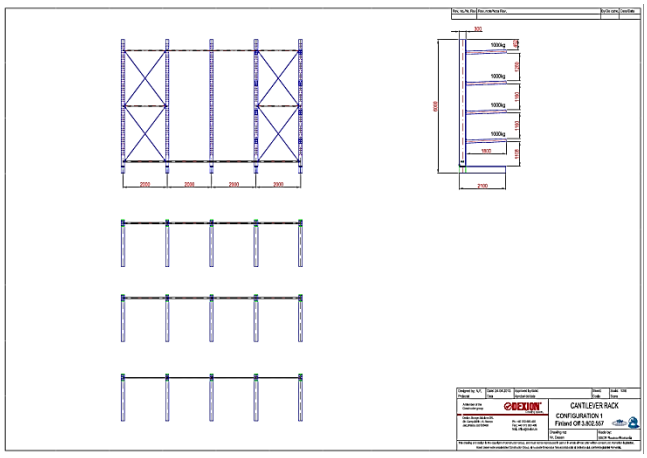


2.4.1.2 The number and position for the braces in „X" direction:

No. of Bays in Row	Configuration
1	IXI
2	IXI I
3	I IXI I
4	IXI I IXI
5	IXI I I IXI
6	IXI I I I IXI
7	IXI I I I I IXI
8	IXI I I IXI I IXI
9	IXI I I IXI I I IXI
10	IXI I I IXI I I I IXI
11	IXI I I I IXI I I I IXI
12	IXI I I I IXI I I I I IXI
13	IXI I I I I IXI I I I I IXI
14	IXI I I IXI I I I IXI I I IXI
15	IXI I I IXI I I I IXI I I I IXI
16	IXI I I I IXI I I I IXI I I I IXI
17	IXI I I I IXI I I I I IXI I I I IXI
18	IXI I I I IXI I I I I IXI I I I I IXI
19	IXI I I I I IXI I I I I IXI I I I I IXI
20	IXI I I IXI I I I IXI I I I IXI I I I IXI
21	IXI I I I IXI I I I IXI I I I IXI I I I IXI
22	IXI I I I IXI I I I I IXI I I I IXI I I I IXI
23	IXI I I I IXI I I I I IXI I I I I IXI I I I IXI
24	IXI I I I IXI I I I I IXI I I I I IXI I I I I IXI
25	IXI I I I I IXI I I I I IXI I I I I IXI I I I I IXI

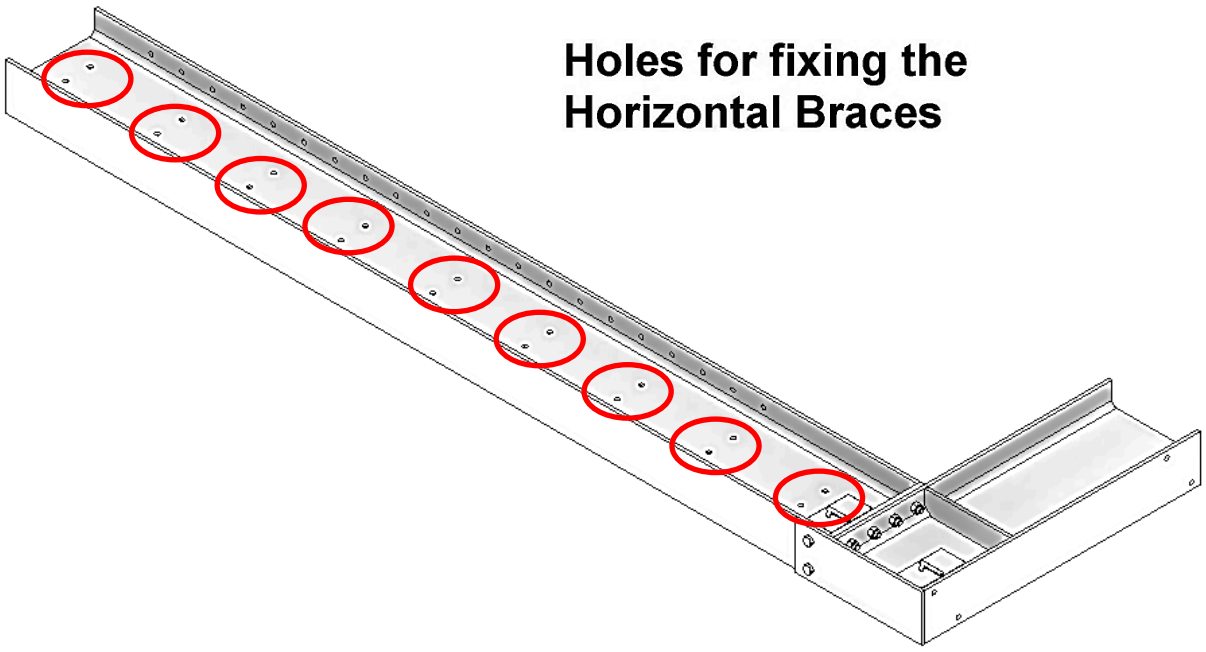
These rules are valid for standard configurations. Always use the Layout received from the Technical Department for the correct brace pattern.

In the received Layout you will see the number of bays with only horizontal braces, the number of bays with horizontal and diagonal braces and the arrangement of these bays.

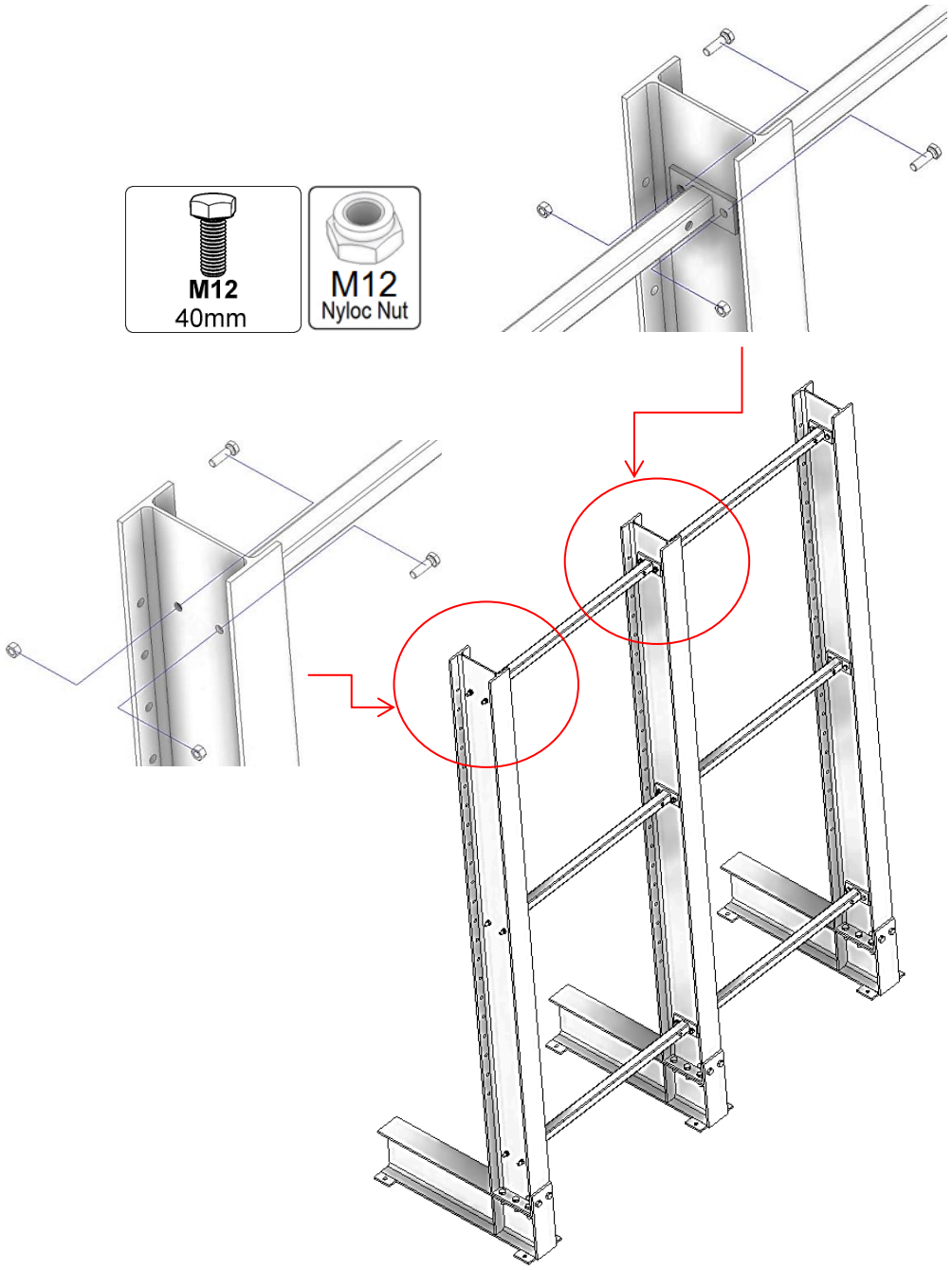


2.4.2 Assembly Horizontal Braces

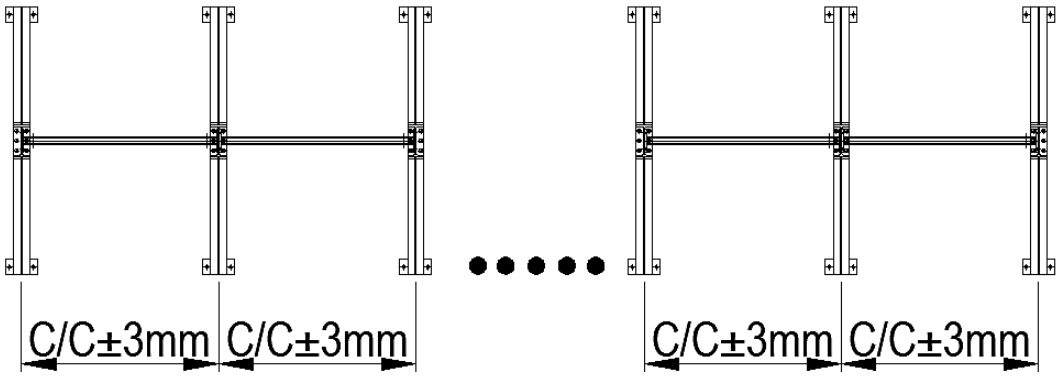
1. Localize the holes from the Column where Horizontal Braces needs to be installed. These holes start at 200mm from the top of the welded plate in the bottom part and continue all the way along the column length till the end. In the top part of the column these holes end at a variable distance from 80mm up to 370mm.



2. See the received Layout for the correct number of Braces and for the correct position (the number of Horizontal Braces and the position are influenced by height of the system, column span and the number of bays in row). Always start with the Horizontal Brace from the first set of holes and end with the last horizontal brace in the last set of holes (in top position). Always the top horizontal must be aligned or above the top arm.
3. Start fixing the Horizontal Braces.

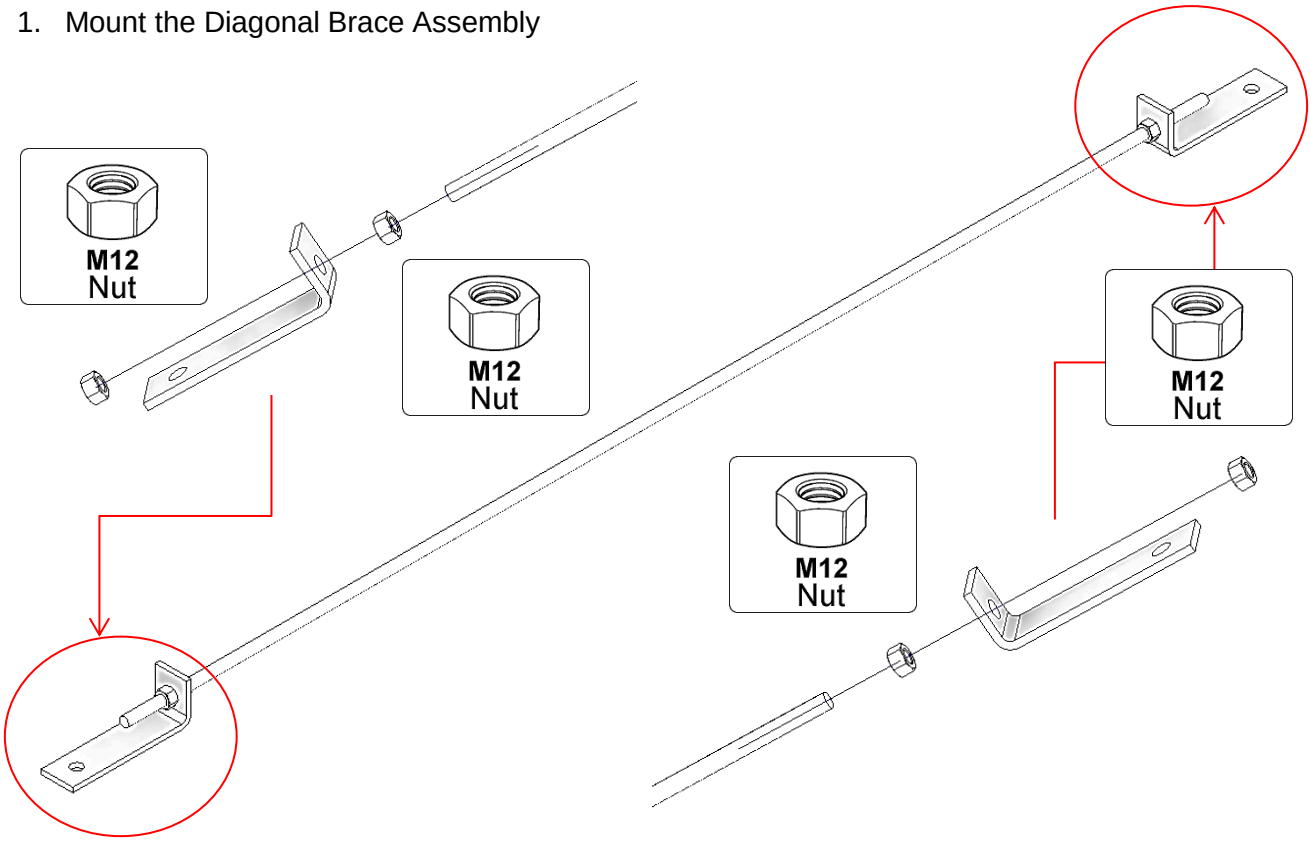


The Center to Center dimension between two Columns is nominal and can vary with a tolerance of ± 3mm.



2.4.3 Assembly Diagonal Braces

1. Mount the Diagonal Brace Assembly

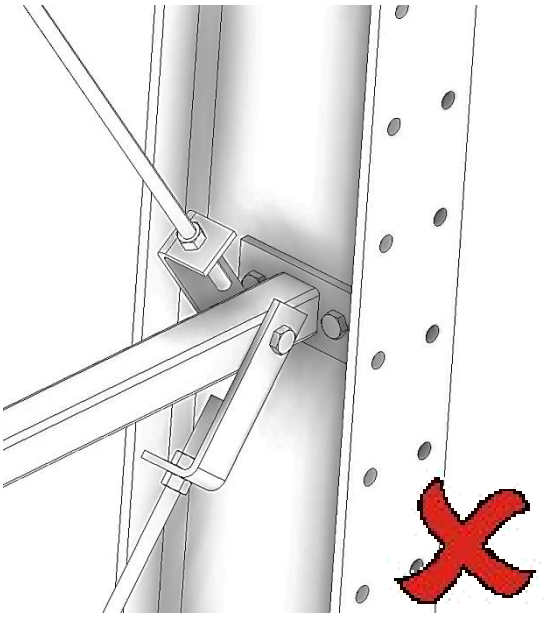


At each end of the Diagonal Brace assembly can remain unused round bar from 25mm till 193mm.

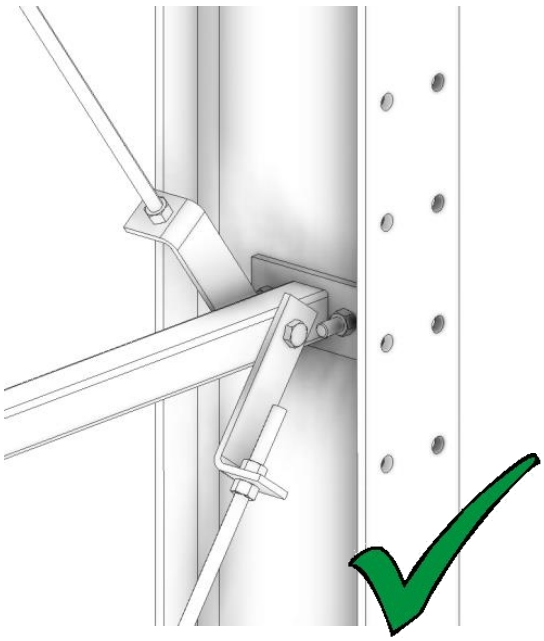
The round bar can be cut on site if wanted, but is not a must to be cut as it is enough space between columns to accommodate these lengths.

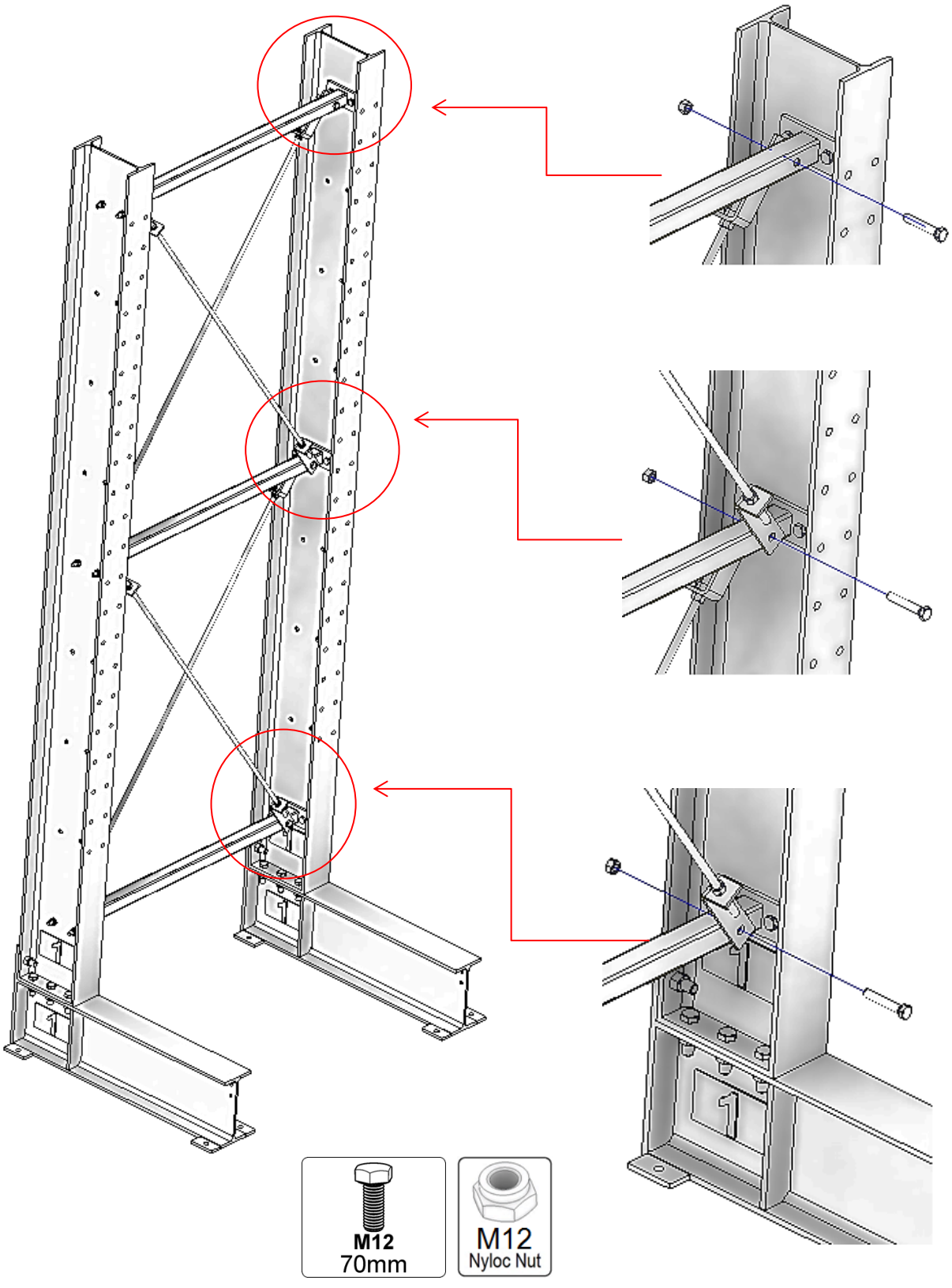
2. Mount the Diagonals to the Horizontal Braces.

Incorrect position:

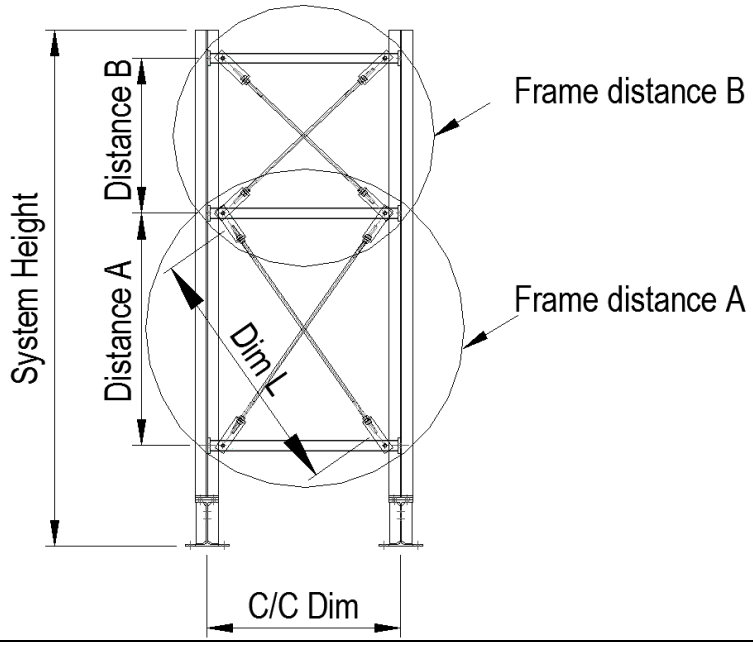


Correct position:




M12
70mm
M12
Nyloc Nut

Standard Brace Configurations



COLUMNS IPE 160							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 2000mm							
500	4	600	2	300	1	550	550
750	3	900	1	600	1	950	950
1000	2	1500	1	-	-	1600	-
1250	2	1500	1	-	-	1900	-
1500	2	1500	1	-	-	1900	-
1750	2	1500	1	-	-	2300	-
2000	2	1500	1	-	-	2300	-
System Height = 2500mm							
500	4	600	3	-	-	550	-
750	3	900	2	-	-	950	-
1000	3	900	2	-	-	1350	-
1250	2	1800	1	-	-	2300	-
1500	2	1800	1	-	-	2300	-
1750	2	1800	1	-	-	2300	-
2000	2	1800	1	-	-	2600	-

COLUMNS IPE 160							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 3000mm							
500	5	600	4	-	-	550	-
750	4	900	2	600	1	950	950
1000	3	1200	2	-	-	1350	-
1250	3	1200	2	-	-	1600	-
1500	3	1200	2	-	-	1900	-
1750	2	2400	1	-	-	2900	-
2000	2	2400	1	-	-	2900	-
System Height = 3500mm							
500	6	600	5	-	-	550	-
750	5	900	2	600	2	950	950
1000	3	1500	2	-	-	1600	-
1250	3	1500	2	-	-	1900	-
1500	3	1500	2	-	-	1900	-
1750	3	1500	2	-	-	2300	-
2000	3	1500	2	-	-	2300	-
System Height = 4000mm							
500	7	600	5	300	1	550	550
750	5	900	3	600	1	950	950
1000	4	1200	2	900	1	1350	1350
1250	4	1200	2	900	1	1600	1350
1500	3	1800	1	1500	1	2300	1900
1750	3	1800	1	1500	1	2300	2300
2000	3	1800	1	1500	1	2600	2300

COLUMNS IPE 160							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 4500mm							
500	8	600	6	300	1	550	550
750	6	900	3	600	2	950	950
1000	4	1500	2	900	1	1600	1350
1250	4	1500	2	900	1	1900	1350
1500	3	2100	1	1800	1	2600	2300
1750	3	2100	1	1800	1	2600	2300
2000	3	2100	1	1800	1	2900	2600

COLUMNS IPE 180							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 3000mm							
500	5	600	4	-	-	550	-
750	4	900	2	600	1	950	950
1000	3	1200	2	-	-	1350	-
1250	3	1200	2	-	-	1600	-
1500	3	1200	2	-	-	1900	-
1750	2	2400	1	-	-	2900	-
2000	2	2400	1	-	-	2900	-
System Height = 3500mm							
500	6	600	5	-	-	550	-
750	5	900	2	600	2	950	950
1000	3	1500	2	-	-	1600	-
1250	3	1500	2	-	-	1900	-
1500	3	1500	2	-	-	1900	-
1750	3	1500	2	-	-	2300	-
2000	3	1500	2	-	-	2300	-

COLUMNS IPE 180							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 4000mm							
500	7	600	5	300	1	550	550
750	5	900	3	600	1	950	950
1000	4	1200	2	900	1	1350	1350
1250	4	1200	2	900	1	1600	1350
1500	3	1800	1	1500	1	2300	1900
1750	3	1800	1	1500	1	2300	2300
2000	3	1800	1	1500	1	2600	2300
System Height = 4500mm							
500	8	600	6	300	1	550	550
750	6	900	3	600	2	950	950
1000	4	1500	2	900	1	1600	1350
1250	4	1500	2	900	1	1900	1350
1500	3	2100	1	1800	1	2600	2300
1750	3	2100	1	1800	1	2600	2300
2000	3	2100	1	1800	1	2900	2600
System Height = 5000mm							
500	9	600	7	300	1	550	550
750	6	900	5	-	-	950	-
1000	4	1500	3	-	-	1600	-
1250	4	1500	3	-	-	1900	-
1500	4	1500	3	-	-	1900	-
1750	3	2400	1	2100	1	2900	2600
2000	3	2400	1	2100	1	2900	2900

COLUMNS IPE 180							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 5500mm							
500	9	600	8	-	-	550	-
750	7	900	4	600	2	950	950
1000	5	1200	4	-	-	1350	-
1250	4	1800	2	1200	1	2300	1600
1500	4	1800	2	1200	1	2300	1900
1750	3	2400	2	-	-	2900	-
2000	3	2400	2	-	-	2900	-
System Height = 6000mm							
500	10	600	9	-	-	550	-
750	7	900	6	-	-	950	-
1000	5	1500	3	900	1	1600	1350
1250	4	1800	3	-	-	2300	-
1500	4	1800	3	-	-	2300	-
1750	4	1800	3	-	-	2300	-
2000	4	1800	3	-	-	2900	-

COLUMNS IPE 200							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 3000mm							
500	5	600	4	-	-	550	-
750	4	900	2	600	1	950	950
1000	3	1200	2	-	-	1350	-
1250	3	1200	2	-	-	1600	-
1500	3	1200	2	-	-	1900	-
1750	2	2400	1	-	-	2900	-
2000	2	2400	1	-	-	2900	-

COLUMNS IPE 200							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 3500mm							
500	6	600	5	-	-	550	-
750	5	900	2	600	2	950	950
1000	3	1500	2	-	-	1600	-
1250	3	1500	2	-	-	1900	-
1500	3	1500	2	-	-	1900	-
1750	3	1500	2	-	-	2300	-
2000	3	1500	2	-	-	2300	-
System Height = 4000mm							
500	7	600	5	300	1	550	550
750	5	900	3	600	1	950	950
1000	4	1200	2	900	1	1350	1350
1250	4	1200	2	900	1	1600	1350
1500	3	1800	1	1500	1	2300	1900
1750	3	1800	1	1500	1	2300	2300
2000	3	1800	1	1500	1	2600	2300
System Height = 4500mm							
500	8	600	6	300	1	550	550
750	6	900	3	600	2	950	950
1000	4	1500	2	900	1	1600	1350
1250	4	1500	2	900	1	1900	1350
1500	3	2100	1	1800	1	2600	2300
1750	3	2100	1	1800	1	2600	2300
2000	3	2100	1	1800	1	2900	2600

COLUMNS IPE 200							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 5000mm							
500	9	600	7	300	1	550	550
750	6	900	5	-	-	950	-
1000	4	1500	3	-	-	1600	-
1250	4	1500	3	-	-	1900	-
1500	4	1500	3	-	-	1900	-
1750	3	2400	1	2100	1	2900	2600
2000	3	2400	1	2100	1	2900	2900
System Height = 5500mm							
500	9	600	8	-	-	550	-
750	7	900	4	600	2	950	950
1000	5	1200	4	-	-	1350	-
1250	4	1800	2	1200	1	2300	1600
1500	4	1800	2	1200	1	2300	1900
1750	3	2400	2	-	-	2900	-
2000	3	2400	2	-	-	2900	-
System Height = 6000mm							
500	10	600	9	-	-	550	-
750	7	900	6	-	-	950	-
1000	5	1500	3	900	1	1600	1350
1250	4	1800	3	-	-	2300	-
1500	4	1800	3	-	-	2300	-
1750	4	1800	3	-	-	2300	-
2000	4	1800	3	-	-	2900	-

COLUMNS IPE 220							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 3500mm							
500	6	600	4	300	1	550	550
750	4	900	3	-	-	950	-
1000	3	1500	1	1200	1	1600	1350
1250	3	1500	1	1200	1	1900	1600
1500	3	1500	1	1200	1	1900	1900
1750	3	1500	1	1200	1	2300	1900
2000	3	1500	1	1200	1	2300	2300
System Height = 4000mm							
500	7	600	5	300	1	550	550
750	5	900	3	600	1	950	950
1000	4	1200	2	900	1	1350	1350
1250	4	1200	2	900	1	1600	1350
1500	3	1800	1	1500	1	2300	1900
1750	3	1800	1	1500	1	2300	2300
2000	3	1800	1	1500	1	2600	2300
System Height = 4500mm							
500	8	600	6	300	1	550	550
750	6	900	3	600	2	950	950
1000	4	1500	2	900	1	1600	1350
1250	4	1500	2	900	1	1900	1350
1500	3	2100	1	1800	1	2600	2300
1750	3	2100	1	1800	1	2600	2300
2000	3	2100	1	1800	1	2900	2600

COLUMNS IPE 220							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 5000mm							
500	8	600	7	-	-	550	-
750	6	900	4	600	1	950	950
1000	4	1500	2	1200	1	1600	1350
1250	4	1500	2	1200	1	1900	1600
1500	4	1500	2	1200	1	1900	1900
1750	3	2100	2	-	-	2600	-
2000	3	2100	2	-	-	2900	-
System Height = 5500mm							
500	9	600	8	-	-	550	-
750	7	900	4	600	2	950	950
1000	5	1200	4	-	-	1350	-
1250	4	1800	2	1200	1	2300	1600
1500	4	1800	2	1200	1	2300	1900
1750	3	2400	2	-	-	2900	-
2000	3	2400	2	-	-	2900	-
System Height = 6000mm							
500	10	600	9	-	-	550	-
750	7	900	6	-	-	950	-
1000	5	1500	3	900	1	1600	1350
1250	4	1800	3	-	-	2300	-
1500	4	1800	3	-	-	2300	-
1750	4	1800	3	-	-	2300	-
2000	4	1800	3	-	-	2900	-

COLUMNS IPE 240							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 5000mm							
500	8	600	7	-	-	550	-
750	6	900	4	600	1	950	950
1000	4	1500	2	1200	1	1600	1350
1250	4	1500	2	1200	1	1900	1600
1500	4	1500	2	1200	1	1900	1900
1750	3	2100	2	-	-	2600	-
2000	3	2100	2	-	-	2900	-
System Height = 5500mm							
500	9	600	8	-	-	550	-
750	7	900	4	600	2	950	950
1000	5	1200	4	-	-	1350	-
1250	4	1800	2	1200	1	2300	1600
1500	4	1800	2	1200	1	2300	1900
1750	3	2400	2	-	-	2900	-
2000	3	2400	2	-	-	2900	-
System Height = 6000mm							
500	10	600	9	-	-	550	-
750	7	900	6	-	-	950	-
1000	5	1500	3	900	1	1600	1350
1250	4	1800	3	-	-	2300	-
1500	4	1800	3	-	-	2300	-
1750	4	1800	3	-	-	2300	-
2000	4	1800	3	-	-	2900	-

COLUMNS IPE 240							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 6500mm							
500	11	600	9	300	1	550	550
750	8	900	5	600	2	950	950
1000	5	1500	3	1200	1	1600	1350
1250	5	1500	3	1200	1	1900	1600
1500	4	2100	2	1500	1	2600	1900
1750	4	2100	2	1500	1	2600	2300
2000	4	2100	2	1500	1	2900	2300
System Height = 7000mm							
500	12	600	10	300	1	550	550
750	8	900	7	-	-	950	-
1000	6	1500	3	900	2	1600	1350
1250	5	1800	3	900	1	2300	1350
1500	4	2100	3	-	-	2600	-
1750	4	2100	3	-	-	2600	-
2000	4	2100	3	-	-	2900	-
System Height = 7500mm							
500	13	600	11	300	1	550	550
750	9	900	7	600	1	950	950
1000	6	1500	4	900	1	1600	1350
1250	5	1800	3	1500	1	2300	1900
1500	5	1800	3	1500	1	2300	1900
1750	4	2400	2	2100	1	2900	2600
2000	4	2400	2	2100	1	2900	2900

COLUMNS IPE 240							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 8000mm							
500	13	600	12	-	-	550	-
750	9	900	8	-	-	950	-
1000	6	1500	4	1200	1	1600	1350
1250	5	1800	4	-	-	2300	-
1500	5	1800	4	-	-	2300	-
1750	4	2400	3	-	-	2900	-
2000	4	2400	3	-	-	2900	-

COLUMNS IPE 270							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 5000mm							
500	8	600	7	-	-	550	-
750	6	900	4	600	1	950	950
1000	4	1500	2	1200	1	1600	1350
1250	4	1500	2	1200	1	1900	1600
1500	4	1500	2	1200	1	1900	1900
1750	3	2100	2	-	-	2600	-
2000	3	2100	2	-	-	2900	-
System Height = 5500mm							
500	9	600	8	-	-	550	-
750	7	900	4	600	2	950	950
1000	5	1200	4	-	-	1350	-
1250	4	1800	2	1200	1	2300	1600
1500	4	1800	2	1200	1	2300	1900
1750	3	2400	2	-	-	2900	-
2000	3	2400	2	-	-	2900	-

COLUMNS IPE 270							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 6000mm							
500	10	600	9	-	-	550	-
750	7	900	6	-	-	950	-
1000	5	1500	3	900	1	1600	1350
1250	4	1800	3	-	-	2300	-
1500	4	1800	3	-	-	2300	-
1750	4	1800	3	-	-	2300	-
2000	4	1800	3	-	-	2900	-
System Height = 6500mm							
500	11	600	9	300	1	550	550
750	8	900	5	600	2	950	950
1000	5	1500	3	1200	1	1600	1350
1250	5	1500	3	1200	1	1900	1600
1500	4	2100	2	1500	1	2600	1900
1750	4	2100	2	1500	1	2600	2300
2000	4	2100	2	1500	1	2900	2300
System Height = 7000mm							
500	12	600	10	300	1	550	550
750	8	900	7	-	-	950	-
1000	6	1500	3	900	2	1600	1350
1250	5	1800	3	900	1	2300	1350
1500	4	2100	3	-	-	2600	-
1750	4	2100	3	-	-	2600	-
2000	4	2100	3	-	-	2900	-

COLUMNS IPE 270							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 7500mm							
500	13	600	11	300	1	550	550
750	9	900	7	600	1	950	950
1000	6	1500	4	900	1	1600	1350
1250	5	1800	3	1500	1	2300	1900
1500	5	1800	3	1500	1	2300	1900
1750	4	2400	2	2100	1	2900	2600
2000	4	2400	2	2100	1	2900	2900
System Height = 8000mm							
500	13	600	12	-	-	550	-
750	9	900	8	-	-	950	-
1000	6	1500	4	1200	1	1600	1350
1250	5	1800	4	-	-	2300	-
1500	5	1800	4	-	-	2300	-
1750	4	2400	3	-	-	2900	-
2000	4	2400	3	-	-	2900	-

COLUMNS IPE 300							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 5000mm							
500	8	600	7	-	-	550	-
750	6	900	4	600	1	950	950
1000	4	1500	2	1200	1	1600	1350
1250	4	1500	2	1200	1	1900	1600
1500	4	1500	2	1200	1	1900	1900
1750	3	2100	2	-	-	2600	-
2000	3	2100	2	-	-	2900	-

COLUMNS IPE 300							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 5500mm							
500	9	600	8	-	-	550	-
750	7	900	4	600	2	950	950
1000	5	1200	4	-	-	1350	-
1250	4	1800	2	1200	1	2300	1600
1500	4	1800	2	1200	1	2300	1900
1750	3	2400	2	-	-	2900	-
2000	3	2400	2	-	-	2900	-
System Height = 6000mm							
500	10	600	9	-	-	550	-
750	7	900	6	-	-	950	-
1000	5	1500	3	900	1	1600	1350
1250	4	1800	3	-	-	2300	-
1500	4	1800	3	-	-	2300	-
1750	4	1800	3	-	-	2300	-
2000	4	1800	3	-	-	2900	-
System Height = 6500mm							
500	11	600	9	300	1	550	550
750	8	900	5	600	2	950	950
1000	5	1500	3	1200	1	1600	1350
1250	5	1500	3	1200	1	1900	1600
1500	4	2100	2	1500	1	2600	1900
1750	4	2100	2	1500	1	2600	2300
2000	4	2100	2	1500	1	2900	2300

COLUMNS IPE 300							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 7000mm							
500	12	600	10	300	1	550	550
750	8	900	7	-	-	950	-
1000	6	1500	3	900	2	1600	1350
1250	5	1800	3	900	1	2300	1350
1500	4	2100	3	-	-	2600	-
1750	4	2100	3	-	-	2600	-
2000	4	2100	3	-	-	2900	-
System Height = 7500mm							
500	13	600	11	300	1	550	550
750	9	900	7	600	1	950	950
1000	6	1500	4	900	1	1600	1350
1250	5	1800	3	1500	1	2300	1900
1500	5	1800	3	1500	1	2300	1900
1750	4	2400	2	2100	1	2900	2600
2000	4	2400	2	2100	1	2900	2900
System Height = 8000mm							
500	13	600	12	-	-	550	-
750	9	900	8	-	-	950	-
1000	6	1500	4	1200	1	1600	1350
1250	5	1800	4	-	-	2300	-
1500	5	1800	4	-	-	2300	-
1750	4	2400	3	-	-	2900	-
2000	4	2400	3	-	-	2900	-

COLUMNS IPE 330							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 6500mm							
500	11	600	9	300	1	550	550
750	8	900	5	600	2	950	950
1000	5	1500	3	1200	1	1600	1350
1250	5	1500	3	1200	1	1900	1600
1500	4	2100	2	1500	1	2600	1900
1750	4	2100	2	1500	1	2600	2300
2000	4	2100	2	1500	1	2900	2300
System Height = 7000mm							
500	12	600	10	300	1	550	550
750	8	900	7	-	-	950	-
1000	6	1500	3	900	2	1600	1350
1250	5	1800	3	900	1	2300	1350
1500	4	2100	3	-	-	2600	-
1750	4	2100	3	-	-	2600	-
2000	4	2100	3	-	-	2900	-
System Height = 7500mm							
500	12	600	11	-	-	550	-
750	9	900	6	600	2	950	950
1000	6	1500	2	1200	3	1600	1350
1250	5	1800	3	1200	1	2300	1600
1500	5	1800	3	1200	1	2300	1900
1750	4	2400	2	1800	1	2900	2300
2000	4	2400	2	1800	1	2900	2600

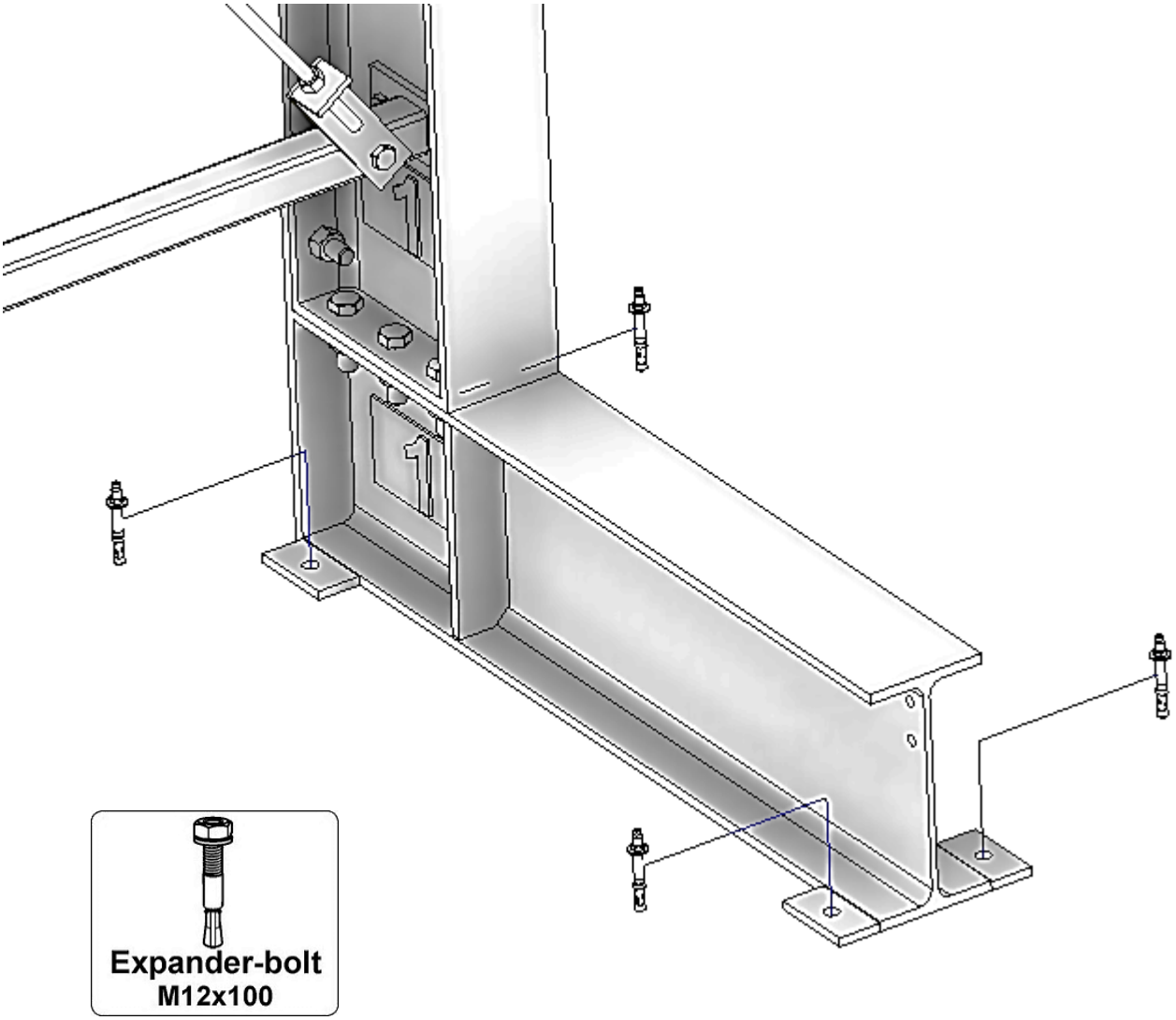
COLUMNS IPE 330							
C/C Dim [mm]	**No. of Horizontal Braces**	**Distance A [mm]**	**No. of frames Distance A**	**Distance B [mm]**	**No. of frames distance B**	**Diagonal Brace dim "L" for distance A**	**Diagonal Brace dim "L" for distance B**
System Height = 8000mm							
500	13	600	12	-	-	550	-
750	9	900	8	-	-	950	-
1000	6	1500	4	1200	1	1600	1350
1250	5	1800	4	-	-	2300	-
1500	5	1800	4	-	-	2300	-
1750	4	2400	3	-	-	2900	-
2000	4	2400	3	-	-	2900	-

2.5 Fix the rack to the ground

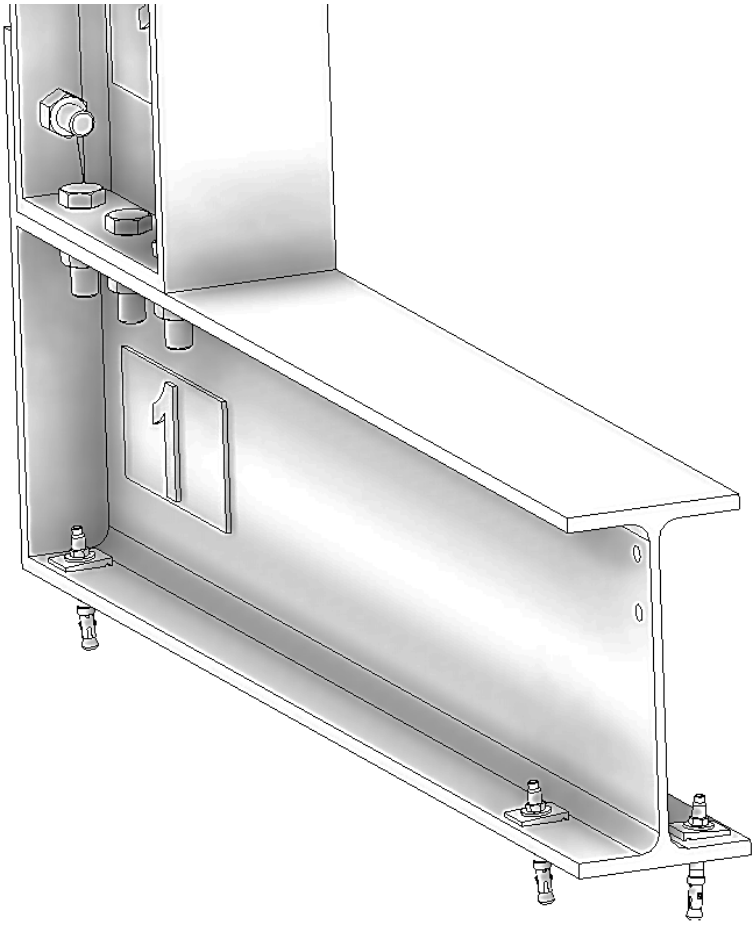
Before starting to fix the Bases to the ground check rack / row for line, level and plumb and then fixed to the floor using the specified leveling shims and floor fixings.

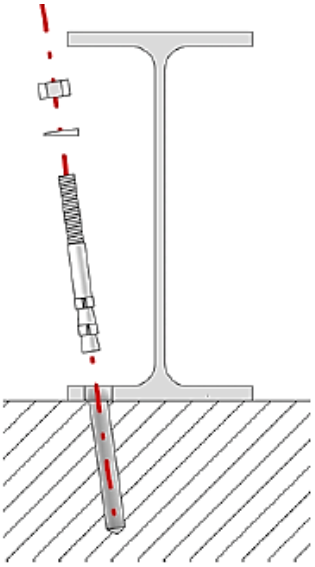
This installation details applies to Concrete floor grade C20/25 only! For other surfaces other specifications may be given by the Technical Department!

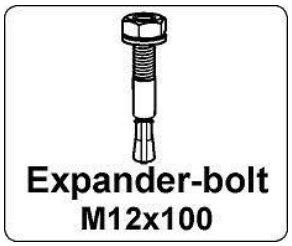
1. Floor fixing for IPE160 to IPE220

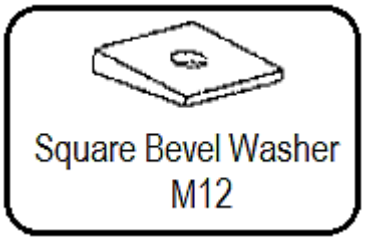


2. Floor fixing for IPE240 to IPE360





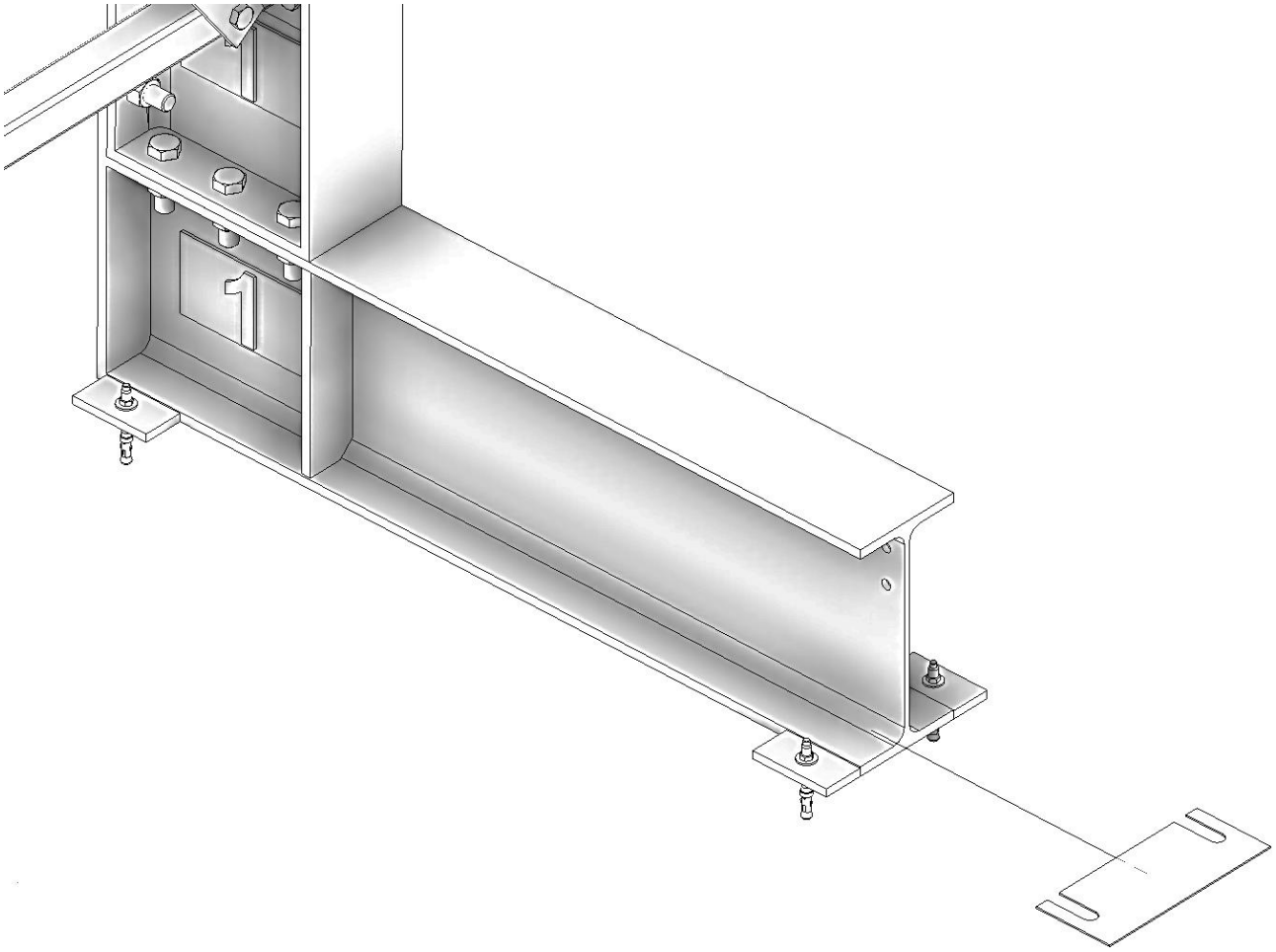




Maximum 10mm high stacking of shims is accepted! If more shims are needed than Technical Department must be asked for the suitable solution.

Make sure that the Anchors have a minimum embedded length of 60mm when using a high stacking of shims!

Shims can be used either in front or back for leveling the system.



All this installation details are for the standard configurations. It is possible that for special configurations the Technical Department to define new fixing conditions. In this case the special conditions from Technical Department will overcome the notes from this Manual!

2.6 FEM 10.2.09 – Installation Guidelines

The following information is taken from FEM 10.2.09 draft version v.023 / May 2015 pages 101 – 103, and it is valid at the moment of this issue of the Manual:

The maximum allowable tolerances after erection, with the cantilever rack in the unloaded condition, shall be as stated in Table E.1 and Table E.2 and shown on Figures E.1 and E.2.

Table E.1 — Tolerances measured horizontally

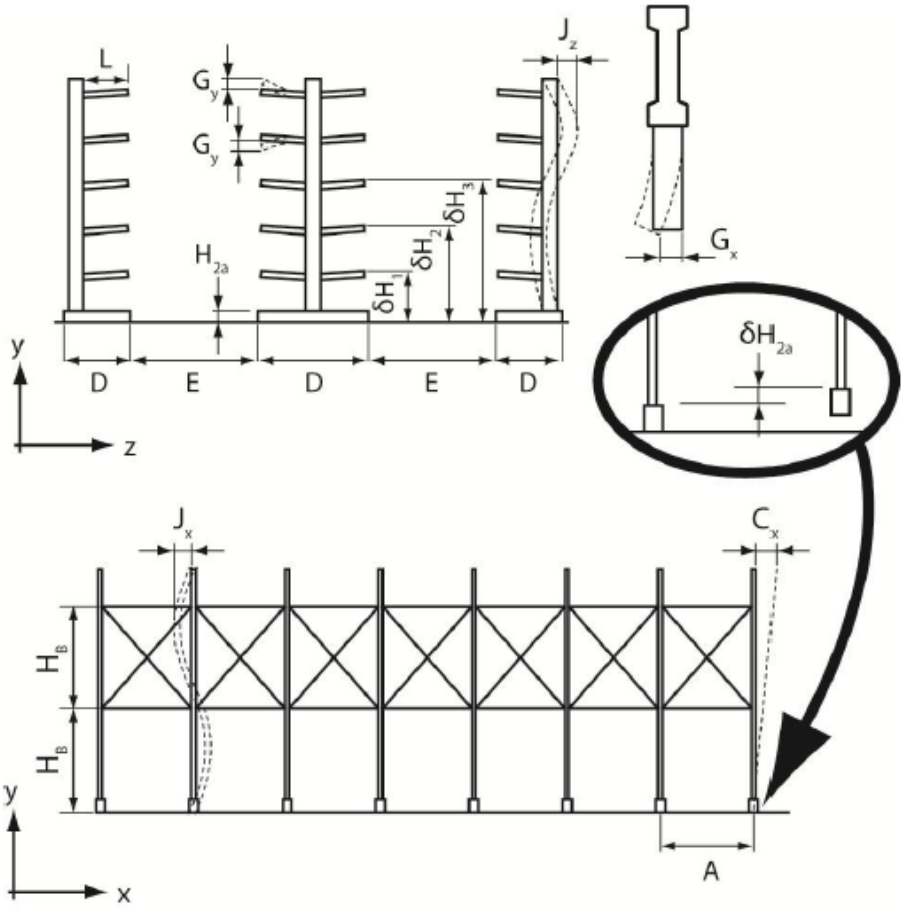
Horizontal tolerance limitations for X Z plane [mm]	
Measuring dimension code and description of tolerance	**Installation tolerances for cantilever racking**
δ**A** Variation from nominal dimension of the bay width between the axes of two columns at any arm level	+ / - 5
δ$\mathbf{A_t}$ Variation from nominal dimension of the total cantilever length, cumulative with the number of bays „n" measured near floor level	+ / - 3n
δ$\mathbf{B_0}$ Variation from nominal of cantilever frontage with regard to the installation "system Z datum line" concerned, measured near floor level	+ / - 10
BF Misalignment of opposing cantilever columns across an aisle, measured near floor level	+ / - 25
$\mathbf{C}_x$ Out of plumb of each frame in the X direction	+ / - H/500
$\mathbf{C}_z$ Out of plumb of each frame in the Z direction	+ / - H/500
δ**D** Variation from nominal dimension of the cantilever depth	+ / - 6
δ**E** Variation from nominal dimension of the aisle width near floor level	+ / - 15
δ**F** Variation from nominal of the straightness of an aisle measured near floor level with regard to the „aisle system X datum line".	+ / - 15
$\mathbf{G}_x$ Straightness of the arm or base in the X direction	+ / - L/100
$\mathbf{J}_x$ Upright straightness in the X direction between bracing beams spaced HB apart.	the larger tolerance of the following + / - 5 or + / - HB/300
$\mathbf{J}_z$ Initial curve of an upright frame in the Z direction	+ / - H/500
$\mathbf{T}_w$ Tw Arm twist	1° per meter or 1.5° per meter for asymmetric sections

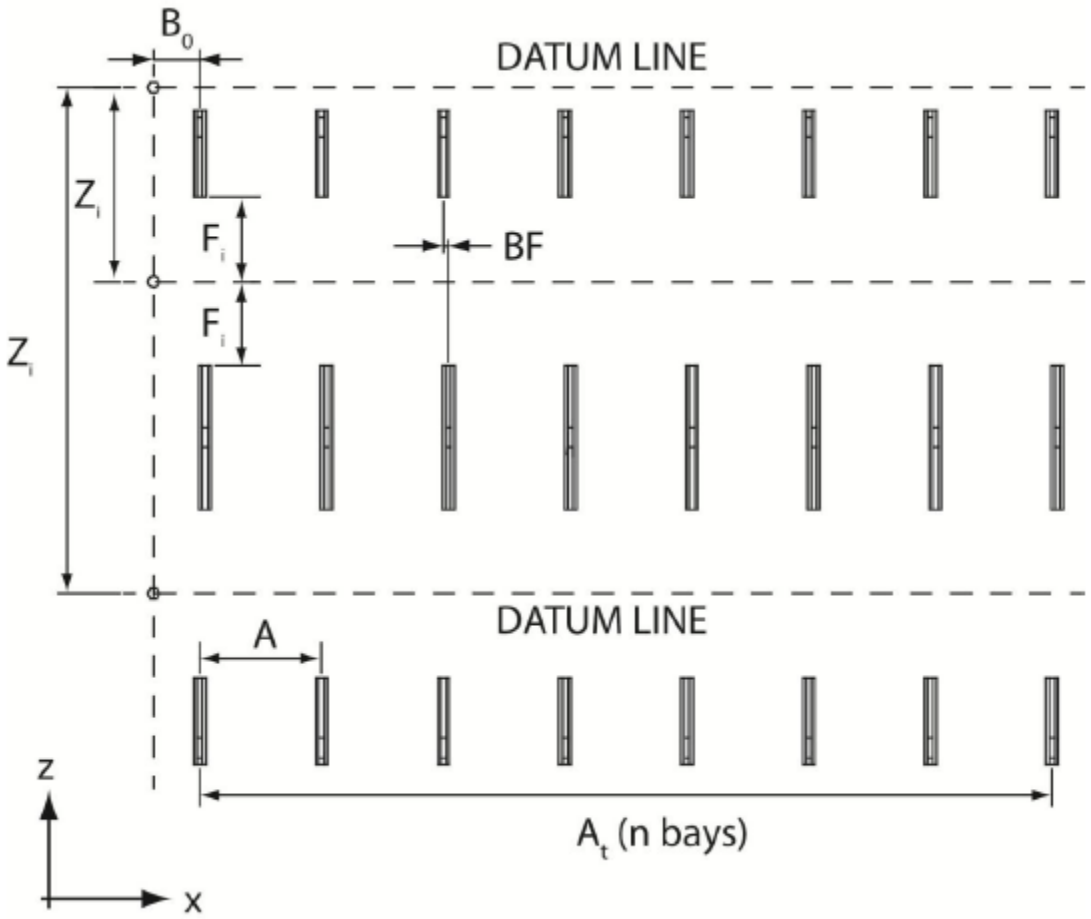
Table E.2 — Tolerances measured vertically

Vertical tolerance limitations for Y direction [mm]	
Measuring dimension code and description of tolerance	**Installation tolerances, for cantilever racking**
$\mathbf{G_y}$ Straightness of the arm in the Y direction	+ / - L/250
$\delta\mathbf{H_{1A}}$ Variation in the height of the top of adjacent bases $\delta\mathbf{H_{2A}}$ etc	+ / - 5
$\delta\mathbf{H_1}$ Height from bottom of base plate to top of arm 1 $\delta\mathbf{H_2}$ Height from bottom of base plate to top of arm 2 etc.,	+ / - 10 + / - 10

NOTE 1:- A measurement survey may be used to measure the installation tolerances and clearances before the racking is loaded. The tolerances stated in this FEM standard may not be applicable after the racking has been loaded. Measurement surveys may be completed when required by individual contracts.

NOTE 2:- The Specifier should determine whether all tolerance values should be the worst case or whether the values can deviate from the figures stated in this document for technical or economic reasons, if the functionality of the whole system can be guaranteed.





Key

See Tables E1 and E2 for definition of symbols

Horizontal and vertical tolerances

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