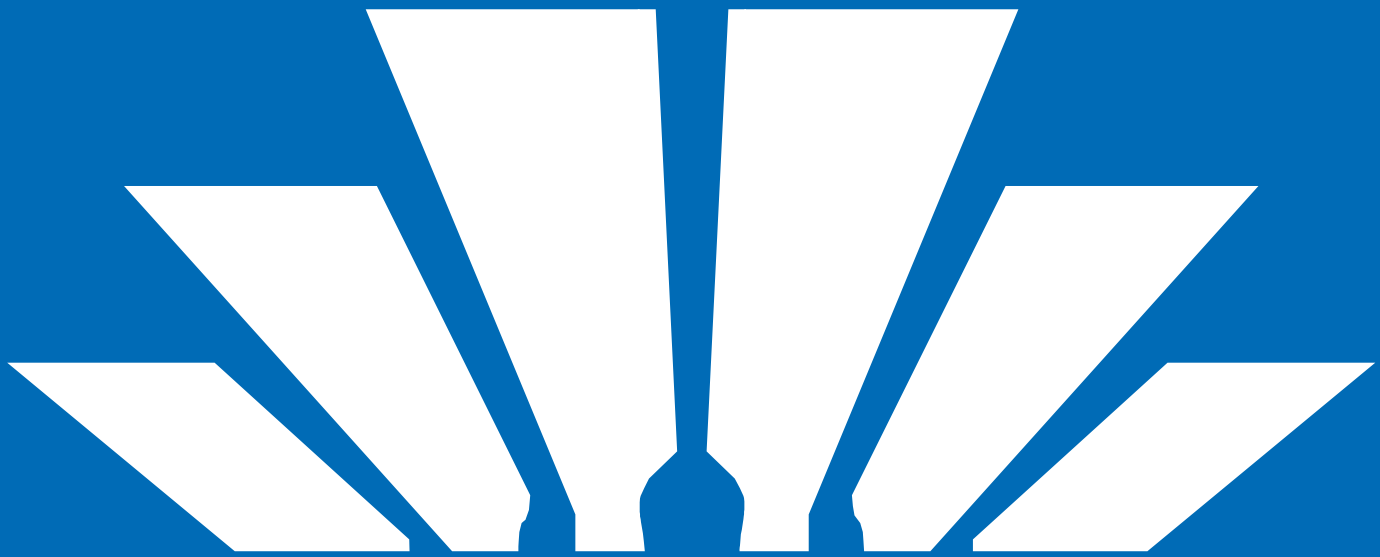
FIRA DE BARCELONA
MWC 2019

General rules for hanging elements and structures in halls / Rigging



CONTENTS

FIRA DE BARCELONA
MWC 2019

Regulations

1. PURPOSE

Its unique purpose is to establish rules for the suspension of exhibitor's elements and improve the safety of people and facilities, during both the assembly and disassembly stages, as well as during any event.

2. HANGING ELEMENTS FROM EXHIBITION HALL CEILINGS - RIGGING

Rigging and security cables hung up from the hall's structure correspond only to the appointed official supplier by Fira Barcelona, EXPO-RIGGING. No third parties are allowed to hang anything directly to the halls ceilings and facilities.

Exhibitor / Stand builder shall hire the rigging points **according to the load distribution carried out by his competent technician.**

Please note it is not always possible to locate hanging points in all areas of the exhibition hall and therefore restrictions may exist which vary depending on the hall and the points already taken up as well as the ceiling´s load capacity. This might lead to the need for pre-rigging. Please see the rigging restrictions floorplan of the venue at **appendix 1** of this manual.

Rigging is not permitted above shell scheme stands, hospitality suite packages or above public gangways. If this last situation cannot be avoided Fira and GSMA will need to approve it.

3. GENERAL INSTALLATION REQUIREMENTS

The structures must be designed to withstand both the static and dynamic loads associated with assembly.

According MWC Stand Building Regulations (Rigging section), due to the fact of having rigging points, you have to consider that suspended structures that require more than 10 rigging points or any other type of hanging structures classed as complex, require load distribution calculations and structural certification through the official stand plan inspection agencies (further information can be found on **page 9 on this manual**)

Fabric banners or lighting trusses (without cladding) that use less than 10 rigging points do not require structural certification but are still required to be inspected on-site before being lifted.

Other timber or heavy elements, classified as a complex structure, that use less than 10 rigging points require load distribution and structural certification too.

IMPORTANT - Before lifting any rigged elements you must advise **Graó Tècnic, on +34 670965795** or contact the hall manager and get your hanging connections inspected, otherwise additional costs for inspecting connections at height will be charged to the exhibitor.

The main requirements for any hanging structure / elements are as follows:

- **The minimum distance permitted between rigging points for hanging elements is 1 meters.**
- **The allowed maximum hanging weight of rigging elements is 15 Kg/m2 calculated by the radio between the total weight of the suspended elements and the contracted stand surface.**
- **It is not allowed to lift up one truss grid with more than 10 manual chain hoists.**
- **The maximum load of one rigging point is 1,50Kn (150kg).**
- The safety factors of hanging elements shall be higher than those laid down in prevailing regulations. This applies to all elements hanging from the points installed by EXPO-RIGGING, whether structural, rigging or merely decorative.
- Loads transferred to the structure during stand assembly due to hoisting of elements or any other assembly or dismantling may not subject the halls to lower safety factors than those set out in prevailing regulations.
- Materials used must be of good quality and in good condition.
- Exhibitors own truss structures and material used are only permitted if it bears the CE mark (European conformity) and it is in perfect working condition.
- Any rigid coverings or wood structures must be attached to a certificated CE (European conformity) truss structure for hanging.
- Roof trusses in each hall have different load bearing characteristics.
- Exhibitors are not permitted to suspend from the existing venue hall's trusses themselves.
- The suspended elements from the rigging must maintain the verticality of the cable.
- The maximum distance recommended between points for hanging elements using a truss is 9 meters for general lighting.
- It is strictly forbidden to tamper with any equipment installed by 'EXPO-RIGGING' including trusses, cables, shackles or slings.
- Note that you are not allowed to hang up any element/banner above the height limit as

specified on the technical floorplans.

- Refer to the build height restrictions of the Event Manual to find out more about special exceptions on technical trusses.

IMPORTANT - If the rigging plan cannot fulfill the above mentioned requirement all the plans and the documentation regarding the rigging and the hanging objects must be send to Expo Rigging and Graó Tècnic 2 months before the official start date of the assembly.

4. SAFETY CABLES

Safety cables must be installed in all assemblies in order to prevent the hanging structure from collapsing, whether any element breaks down.

When using **manual or electric chain hoist**, safety cables will always be required to retain the element to be lifted by the hoist.

The following conditions must be satisfied:

A. Safety cables must connect the structures rigged by the exhibitor to the O-ring, by-passing the electrical motor or manual chain hoist.
B. Once the two ends of the safety cables are fixed, they must be stress free.
C. The diameter of these cables must be at least 6 mm and equal to or greater than the diameter of the main cables.
D. Their section must support the associated cable load plus 25% to factor in any sudden stress.
E. Safety cables must be positioned so that they are stress free in their final situation.

All **suspended fittings and equipment** (e.g. lights, sound clusters and speakers, display rigs, etc.) shall be fitted with secondary safety wires/chains and brackets.
The following conditions must be satisfied:

A. The fixture of each fitting must act independently from the secondary one and steel cables used must have a diameter of at least 4 mm.
B. Safety cables may be of synthetic fiber in cases where the main union system is made of steel cable, but it will not be used when placed near lightning systems.
C. Nylon elements must have a minimum tensile strength of 7 kN (700 kg).
D. Cables and slings made of steel, nylon or a combination of the two may be used to hang elements.

5. RIGGING ORDER & APPROVAL

Rigging points may be installed by the Fira's appointed supplier EXPO-RIGGING. Rigging points are not always available and every request will be dealt with individually.

There are local restrictions that change according to the hall structure, points already taken up and the ceiling´s load capacity. These restrictions may entail the installation of pre-rigging structures and/or extra costs. Please see the rigging restrictions floorplan of the venue at **appendix 1** of this manual.

Fira Barcelona will only provide fixed points when requests meet the allowed parameters foreseen for your space.

To **request rigging** service it is necessary to fill in the form available on ServiFira online ordering system website.

EXPO-RIGGING
Tel: +34 931856541
Email: info@expo-rigging.com

Please submit the following basic documentation / report with your rigging order form:

- Drawing (in AutoCAD Version 2010) indicating height, weight supported per rigging point and orientation of the booth within the hall.
- Expo-rigging order form indicating company details and rigging requirements.
- Type of point desired (with or without safety steel, manual chain hoist or electrical motor).
- Extra documentation needs to be sent depending on complexity of the rigging (A, B, C):

A. SIGNS & TARPAULINS (Weight < 0,05kN/m2):

- Certificates of all materials that will be used - Safety fixture elements to be used - Contact information and signature of the person in charge of the installation

B. TRUSS STRUCTURES WITH ATTACHED EQUIPMENT & TARPAULIN - Up to 10 rigging points (unsheathed truss):

REPORT with: - List with all elements weight (trusses and all elements attached / hung from them - Drawing indicating height, weight supported per rigging point and orientation of the booth within the hall - Structural materials to be used - Certificates of all materials that will be used - Safety fixture elements to be used - Contact information and signature of the person in charge of the installation

C. TRUSS WITH SHEATING & COMPLEX STRUCTURES - More than 10 rigging points:

STRUCTURAL PROJECT with:
- Report with previous requirements (left column)
- Structural calculations with weights of materials, trusses and other hanged elements
- Drawing indicating height, weight supported per rigging point and orientation of the booth within the hall
- Structural materials to be used
- Certificates of all materials that will be used
- Safety fixture elements to be used
- Contact information and signature of the technician in charge of the calculations
- Contact information and signature of the person in charge of the installation

Quotes must be **confirmed** before **18 January 2019.**

Please note: Any orders that have not been finalized by the deadline will incur a surcharge or might not be delivered.

Approval of complex structures after this date will still be mandatory. Any required rigging and certification will be subject to sufficient time being available to carry out such operations.

To ensure the safety and compliance of structure to current regulations, consider that certain structures hung from rigging points will be subject to undergo a certification process. This process may require from further documentation from the exhibitor, it may have a cost on top of the rigging cost, and will be carried out by official structural technicians, Graó Tècnic. In the below diagram you will find a breakdown of how rigging and trusses structures will be processed under each category and what documents will be required. At any point Graó Tècnic may require further documentation beside the one here under to complete their review and approval process.

CERTIFICATION PROCESS FOR HANGING ELEMENTS FROM THE CEILING
RIGGING COMPLEX STRUCTURES

PRE SHOW

ON SITE
BUILD UP PERIOD

SUBMIT STAND PLANS USING THE STAND PLAN SUBMISSION FORM
You can find this form in the Forms & Deadlines section

ORDER RIGGING POINT TO EXPORIGGING
You can find this form in the Forms & Deadlines section

SIGNS & TARPAULINS
Weight < 0,05kN/m2

- Certificates of all materials that will be used
- Safety fixture elements to be used
- Contact information and signature of the person in charge of the installation

TRUSS STRUCTURES WITH ATTACHED EQUIPMENT & TARPAULIN
Up to 10 rigging points
(unsheathed truss)

- REPORT with:
- List with all the elements weight (trtusses and all elements attached / hung from them
- Dimensioned drawing indicating height, weight supported per rigging point and orientation of the booth withing the hall
- Structural materials to be used
- Certificates of all materials that will be used
- Safety fixture elemets to be used
- Contact information and signature of the person in charge of the installation

REQUEST REVIEW BY EXPORIGGING

if confirmed as not a complex structure

if complex structure

TRUSS WITH SHEATING & COMPLEX STRUCTURES
More than 10 rigging points

- STRUCTURAL PROJECT with:
- Report with previous requeriments (left colum)
- Structural calculations with weights of materials, trusses and other hanged elemets
- Dimensioned drawing indicating height, weight supported per rigging point and orientation of the booth withing the hall
- Structural materials to be used
- Certificates of all materials that will be used
- Safety fixture elemets to be used
- Contact information and signature of the technitian in charge of the calculations
- Contact information and signature of the person in charge of the installation

DOCUMENT REVIEW BY GRAÓ TÈCNIC AND APPROVAL (OR REVISION) OF THE STRUCTURE AND MATERIALS

BUDGET FROM EXPORIGGING

BUDGET FROM EXPORIGGING (Including rigging points budget from Expo Rigging + Rigging certification budget from Graó Tècnic)

CLIENT BUDGET APPROVAL

CLIENT BUDGET APPROVAL

LEGALITZATION PROCESS

INSTALLATION PROCESS OF RIGGING POINTS BY EXPORIGGING
Always after general stand approval from Abraxys has been given

ON SITE INSPECTION

STRUCTURAL CERTIFICATE ISSUED BY GRAO TECNIC

FINAL APPROVAL

Conditions for project approval:

- Minimum project content must be submitted.
- Reviews of project content must not uncover errors.
- During analysis of project and applications, and of the structure of the halls involved, safety factors must meet prevailing regulations.
- Suitable materials must be used.
- Quality certifications of the precise materials must be provided.
- Assembly procedures must be followed so there is no damage to the hall's structure or pose a threat to the safety of people and the facilities.
- All project data shall be presented in accordance with the International System of Measuring Units and provided in Spanish or English.

Once a rigging project is approved, the exhibitor may perform the assembly on the dates scheduled for each event. The assembly must be exactly as approved in the application. Any changes must be notified and reviewed by all implicated parties (Abraxys, Graó Tècnic, Expo Rigging & Fira Barcelona).

Applicants must have the project approval document and copies of approved plans available at all times during assembly.

6. MANDATORY REGULATIONS FOR RIGGING HARDWARE

EUROPEAN REGULATIONS:

- UNE EN 13414. Steel wire cable slings. Safety
- UNE-EN 1677. Series of regulations for sling accessories. Safety.
- UNE-EN 12385:2003. Steel cables. Safety.
- UNE-EN 13411:2002. Steel cable grips. Safety.
- UNE-EN 13889:2004+A1:2009. Forged steel shackles for general lifting purposes - dee shackles and bow shackles - Grade 6 – safety
- Directive on machinery 2006/42/CE

SPANISH REGULATIONS:

- CTE. Technical building code

RECCOMENDED PRACTICES:

- NTP 155: Cables de acero
- NTP 221: Eslingas de cables de acero

7. INSPECTIONS & BUILD PERIOD

FIRA through its official structural technicians Graó Tècnic may carry out any inspection isduring assembly. Contractors must facilitate such inspections. To this end, they must make any auxiliary means used, such as lifting baskets, scaffolds, and ladders or other, available to the appointed inspectors.

Applicants must have the project approval document and copies of approved plans available at all times during assembly.

Assembly of installations that are not specifically set out in the approved projects is forbidden. If during the assembly of any element there are reasonable doubts about their suitability, FIRA may require viability tests. The costs of such testing shall be charged to the exhibitor.

Before lifting any rigged elements, you must advise **Graó Tècnic, on +34 670965795** or contact the hall manager and get your hanging connections inspected, otherwise additional costs for inspecting connections at height will be charged to the exhibitor.

FIRA and its appointed technicians have the authority to stop any structure from being built or raised if deemed necessary for safety reasons or incompliance with the submitted documentation.

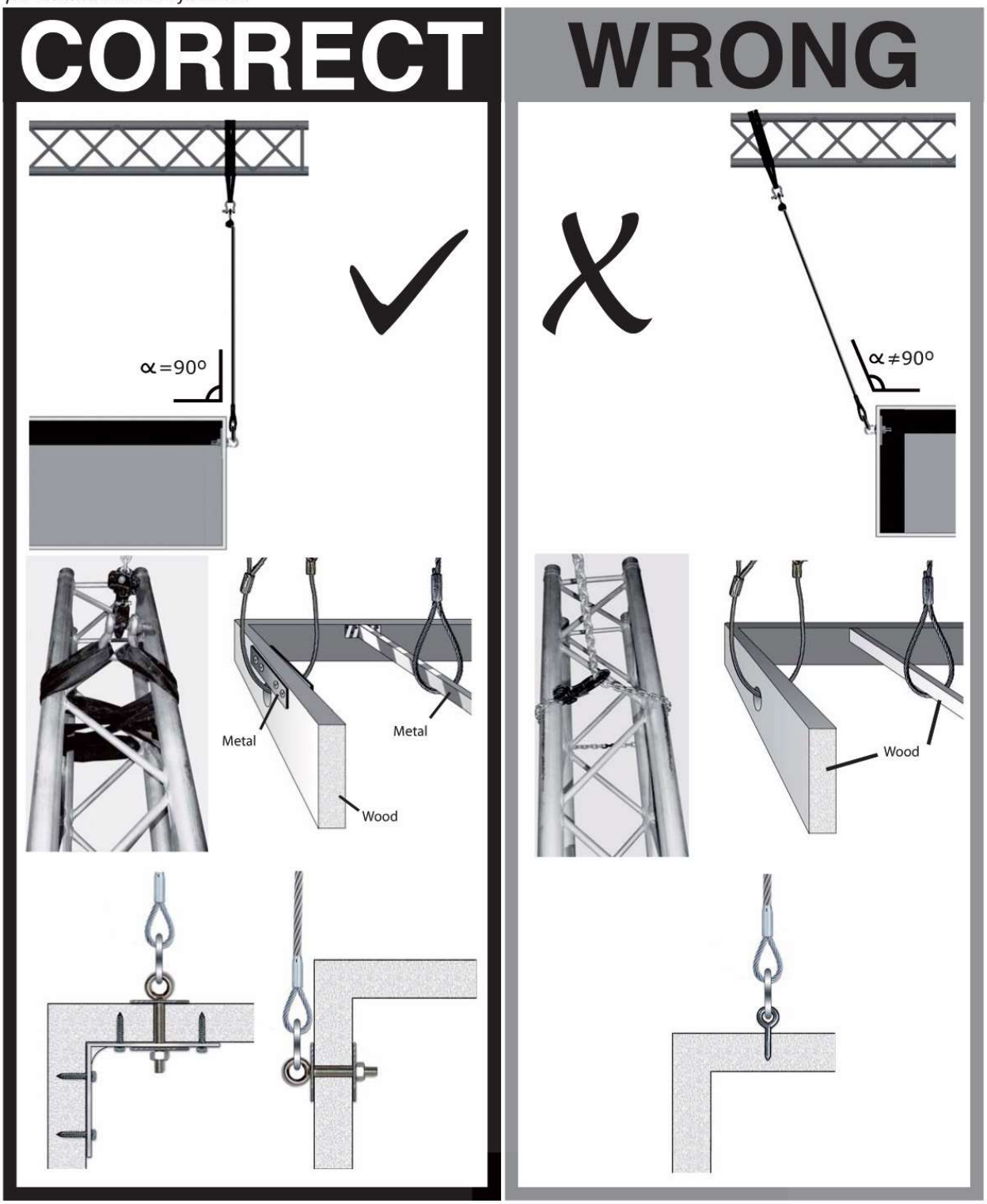
All rigging on stands has to be finished by **Saturday, 23th February 2018**, as machinery is not allowed to enter the hall and no work at height is permitted after that date.

FIRA DE BARCELONA
MWC 2019

Manual

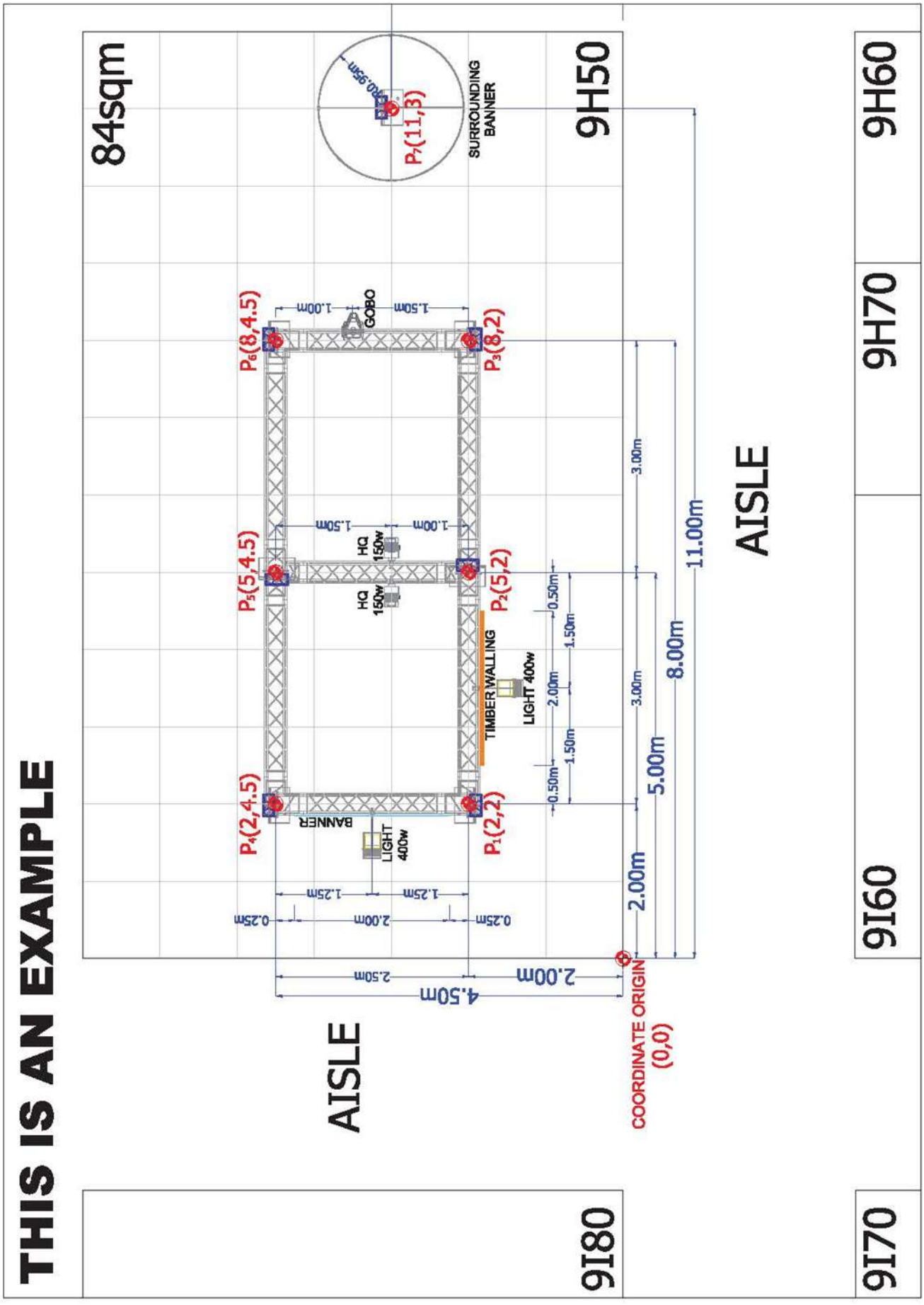
1. REMINDER FOR RIGGING AND CEILING JOINTS

Rigging points are provided with a ring or a hook. It is strictly prohibited to modify any part above these fittings.
Los puntos de Rigging se entregan con una anilla o gancho. Queda totalmente prohibido modificar cualquier elemento por encima de estas fijaciones.



Fira Barcelona EXPO-RIGGING® graó tècnic

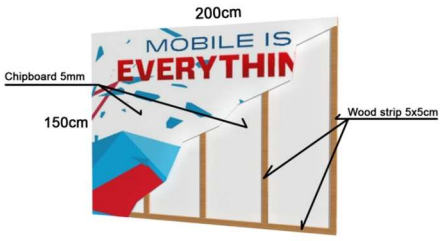
2. SAMPLE OF REQUIRED DOCUMENTATION



TOTAL LOAD EXAMPLE:

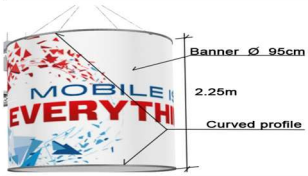
ELEMENTS WEIGHT				
	FIXED ELEMENT OF RIGGING POINT	Unit weight	Units	Total weight
	Motor hoist 500 Kg	30,00 Kg /un	7	210,00 Kg
	Truss 300 x 300mm	5,00 Kg /m	19,5	97,50 Kg
	Auxiliar truss, steel ropes and segurity cables	4 Kg /un	7	28,00 Kg
	TOTAL WEIGHT FIXED ELEMENT OF RIGGING POINT			335,50 Kg
	OTHER ELEMENTS	Unit weight	Units	Total weight
	(1) Timber walling 200 x 150cm	29,40 Kg /un	1	29,40 Kg
	Banner 200 x 120cm	0,50 Kg /sqm	2,4	1,20 Kg
	Lights 400w	14 Kg /un	2	28,00 Kg
	Lights 150w	5,00 Kg /un	2	10,00 Kg
	Gobo	30,00 Kg /un	1	30,00 Kg
	(2) Surrounding banner	9,1 Kg /un	1	9,10 Kg
		TOTAL WEIHGT OTHER ELEMENTS		107,70 Kg
		TOTAL WEIHGT		443,20 Kg

(1)



(1) Timber walling 200 x 150cm	Un	Volume m3				Density	Weight
		A m	B m	L m	m3	Kg / m3	Kg
Wood strip 5 x 5 cm	2	0,05	0,05	2,00	0,005	600	6,00
	5	0,05	0,05	1,40	0,0035	600	10,50
Chip Board thickness 5mm	2	0,005	1,50	2,00	0,015	430	12,90
						(1) WEIHGT:	29,40

(2)



(2) Surrounding banner	Un	Area and length			Density		Weight
		R m	H m	Area/length	Kg/ m	Kg / sqm	Kg
Banner Circumf. 0,95 cm radius x 2,25m	1	0,95	2,25	13,42 sqm		0,5	6,71
Curved aluminum profile Ø 10mm /1mm	2	0,95		5,97 m	0,2		2,39
						(2) WEIHGT:	9,10

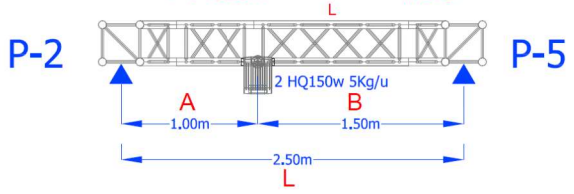
DISTRIBUTION LOAD EXAMPLE

ELEMENT	Unit weight	RIGGING POINTS P-1 UNITS	P-1 WEIGHT	P-2 UNITS	P-2 WEIGHT	P-3 UNITS	P-3 WEIGHT	P-4 UNITS	P-4 WEIGHT	P-5 UNITS	P-5 WEIGHT	P-6 UNITS	P-6 WEIGHT	P-7 UNITS	P-7 WEIGHT	TOTAL
Motor hoist 500 Kg	30,00 Kg /un	1	30	1	30	1	30	1	30	1	30	1	30	1	30	210,00
Truss 300 x 300mm	5,00 Kg /m	2,75	13,75	4,25	21,25	2,75	13,75	2,75	13,75	4,25	21,25	2,75	13,75			97,50
Auxiliar truss, steel ropes and segurity cables	4,00 Kg /un	1	4	1	4	1	4	1	4	1	4	1	4	1	4	28,00
Timber walling 200 x 150cm	29,40 Kg /un	0,5	14,7	0,5	14,7											29,40
Banner 200 x 120cm	1,20 Kg /sqm	0,5	0,6					0,5	0,6							1,20
Lights 400w	14,00 Kg /un	1	14	0,5	7			0,5	7							28,00
Lights 150w	5,00 Kg /un			(3)	6					(3)	4					10,00
Gobo	30,00 Kg /un					(4)	12					(4)	18			30,00
Surrounding banner	9,10 Kg /un													1	9,1	9,10
		P-1 =	77,05	P-2 =	82,95	P-3 =	59,75	P-4 =	55,35	P-5 =	59,25	P-61 =	65,75	P-7 =	43,10	443,20

(3)

$$\text{P-2 WEIGHT} = \frac{2 \times 5\text{Kg} \times B}{L} = 6{,}00\text{Kg}$$

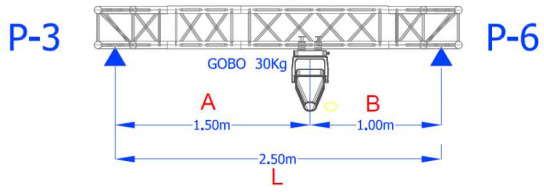
$$\text{P-5 WEIGHT} = \frac{2 \times 5\text{Kg} \times A}{L} = 4{,}00\text{Kg}$$



(4)

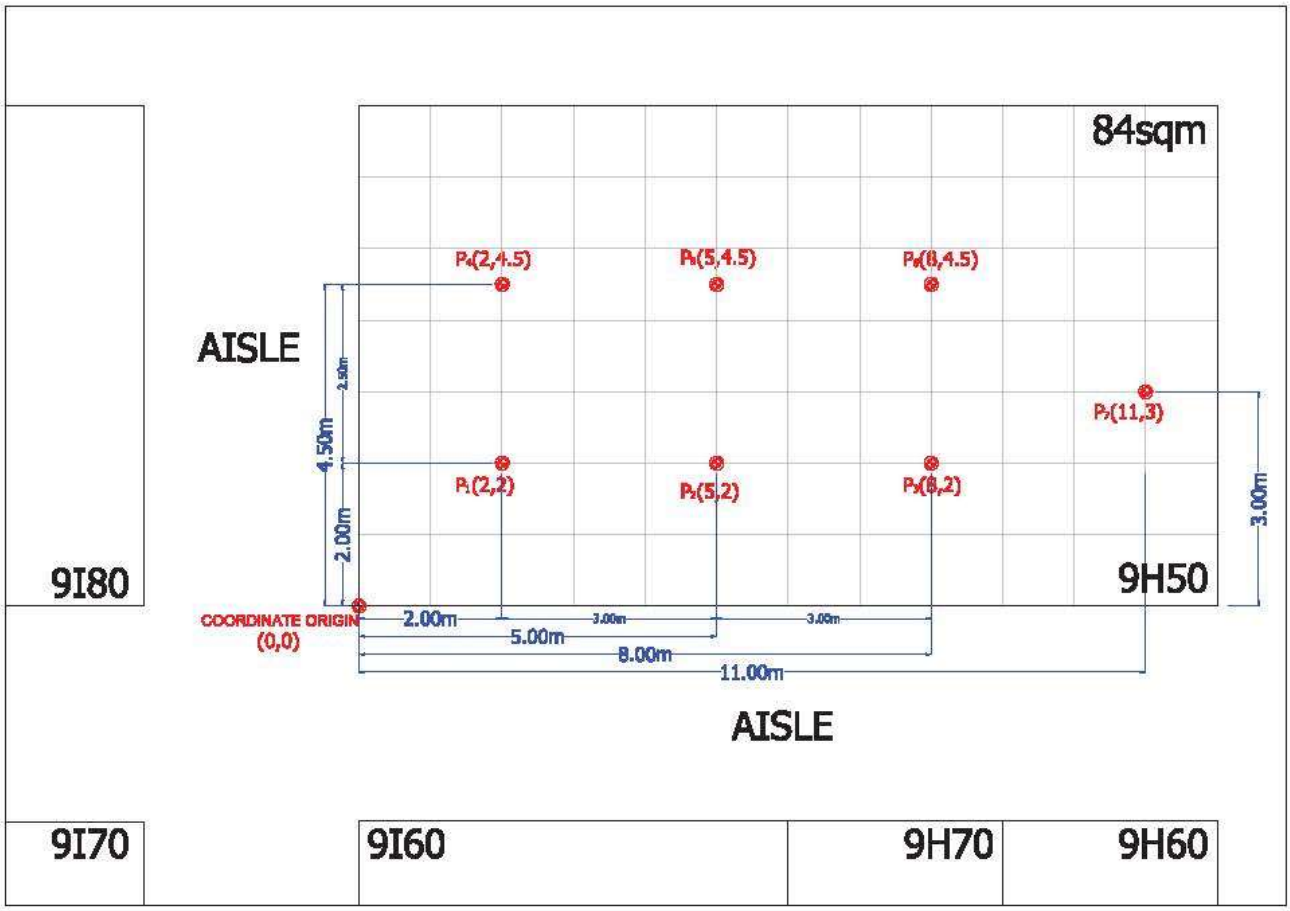
$$\text{P-3 WEIGHT} = \frac{30\text{ Kg} \times B}{L} = 12{,}00\text{ Kg}$$

$$\text{P6 WEIGHT} = \frac{30\text{ Kg} \times A}{L} = 18{,}00\text{ Kg}$$

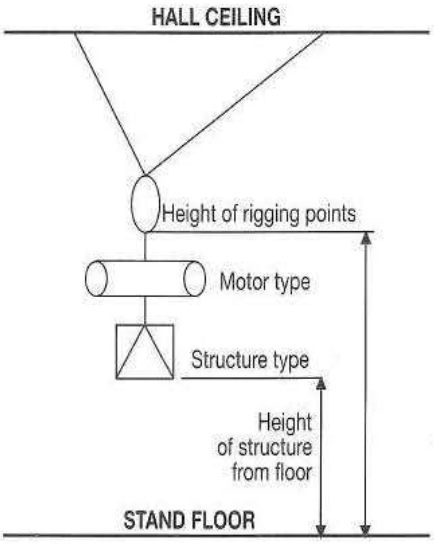


MAXIMUM ALLOWED POINT LOAD = 150 Kg

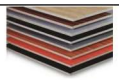
COORDINATES + WEIGHTS EXAMPLE



COORDINATES OF RIGGING POINTS				
POINT	X	Y	HEIGHT	WEIGHT
P-1	2,00	2,00	7,00	77,05 Kg
P-2	5,00	2,00	7,00	82,95 Kg
P-3	8,00	2,00	7,00	59,75 Kg
P-4	2,00	4,50	7,00	55,35 Kg
P-5	5,00	4,50	7,00	59,25 Kg
P-6	8,00	4,50	7,00	65,75 Kg
P-7	11,00	3,00	9,00	43,10 Kg

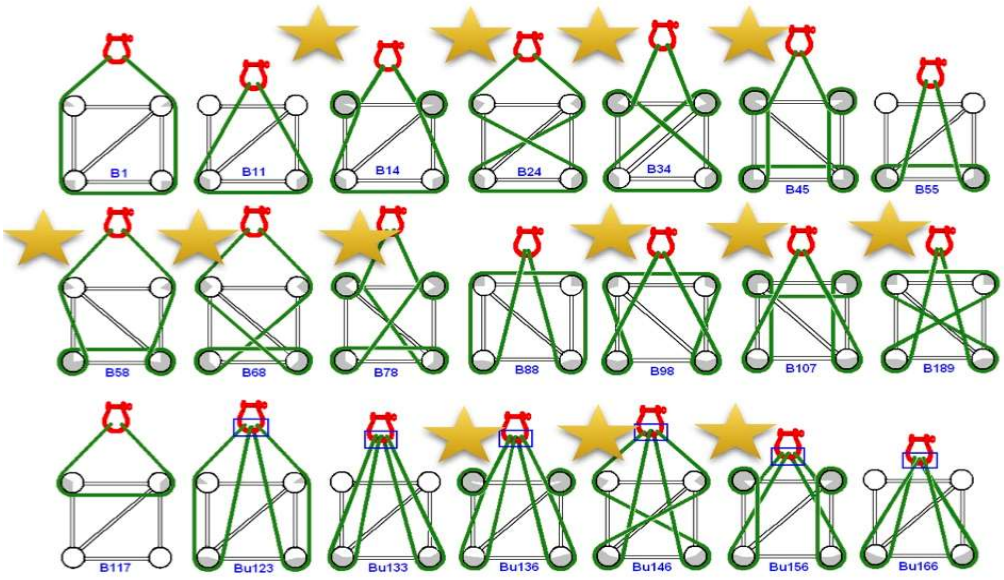


3. SPECIFIC WEIGHT OF THE MOST COMMON MATERIALS

MATERIAL	WEIGHTS		ILLUSTRATIVE EXAMPLE
Truss 30x30 NORMAL 2mm	5 - 6 Kg/m	50 - 60 N/m	
Truss 30x30 3mm Heavy duty	8 -9 Kg/m	80 - 90 N/m	
Motor up to 500 kg. Depens on the chain length	22 - 30 Kg/ut	220 - 300 N/ut	
Motor up to 1000 kg. Depens on the chain length	35 - 45 Kg/ut	350 - 450 N/ut	
Wires, slings and safety wires. Depens on length	3 - 4 Kg/ut	35 - 45 N/ut	
Manual chain hoist. Depens on length	20 - 30 Kg/ut	200 - 300 Ng/ut	
Electrical wire. According to section 0,6-1,1Kv 5x6	550 gr/m	5,5 N/m	
Electrical wire. According to section 0,6-1,1Kv 5x10	873 gr/m	8,73 N/m	
Electrical wire. According to section RV-K0,6-1,1Kv 4x2,5	135 gr/m	1,35 N/m	
Fixed spotlight	5 Kg	50 N	
Mobile spotlight	30 Kg	300 N	
Halide lamps	12 - 15 Kg	120 - 150 N	
Built-in walls/ceilings	8 -10 Kg	80 -100 N	
Banner	350-600 gr/m^2	3,5-6 N/m^2	
Opaque textile ceiling	300-350 gr/m^2	3-3,5 N/m^2	
Textile ceiling	120-180 gr/m^2	1,2-1,8 N/m^2	
Pine wood, spruce bar (resinous woods)	600-620 Kg/m^3	6,00-6,20 kN/m^3	
DM wood (MDF, Medium densitiy fibreboard)	750-770 Kg/m^3	7,50-7,70 kN/m^3	
Normal chipboard	660-680 Kg/m^3	6,60-6,80 kN/m^3	
Fireproof chipboard	720 Kg/m^3	7,20 kN/m^3	
Laminated chipboard (melamine)	700 Kg/m^3	7,00 kN/m^3	
Plywood	430 Kg/m^3	4,30 kN/m^3	
Hot-rolled steel profiles	7.850 Kg/m^3	78,50 kN/m^3	
Alluminium profiles	2.700 Kg/m^3	27 kN/m^3	

4. GOOD PRACTICES WITH RIGGING HARDWARE: SLING HITCHES

With a star the most appropriate practice to sling truss. Notice always technical data of the slings and trusses.



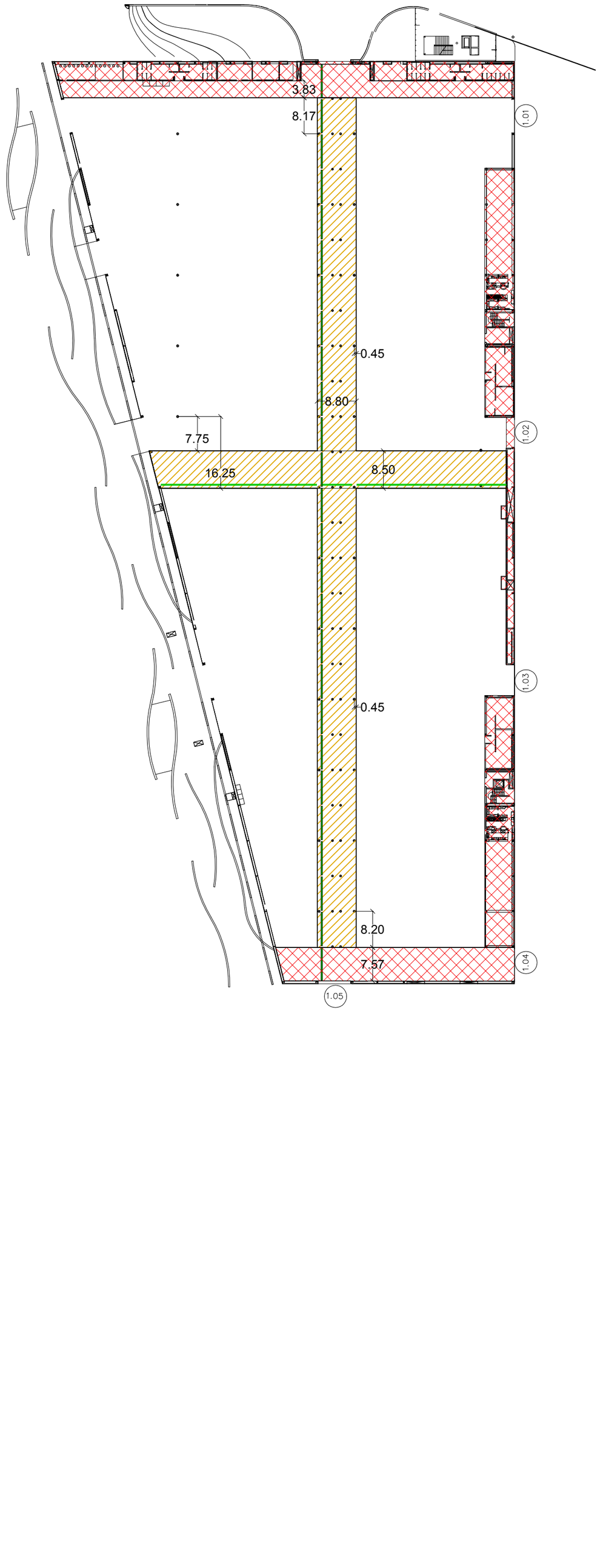
FIRA DE BARCELONA
MWC 2019

Appendix

(RIGGING RESTRICTIONS FLOORPLANS)

M2 H1. Pre rigging areas and Rigging restrictions

Main entrance



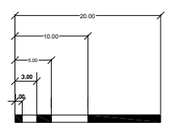
Av. de Joan Carles I

Hall 2

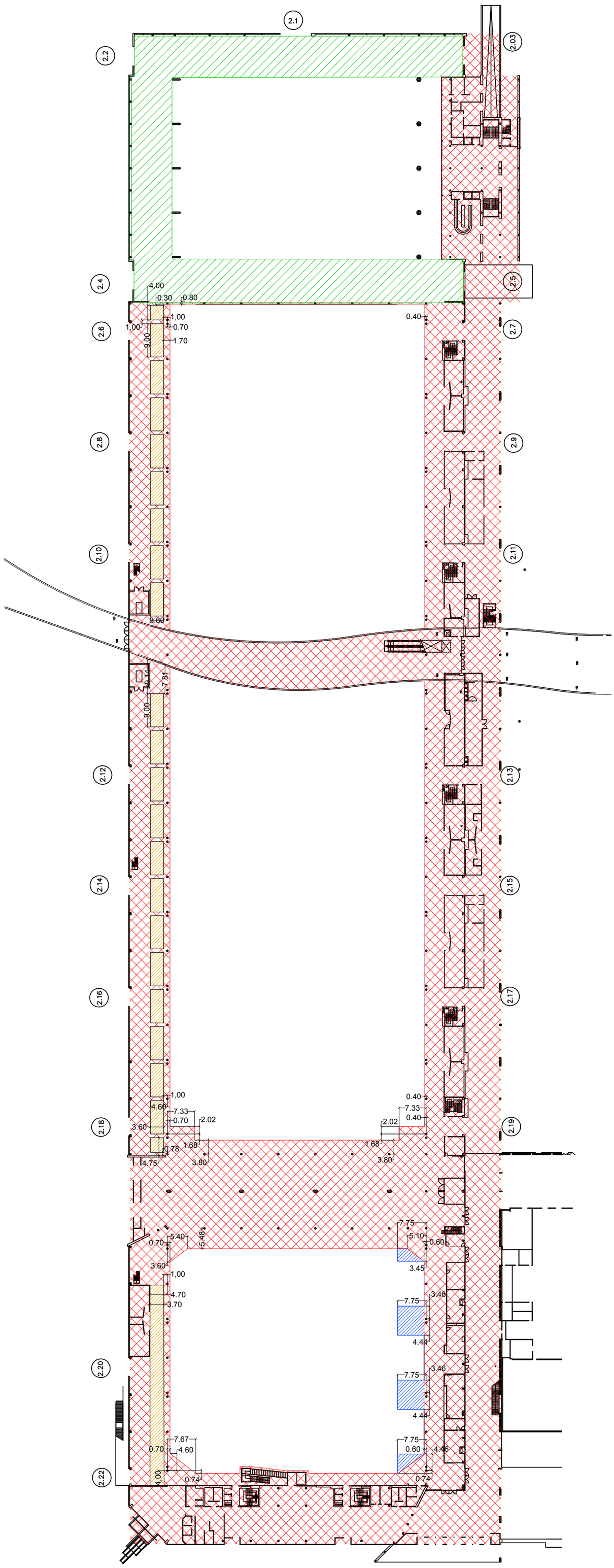
Smoke courtain h = 7,26 m
(height under the courtain)

No Rigging

Using pre-rigging; Height O-ring: 6,80 m



M2 H2. Pre rigging areas and Rigging restrictions



Hall 1

Hall 3

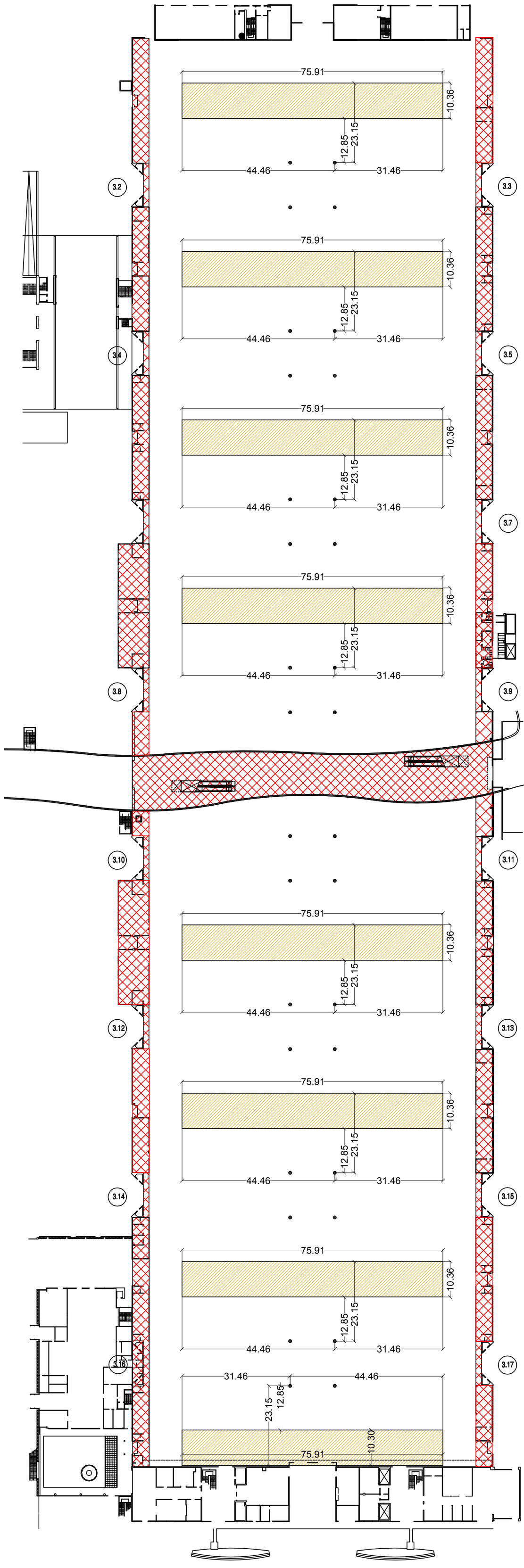
Height O-ring = 6,50 m.

Using pre-rigging; Height O-ring = 4,80 m.

Using pre-rigging. Height O-ring = 6,50 m.

No Rigging

M2 H3. Pre rigging areas and Rigging restrictions



Hall 2

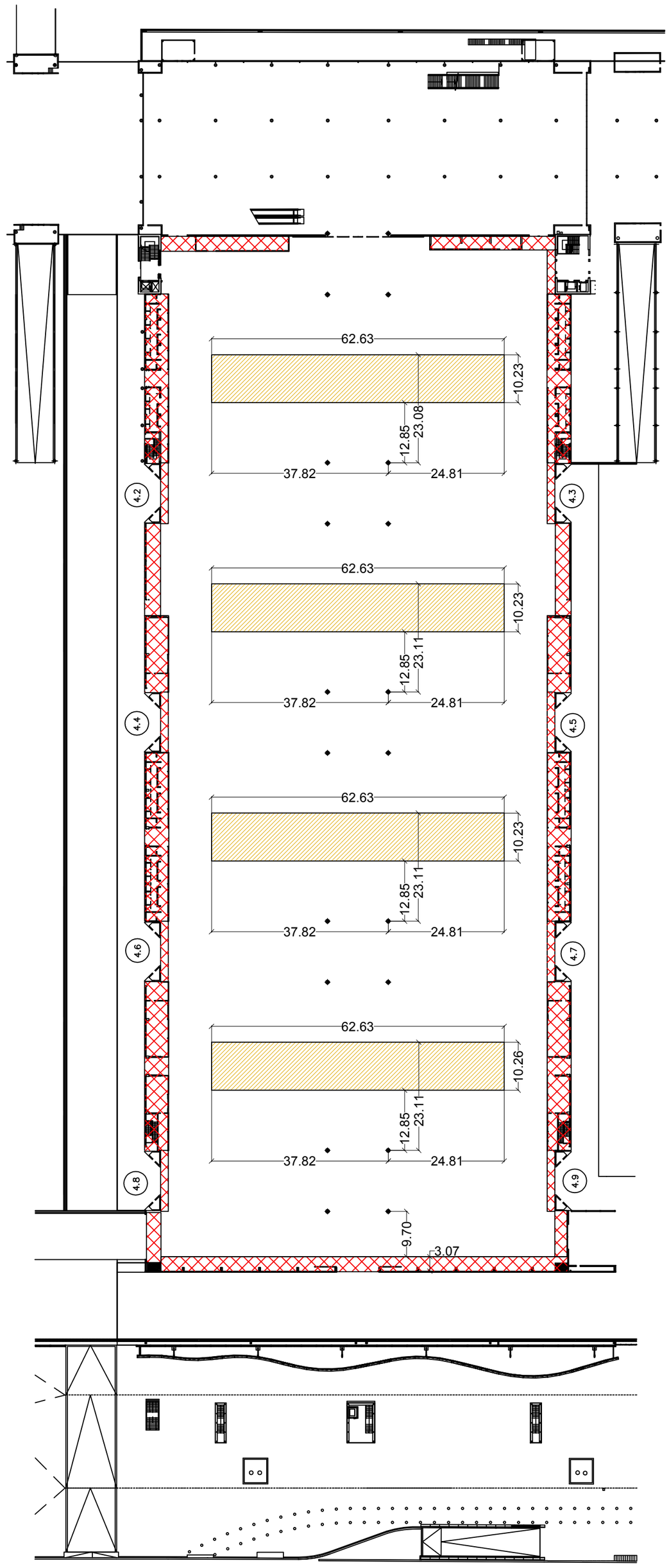
Hall 4

No Rigging

Low capacity rigging area.
Using pre-rigging; Max height O-ring: 8,00 m.

C/ de la Botànica

M2 H4. Pre rigging areas and Rigging restrictions

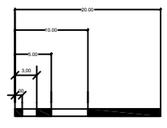


Hall 3

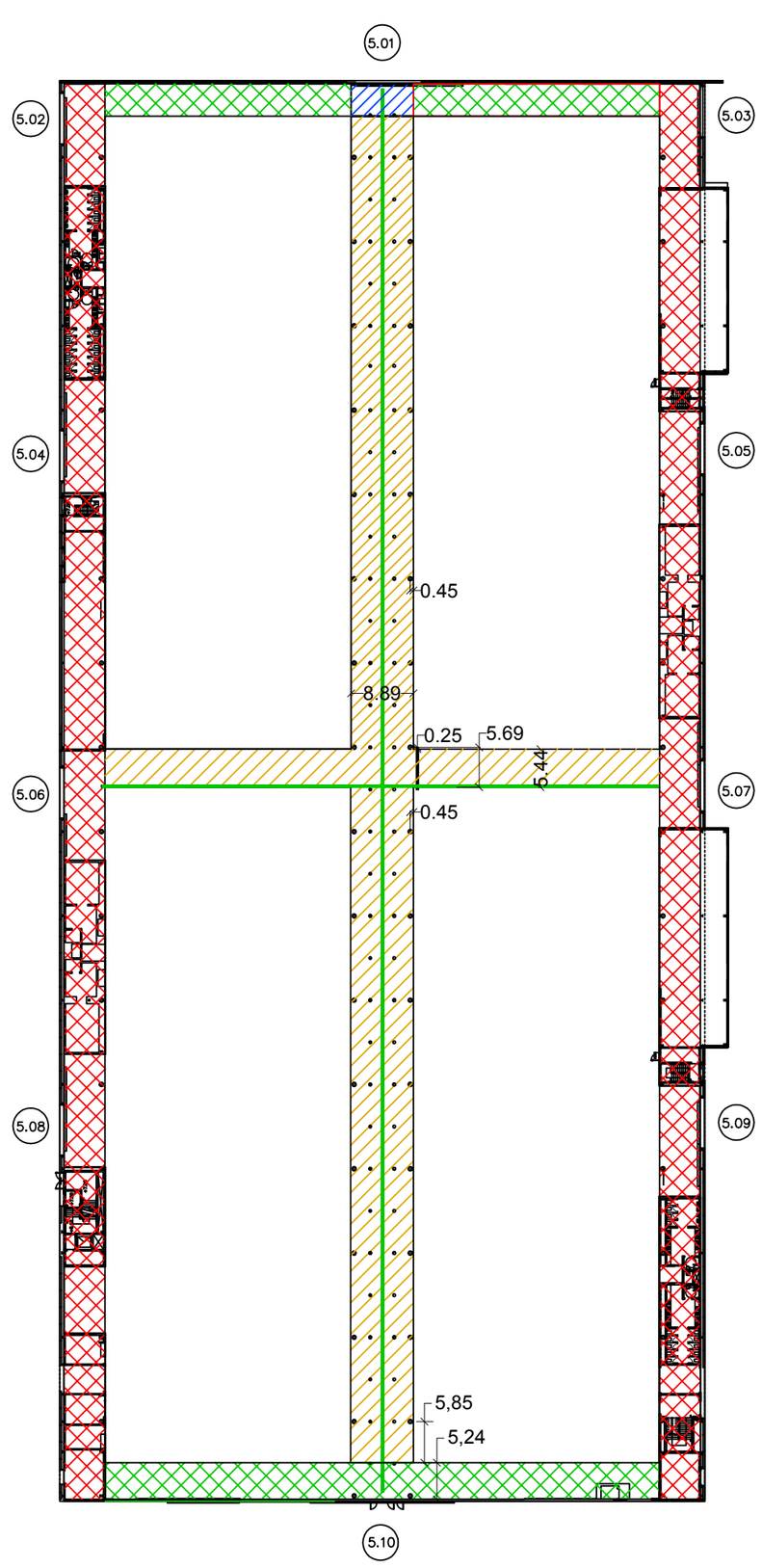
Hall 6

No Rigging

Low capacity rigging area.
Using pre-rigging; Max height O-ring: 8,00 m.



M2 H5. Pre rigging areas and Rigging restrictions



Hall 3

Hall 7

Gateway

Hall 4

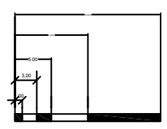
Smoke courtain h = 7,90 m
(height under the courtain)

Using pre-rigging; Height O-ring = 7,40 m

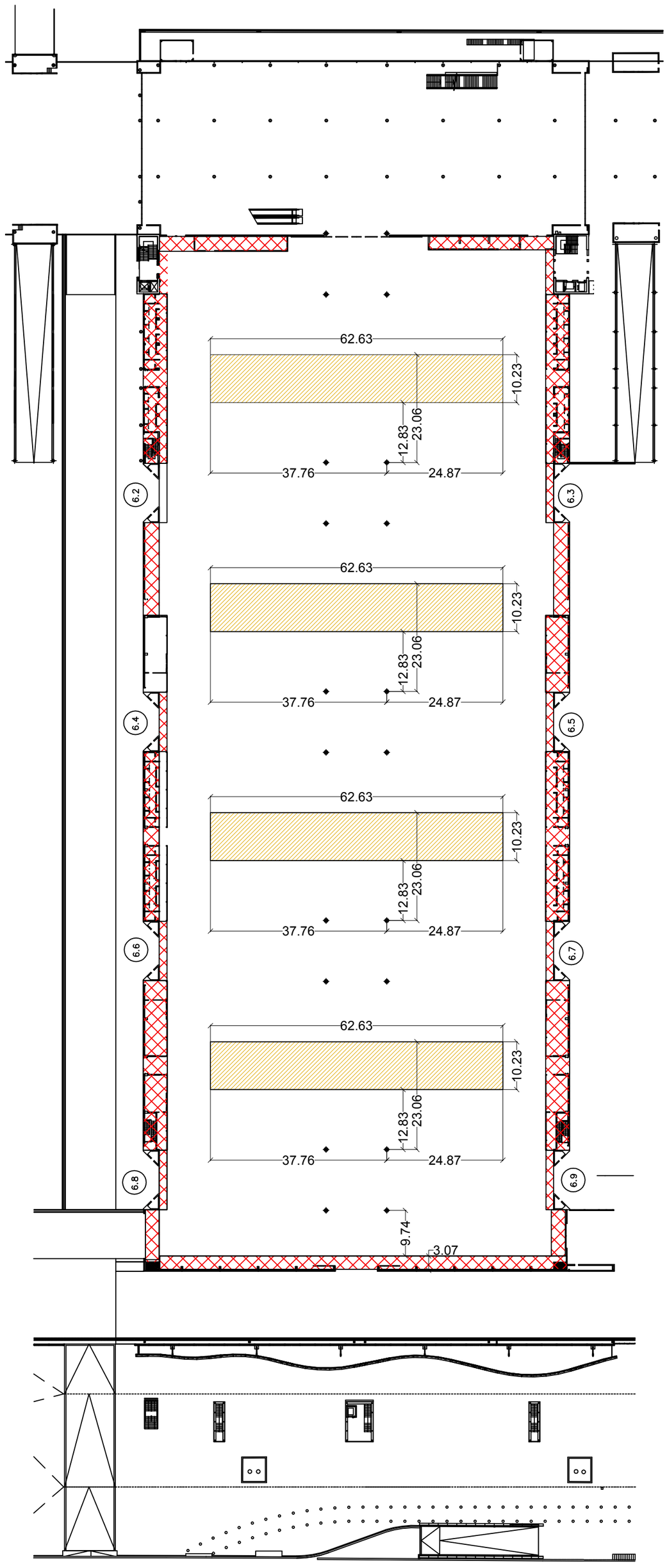
Using pre-rigging; Height O-ring = 6,50 m

Low capacity rigging area

No Rigging zone



M2 H6. Pre rigging areas and Rigging restrictions

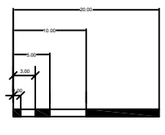


Hall 4

Hall 8

No Rigging

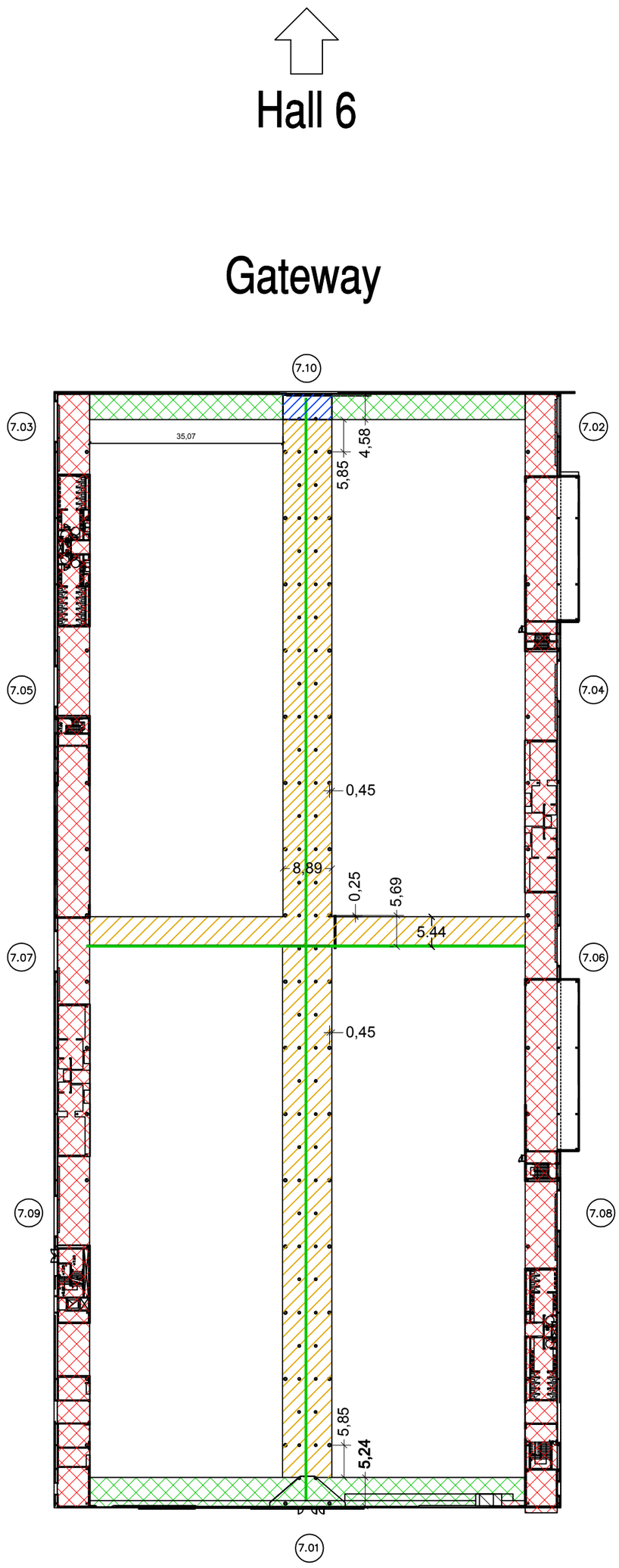
Low capacity rigging area.
Using pre-rigging; Max height O-ring: 8,00 m.



M2 H7. Pre rigging areas and Rigging restrictions

Hall 6

Gateway



c / de l'Alumini

Hall 5

c / de les Ciències

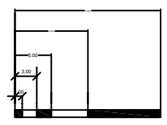
Smoke courtain h = 7,90 m
(height under the courtain)

Using pre-rigging; Height O-ring = 7,40 m

Using pre-rigging; Height O-ring = 6,50 m

Low capacity rigging area

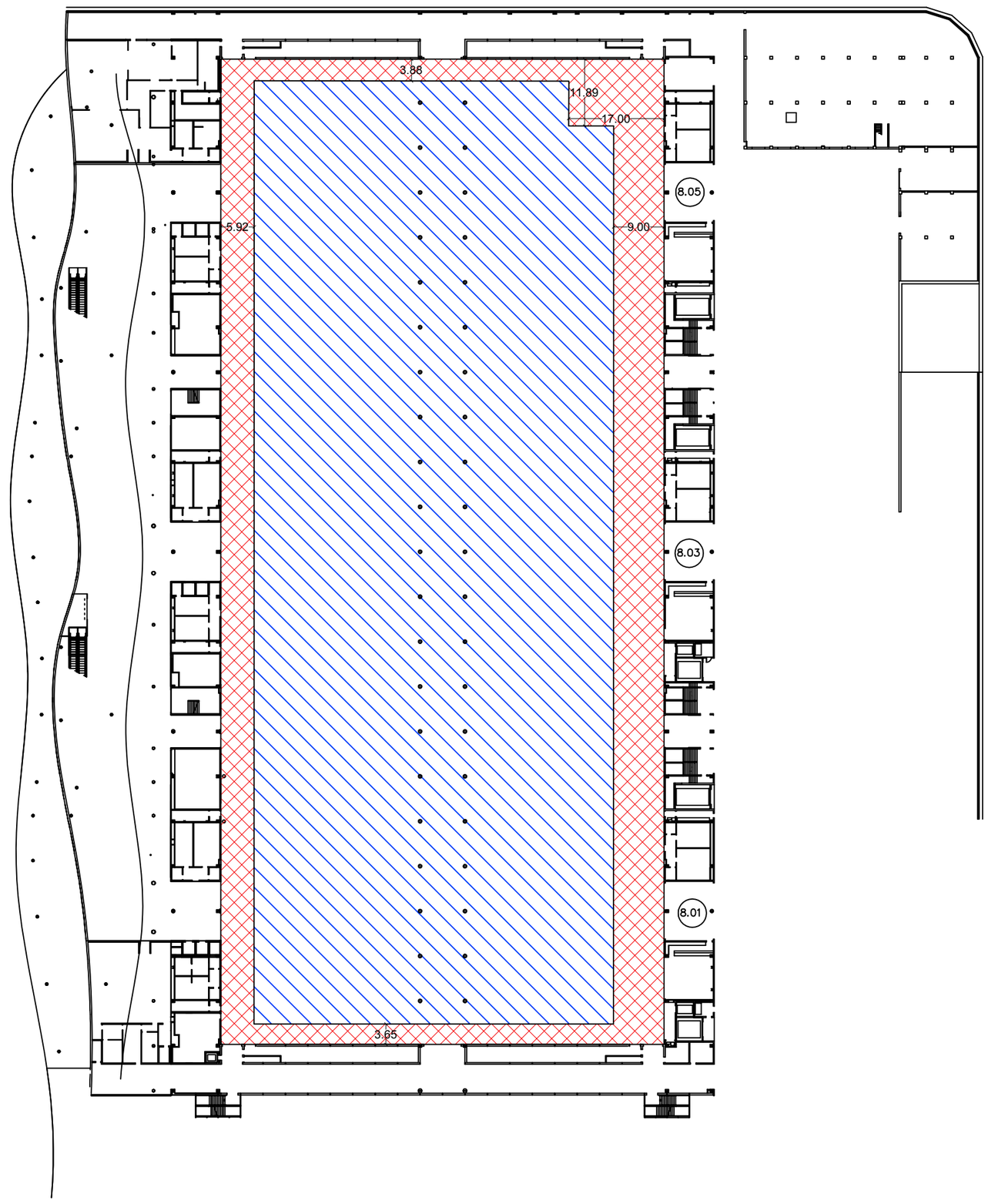
No Rigging zone



M2 H8.0. Pre rigging areas and Rigging restrictions

Hall 6

c/ de l'Alumini



Square

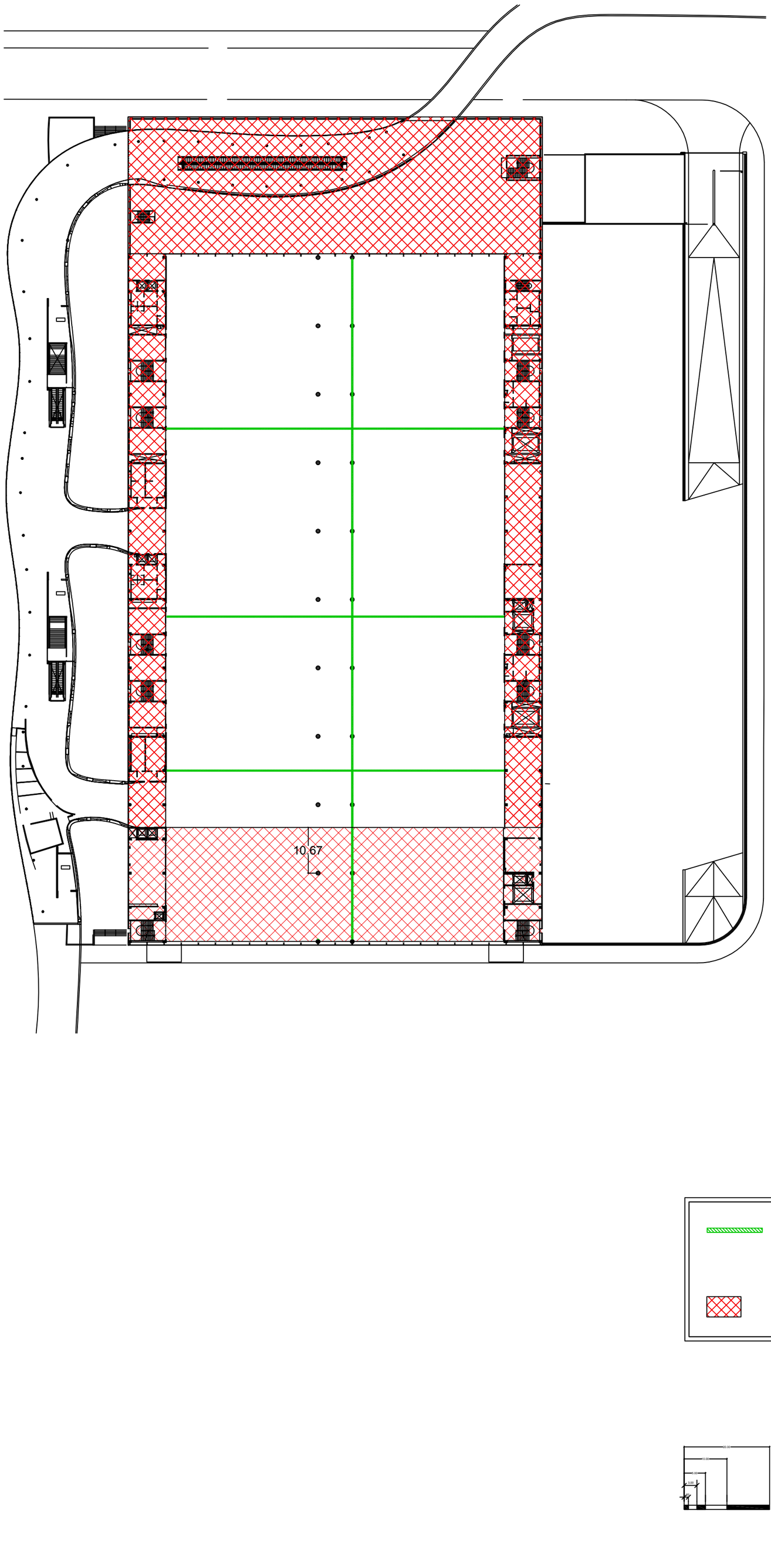
Using pre-rigging 2 levels
H rigging point = 5,70 m (5,55 with O-Ring)

No-rigging zones

M2 H8.1. Pre rigging areas and Rigging restrictions

Hall 6

c/ de l'Alumini



Square

Smoke courtain h = 8,00 m
(height under the courtain)

No rigging zone