2021

Regulations for hanging structures in halls. Rigging

IFEMA MADRID

Contents

NOTE: The pertinent NTP Regulations can be found on the official website of the National Institute for Occupational Safety and Health At Work, pertaining to the Ministry of Employment and Social Security. Please see below the corresponding links.

MAIN SITE
http://www.insht.es/portal/site/Insht/

NTP 155
http://www.insht.es/InshtWeb/Contenidos/Documentacion/FichasTecnicas/NTP/Ficheros/101a200/ntp_155.pdf

NTP 221
http://www.insht.es/InshtWeb/Contenidos/Documentacion/FichasTecnicas/NTP/Ficheros/201a300/ntp_221.pdf

NTP 861
http://www.insht.es/InshtWeb/Contenidos/Documentacion/FichasTecnicas/NTP/Ficheros/856a890/861w.pdf

NTP 866
http://www.insht.es/InshtWeb/Contenidos/Documentacion/FichasTecnicas/NTP/Ficheros/856a890/866w.pdf

1. PURPOSE

This purpose of this document (the "Regulations") is to set out the requirements for any elements to be rigged to or hung from any structure in IFEMA's exhibition halls. The Regulations are intended to ensure the safety of people and facilities, during both the assembly and disassembly stages, as well as that of the finished structure during any event.

2. SCOPE

The Regulations govern all rigging components used to hoist any element from the structure of IFEMA's exhibition halls.

Rigging materials covered in the Regulations include hoisting and hanging elements. Other hanging elements from these are not covered.

3. TARPAULIN INSTALLATIONS WEIGHING UNDER 0.05 KN/m²

Installations of signs whose necessary materials for their rigging weigh less than **0.05 Kn/m²** (5 kg/m²) shall be exempt from the approval procedure.

All signs must have at least three rigging points. They must be rigged as indicated in point 2 of the Manual.

4. GENERAL INSTALLATION CONDITIONS FOR THE OTHER ELEMENTS

Companies that are exhibiting and/or assembling signs must rig their elements on the points installed by IFEMA, in accordance with the request submitted by the former. From these points, all rigged elements must comply with the characteristics stipulated following the procedure specified in this document.

The structure to be rigged must be designed in such a way as not to compromise the safety of persons or the installations, both during the assembly phase and in the finished structure. The main objectives and requirements for any element hanging from the structure of IFEMA's exhibitions are as follows:

- Exhibition hall structures bearing loads transferred from hanging elements have higher safety structures than those laid down in prevailing regulations.
- 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 IFEMA, 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, as guaranteed by compliance with the regulations outlined in section 5 of the Regulations and any another applicable regulations.
- Any steel cables used must have a diameter of at least 6 mm. Nylon elements must have a minimum tensile strength of 7 kN (700 kg).
- Structures must be fitted with a safety system comprising enough stress-free steel cables to support the load if the main cables break. The diameter of these cables must be at least 8 mm and equal to or greater than the diameter of the main cables. These elements shall be installed by IFEMA together with the rigging points, leaving enough length for their subsequent use. Safety cables will be installed in any structure or hanging element immediately after it is hoisted.

The safety cables must be arranged to prevent stress in their final structure. Accordingly, they must be placed with a length limiting maximum play to less than 15 cm.

The full installation of the safety cable shall be performed by IFEMA under any type of contract.

- Any elements hanging from a truss or structure (e.g. spotlights, loudspeakers, motors, sheathing, truss weights) must have a safety system consisting of steel cables.

- Exhibitors may only use the hanging points located in the vertical line of the space occupied by the stand. Where such points must be located outside this area, authorisation by IFEMA is required.
- There must be at least two rigging points for each assembly.

5. PROCEDURE FOR REQUESTING AUTHORISATION TO HANG ELEMENTS FROM HALL STRUCTURES

The procedure for exhibitors wishing to hang elements from any of the rigging points provided by IFEMA in the structure of exhibition halls is as follows:

- A floor layout must be sent to **stecnica@ifema.es** indicating the position and height of each requested point.
- A rigging project must be sent to **inspeccion.rigging@ifema.es** indicating the minimum content specified in Section 6 of this document, together with a printed copy of the authorisation request, properly filled-out.
- The due date for receiving projects is one month prior to the start of assembly for the event being requested. Any applications received thereafter might not be considered, and thus not be authorised to hang riggings from the hall structures.
- Projects received shall be reviewed for compliance with IFEMA's rules and regulations and the conditions laid out in the Regulations.
- IFEMA shall issue a ruling on the application within seven days from receipt. Potential rulings include:
  i. Application approved. The exhibitor may perform the assembly shown on the application form. Approval of an application implies authorisation for assembly only. Neither IFEMA, nor companies participating in inspection of the assembly, assume any responsibility for the project.
  ii. Application with remarks. The exhibitor must adapt the project in accordance with IFEMA's remarks and resend it for a new review. Remarks may refer to any aspect of the installation; e.g. the need to increase the number of force transmission points, reduce the amount of each, change location, change materials.
  iii. Application rejected. Applications that fail to comply with the conditions outlined in this manual are denied.
- 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 receive prior approval by IFEMA.
- Applicants must have the project approval document and copies of approved plans available at all times during assembly.
- IFEMA technicians or technicians of companies contracted for assembly must ensure that the assembly adheres to the approved projects. 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, IFEMA may require viability tests. The costs of such test shall be borne by the exhibitor.

6. MINIMUM CONTENT OF RIGGING PROJECTS

Projects attached to rigging authorisation applications must provide precise definitions of any elements to be rigged. The minimum documentation, depending on the type of installation, is detailed below.

6.1. Applications for truss rigging authorisation

Where only unsheathed truss-type structures are to be rigged, together with individual objects, the following documentation must be provided:

- Explanatory brief of the installation to be carried out.
- Description of the assembly provided it involves transferring loads to the structure.

- Weight values all elements comprising the rigging system (e.g. spotlights, loudspeakers, motors, sheathing, truss weights).
- Scale diagrams showing floor and elevation measurements of the installation, indicating the location and situation of each rigging point for hanging elements and the hall structure. Appendix 1 of this manual provides an example.
- Value of the load transferred by each hanging point.
- List of materials to be used for structural purposes.
- Quality certification of these materials.
- Description of the safety system used, doubling the capacity of the original system.
- Signed documentation by an officer from the installing company.

6.2. Signage weighing less than 0.05 Kn/m² (5 kg/m²)

Signage elements (tarpaulins / canvases) whose necessary materials for their rigging weigh less than **0.05 Kn/m²** (5 kg/m²) shall be exempt from the approval procedure if they use at least three support points.

6.3. Other riggings

Where authorisation applications are submitted to rig elements other than those described in the preceding sections, the minimum documentation required is listed in section 6.1, in addition to a project drafted by a qualified technician, certified by their professional organisation describing and supporting the structural safety of such elements.

7. CONDITIONS FOR PROJECT ACCEPTANCE

All projects that comply with the following conditions will be accepted:

- Minimum project content must be as specified in section 6 of this document.
- Reviews of project content must not uncover errors.
- During analysis of the project and applications, and of the structure of the halls involved, safety factors must meet prevailing regulations.
- Suitable materials must be used to transfer loads safely.
- Quality certifications of the precise materials must be provided.
- Assembly procedures must be followed that do not damage the structure of the exhibition hall or pose a threat to the safety of people or the facilities.

All project data shall be presented in accordance with the International System of Measuring Units and provided in Spanish or English.

8. MANDATORY 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-CWA 15902-2. Equipment for the elevation and suspension of loads on stages, and other production areas, within the entertainment industry. Part 2: Specifications for the design and production of trusses and steel or aluminum towers.
- CTE. Technical building code.

9. QUALITY DOCUMENTATION TO BE SUBMITTED WITH PROJECTS

Installers must provide quality certification for all resistance-mission materials to be used in the assembly.

10. COLLABORATION WITH INSPECTIONS

IFEMA may carry out any inspections is deems fit during assembly. Installers must facilitate any such inspections. To this end, they must make available to the appointed inspectors any auxiliary means they are using, such as lifting baskets, scaffolds, ladders or others.

11. COMMUNICATION BETWEEN IFEMA AND APPLICANTS

Rigging authorisation applications must be sent via e-mail to **inspeccion.rigging@ifema.es**. Any modifications thereto must be sent to the same address. Communications by other means will be rejected.

Manual

1. PURPOSE

On 1 January 2009, mandatory regulations regarding the hanging structures in IFEMA's exhibitions halls came into force. The Regulations are designed to provide a series of guidelines for drafting authorisation applications and for assembly and dismantling operations of hanging elements. The contents of the Regulations are complemented by the aforementioned mandatory regulations. In the event of discrepancy between the two, the mandatory regulations shall prevail.

2. INSTALLATION OF SIGNAGE TARPAULINS / CANVASES

Before performing your installation in the hall, you will first need to fill out the form that will be provided to you by the hall manager.

To hang signs, materials must be chosen that will not damage the structure of the exhibition hall by adopting measures such as the protection of slings with rubber.

Supports on exhibition hall structures must be designed so as not to damage the structures. The main rules applicable in this respect are as follows:

- Rigging elements must be arranged vertically when the structure permits, except in exhibition halls 12, 14.0 and 14.1 where vertical loads are mandatory in all cases.
- Support must be provided by a simple steel sling.
- Steel thimbles must be fitted at both ends.
- Any parts of cables that come into contact with the structure of the exhibition halls must be covered with a PVC, reinforced polyurethane or other plastic material sleeve to protect both the cables and the structure paint.
- Slings may not rest on the sharp edges of the structure. To prevent this, protection corner pieces and brackets must be inserted between the sharp edges and the cable.

3. INSTALLATION OF OTHER ELEMENTS

3.1. Acceptable rigging locations

Elements may only be installed from the points provided by IFEMA after an authorisation request has been submitted from the exhibitor or assembler. The following elements, amongst others, may not be hung:

- Installation elements (e.g. ducts, channels, lighting elements, etc.).
- Elements from other rigged elements (e.g. informative panels, etc.).
- Secondary elements of the structure (e.g. belts, bracing, etc.).

If for the requested rigging points to be hung vertically, indispensable pre-rigging elements must be installed, the exhibitor will be invoiced for this pre-rigging at the established rates.

3.2. Maximum loads permitted for structures

The maximum hanging load at each point shall be 5 Kn (500 kg) at truss connections in exhibition halls 1 through 10 and 2.5 Kn (250 kg) at positions between connections. In hall 12 the maximum load shall be 3.0 Kn (300 kg), and in Halls 14.0 and 14.1 it shall be 3.5 Kn (350 kg).

3.3. Acceptable materials

Cables and slings made of steel, nylon or a combination of the two may be used to hang elements.

Nylon slings may be used provided that the safety cable system described in Section 6 is made of steel, so that the system is sufficiently stable in the event of a fire.

Slings must have a loop or eye at each end. This can be obtained by means of a forged end fitting, a conic end fitting, a pressure-fit ferrule (sleeve) or a welded end ferrule. All loops must be formed using thimbles.

Clamps (staples) or clips may only be used to form eyelets on the safety cable, reducing the load resistance of the cable by at least 20%. Thimbles must always be used to form eyelets or loops. Clamps must be installed as indicated in Figures 4 and 5 of NTP 155.

The company must check the conditions of slings along their entire length before they are positioned. Slings that are unsuitable or were manufactured more than five years prior, cannot be used.

Cables with broken, loose, frayed, knotted, folded or kinked wires cannot be used.

Slings where the end fittings, ferrules or thimbles are damaged or bent are considered unsuitable and may not be used for rigging in the exhibition halls.

All elements require manufacturer quality certificates and must be properly marked.

The manufacturer, or its representative established in the European Economic Community must issue a certificate that includes at least the following information:

- The manufacturer's name and address or that of its European Union representative.
- Geometrical specifications.
- For cables: the type and direction of wiring (braiding to the right or left, preformed or not, crossed or Lang type), the wiring feedthrough, the manufacture (cable composition, nature and composition of the cable core, number of thin wires and number of wires). A section diagram with measurements.
- Material specifications. For cables: nominal wire tensile strength, minimum tensile strength, information about the nature of protection against internal and external corrosion (in the event of galvanization, the quality must be indicated), certification that the cable is manufactured in a single piece and that its specifications are the same along its entire length.
- Temperature limits for use of the cable.
- Maintenance and inspection regulations

Compliance with the following regulations is mandatory:

- UNE EN 13414:2004. Steel wire cable slings. Safety.
- UNE-EN 1677:2001. Series of regulations for sling accessories. Safety.
- UNE-EN 12385:2003. Steel cables. Safety.
- UNE-EN 13411:2002. Steel cable grips. Safety.
- UNE-CWA 15902-2. Equipment for the elevation and suspension of loads on stages, and other production areas, within the entertainment industry. Part 2: Specifications for the design and production of trusses and steel or aluminum towers.
- CTE. Technical building code.

Compliance with the provisions in documents NTP 155, NTP 221, NTP 861 & NTP 866 is also recommended.

3.4. Safety cables

Safety cables must be put in place in all assemblies to prevent the hanging structure from collapsing if any element breaks. The following conditions must be satisfied:

- Safety cables must connect the structures rigged by the exhibitor to the structure of the exhibition hall.
- Once the two ends of the safety cables are fixed, they must be stress free.
- Their section must support the associated cable load plus 25% to factor in any sudden stress.
- Exhibitors must fix all structure or elements rigged immediately after they are hoisted.
- Safety cables must be positioned so that they are stress free in their final situation. The distance between the truss point and the hall structure point to which they are joined may not exceed 15 cm.

- Slings and shackles must be used to fix safety cables to the structure of the exhibition halls. Staples (cable grips) or any other duly approved system must be used at the other end.

3.5. Reaction calculations procedure during assemblies

Applications for authorisation to hang structures must contain data on the loads to be transferred to the structure at each requested rigging point. To determine these values, the real weight of each hanging component and their distribution must be taken into consideration. Depending on the characteristics of the system to be installed, the use of one of the following procedures will be admitted:

- An estimate of reactions via distribution by load areas. This simplified procedure is only allowed where the load per point is lower than 3 kN (300 kg). A diagram showing the location of each weight and justification of their value is also required. The procedure consists of distributing load areas and assigning the corresponding loads to each point. Appendix 1 of the Regulations includes an example of its application.
- An estimate of reactions via a structural model. This is the standard and mandatory model for systems with loads of over 3 kN (300 kg).

3.6. Procedure during assemblies

Installing companies authorised to hang elements that will be suspended in any exhibition hall must contact the hall manager for authorisation before commencing any assembly.

Only installations that comply strictly with the project approved by IFEMA will be authorised. Any required on site modifications must also receive prior authorisation by IFEMA.

IFEMA may carry out any inspections is deems fit during assembly. Installers must provide all necessary means for such inspections. To this end, they must make available to the appointed inspectors any auxiliary means being used, such as lifting baskets, scaffolds, ladders or others.

Appendix: Sample of Required Graphic Documentation and Calculation by Load Area

REQUEST FOR AUTHORIZATION TO FIT HANGING STRUCTURES/RIGGING

FAIR SERVICES DEPARTMENT

Send to inspeccion.rigging@ifema.es

IFEMA CALL CENTRE

CALLS FROM SPAIN
INFOIFEMA 902 22 15 15

INTERNATIONAL CALLS (34) 91 722 30 00

FAX (34) 91 722 51 27

IFEMA
Feria de Madrid
Avda. del Partenón, 5
28042 Madrid
Spain

lineaifema@ifema.es

www.ifema.es

IFEMA Feria de Madrid

C.I.F. Q-2873018-B

INFORMATION TO BE FILLED IN BY THE INSTALLATION COMPANY

FAIR/EVENT _____

APPLICANT COMPANY DETAILS

COMPANY _____ Tax ID _____

TRADE NAME _____

ADDRESS _____

POSTCODE _____ CITY _____

PROVINCE/STATE _____ COUNTRY _____

TELEPHONE _____ FAX _____ EMAIL _____ WEBSITE _____

PERSON IN CHARGE _____ POSITION _____

INVOICE DETAILS (Fill in only if other than above)

COMPANY _____ Tax ID _____

ADDRESS _____ CITY _____

PROVINCE/STATE _____ COUNTRY _____

TELEPHONE _____ FAX _____ EMAIL _____ WEBSITE _____

PERSON IN CHARGE _____ POSITION _____

EXHIBITING/ORGANISING COMPANY DETAILS

COMPANY _____ STAND N° _____

BASIC INFORMATION FOR THE ELEMENTS TO BE HUNG FROM THE HALL STRUCTURE

TYPE OF STRUCTURE TO BE HUNG _____

N° OF HANGING POINTS IN THE HALL STRUCTURE _____

TOTAL SUSPENDED WEIGHT _____

INFORMATION TO BE FILLED IN BY THE INSPECTION COMPANY

PLAN CHECK

	YES	NO
REPORT IS ATTACHED	☐	☐
THE WEIGHTS OF ALL ELEMENTS ARE SHOWN	☐	☐
ANNOTATED SKETCHES ARE PROVIDED	☐	☐
THE LOADS FOR EACH HANGING POINT ARE SHOWN	☐	☐
THE LOADS TO BE TRANSMITTED ARE ACCEPTABLE	☐	☐
THE SECURITY SYSTEM IS DESCRIBED	☐	☐
QUALITY CERTIFICATES ARE PROVIDED	☐	☐

RESULT OF THE PLAN CHECK: _____

COMMENTS: _____

HANGING POINTS TO BE INVOICED

N° OF POINTS: _____

PLAN PRESENTATION DATE: _____

ASSEMBLY CHECK

	YES	NO
ASSEMBLY CONFORMS TO THE APPROVED PLAN	☐	☐
CORRECTIONS WERE NEEDED	☐	☐
THE SECURITY SYSTEM IS IN PLACE	☐	☐
MEASURES HAVE BEEN ADOPTED TO PROTECT THE HALL STRUCTURE	☐	☐

RESULT OF THE ASSEMBLY CHECK: _____

COMMENTS: _____

IMPORTANT INFORMATION: The installation company must make known, before the start of assembly, any damage found in the structural elements in the area where the installation is to be performed. In the event it does not, IFEMA shall assume that it is satisfied with the area and any damage detected from then onward shall be assumed to have been caused by the company. Furthermore, the installation company undertakes to collect all of the elements referred to in this authorisation at the end of the fair. In the event it fails to do so or if the facilities are damaged, IFEMA shall invoice the company for the cost incurred to collect, repair and/or return such to their original state.
The installation company is responsible for the accuracy of the information provided in this application and any documents attached hereto such as the plan, the rigging report and, in particular, all that concerns the weight and dimensions of each component of the system.
The authorisation of this application in no event means that IFEMA or the companies with which it has partnered for this service are responsible for the structural solution planned.

Person in charge from the installation company	Project check. Inspection company	Assembly inspection check. Inspection company
Date and signature	Date and signature	Date and signature

The applicant company confirms that it is aware of and accepts the prevailing rules (see note on reverse).

STAND INFORMATION:

FAIR: EXAMPLE 2012

STAND NUMBER: 7B11

NAME OF THE EXHIBITOR: IFEMA

CONTACT DETAILS OF THE MANAGERS:

Phone number and e-mail address of the project and rigging managers.

666 555 444, 91 333 22 11 inspeccion.rigging@ifema.es

Rigging start date: 12-12-2012

DESCRIPTION OF THE RIGGING INSTALLATION:

The installation will consist of a square 30x30 cm aluminum truss structure of 10 meters by 7 meters. On that structure there will be 40 lights and two corporative banners. The structure will be carried by 4 motor hoists.

For the security cable system, there will be four cables at the same position as the chain hoists.

MATERIALS TO USE:

- Square aluminum truss 30x30 cm by TRUSS brand (included all auxiliary elements).
- Electric motor hoists for 500 kg by MOTOR brand.
- Steel ropes 6 mm diameter for tension cables (hanging cable), brand CABLE.
- Steel ropes 10 mm diameter for free tension cables (security cable), brand CABLE.
- Steel plastic protected ropes 10 mm diameter for contact to hall strucutre, brand CABLE.
- Lights 400 brand FOCO.

WEIGHT VALUES:

The total weight of the assembly is distributed in four rigging points to the Hall beams:

Element	Unit weight	Quantity	Total weight
Motor hoist 500 kg	50 kg	4	200
Truss 30 x 30	5 kg/m	34	170
Corner 30 x 30	10 kg	4	40
Aux. truss elements	0,5 kg/m	34	17
Steel ropes	0,5 kg/m	40	20
Security cables	1,0 kg/m	25	25
Lights 400 W	12 kg	40	480
Banners	25 kg	2	50
TOTAL			**1002**

		ZONE 1		ZONE 2		ZONE 3		ZONE 4		TOTAL
Motor hoist 500 kg	50 kg	1	50	1	50	1	50	1	50	200
Truss 30 x 30	5 kg/m	8,5	42,5	8,5	42,5	8,5	42,5	8,5	42,5	170
Corner 30 x 30	10 kg	1	10	1	10	1	10	1	10	40
Aux. truss elements	0,5 kg/m	8,5	4,25	8,5	4,25	8,5	4,25	8,5	4,25	17
Steel ropes	0,5 kg/m	10	5	10	5	10	5	10	5	20
Security cables	1,0 kg/m	9	9	9	9	3,5	3,5	3,5	3,5	25
Lights 400 W	12 kg	5	60	5	60	5	60	25	300	480
Banners	25 kg	0,5	12,5	0,5	12,5	0,5	12,5	0,5	12,5	50
		TOTAL	**193,25**	**TOTAL**	**193,25**	**TOTAL**	**187,75**	**TOTAL**	**427,75**	**1002**

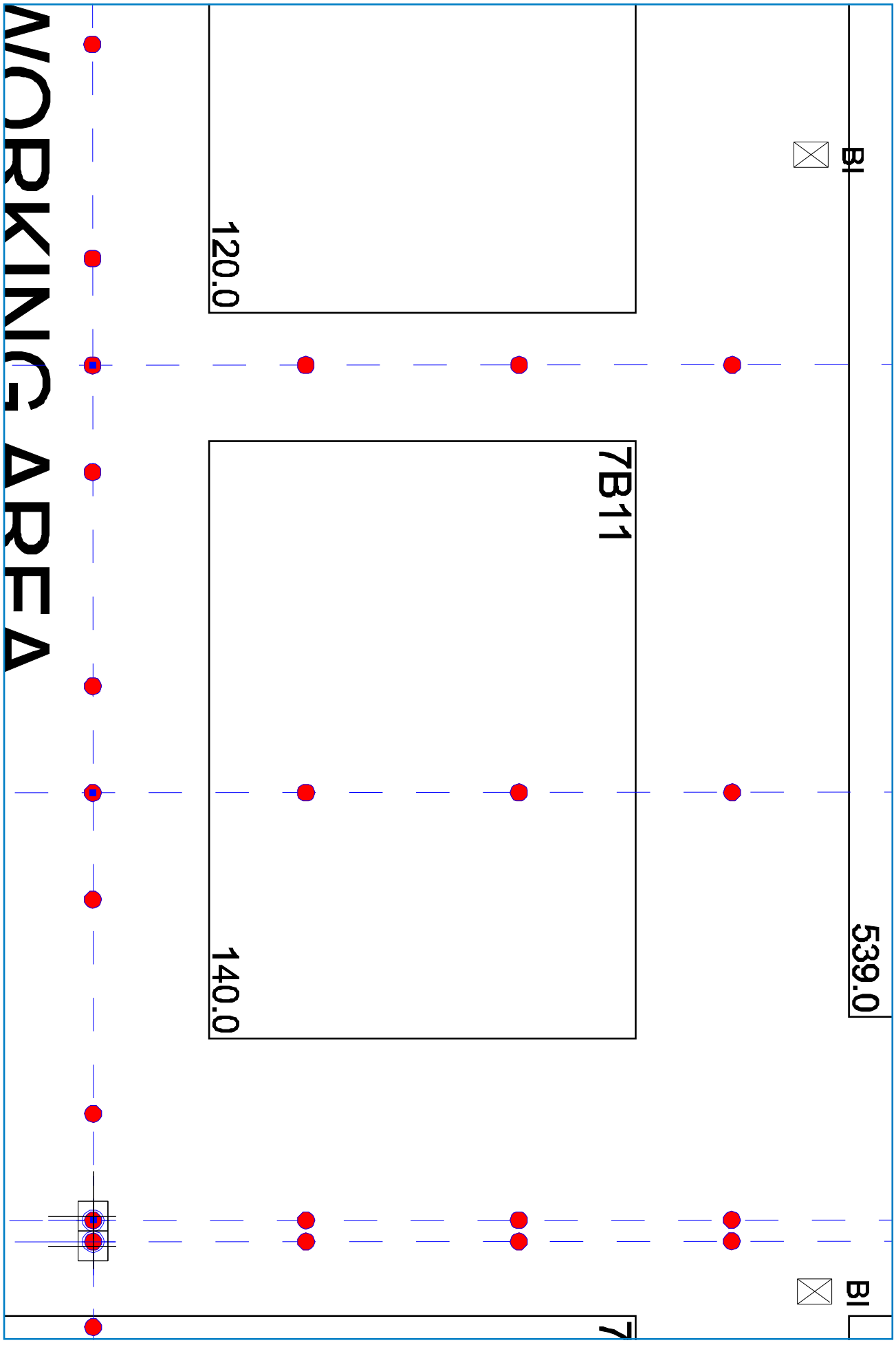
Given the total weight to be carried by chain hoists numbers 3 & 4, the sum of the load along the beam exceeds the 250 kg allowed by IFEMA regulations, so the truss connection points shown on the rigging plans must be used.

SECURITY CABLE SYSTEM:

There will be four security cables in the assembly (free of tension). The cables will be with bridles to make secure the installation.

ATTACHED:

- Original structure plan.
- Measured element plans (top view, front view, right view).
- Measured plan with the weight per point and the weight to the beam (top view, front view, right view).
- Measured plans (top view, front view, right view) with the truss and motor hoists.
- Measured plans (top view, front view, right view) with the security cables.
- Quality certificates of the structural materials..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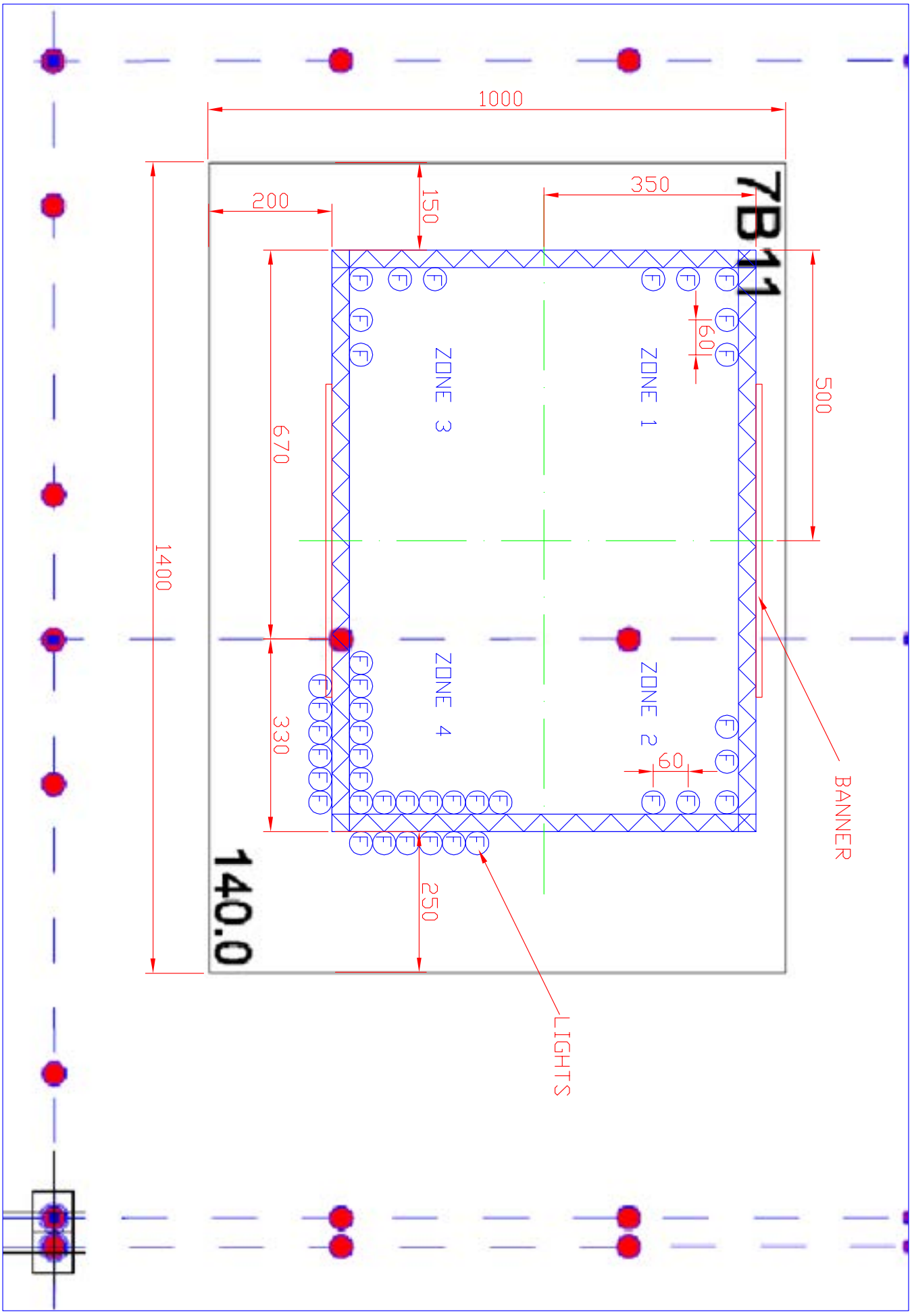
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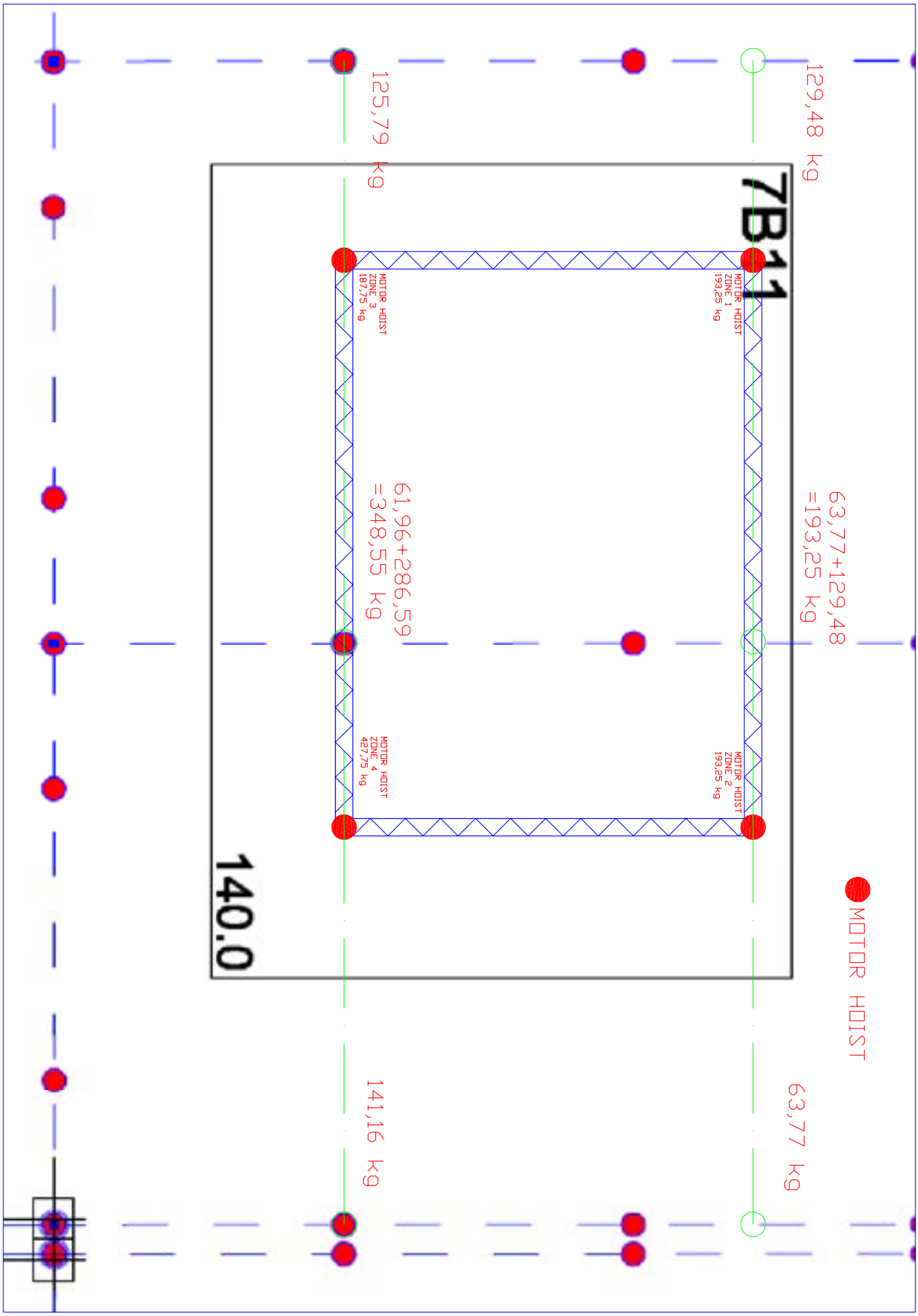
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140.0
129,48 kg
125,79 kg
63,77+129,48
=193,25 kg
61,96+286,59
=348,55 kg
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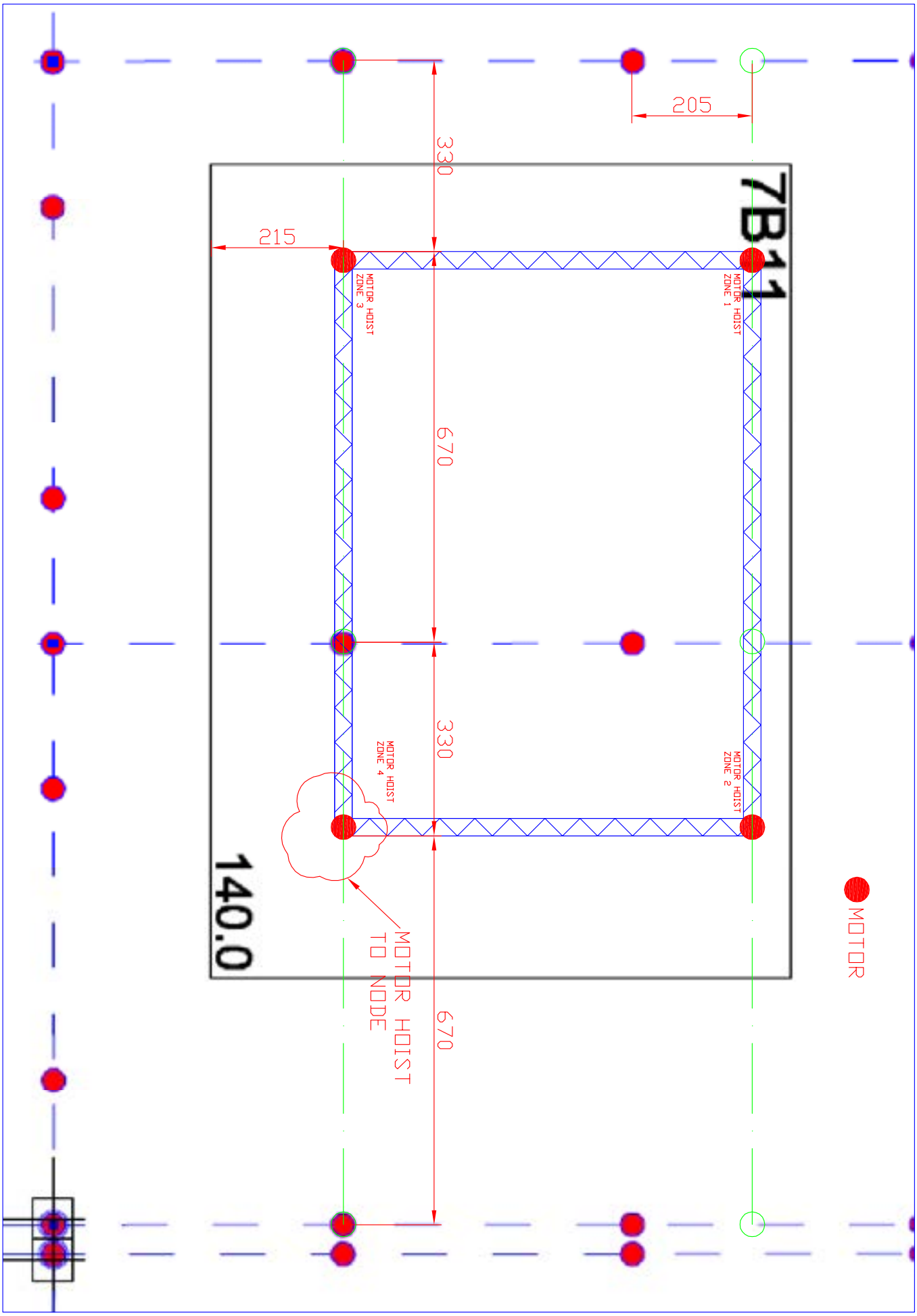
MOTOR HOIST
MOTOR HOIST ZONE 1 193,25 kg
MOTOR HOIST ZONE 2 193,25 kg
MOTOR HOIST ZONE 3 187,75 kg
MOTOR HOIST ZONE 4 427,75 kg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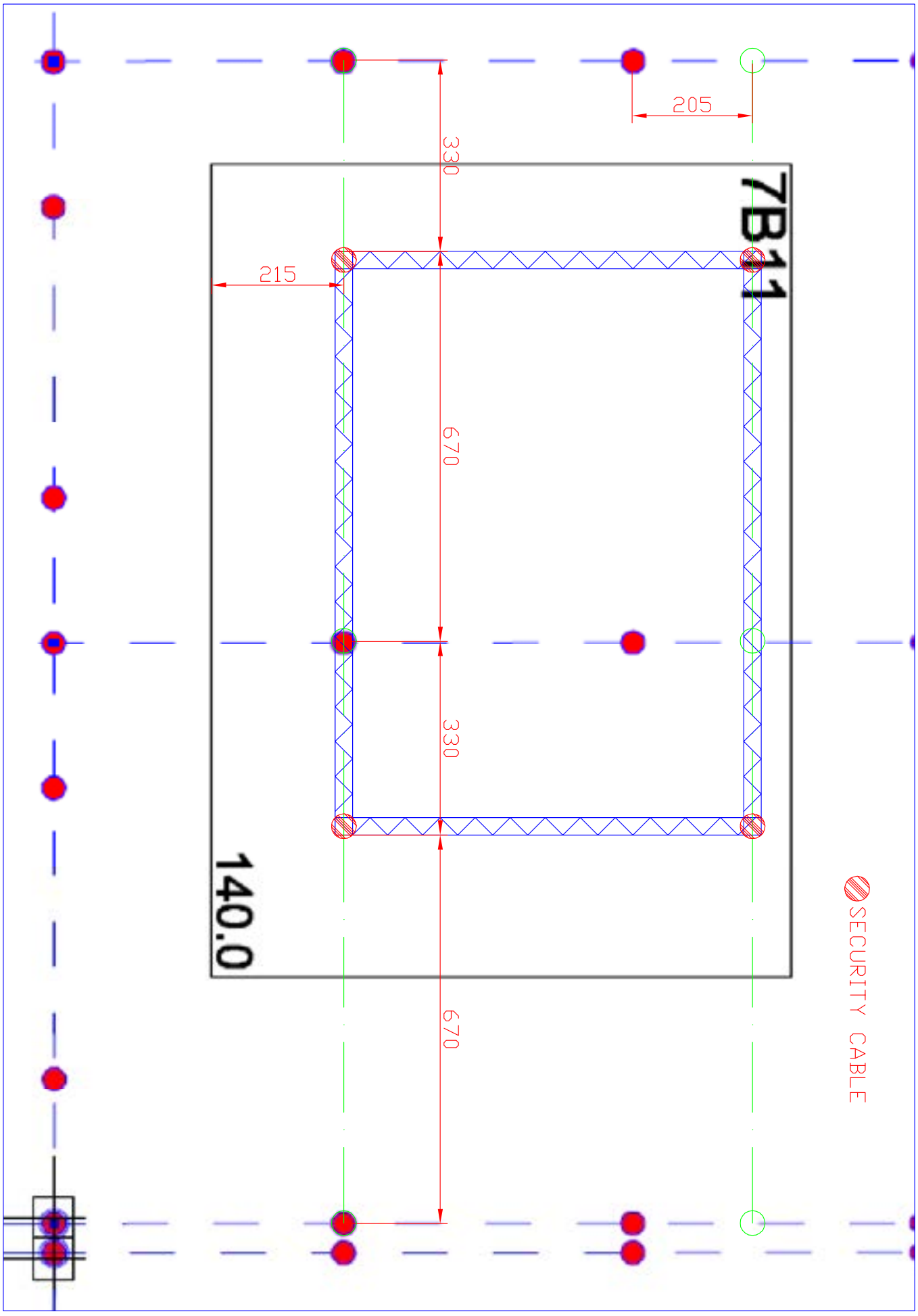
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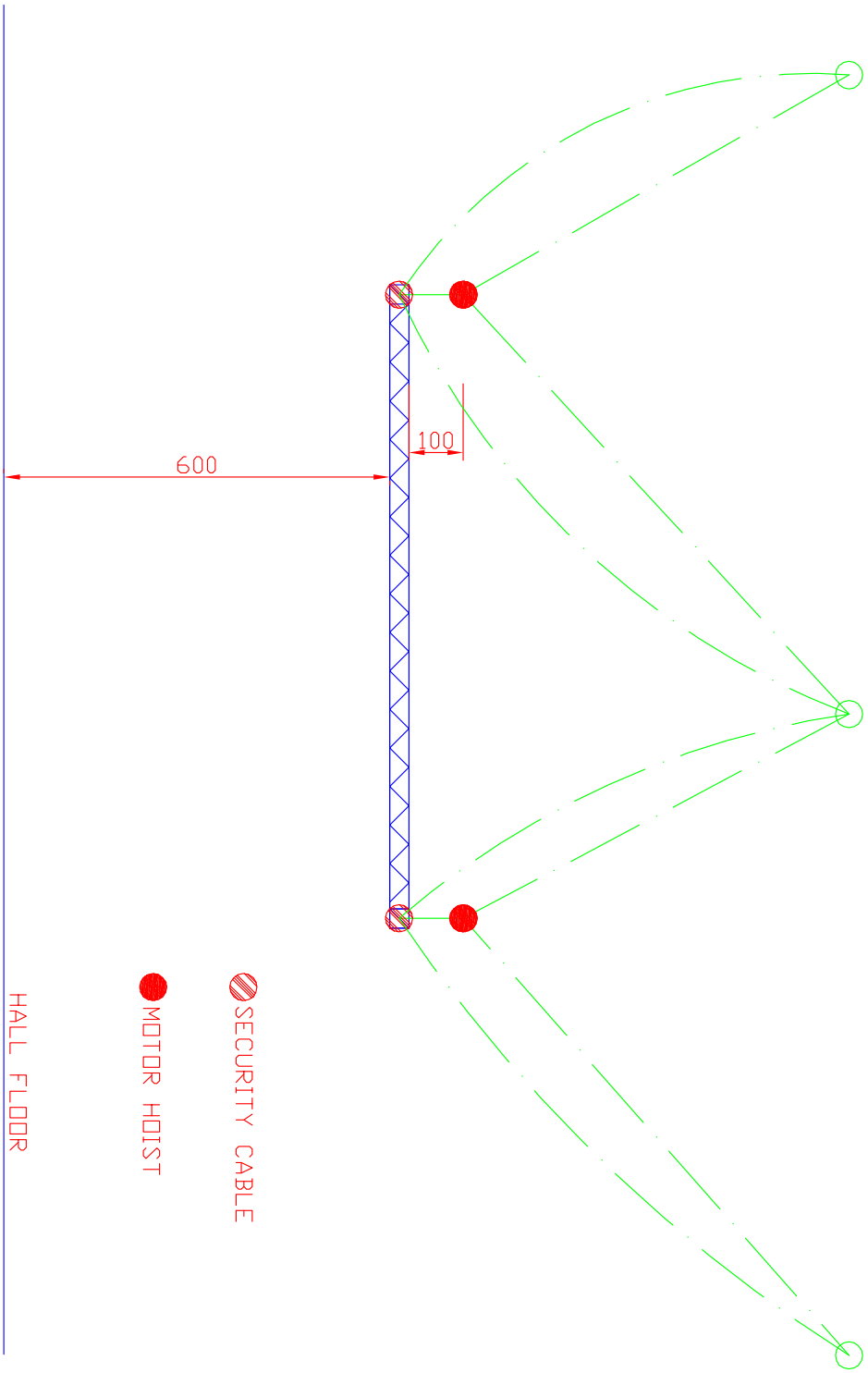
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HALL FLOOR
MOTOR HOIST
SECURITY CABLE

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