Orion Vertical Platform Lift

Pre-installation manual

Construction and auxiliary work which must be performed by the customer in order to prepare for the installation of the ORION vertical platform lift

PRE-OR04-EN-01

ThyssenKrupp Encasa

ThyssenKrupp

The Customer must perform all of the operations prescribed by this manual in order to allow for the installation of the vertical platform lift.

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1. Definitions

Vertical Platform lift: A fixed-installation lift device for people which services defined levels and moves along vertical guides (in conformity to that which is defined in points 4.1.13 and 8.1.13 of the Italian Ministerial Decree no. 236 dated June 14th 1989). The vertical platform lift has a speed of 0.15 m/s.

Shaft: The space in which the vertical platform lift moves. It is delineated by the pit, the walls and the ceiling.

Shaft width: The internal width of the shaft (measurement of the side which runs parallel to the guide wall).

Shaft depth: The internal depth of the shaft (measurement of the side which runs perpendicular to the guide wall).

Guides: The structures, firmly fastened to one of the shaft's internal walls, which guide the car frame.

Arcade: The mobile metal structure which sustains the cabin or the platform.

Chain: The flexible element which sustains the arcade.

Guide wall: The structural wall of the shaft upon which the guides are anchored; the guide wall serves the purpose of sustaining a portion of the stresses which are transmitted from the vertical platform lift.

Run: The passage occupied by the vertical platform lift when moving between the lowest and the uppermost levels serviced.

Pit: The part of the run shaft situated beneath the lowest level serviced by the vertical platform lift.

Headway: The height difference between the floor and the ceiling (or any other fixed obstacle) of the last floor serviced.

Cabin/Platform: The element of the vertical platform lift to be occupied by the people being transported.

Protection: The panel of the vertical platform lift which is positioned towards the guide wall.

Button panel: The group of buttons, located on one of the cabin's inner walls or upon the protective panel, used to manoeuvre the vertical platform lift.

Ceiling: The ceiling of the cabin/platform.

INSTRUCTIONS: with the word "instructions", what is meant is that all of the information provided by the manufacturer for the safe use of this machine as pursuant to the Machine Directive 2006/42/EC, including those for the masonry work, for installation, use and the correct maintenance and not excluding the warnings to avoid improper utilisation.

ORIGINAL TEXT This user manual in the Italian language is the ORIGINAL VERSION to which every translated version must make reference.

2. Shaft preparation

The shaft which contains the Vertical Platform Lift (VPL) must conform to that which is prescribed by the EN 81-2 (1998 ed.) standard, with particular attention to the paragraphs specified below:

- *Paragraph 5.2.1.1 - **Totally enclosed well***
  In sections of the building where the well is required to contribute against the spread of fire, the well shall be totally enclosed by imperforate walls, floor and false ceilings. The only permissible openings are:
  a) *openings for landing doors;*
  b) *openings for inspection and emergency doors to the well and inspection traps;*
  c) *vent openings for escape of gases and smoke in the event of fire;*
  d) *ventilation openings;*
  e) *necessary openings for the functioning of the lift between the well and the machine or pulley rooms; […]*
- *Paragraph 5.2.3 - **Ventilation of the well***
  The well shall be suitably ventilated. It shall not be used to provide ventilation of rooms other than those belonging to the lift.
  In the absence of relevant regulations or standards, it is recommended that ventilation openings at the top of the well, with a minimum area of 1% of the horizontal section of the well, are provided.
- *Paragraph 5.3.1 - **Strength of the walls***
  For the safe operation of the lift, the walls shall have a mechanical strength such that when a force of 300 N, being evenly distributed over an area of 5 cm² in round or square section, is applied at right angles to the wall at any point on either face they shall:
  a) *resist without permanent deformation;*
  b) *resist without elastic deformation greater than 15 mm.*
  Glass panels, plane or formed, placed at points normally accessible to persons shall be made of laminated glass up to a height as required in 5.2.1.2.
- *Paragraph 5.3.2 – **Strength of the pit floor***
  *The pit must be capable of sustaining the load indicated in **paragraph 3.1** of the present manual.*
- *Paragraph 5.4 - **Construction of the walls of lift wells and landing doors facing a car entrance**[1]*
  ***5.4.1** The following requirements relating to landing doors and walls, or parts of walls, facing a car entrance shall apply over the full height of the well. […]*
  ***5.4.2** The assembly comprising the landing doors and any wall or part of a wall facing the car entrance shall form an imperforate surface over the full entrance width of the car, excluding the operational clearances of doors.*

The walls of the shaft must form a vertical surface, for the entire width and height of the shaft, and must have the following characteristics: **any eventual protrusions may not be more than 5 mm in size**. Protrusions more than 2 mm in size must be blunted to at least 75° horizontally.

[1] *In the case of the Orion Vertical platform lift, the information provided applies to all of the shaft's walls, excluding that upon which the lift's guides are anchored.*

2.1. Geometric characteristics of the shaft

The run shaft (figure 1) is characterised by the measurements shown in the plan: L (guide wall width), P (depth of the wall perpendicular to the guides). These measurements, established during the ordering phase, are included either upon the ordering form or upon the shaft-section form, which also specifies the positions of the doors for each floor.
The shaft's actual plan measurements may be within a range of tolerance of plus or minus **5 mm** with respect to the nominal values L and P indicated in the "Orion shaft Section" form. This condition must be respected for the entire length of the shaft. The minimum size of the guide wall (L) may not be less than 650 mm regardless.
The **misalignment** of the shaft's four masonry walls may not be above **10 mm** for the entire length of the shaft.

2.2. Configuration with a cabin

If the vertical platform lift's configuration foresees the installation of a cabin, the doors located on the same side must be of the same size and must be have the same vertical alignment (see figure 2).

2.3. Pit depth

In order to avoid a step in correspondence to the ground level tower door, the pit must be prepared according to the following specifications:

- The pit's depth(H_{fos}) must be between 100 and 120 mm.

2.4. "Cabinet" for containment of the "Electrical Control Panel and Hydraulic Control Unit"

Each platform lift must be equipped with a "Cabinet" that will contain the "Electrical Control Panel and Hydraulic Control Unit".
In the event that the client, for reasons of space, aesthetics and/or environmental concerns, wishes to not purchase the "Cabinet" made available by ThyssenKrupp Encasa, may construct said container autonomously.

The essential specifications that this "Cabinet" must have may be found below.

- It must be made up of walls, floor, roof and an unpierceable door.
- It must have these minimum dimensions: Width = 900 mm; height = 1500 mm, depth = 460 mm.
- It must have a door of the minimum dimensions according to the tables and this door must not be able to open inwards. The door must be self-locking: once closed it may only be opened using "a specific key" (that is, being accessible only by way of the use of that specific key).
- It must be free of openings that could permit the ingress of the hands or small animals.
- It must be of IP2X protection grade.
- It must be set up for connections, by way of corrugated conduit, with the platform lift well.

ORION–XL shaft section

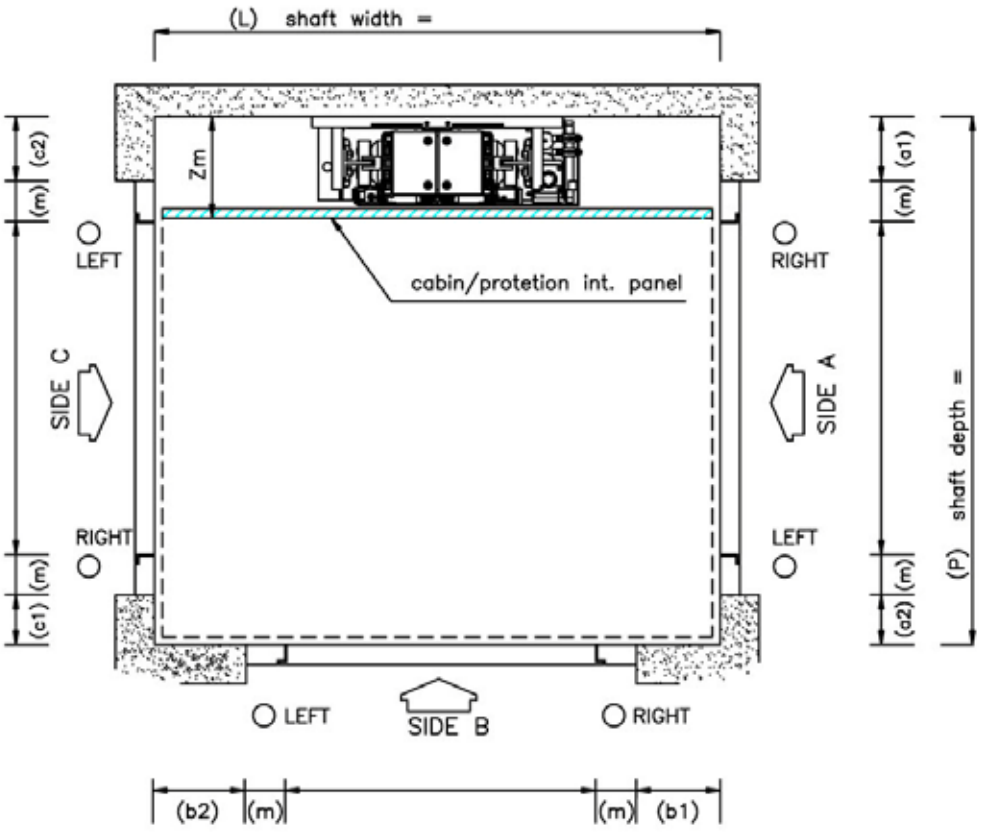
PLAN

CONFIGURATION		Zm (*)	REVEAL a1–c2 (**)	MIN. FOUNDATION
PROTECTION OR CABIN L>=720	☐	260	>=160	100

FINISHED SHAFT RELIEF	YES☐	NO☐
DEFINITIVE MEASUREMENTS	YES☐	NO☐
HEADWAY		
TOTAL HEIGHT DIFFERENCE		
FOUNDATION (MAX. 120)		

(*) m = door upright, Zm = machine zone
(**) valid reveal zone with door upright = 100 mm

measurement in millimetres



RULES FOR FILLING OUT

–select the type of configuration

–cancel the doors not required with ⊘

–select the hinge side door upright with ⊠LEFT – ⊠RIGHT

IF FINISHED SHAFT RELIEF = NO AND DEFINITIVE MEASUREMENTS = YES, THE CUSTOMER SHALL BE RESPONSABLE FOR RESPECTING THE MEASUREMENTS INDICATED ABOVE

DATE: _____ CUSTOMER: _____ CUSTOMER SIGNATURE _____

Note:

DS/28.012 Rev.00 del 14/01/09

Figure 1 - "Orion Shaft Section" Form

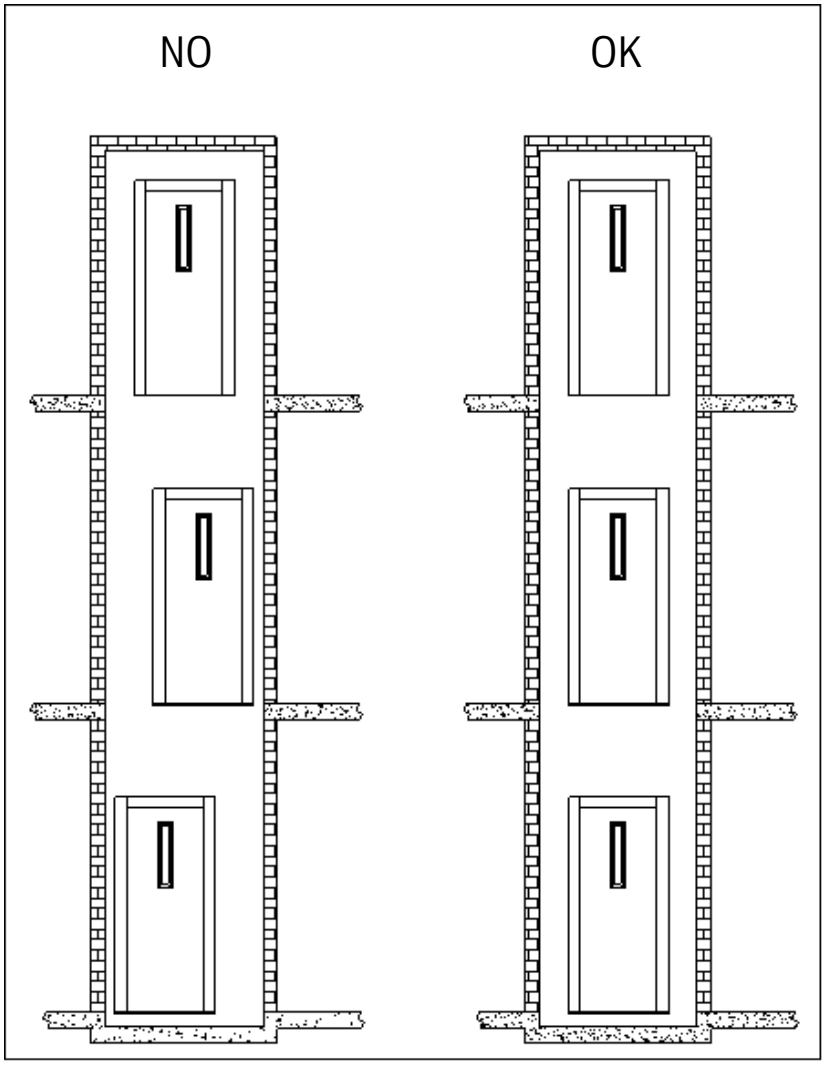


Figure 2 – Door positioning for systems with a cabin

3. Loads

3.1. Loads sustained by the pit

The mass of the vertical platform lift is given by the sum of the weights of the structure, the cylinder, the guides and the transportable load (capacity):

It can be roughly considered that the base level must bear the sum of the weights above, increased so as to compensate for dynamic effects (in fact, a part of the vertical load is sustained by the anchors). For this reason, the maximum load sustained by the pit (R) is 16500 N. This load can be considered uniformly distributed upon the base plate, with a surface area of about 114000 mm^2, located on the side where the guides are installed. Therefore, the maximum pressure exerted upon the pit is 0.14 N/mm^2 (1,43 kg/cm^2).

3.2. Loads sustained by the guide wall

The maximum distance between the anchoring units is about 130 cm (See figure 3). These anchoring units are fixed to the guide wall by means of two screws, each of which must bear a maximum horizontal normal load equal to about 2600 N (about 260 kg, see H in the figure).

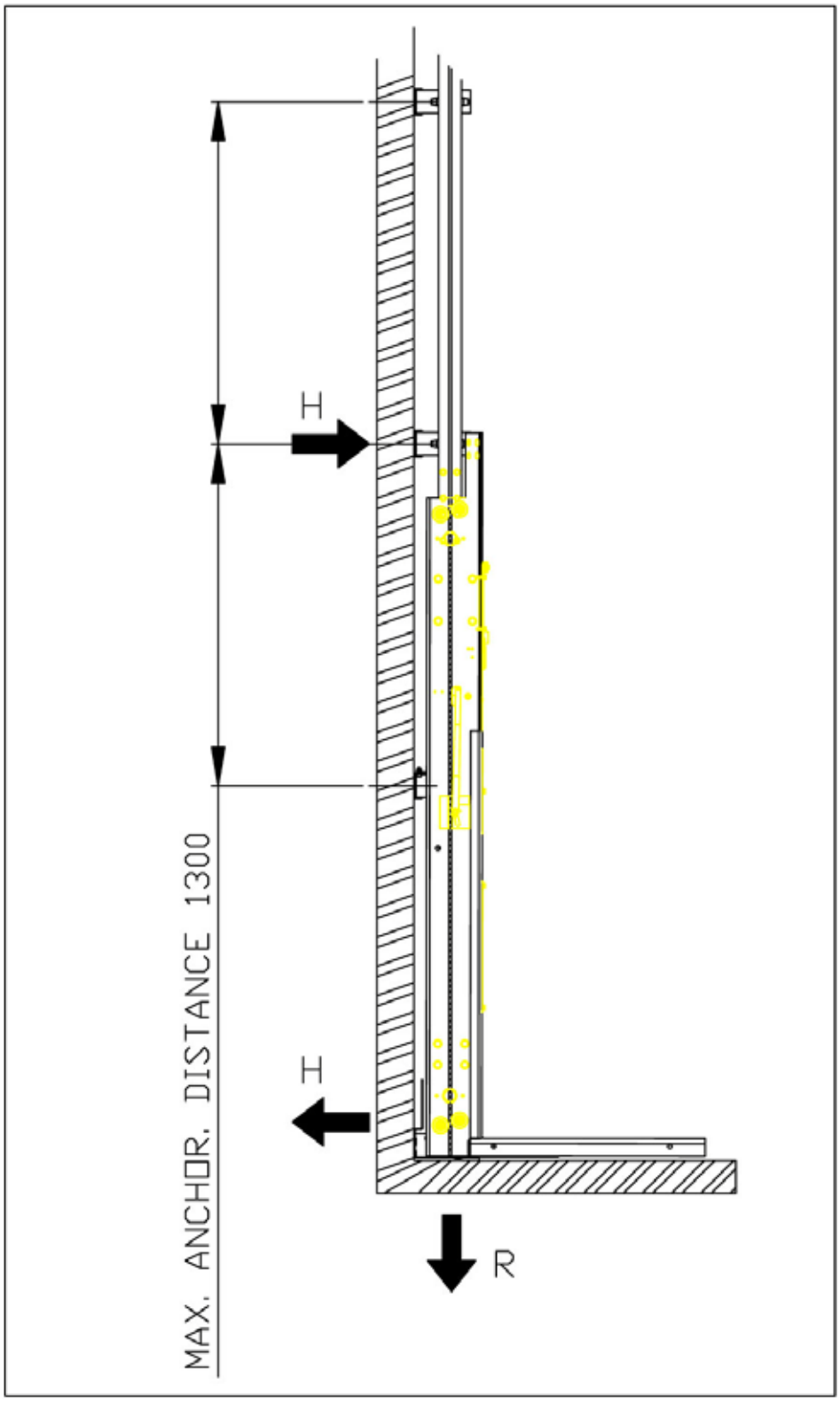


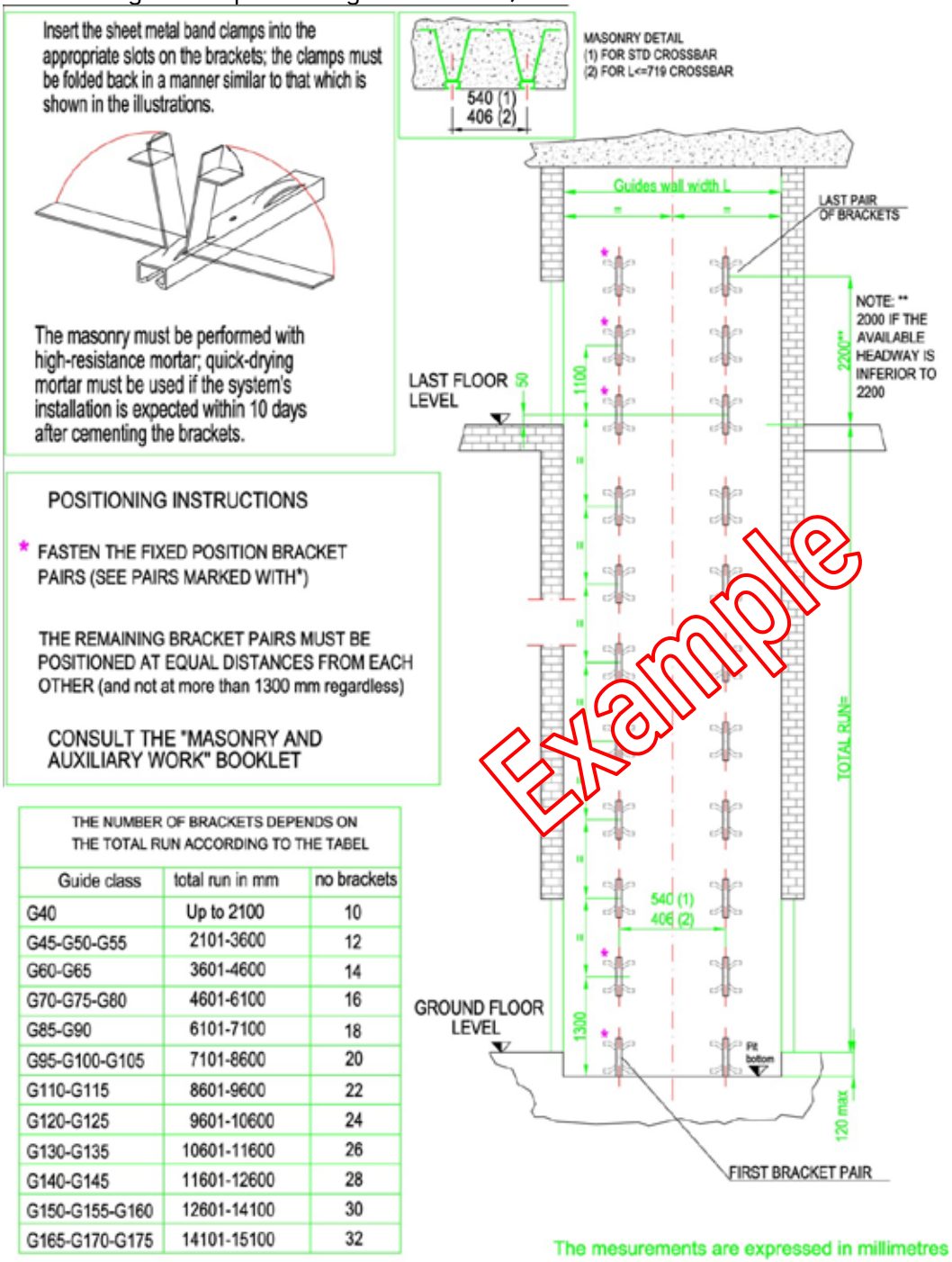
Figure 3 – Loads sustained by the anchoring units

4. Predisposing for the guide anchors

The guides can be anchored by means of one of the two following methods:

4.1. Halfen brackets

Halfen brackets can be mounted upon a solid or perforated brick wall with a thickness superior to 250 mm (see figure 4). The masonry must be performed with high-resistance mortar; use quick-drying mortar if the system's installation is expected within 10 days. The brackets must be positioned in accordance with the scheme sent by ThyssenKrupp Encasa (figure 4 shows an example of the diagram for positioning the brackets).



THE NUMBER OF BRACKETS DEPENDS ON THE TOTAL RUN ACCORDING TO THE TABEL

Guide class	total run in mm	no brackets
G40	Up to 2100	10
G45-G50-G55	2101-3600	12
G60-G65	3601-4600	14
G70-G75-G80	4601-6100	16
G85-G90	6101-7100	18
G95-G100-G105	7101-8600	20
G110-G115	8601-9600	22
G120-G125	9601-10600	24
G130-G135	10601-11600	26
G140-G145	11601-12600	28
G150-G155-G160	12601-14100	30
G165-G170-G175	14101-15100	32

Figure 4 – Halfen brackets installation

It is important for the brackets to be properly vertically aligned (15 mm max. tolerated misalignment between the highest and the lowest) (see figure 5):

- If the wall is vertical, the brackets will be aligned with the wall itself;
- If the wall is not perfectly vertical, the brackets must be installed with appropriate cement spacers to compensate.

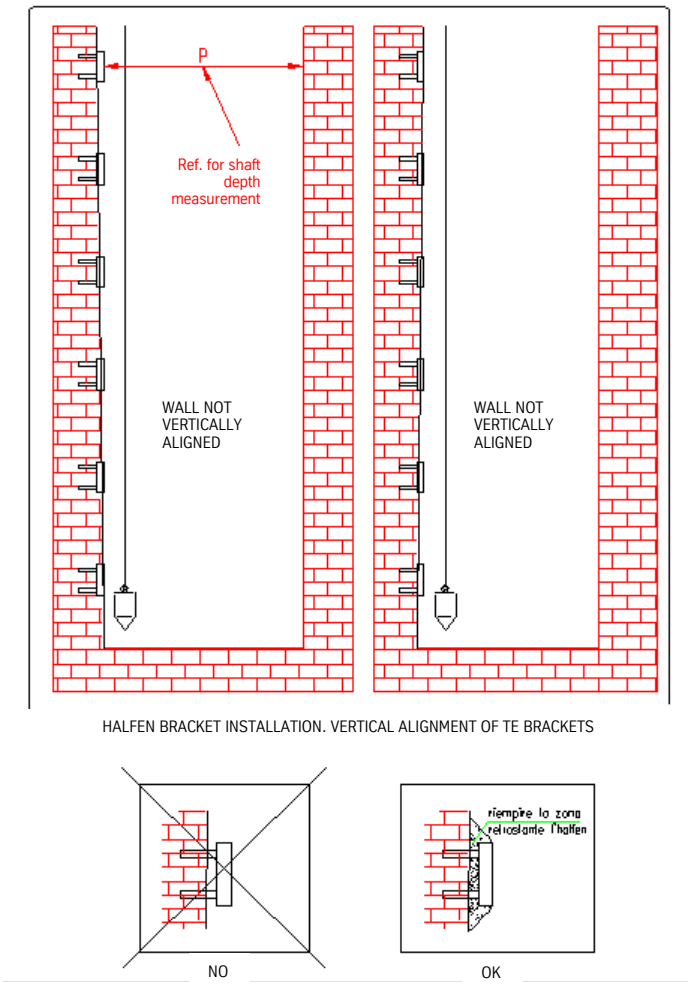


Figure 5 – Positioning the Halfen brackets

4.2. Welded anchors on vertical tubular supports

If the guide wall is not suitable for sustaining the horizontal loads (H) which it would have to bear, a metallic support structure will have to be installed upon the wall itself.
Two 100x100x5 tubular supports (columns), of at least FE420 grade, connected at 2500 mm intervals with 370 mm long NPU70 crossbars, are sufficient for this purpose. The structure's base, and preferably it's top as well, must be completed with a base plate of a minimum size of 600x100x10 mm. This structure must be anchored to the wall with mechanical anchoring screws (for reinforced cement walls) or else with clamps which have been walled with high-resistance mortar. (See figures 6 and 7).

ATTENTION! A qualified technician must nevertheless be consulted in order to evaluate the specific requirements of the installation site

The crossbars, which support the platform's running guides, can be welded onto the structure described above during installation.

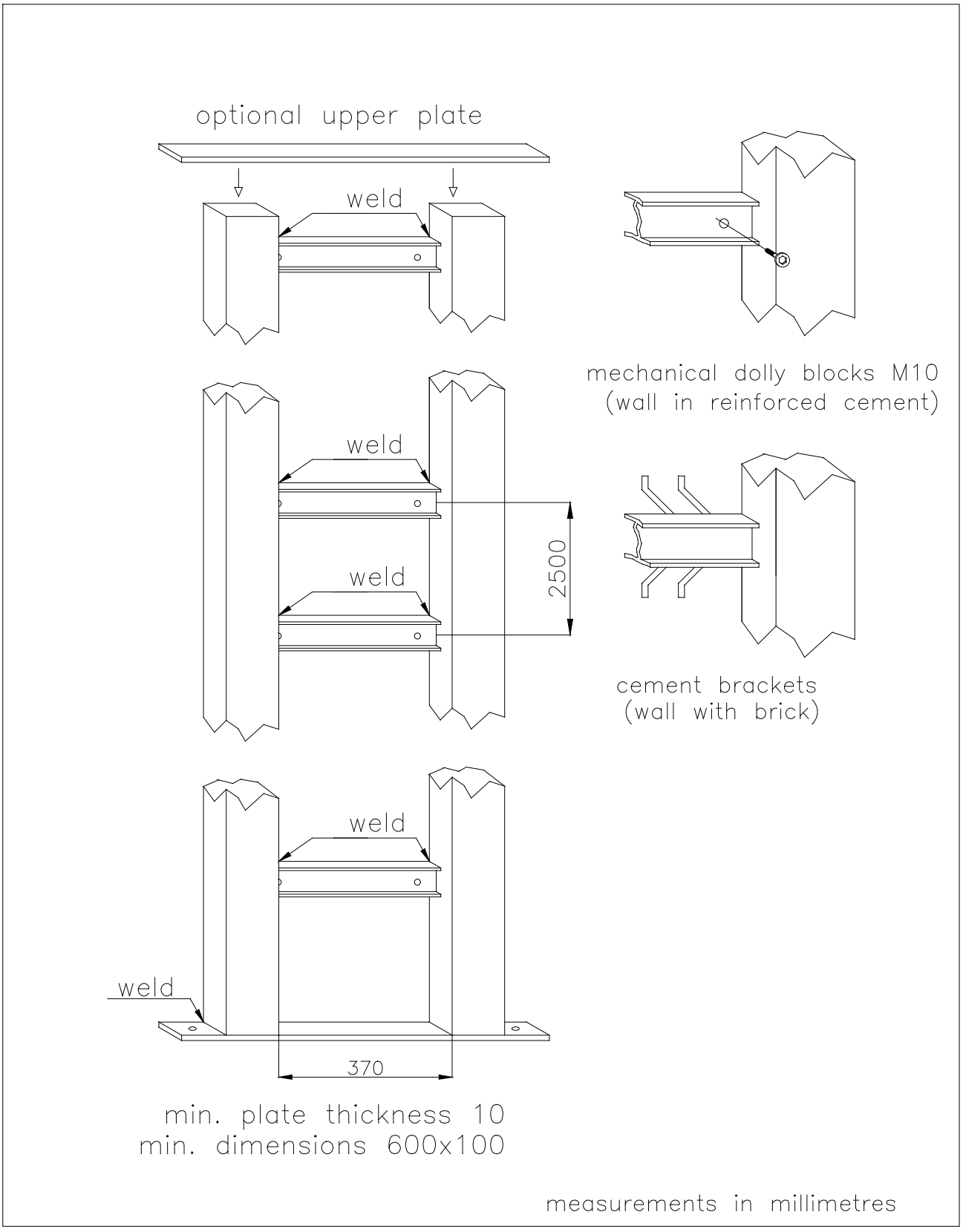


Figure 6 – Support structure for the guide crossbars

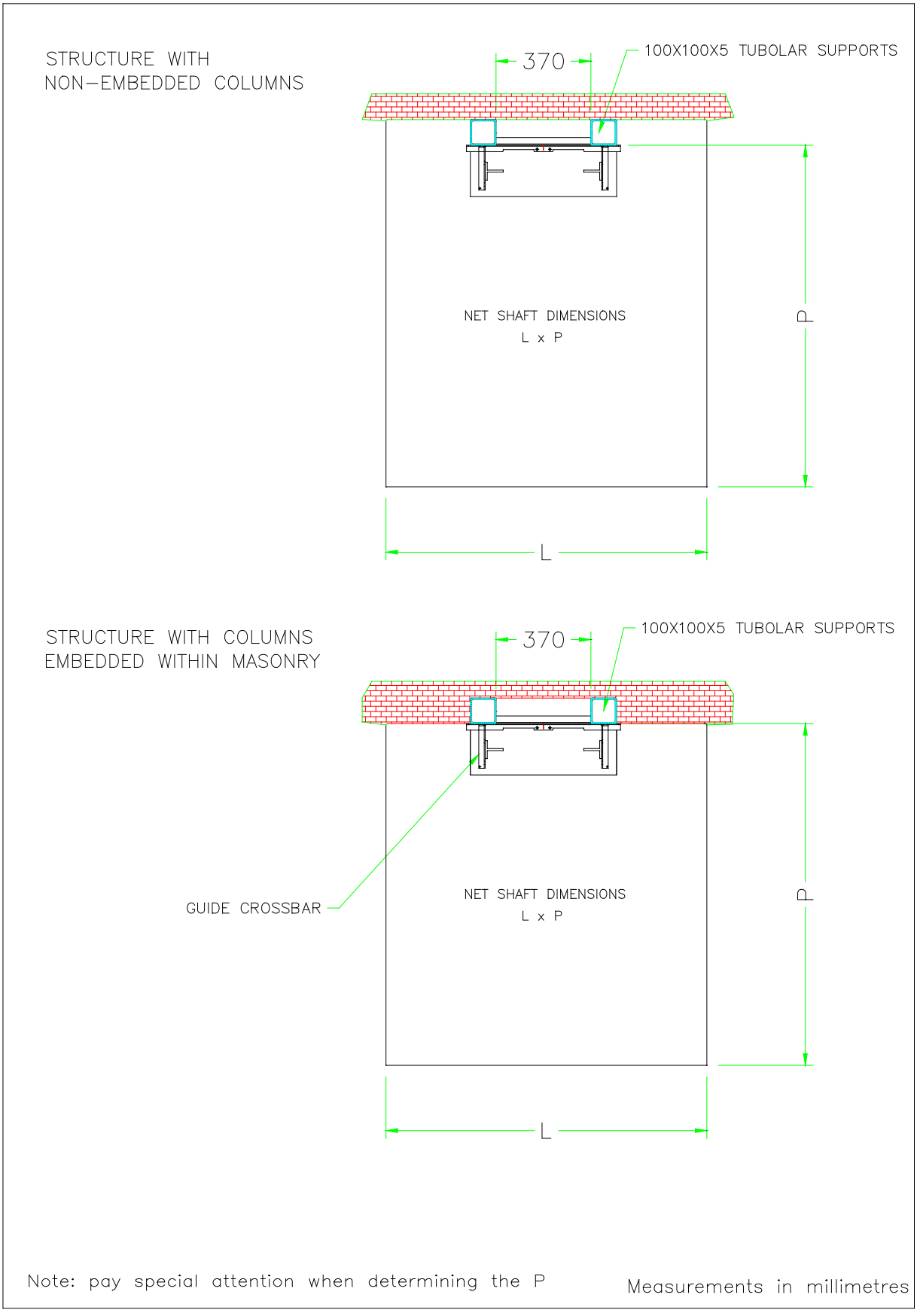


Figure 7 – Possible positions for the supports

4.3. Screw anchor supports

When the guide wall is vertically aligned and is made of reinforced cement of a thickness greater than 160 mm, the guide crossbars can be anchored directly upon the wall with expanding screw anchors. In this case no additional operations are required to be performed upon the guide wall.

4.4. Welded anchors upon horizontal support tubes

A metallic structure with a series of horizontal tube supports, upon which the platform's guide crossbars can be welded, can be installed as an alternative to the previously described methods. See diagram "DS 28.009", sent by ThyssenKrupp Encasa, for the height positions of the horizontal support tubes (an example is provided in figure 8 below).

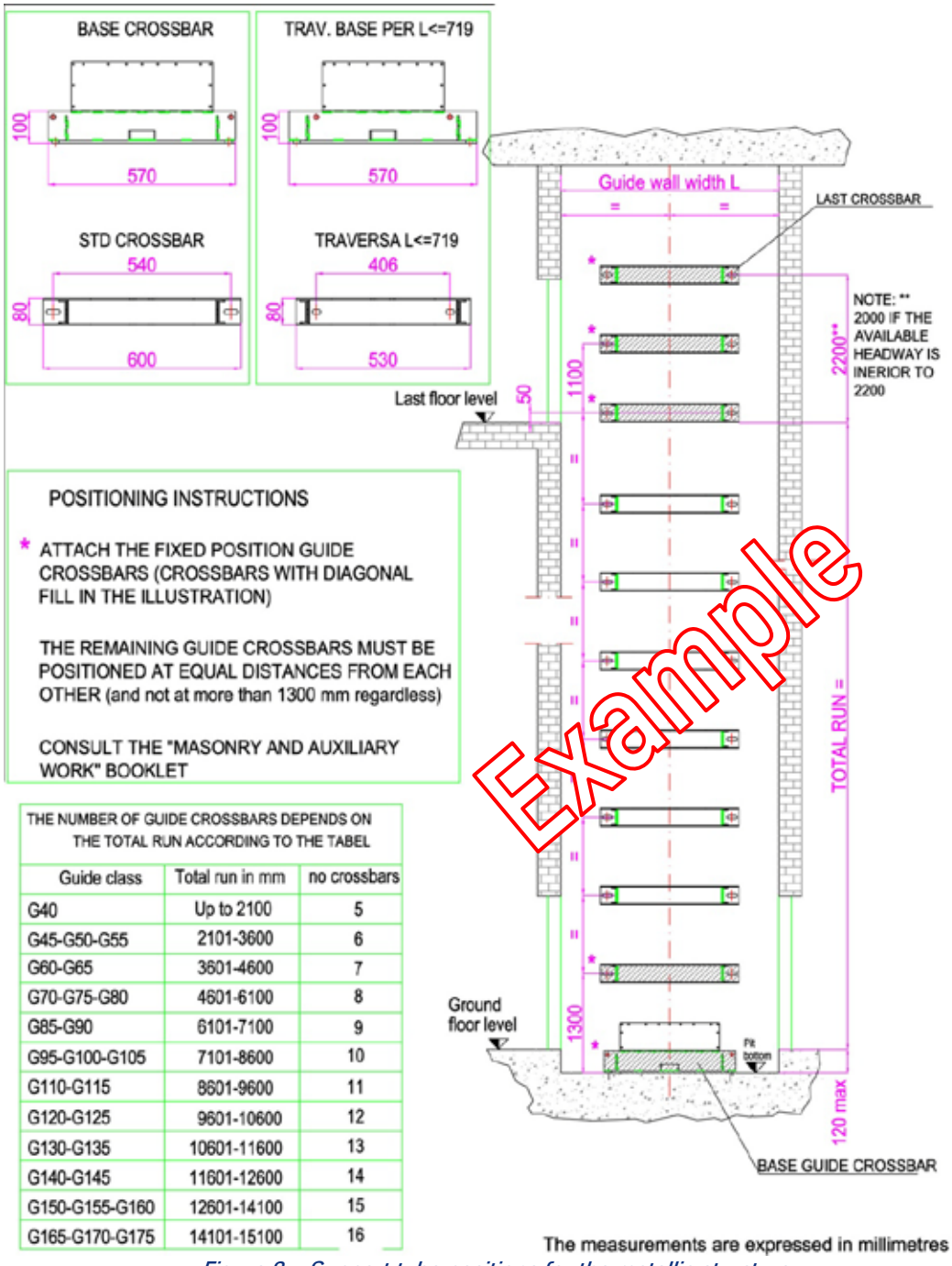


Figure 8 – Support tube positions for the metallic structure

5. Door positioning and installation

Doors must be positioned in such a way so that their internal surface is perfectly aligned with the shaft's internal wall. **After installation, the doors must be perfectly aligned (vertically) and their bases must be perfectly horizontal (squared)**. Insert a 4 mm spacer beneath the frontal portion of the door's wing in order to properly install the frame. (see figure 9).

In order to properly install the door, the appropriate "clamps", located on the doors' posts, or else to be bolted on to them, must be cemented in. As an alternative, the door may be bolted to the adjacent structure by making use of the 2 attachment slots located on the door's borders (see figures 10 and 11).
Position the door according to the indications provided in the attached "ORION shaft section" (see figure 1). These are the same indications which were accorded during the ordering phase

Attention! The door's total height is normally 2100 mm. For systems with door-opening devices the height is 2140 mm.

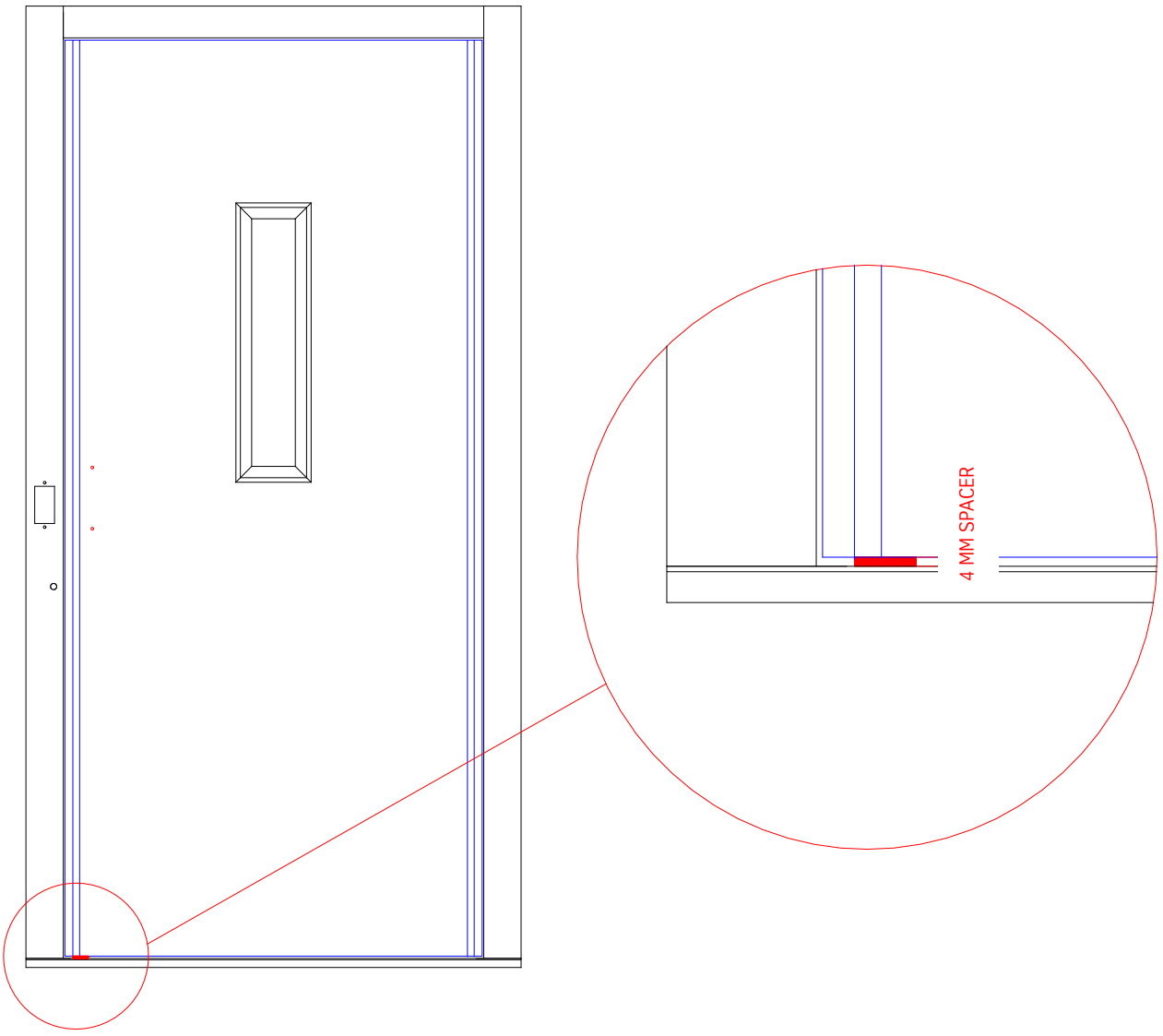


Figure 9 – Door-wing spacer to be used during installation

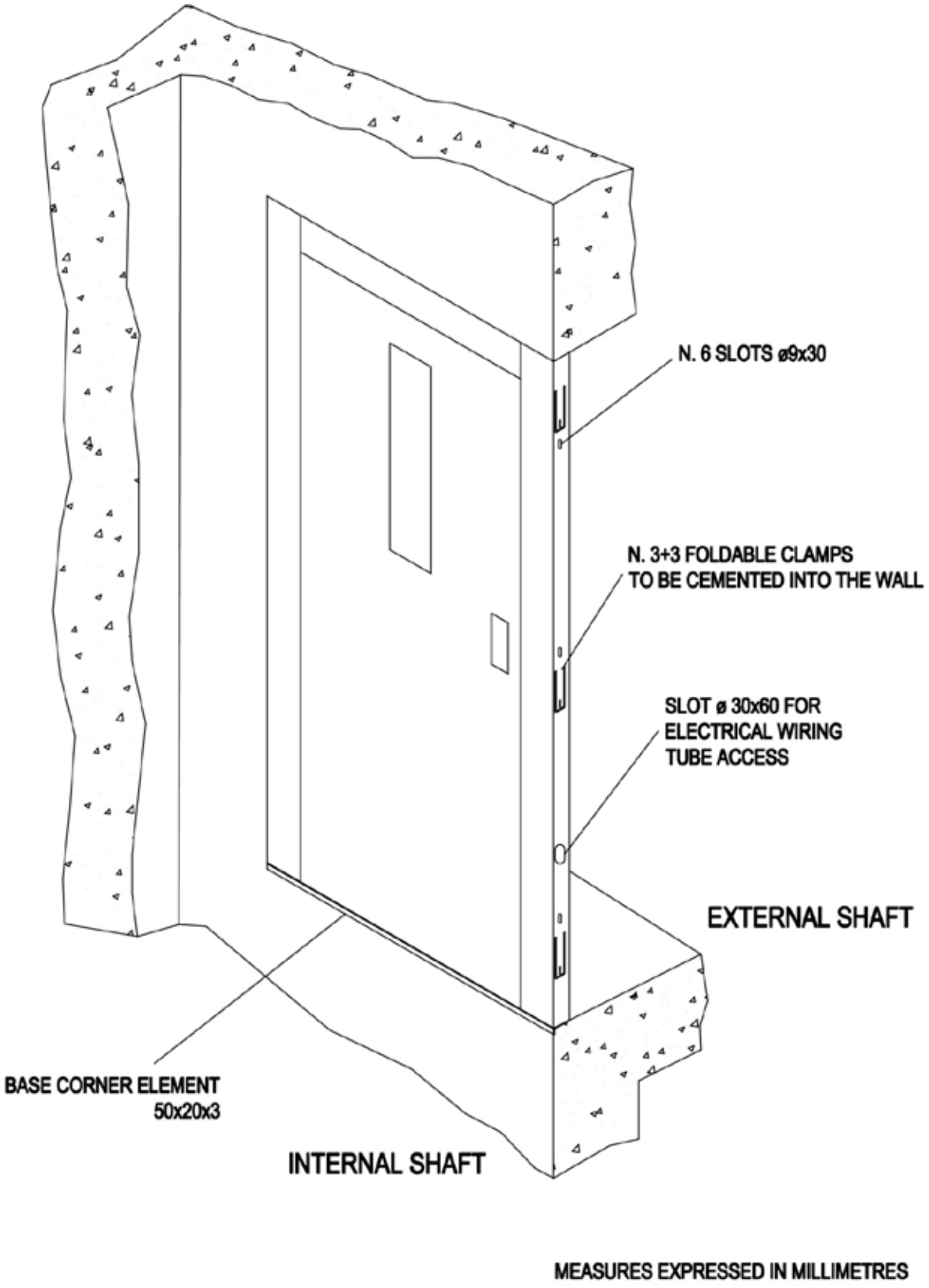


Figure 10 – Positioning the door

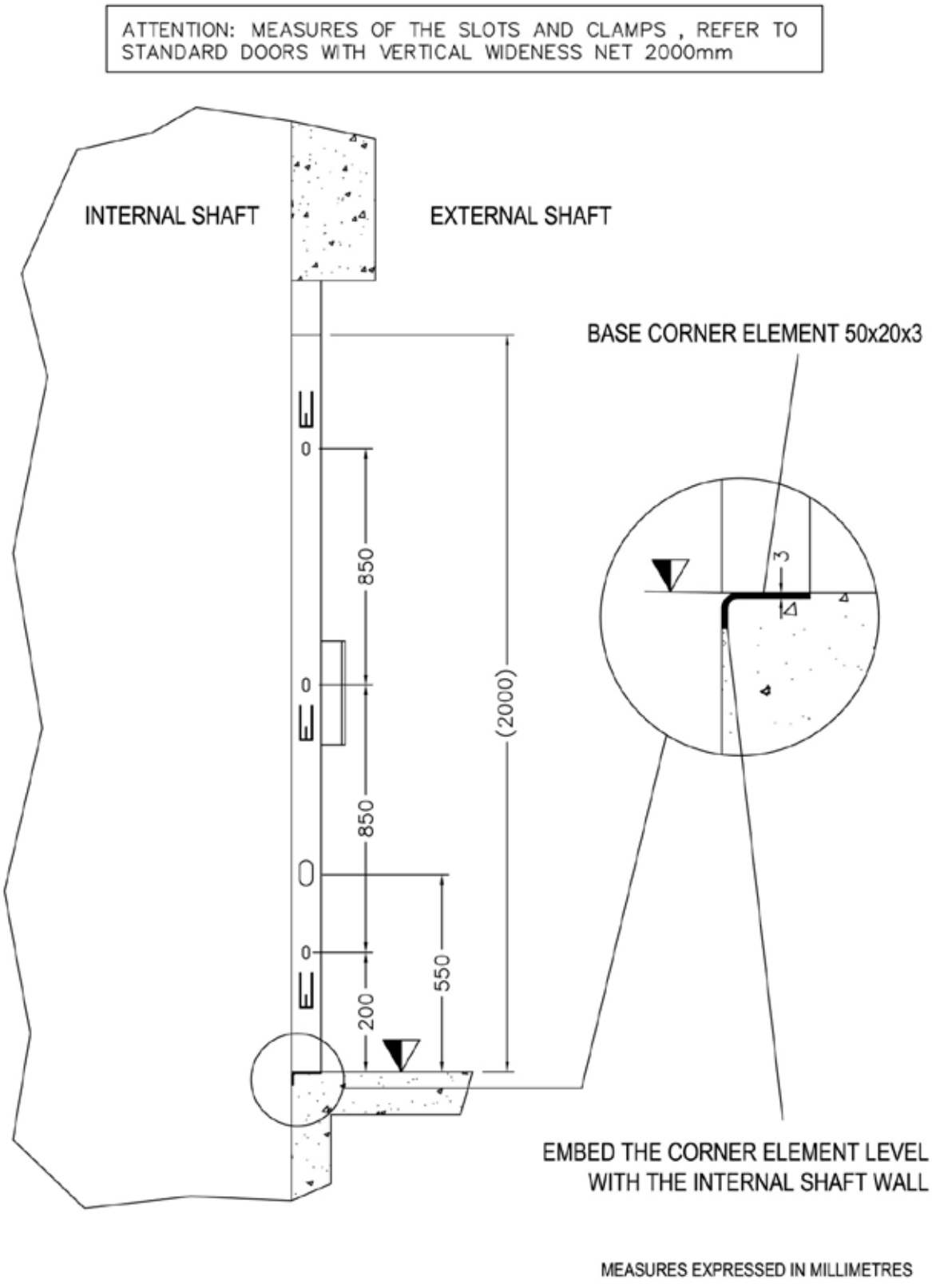


Figure 11 – Aligning the door with the shaft's internal wall

Attention! The door's base corner element must be embedded, as shown in figure 11.

5.1. “Narrow” door

In case of “narrow” door (door panel 600mm - door jamb 60mm) on side B, can be necessary to embed the door jamb. See figure 12 for the correct installation of the door. In order not to jeopardize the full opening of the door and to ensure the emergency operation from outside, the door frame cannot be embedded from the external of the shaft.

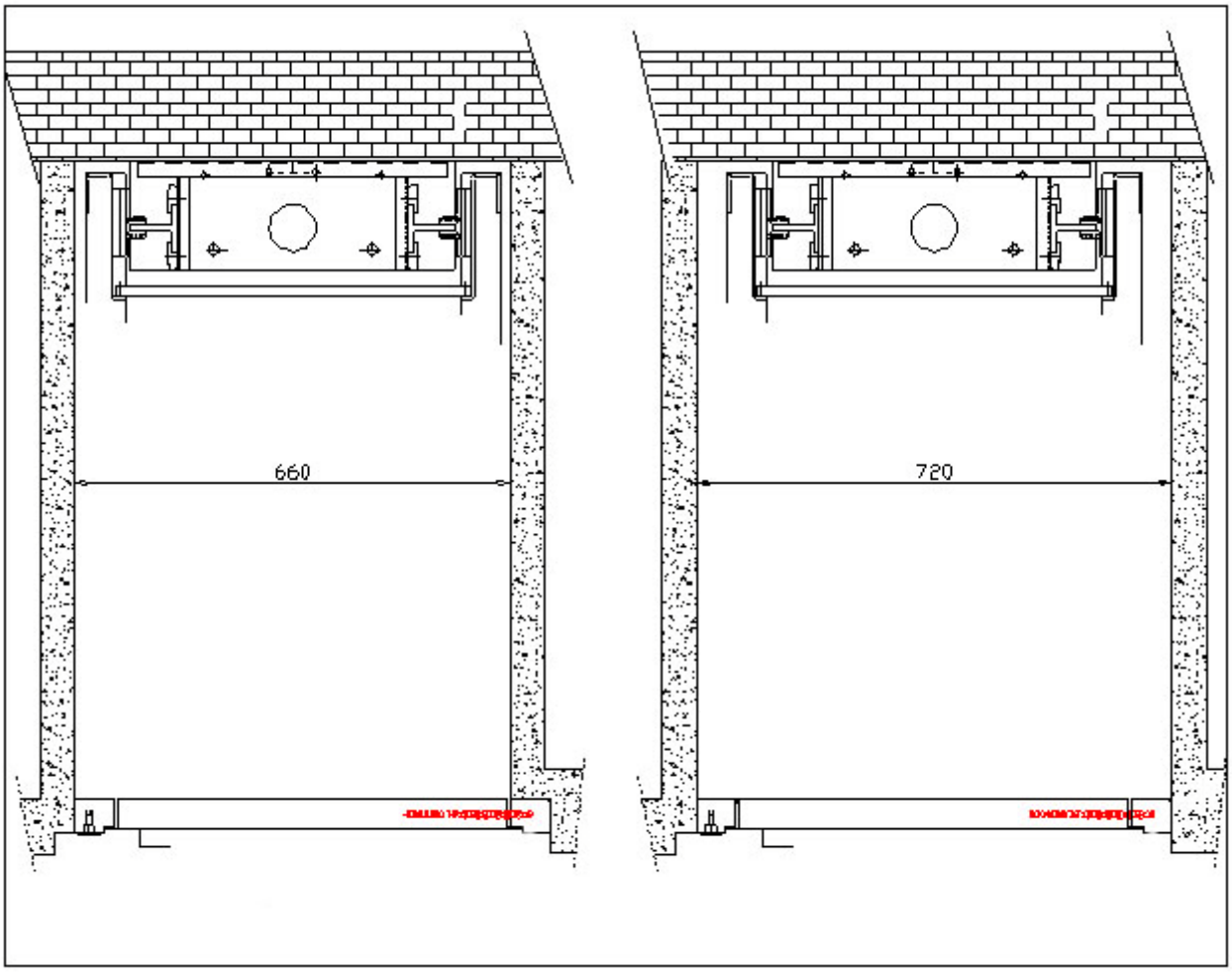


Figure 12 – Diagram for positioning “narrow” door

5.2. Instructions for passing the flexible tubes for the door's electrical fittings

In order to connect the door's automatic opening/closing mechanism to the electrical panel, flexible tubing must be installed in accordance with the diagrams shown in figures 13 and 14 (figure 14 shows the installation for doors with the EVO door opening device).

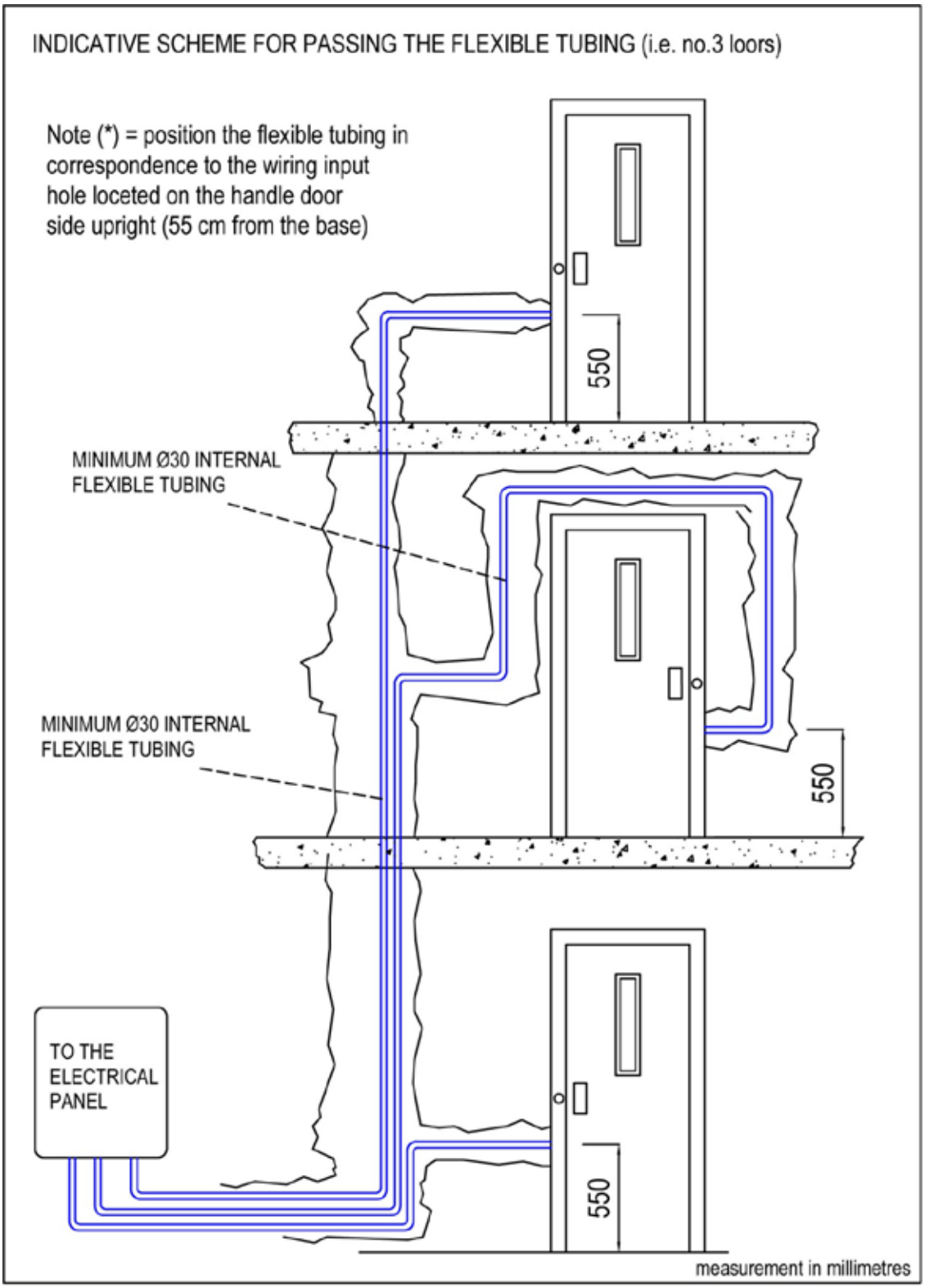


Figure 13 – Passing the flexible tubing for the door's electrical fittings

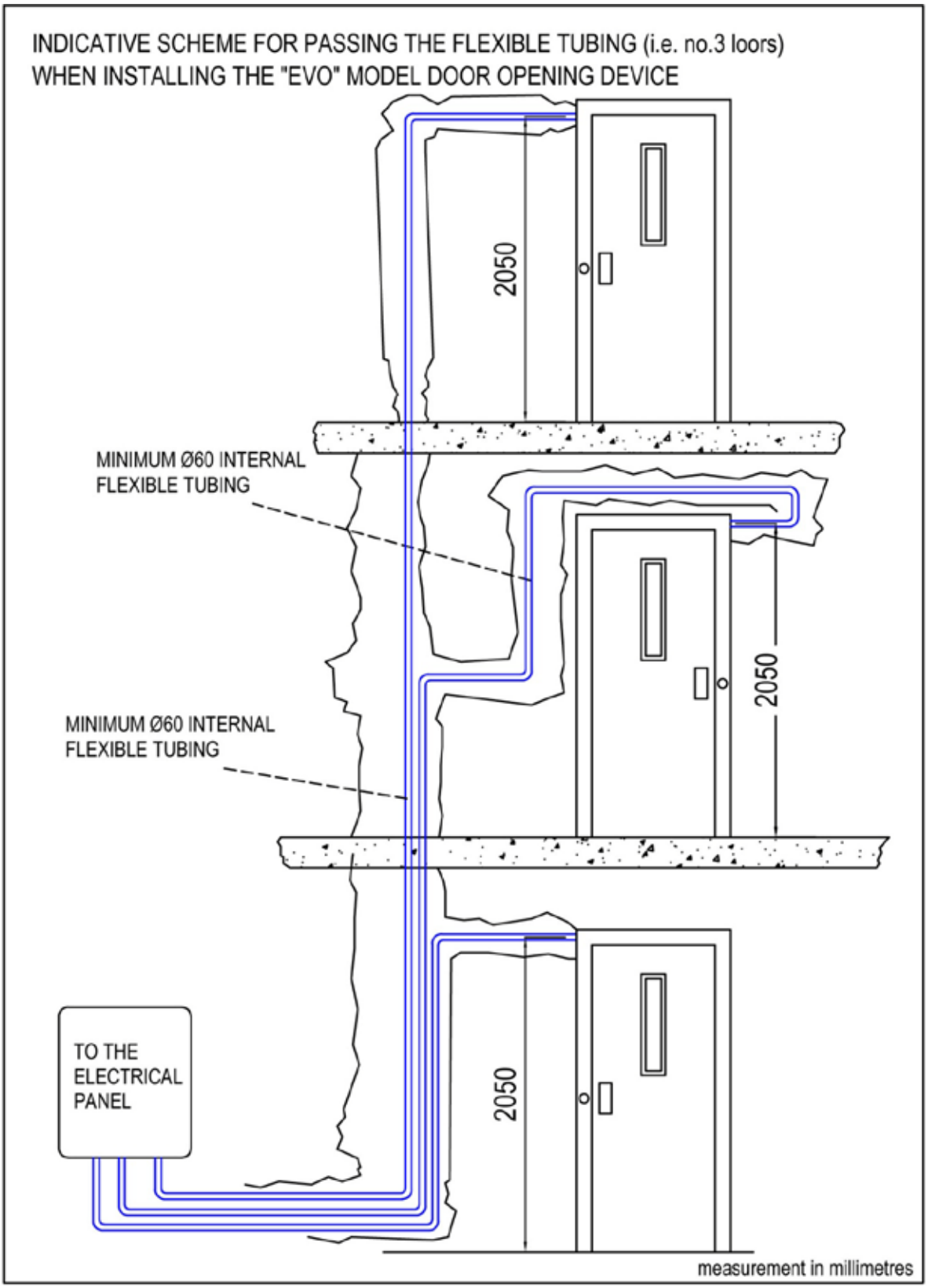


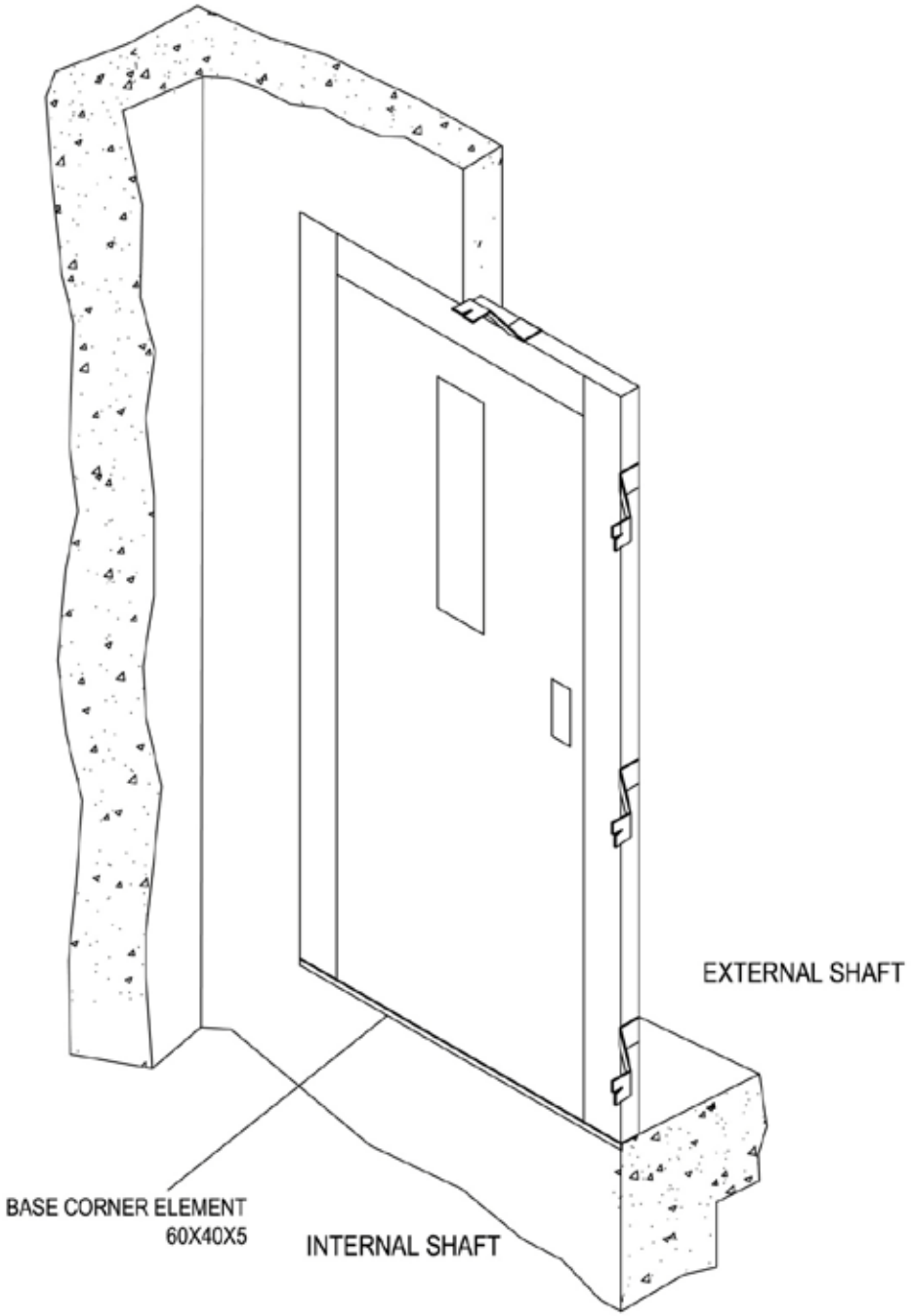
Figure 14 – Passing the flexible tubing for the door's electrical fittings with the EVO door opening device

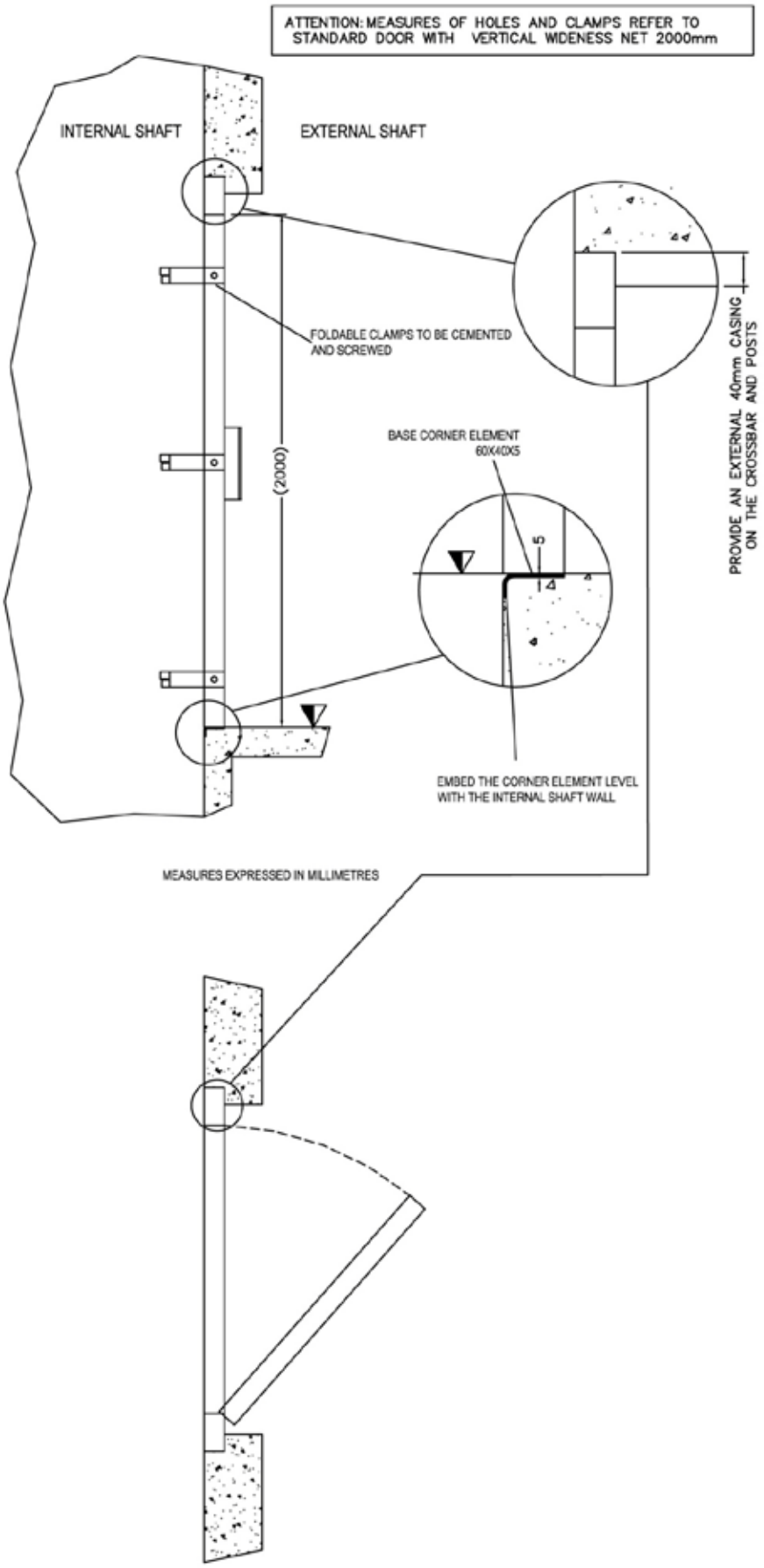
Attention! The flexible tubing must be inserted into the appropriate 30 mm diameter slot, located on the door's border.
The electrical material shown in the illustration is not included with the material supplied.

5.3. Installing the REI doors

The REI doors must be installed with at least 40 mm of external casing both along the posts as well as along the crossbars.
These doors have one special aspect: as they must not have any openings, a call system must absolutely be installed within an encasement in the adjacent wall.

In order to connect the door's opening/closing mechanism with the call button, a length of flexible tubing (min. 30 mm internal diameter) must connect the call system's housing with the door.




ATTENTION: MEASURES OF HOLES AND CLAMPS REFER TO STANDARD DOOR WITH VERTICAL WIDENESS NET 2000mm
INTERNAL SHAFT
EXTERNAL SHAFT
FOLDABLE CLAMPS TO BE CEMENTED AND SCREWED
(2000)
BASE CORNER ELEMENT 60X40X5
5
PROVIDE AN EXTERNAL 40mm CASING ON THE CROSSBAR AND POSTS
EMBED THE CORNER ELEMENT LEVEL WITH THE INTERNAL SHAFT WALL
MEASURES EXPRESSED IN MILLIMETRES

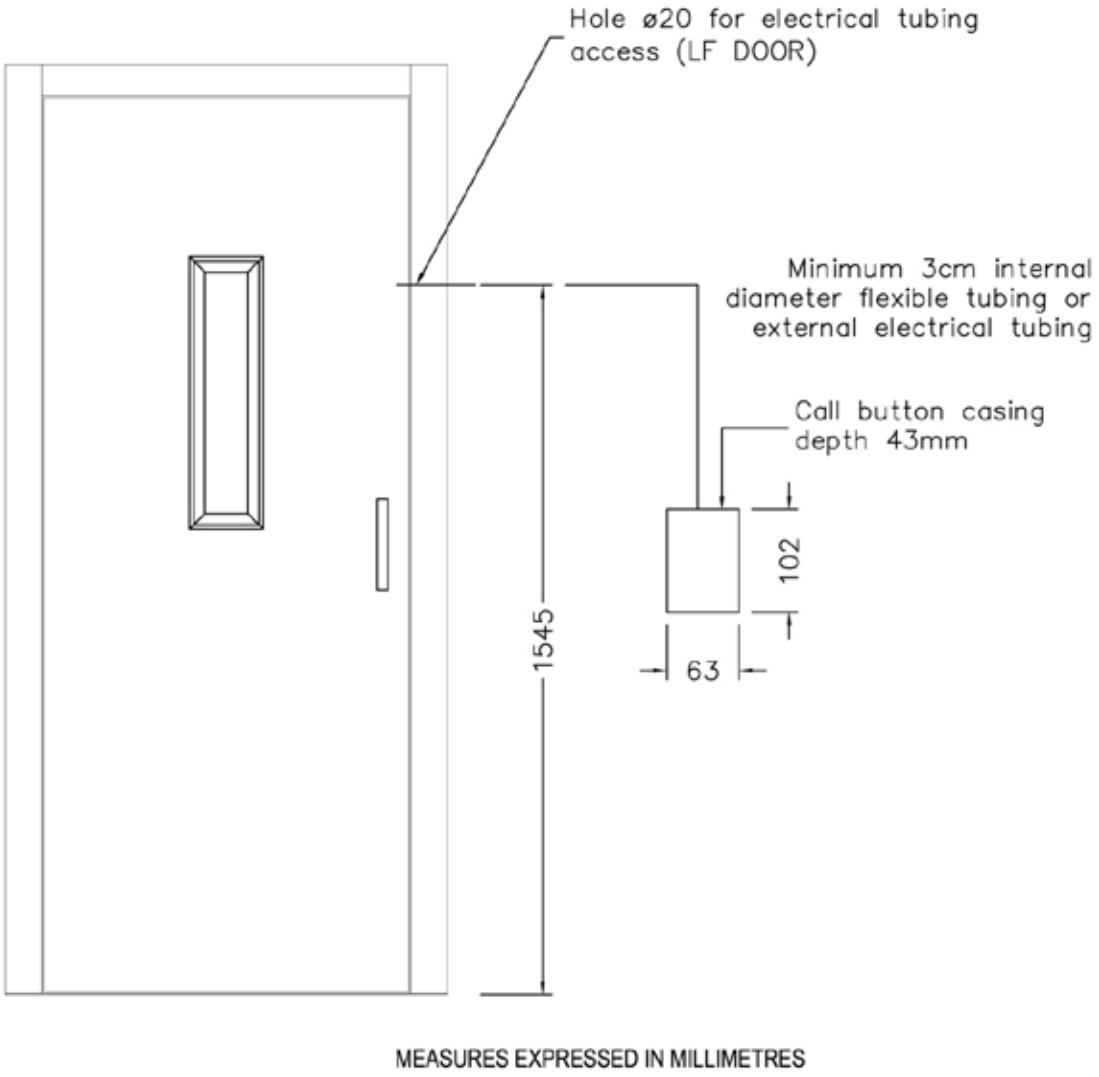


Figure 15 – Pre-installation operations for REI doors

6. Pre-installation operations for the Electrical Panel and Hydraulic Control Unit

The electrical panel and hydraulic control unit must be housed in a casing or in an appropriate container in order to protect them from the atmospheric elements (the control unit and the electrical panel cannot be installed in separate locations nor can they be installed with a distance of more than 1m between them).

"Cabinet" for containment of the "Electrical Control Panel and Hydraulic Control Unit"
Each platform lift must be equipped with a "Cabinet" that will contain the "Electrical Control Panel and Hydraulic Control Unit".
In the event that the client, for reasons of space, aesthetics and/or environmental concerns, wishes to not purchase the "Cabinet" made available by ThyssenKrupp Encasa, may construct said container autonomously.

The essential specifications that this "Cabinet" must have may be found below.

- It must be made up of walls, floor, roof and an unpierceable door.
- It must have these minimum dimensions: Width = 900 mm; height = 1500 mm, depth = 460 mm.
- It must have a door of the minimum dimensions according to the tables and this door must not be able to open inwards. The door must be self-locking: once closed it may only be opened using "a specific key" (that is, being accessible only by way of the use of that specific key).
- It must be free of openings that could permit the ingress of the hands or small animals.
- It must be of IP2X protection grade.
- It must be set up for connections, by way of corrugated conduit, with the platform lift well.

6.1. Control unit and electrical panel encumbrances

The dimensions of the hydraulic control unit and the electrical panel are indicated below.

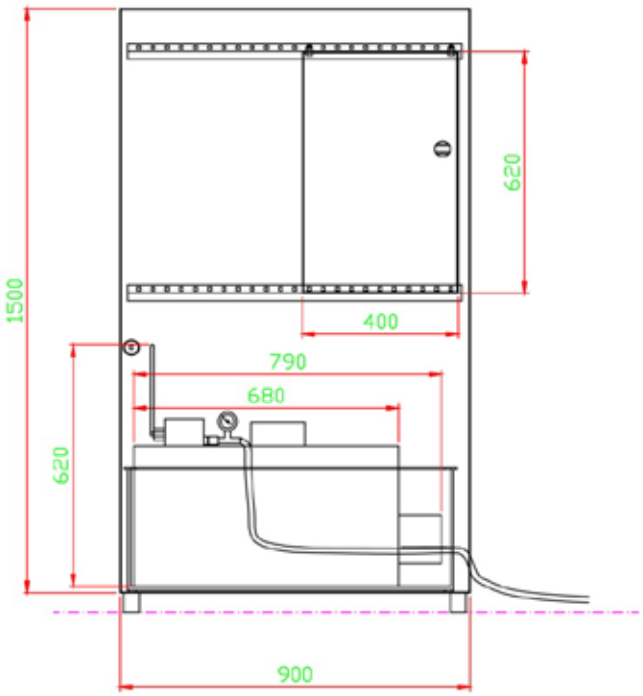


Figure 16 – Electrical panel encumbrance

6.2. Electrical connections

According to Italian Ministerial Decree 37/08, the vertical platform lift's electrical connection must be performed by qualified personnel.
The vertical platform lift's electrical panel must be equipped with a power line (230±10% V / 50Hz single phase) and a shunt box.
The neutral and grounding phase conductors must have a minimum section of no less than 2.5 mm^2.
A minimum 3 kW electrical system is required to sustain the vertical platform lift's power consumption.

Voltage	Max. operational Consumption
Single phase 230V±10% - 50Hz	11 A – 13 A

Table 1 – Hydraulic control unit consumption

The values expressed in the table refer to maximum consumption. In normal working conditions the consumption levels are significantly lower.
Upon request, the customer can be furnished with a container of the following dimensions to house the electrical panel and the hydraulic control unit:

- height = 1350 mm; width = 750 mm; depth = 460 mm
- height = 1500 mm; width = 900 mm; depth = 460 mm

Important! A 6 mm^2 tube must provide the possibility of accessing the building's grounding system from the tower's installation site (figure 17)

6.2.1. Instructions for running flexible tubing into the shaft

During installation, electrical and hydraulic cables must be brought into the tower's shaft in order to power the electrical panel and the hydraulic control unit. For this reason, flexible tubing (or PVC conduit) must be installed in accordance with the indications provided in figure 16. The flexible tubing (or conduit) must have an internal diameter of no less than 100 mm or else be of an equivalent capacity (Alternatively, two smaller tubes with an internal diameter **not inferior to 80mm**, may be installed).
The lengths of the supplied electrical and hydraulic connections require that the electrical panel and the hydraulic control unit be positioned within **5 (five) meters** from the base of the cylinder.

Attention! The path of the flexible tubing/conduit must be as linear as possible (avoid curves of a radius inferior to 200mm)

Attention! As compared to what is indicated in the figure, it is possible to place the cable passage to the left as well, based on the needs of the customer, in compliance with work standards, place the passage in the point closest to where the container cabinet will be installed.

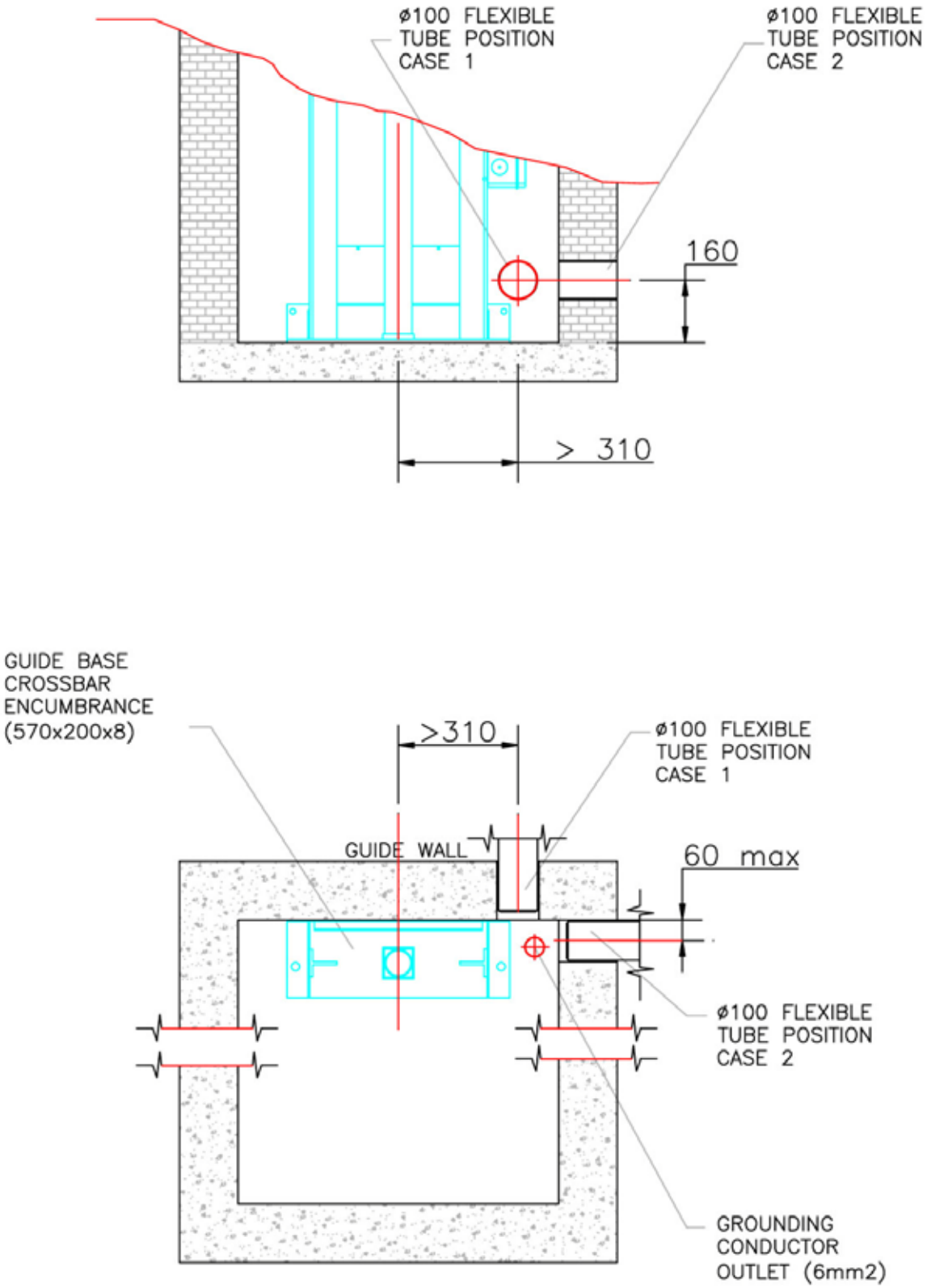


Figure 17 – Flexible tubing inlets

7. Predisposing a telephone line or a fixed line dialler

Lead a two-wire telephone cable to the point in which the electrical panel will be installed. Connection of the telephone to the normal telephone network must be carried out by and under the responsibility of the client within 5 days.

8. Predisposing an intercom line (optional)

Run a three-pole(1mm^2 section) cable from the point in which the electrical panel will be installed to the point in which the intercom handset will be attached. The intercom must be activated within 5 days.

9. Predisposing for remote unlocking system with a return-to-ground level button (optional)

Prepare a line made up of four 1 mm^2 section cables to connect the electrical panel to the point in which the return-to-ground level button will be installed.