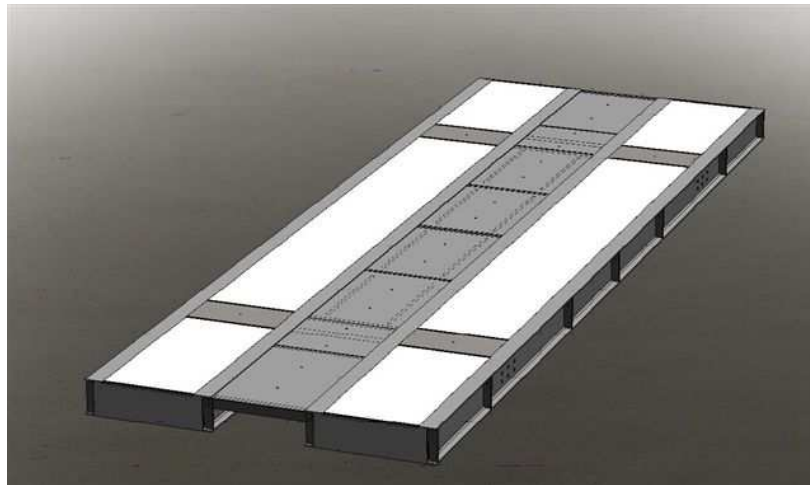




Chassieu, February 2, 2010

<p><b>PERFECT FT</b></p> <p><b>WEIGHBRIDGE</b></p> <p><b>USER MANUAL</b></p>
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Software No.	Manual Reference	Edition
	PON_Gb_Perfect FT Guide de montage_rev02.doc	00



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**PERFECT FT WEIGHBRIDGE  
USER MANUAL**

<b>Date</b>	<b>Edition number</b>	<b>Object of the modification</b>
02/02/2010	00	Original.
25/05/2010	01	Addition of the view + Photos
28/06/2010	02	Tooling change + Photos addition

SUMMARY
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## 1. PRESENTATION OF THE PERFECT FT WEIGHBRIDGE

### 1.1. Presentation

The **ARPEGE MASTER K PERFECT FT** weighbridge is composed of one or two modules of 7m and (or) 9m, each module is composed of two module de compose de 2 two weighing bars made from IPE 300 mm beams and filled with concrete poured at the factory or on site.

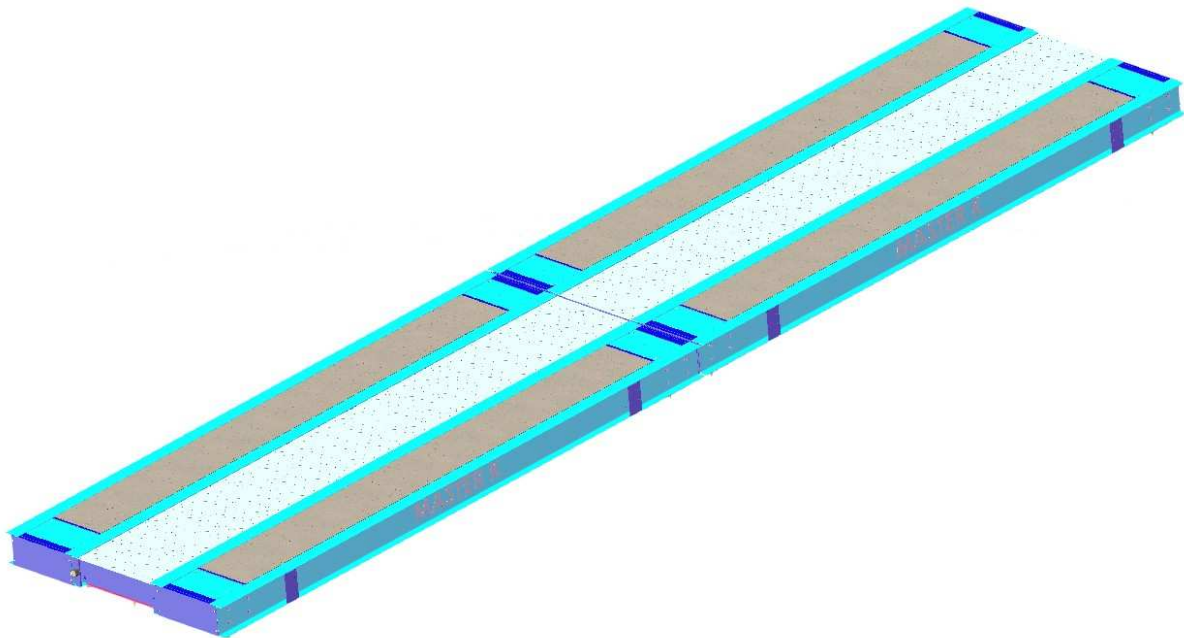
These weighing bars are interconnected by connecting two load plates incorporating the bumpers, thus the whole set forming a module.

The central part of the weighbridge is covered by metal plates or concrete panels (option)

The access to the load cells is done due to the traps arranged in the technical crossbars of the load plates.

The set of the modules is delivered in Kit or pre-assembled and is fixed in the civil engineering with plugs.

The load cells and junction boxes are delivered and installed in the load plates.



## 2. MATERIALS NEEDED TO ASSEMBLE THE WEIGHBRIDGE

- 1 controlled dumpy level and its accessories
- 1 Double decimeter class II
- 1 Powerful concrete electro-pneumatic perforator  
(14 to 42 holes of 20 mm to be drilled !!!)
- 1 Concrete drill, diameter 20mm, minimum length 400mm
- 1 Concrete drill, diameter 12mm, minimum length 400mm (*pre-drilling*)
- 1 Steel bar, diameter 30mm, length 500mm  
(*for the implementation of the sleeve anchors*)
- 1 Big hammer
- 1 Chalk line, length 20m, may be useful when mounted out of ground.
- 1 Spanner set open 17 / 19 / 21 / 32 mm (*tightening the grounding terminals*)
- 1 Spanner open 21mm (*Ties mounting*)
- 1 Spanner socket 21 mm (*Ties mounting*)
- 1 Spanner, open 36 mm (Load plates mounting, adjustment of the bumpers)
- 1 Spanner socket 32 mm (Load plates mounting, adjustment of the bumpers)
- 1 Spanner, open 46 mm (*Counter nut adjustment of the bumpers*)
- 1 Ratchet + accessories Caps 17 / 19 / 21 / 32
- 1 Screwdrivers set (Connection of the junction boxes)

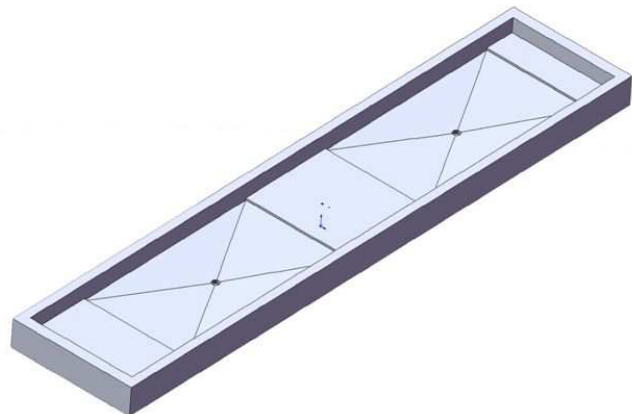
## 3. RECEPTION

### 3.1. Civil Engineering

In no case the weighbridge shall be installed without civil engineering have been previously checked, and in particular the flatness of support points and the results must be written in a report to be transmitted to the metrological department of **ARPEGE MASTER K.**

Check the following quotations according to the drawings of the civil engineering:

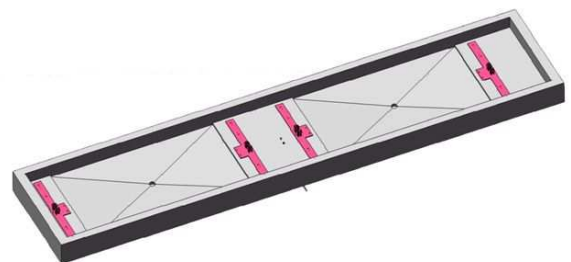
Length of each side,  
Width in several places,  
Diagonals,  
Depth of the pit,  
The squareness of the pit  
according to the ground.



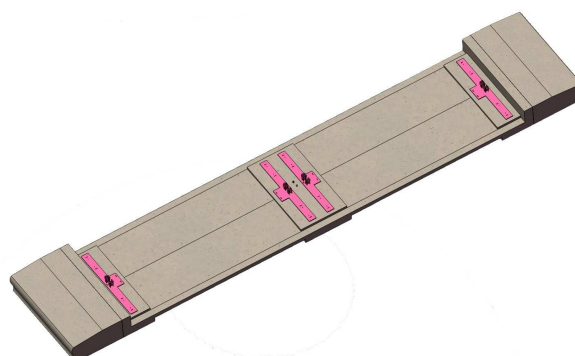
Then trace on the ground the location of the load cells according to the drawings of the civil engineering: load cell support point = location between reservation without reinforcement and verify with a telescope the differences in height of the support points, which determine whether a possible wedging is necessary.

The support points correspond to the zone in pink color hereafter.

*(Weighbridge presented model 16m: 1 module 7m on the left and 1 module 9 m to the right)*



Or aboveground model *(Weighbridge presented model 14m: 2 modules of 7 m)*



The observed differences will determine the location and thickness of the wedges to be added.



**Attention:** These wedges must be obligatory implemented before posing the modules, there is no possible access after posing the modules.



**Attention:** the maximum gap allowed between support points, once the wedging is done is **+/- 5mm**.  
(Wherever possible, reduce this gap to the minimum according to the available wedges)



Verify the presence of an earth picket (Not delivered by **ARPEGE MASTER K**), and (Or) the arrival of an earth cable to the location specified on the execution drawings.



In case of a pit mounting, verify the presence of a (*or many*) water evacuation systems in the bottom of the pit.



**Important:**

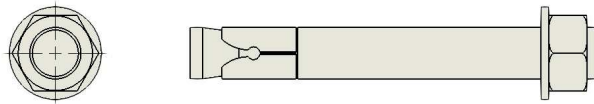
Any anomaly detected during the reception of the civil engineering must be reported on the reception statement, and as far as possible, must be recorded by the principal donor.

Before the implementation of the weighbridge, proceed to a cleaning of the pit and also verify the absence of concrete residues at the load cells support points, the bumpers and at the angles of the pit.

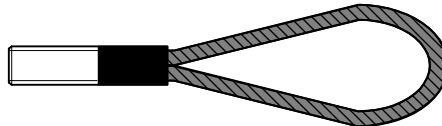
**3.2. Materials**

At the arrival of the weighbridge, check the presence of the following parts:

14, 28, or 42 x sleeve anchors Diameter 20mm



4 x Slings



4, 8, or 12 x Earth braids  
*(Mounted on the weighbridge, 1 per load cell)*



1 x Grounding cable per module  
*(1 module = 2 load plates)*

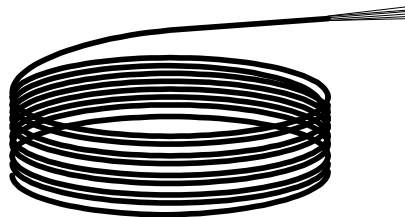


1 x Indicator.

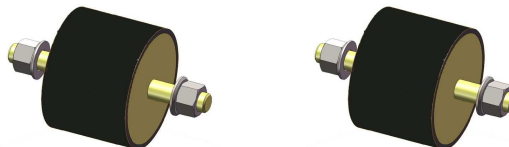


Or another model according to the order

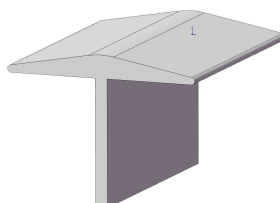
1 x connection cable



2 x Silent blocks *(2 modules weighbridge only)*



3m of T-joint *(2 modules weighbridge only)*





## 4. CONTRACTUAL PROCEDURE

The instructions below detail the steps to follow during the installation of a weighbridge that has undergone the type conformity verification and the affixing of the EC marking in factory.

**These steps are necessary and mandatory to ensure the compliance to our EC type approval.**

### 4.1. Responsibilities

- The installer must ensure the flatness of the support points before the implementation of the weighbridge.
- The installer must have:
  - A dumpy level
  - Wedges of various sizes for leveling
  - the DOC 066 or the Doc 102

### 4.2. Procedure

- Position and adjust the dumpy level  
*(In worst cases refer to the manual of the instrument).*

Control the flatness

- a - Measure the level of each support point with the dumpy level.
- b - Report all the measures "Hi" expressed in millimeters on the DOC 066.
- c - Determine the highest position "Hi max".
- d - For each point, calculate the difference between "Hi max" and "Hi".
- e - Report these values on the DOC066.

Control if the different values are within the tolerances.

If  $(\text{Hi max} - \text{Hi}) < 10 \text{ mm}$ , it is not necessary to put one (or several) wedge(s).

- Check the NO checkbox on the conclusion of the DOC 066.
- Complete the part 3 of the DOC 066.
- Mount the weighbridge on the supports without wedging.
- **Then at the end of the mounting go to the point 4.3 below**

If  $(\text{Hi max} - \text{Hi}) > 10 \text{ mm}$ , it is necessary to use one (or several) wedge(s) on one or several support points.

- Check the YES checkbox on the conclusion of the DOC 066.
- Go to the point 2 of the DOC 066.
- Ensure the leveling of the support points:

a – Determine the thickness of the wedge(s) in order to obtain a difference less than **10 mm**.

b – Put the wedge(s) on the concerned support point(s).

c – Indicate the thickness of the used wedges on the DOC 066 (part 2).

d – Measure each position of the support points with the dumpy level.

e – Report all the measures "Hi" expressed in millimeters on the DOC 066.

d - For each point, calculate the difference between "Hi max" and "Hi".

e - Report these values on the DOC066.

If the values are within the tolerances, go to the point 3 of the DOC 066.  
If not, take off all the wedges and restart from the beginning using a new document.

- Mount the weighbridge on the support points with the wedges.
- **Then at the end of the mounting, go to the point 4.3 below.**

### **4.3. Load Crossing**

The weighbridge must be loaded many consecutively with a load close to maximum (at least 80% of Max), in order that all the elements will be placed one over the other following the assembly of the load receptor. This action must be formalized on the part 3 of the DOC 066. In case this operation is not possible, mention the reason at the same place on the DOC 066.

In case of a PERFECT FT weighbridge with several modules, get sure that the junction of the modules is at the same level.

## 5. MECHANICAL MOUNTING OF A WEIGHBRIDGE DELIVERED AS A KIT

For the weighbridges delivered as Kits, you must foresee a flat location close to the final place of installation.



For the weighbridges mounted in pit, it is not possible to assemble the weighbridge directly in the pit. You must proceed to the assembly over the pit by putting the weighing plates on heavy section beams previously laid across the pit.

Put the first weighing plate

Position all the crossbars; bolt them to the first weighing plate without blocking them

Position the second weighing plate in support on the crossbars

Engage the fixing bolts

Verify the alignment of the modules in the direction of the length

Verify the diagonals which must be strictly identical.

Adjust if necessary

Proceed to the blocking of all the crossbars

Verify once again the alignment of the modules in the direction of the length

Verify once again the diagonals which must be strictly identical.

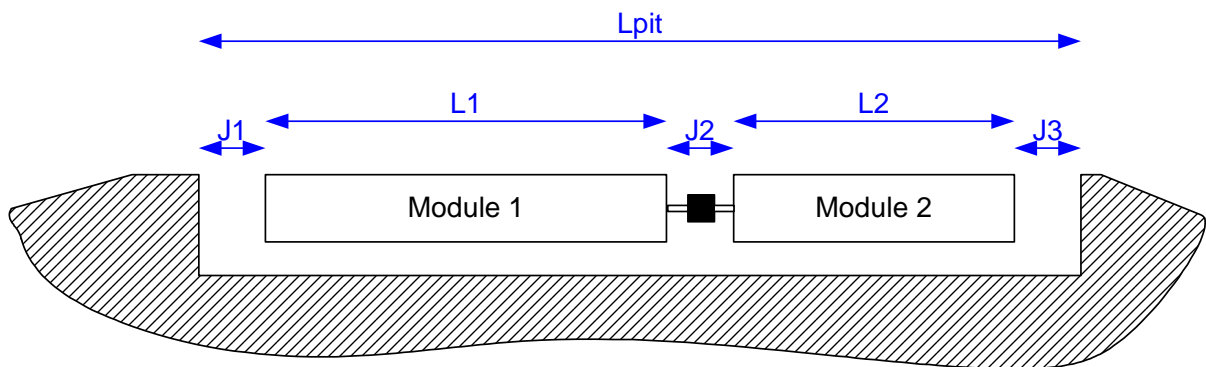
## 6. MECHANICAL ASSEMBLY OF A PRE-MOUNTED WEIGHBRIDGE

To unload the module(s) of the **PERFECT FT** weighbridge you must:

### 6.1. Preliminaries

#### 6.1.1. Position of the weighbridge

Measure the length of each module (L1 / L2) then calculate the position of the first module regarding the edge of the pit, knowing that J2 = 15mm



$$J1 = J3 = (L_{pit} - (L1 + J2 + L2)) / 2$$

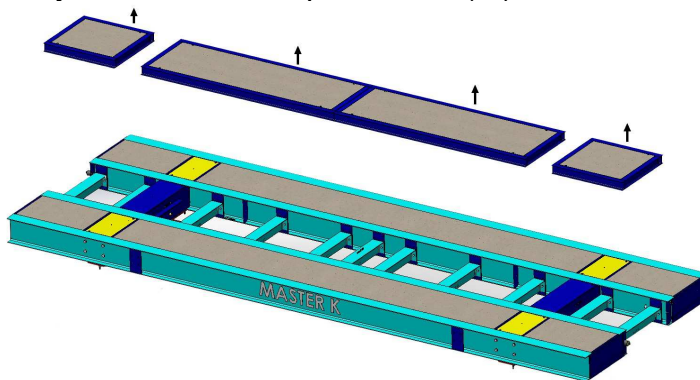
#### 5.1.2. Load cell locations

The load cells numbers (1 / 2 / ...) are marked on the frame (and) (or) on the load cells

To facilitate the maintenance, always position the load cell N°1 in a corner of the pit.

### 6.2. Mechanical mounting

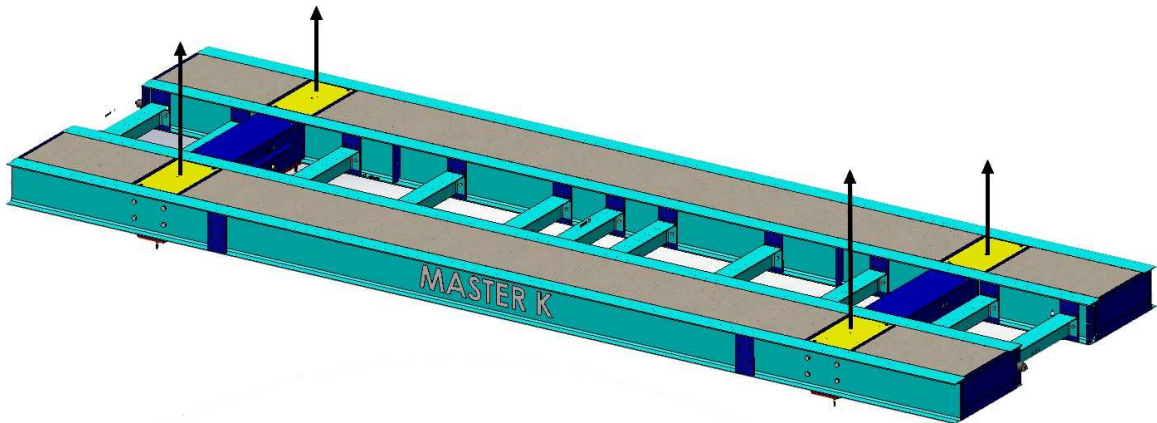
1. Lay down the metal plates and (or) the concrete panels of the central part



**Remark:**

*The concrete panels should never be placed directly on the ground, use wooden bastings correctly dimensioned on a flat surface.*

- Put the access traps to the technical crossbars of the loading plates, keep them near the weighbridge.



- Sling the weighbridge by using the holes provided for the lifting rings

Use the lifting rings implemented on the lifting brackets of the weighing modules (refer to photo 1 & 2) or on the anchoring points of the technical crossbars (photo 3)

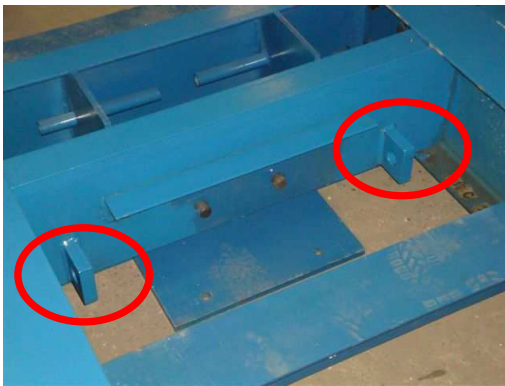


Photo 1



Photo 2

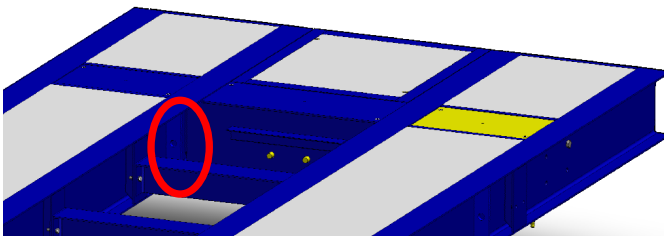
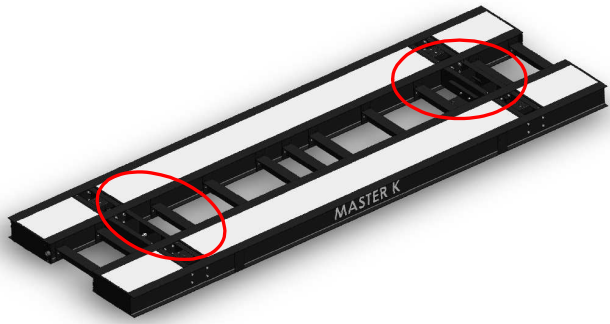


Photo 3

4. Then unload the weighbridge using **exclusively** 4 anchoring points provided for this effect. (See below)



5. Introduce the weighbridge above its location, align it to the edges of the pit and (or) regarding the headrest for the aboveground weighbridges. Calculated tolerance in the §5.1.1 at the ends of the weighbridge and tolerance of 15 mm in width for the weighbridges in pit.



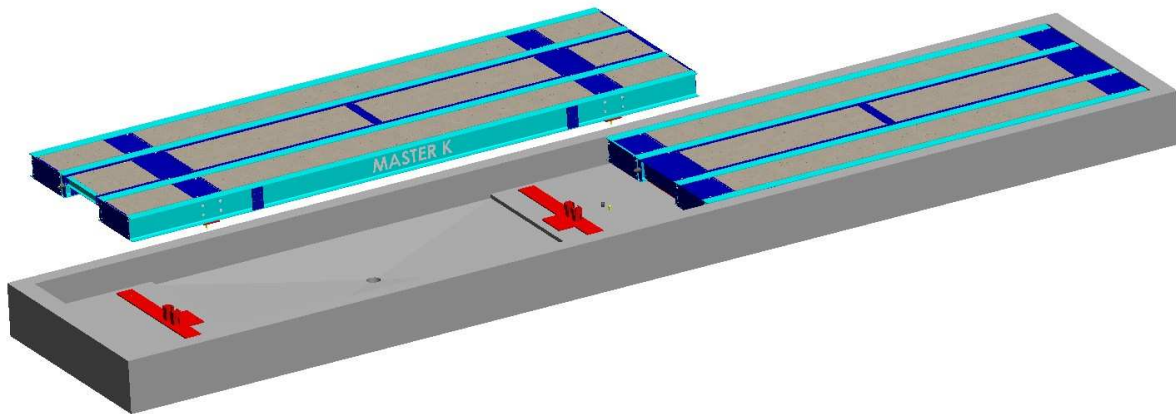
6. Down the weighbridge slowly and get sure that nothing will obstruct its passage.
7. Position the module to the distance calculated in §5.1.1 from the headrest (if it is a double module weighbridge) or center the weighbridge in case of a simple module weighbridge.



8. In case of a double module weighbridge, mount the silent blocks, used for the link between the two modules, on the module already in place.



9. Proceed the same way to position the second module, in case of an overground weighbridge, use the chalk line to align the modules.



10. Adjust the second module on the silent blocks of the first module, control the tolerance on the ends of the weighbridge regarding the preliminary calculation (refer to § 5.1) correct if necessary the position of the modules in order to center the weighbridge in the pit or between the headrests.



Do not mount the central panels until the weighbridge is fixed to the ground and unlocked.

11. Once the weighbridge is in place, proceed to the drilling in the holes foreseen for that on the support plate: 7 holes per plate, holes depth 12 cm)  
Clean the holes with an air pump before positioning the dowels.



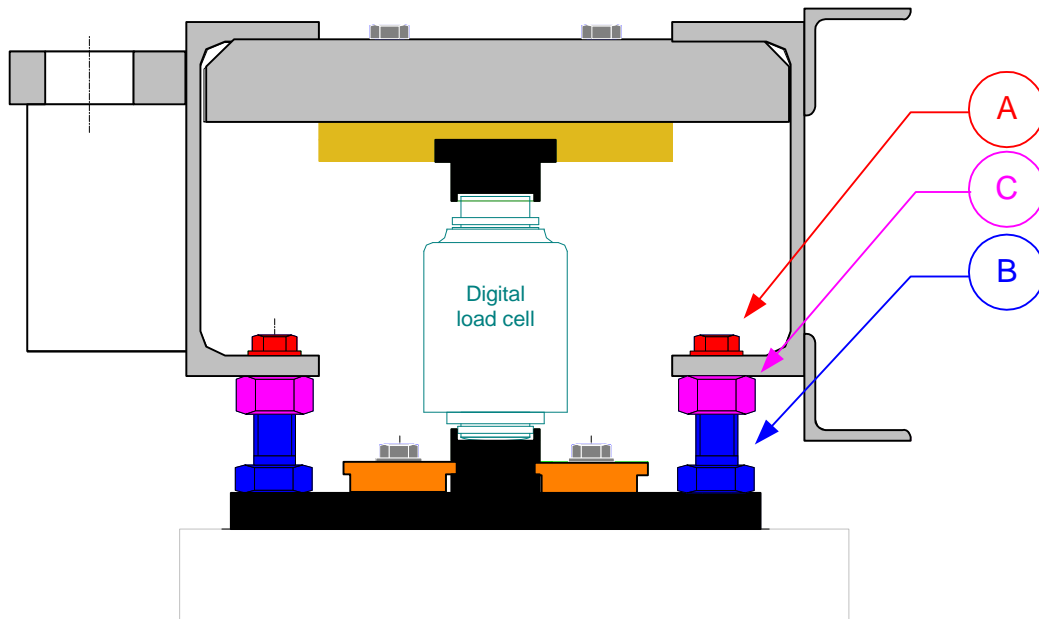
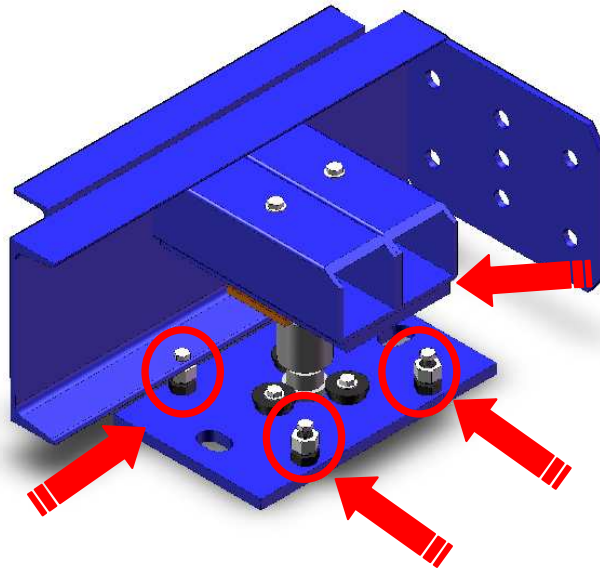
12. Position all the sleeve anchors (Diameter 20 x 160 provided)  
Enter the sleeve anchors using the steel bar Diameter 30 (minimum) and the hammer



13. Position all the anchors before tightening
14. Block all the anchors.
15. Verify once again with the dumpy level the flatness of the support points, note the values and ensure that they are still within the tolerances, if it is not the case proceed to a new wedging.
16. The weighbridge is now fixed to the ground and the platform may be released.



17. Release the platform of the weighbridge by removing the screws and nuts present near each load cell (if necessary relieve slightly with a jack)

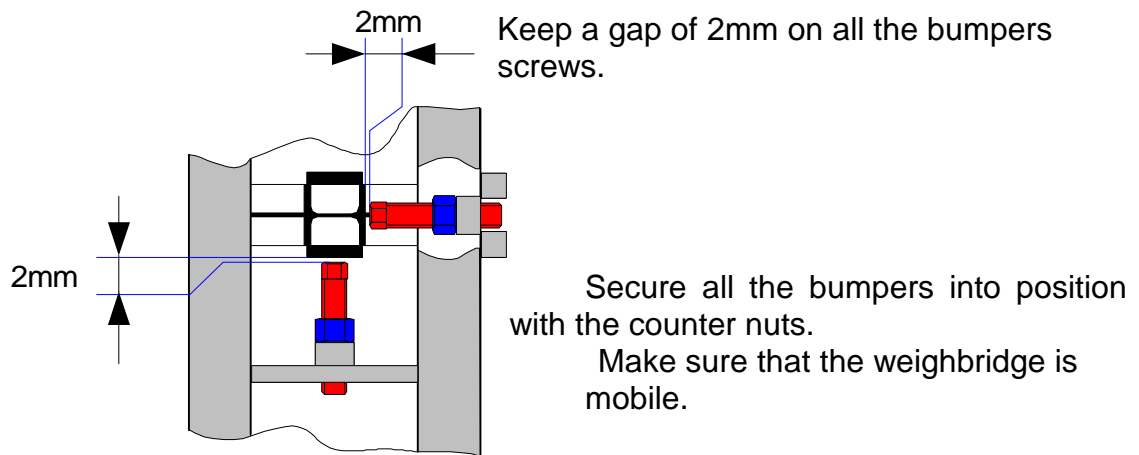


Unlock and remove the screws A

Unlock the screws B and nuts C sets, remove them.

Repeat the operation for each set and for each support point.

18. Once the weighbridge is completely released, proceed to the adjustment of the bumpers.



You can now position the central panels.

## 7. ELECTRICAL CONNECTIONS



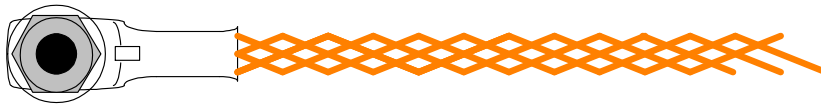
The earth picket or the lead of a ground cable is a customer supplied (Civil engineering batch)

The earth must be  $< 5\Omega$ .

### 7.1. Grounding:

Unless otherwise specified, the ground cable must be connected to a bolt welded to the deck of the weighbridge close to the protection junction box BRN2P on which the indicator's cable arrives.

For this kind of connections, the use of a crimp connector is required. The use of locking washers is recommended.



Attention: the immunity of the weighbridge to external electrical phenomena depends of the quality of this connection. (Lightning ....)

### 7.2. Location of the junction boxes

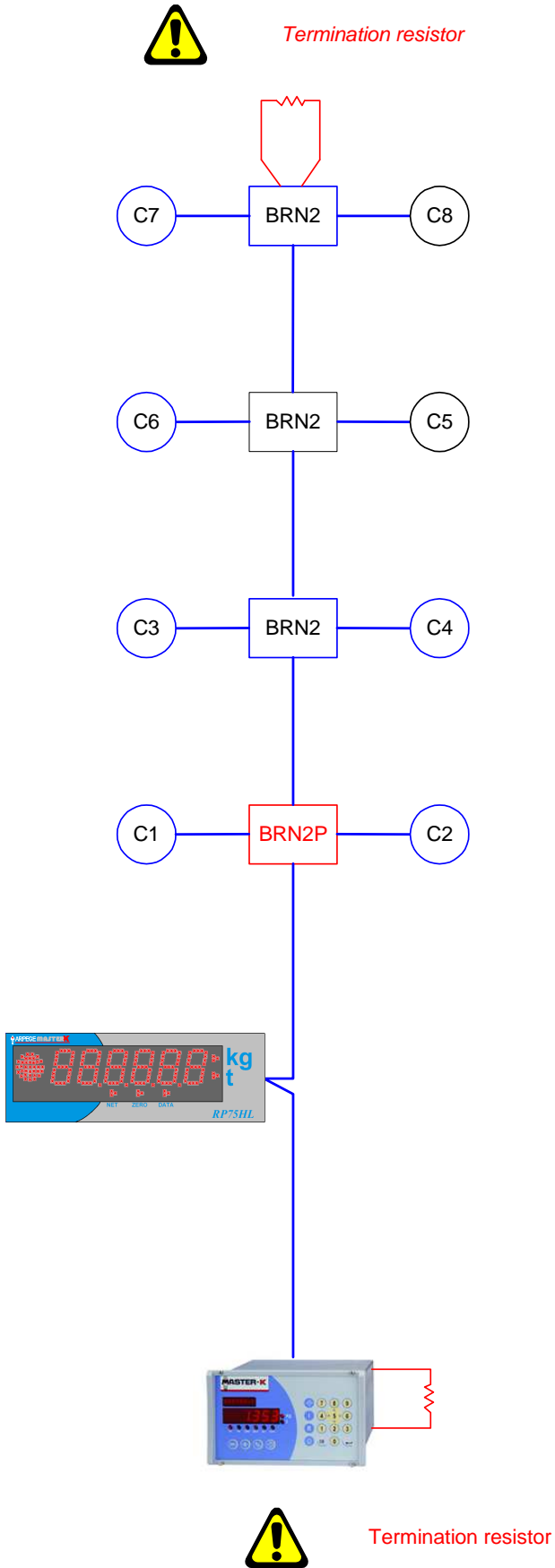
The junction boxes are fixed under the load cells' access traps.

### **7.3. Grounding of the junction boxes**

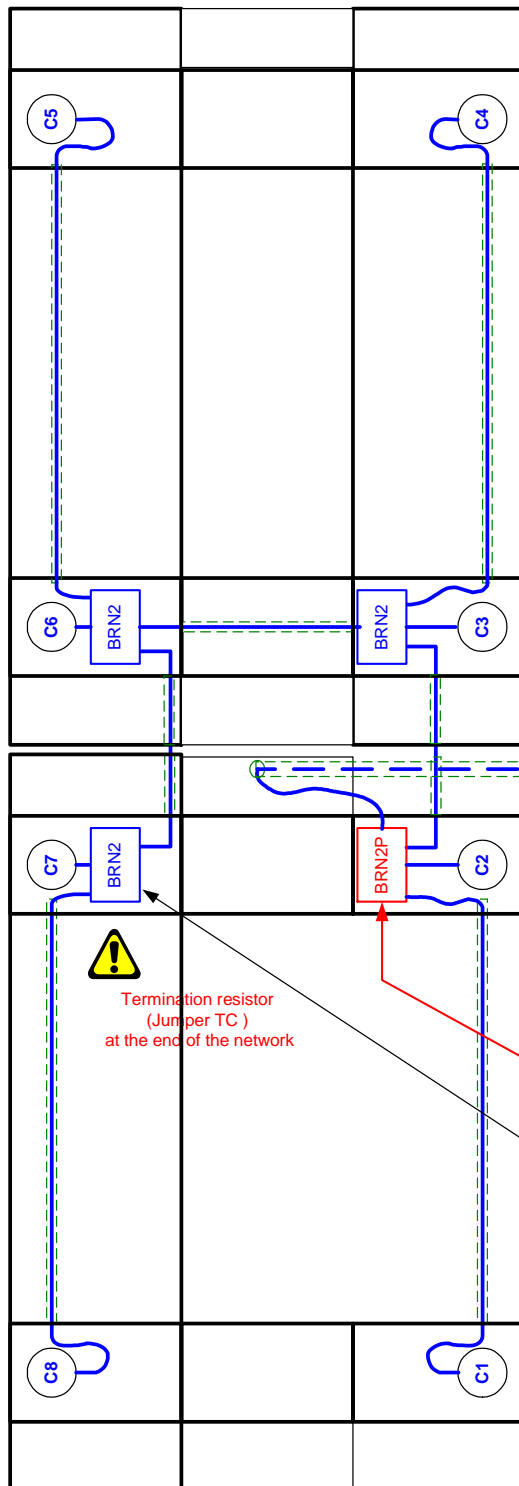
The junction box, on which the indicator's cable link arrives, must be obligatory connected to the earth of the weighbridge. A ground cable must connect the junction box to the earth braid of the nearest load cell.

The other junction boxes are grounded due to their connection cables.

### 7.4. Connection principle diagram



**7.5. Location of the load cells and junction boxes**



Termination resistor (Jumper) at the end of the network



Indicator's cable link:  
3 stranded twisted pairs with overall braid shield please respect the pairs (colors)

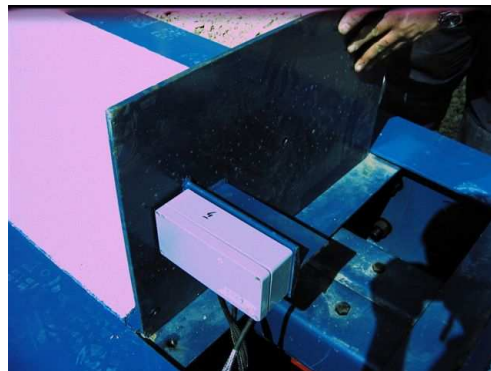


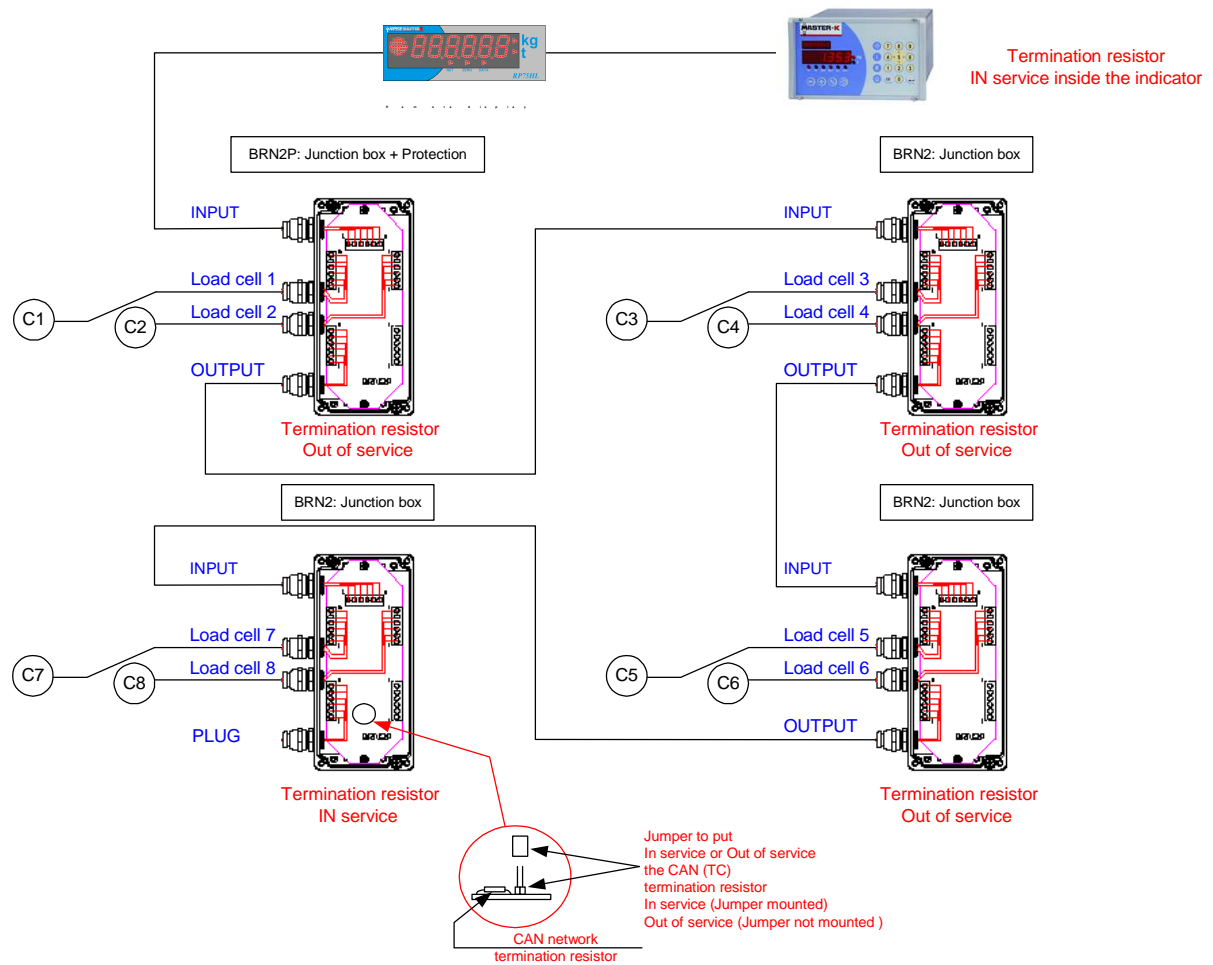
Termination resistor (Jumper TC) at the end of the network



Arrival of the indicator's cable in the BRN2P (Protection junction box)

**Remark:** In case of a 3 modules weighbridge distribute starting from the BRN2 and move the termination jumper to the end of the network





Pass the module 1 / module 2 interconnection cables and the indicator cable in the sheaths foreseen for that.

Proceed to the connection

In the junction box, connect the connection cable toward the indicator

Connect this cable to the connector of the indicator (*Refer to the technical file of the indicator*)



Give a particular attention to the following points:

**The recovery of the internal shield of the cable must be done at the level of the cable gland**

*(Refer to §6 appendix)*

The cable glands must be fitted tightly around the plastic sheath of the cable, never on the metal sheath.

The metal sheath or metal braid must be over the cable gland by a heat shrink sleeve.



Verify the presence of the jumper "TC", CAN Termination, in the farthest junction box from the indicator, and its absence in the other boxes.

Tip: Just measure the resistance value between CAN H and CAN L at the end of the load cell cable (indicator side) without being connected to the indicator, the resistance measured must be  $> 120 \Omega$



Verify the tightness of all the connections of the junction box.  
Close the connection boxes taking care not to pinch the wires.

Reinstall all the access traps.



Verify with a multimeter the operating voltage. (230Vac)

Verify with a multimeter the voltage between the neutral and the earth. (A few volts)

Verify with a multimeter the voltage between the phase and the earth. (230 Vac)

If all the voltages are good, turn on the indicator, after testing, the displayed weight must be 0kg, if it is not the case press on the re-zero key.



8. APPENDIX

**8.1. Mounting of the cable glands of the junction boxes**

The unused cable glands must be closed:



- (Rubber ring none pierced)
- Or
- Replaced by caps (not provided)



The cable gland model may change but the mounting principle remains the same

