WATER SUPPLIES DEPARTMENT

STANDARD SPECIFICATION EM-02-07

WEIGHING SCALE FOR CHLORINE CONTAINERS

1. GENERAL

The specification covers the technical requirements for weighing scale used for different types of chlorine containers stipulated below.

2. DESIGN AND CONSTRUCTION

All weighing scales including the associated pressure transmitter and indicator, if required to be provided, shall be designed to be suitable for use in an environment which may be subject to chlorine corrosion attack. The degree of protection for the enclosure of the pressure transmitter and indicator supplied shall be IP 67 to IEC 60529. The accuracy of the measuring system including the load cell shall be 0.5% of the instrument span or better.

2.1 Weighing Scale

Unless otherwise specified, the weighing scales provided shall meet one of the following container type arrangements, which shall be specified in the Particular Specification.

(a) Single Cylinder or Twin Cylinders

For uninterrupted chlorine supply, two single chlorine cylinders each of capacity 50 kg and dimensions 230mm (dia.) x 1700mm (H) approximately shall be connected together to form a draw-off unit for automatic changeover with one duty and one standby. Each chlorine cylinder shall be provided with one weighing scale and one indicator. One common platform shall be provided for the two weighing scales to form a draw-off unit. A general arrangement of the weighing scales for a draw-off unit is shown in **Appendix I**.

For larger chlorine draw-off rate, two twin chlorine cylinders will be connected together to form a draw-off unit. Each pair of chlorine cylinder shall be provided with one weighing scale and one indicator and the weighing scale platform shall be capable of mounting two chlorine cylinders.

(b) Multiple Chlorine Cylinders in a Bank of Five

For chlorine installations with higher draw-off rate, chlorine supply in cylinders shall be in cages in a bank of five to facilitate handling and transportation. The overall dimensions for a bank of five cylinders in a cage is approximately 1450mm (L) x 315mm (W) x 1800mm (H). A general arrangement is shown in **Appendix II**.

Two banks of five chlorine cylinders in cages shall be connected together to form a draw-off unit. Each bank of chlorine cylinders shall be provided with one weighing scale and one indicator. The platform of each weighing scale shall be suitable for placement of the cage with dimensions given above. Where specified, a stainless steel tray of grade 316 shall be provided for collection of condensed water with pipes collected to the nearest drain.

(c) Drums

Two chlorine drums each of capacity 1,000 kg and dimensions 820mm (dia.) x 2080mm (L) approximately shall be connected together to form a draw-off unit. Each chlorine drum shall be provided with one weighing scale and one indicator and each weighing scale shall have a trunnion set mounted on the platform. The trunnion set shall have 4 castors for supporting the steel rings of the chlorine drum at a distance of center-to-centre about 1.17 m and rotation of the drum in case of emergency.

A general arrangement of the trunnion set on the weighing scale is shown in **Appendix III**. Where specified, a stainless steel tray of grade 316 shall be provided for collection of condensed water with pipes collected to the nearest drain.

2.2 Load Cell

Unless otherwise specified in the Particular Specification, the weighing scale shall operate on either electronic or hydraulic load cell with separate wall/stand mounted indicator. The load cell shall withstand a shock loading up to 10 times of its measuring range.

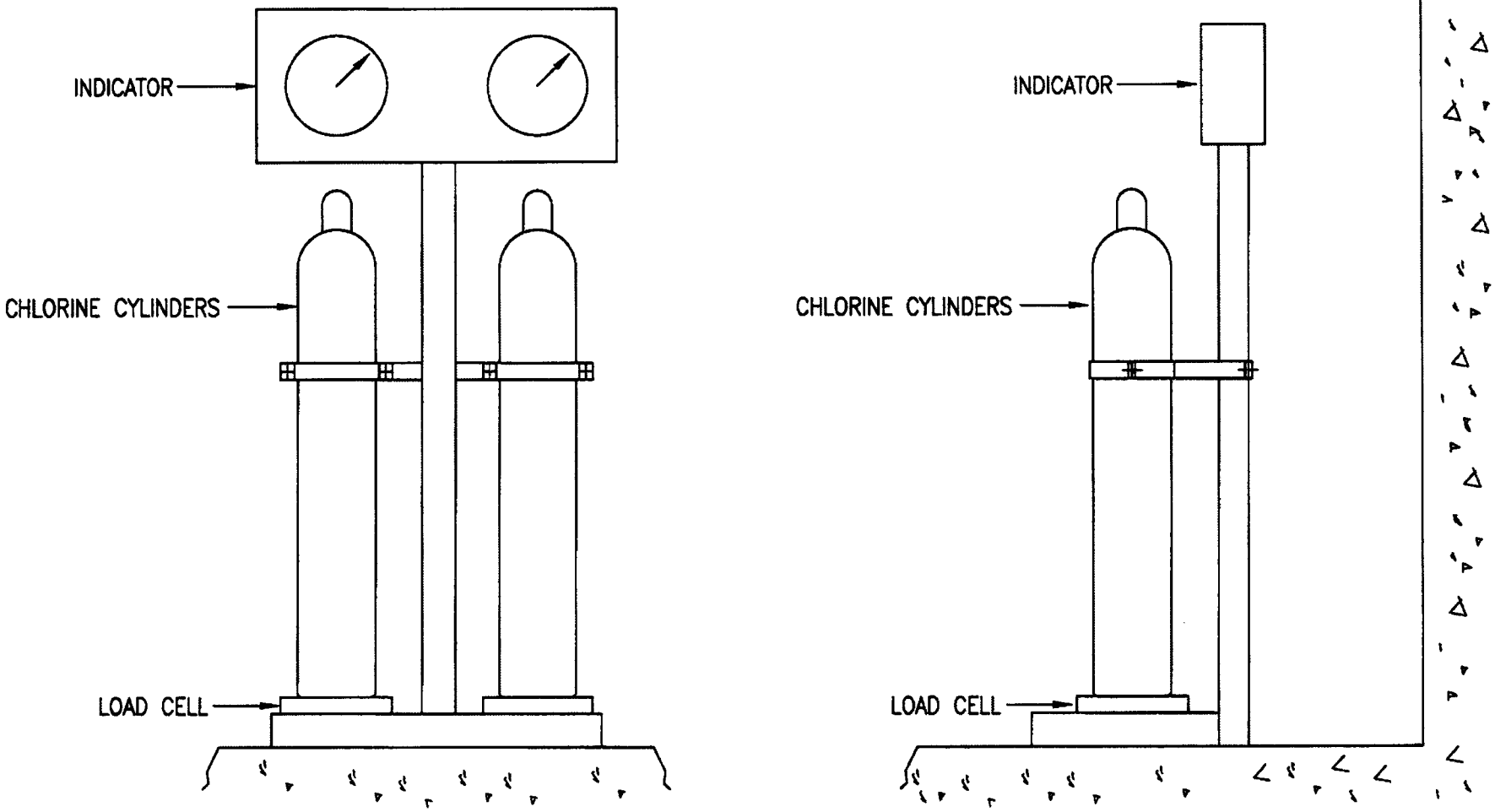
For electronic load cell, it shall be suitable for a power supply of 220V 50 Hz.

2.3 Particular Requirements

The weighing scale shall also meet the following particular requirements :-

Load Cell	Electronic	Hydraulic
Indicator	Digital	Dial
Span	Drum: 2,000 kg Single cylinder: 150 kg Twin cylinder: 200 kg Cylinders in a bank of five: 1,000 kg	Same as electronic load cell.
Resolution of indicator	Drum: 0.5 kg Single or twin cylinder(s): 0.1 kg Cylinders in a bank of five: 0.2 kg	Drum: 5 kg Single or twin cylinder(s): 0.5 kg Cylinders in a bank of five: 2.5 kg
Container tare weight adjustment	Tare weight adjustment for container(s) for computation of the net weight of chlorine in container(s) for remote indication and alarms as required below shall be provided. The tare weight setting shall be retrievable after adjustment.	Same as electronic load cell.
Local display on indicator	The local indicator for showing the net weight of chlorine in or the gross weight of the container(s) shall have a backlit display of character height not less than 10mm.	The local dial indicator for showing the net weight of chlorine in or the gross weight of the container(s) shall be not less than 300mm in diameter.
Remote indication	A 4-20mA signal proportional to the net weight of chlorine in container(s) on the weighing scale shall be provided for remote indication.	Same as electronic load cell. The pressure transmitter and the associated power supply and monitor unit for producing the 4-20mA signal for remote indication of net chlorine weight in container(s) and for alarms. The pressure transmitter and the associated power supply shall be in compliance with WSD Standard Specification E-82-01 and E-86-03 respectively.
Output signal for remote alarms	Two volt-free output contacts of rating 2A at 30V shall be provided for generation of remote alarms for "container nearly empty" and "container empty".	
Monitor unit for remote indication and alarms	Monitor unit if required for remote indication and alarms shall be of IP 54 enclosure provided in the nearby chlorine control room.	
Power Supply	220V, 50 Hz	Same as electronic load cell.

- End of this Specification -



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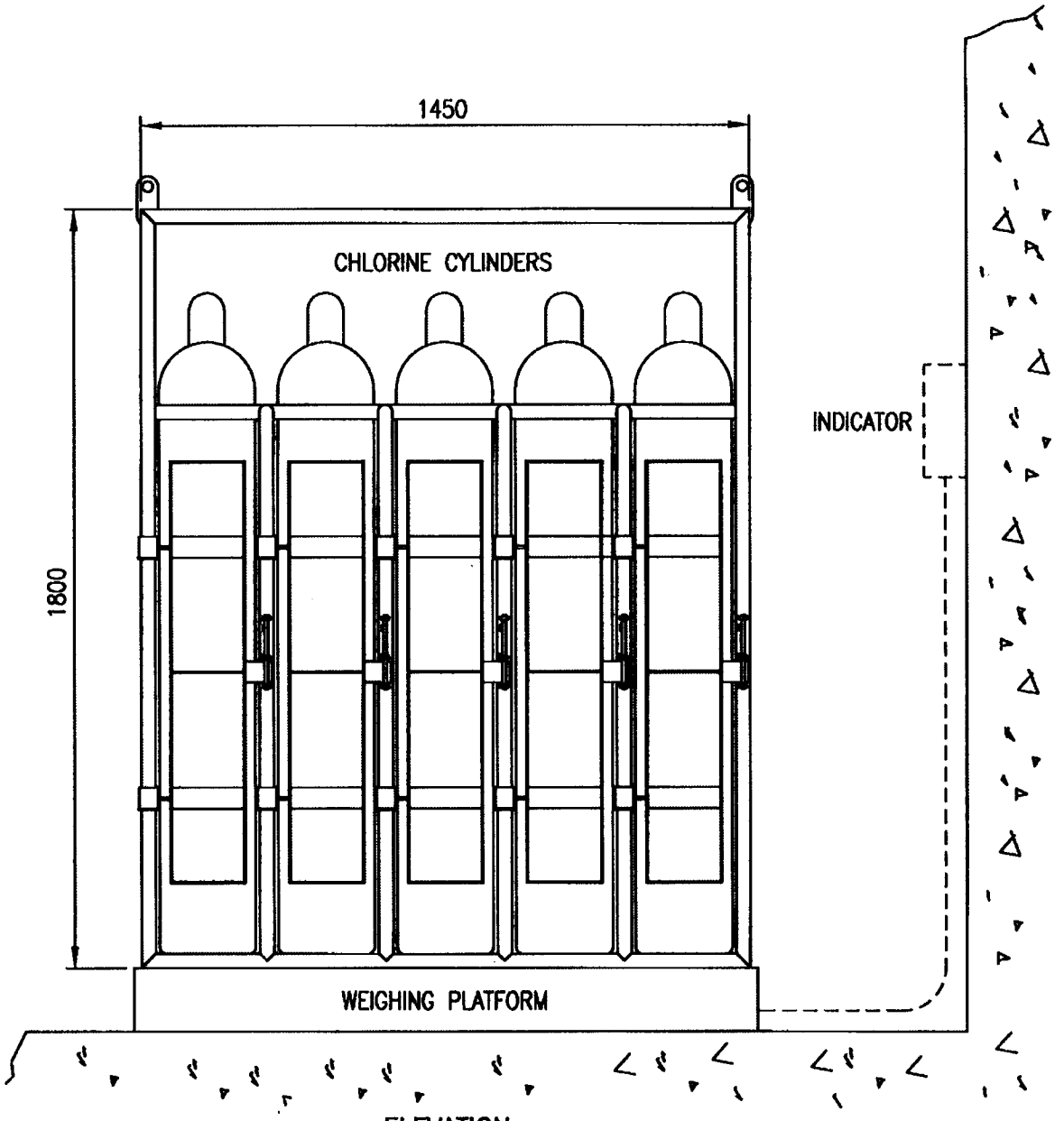
ARRANGEMENT OF 2 OFF 50KG CHLORINE CYLINDERS

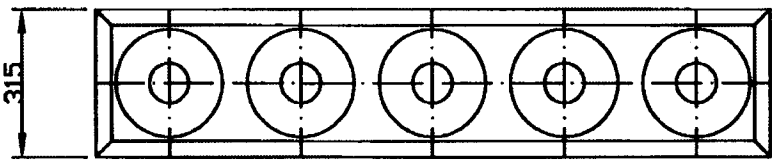
APPENDIX I

APPENDIX II



ELEVATION

ALL DIMENSIONS IN mm.



PLAN

CAGE FOR 5 OFF 50KG CHLORINE CYLINDERS

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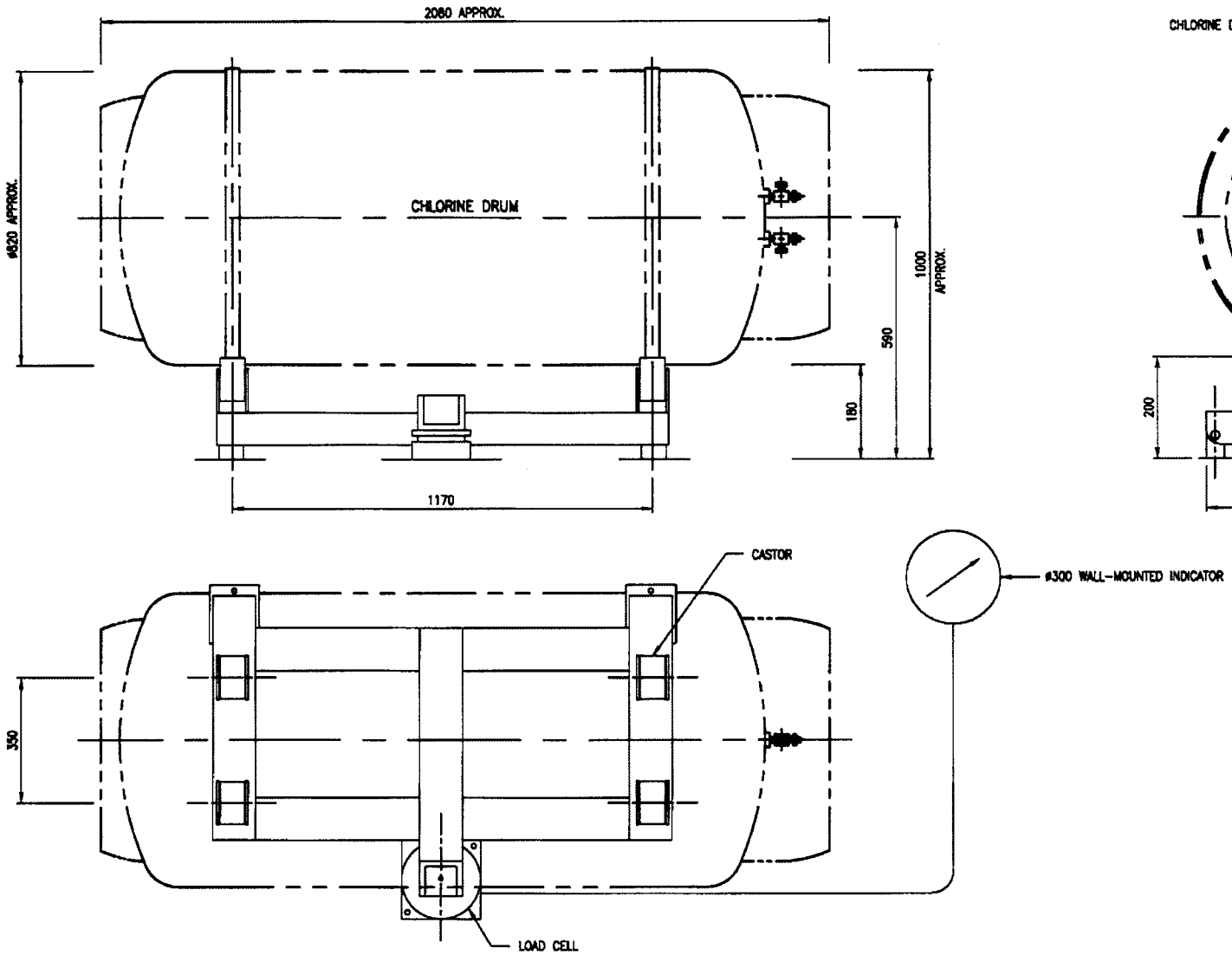

ARRANGEMENT OF TRUNNION SET

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APPENDIX III