



**TAMILNADU GENERATION & DISTRIBUTION CORPORATION
LIMITED. (TANGEDCO)**

2X660 MW UDANGUDI STPS, STAGE-I

**TECHNICAL SPECIFICATION
FOR
WEIGH BRIDGE**

SPECIFICATION NO.: PE-TS-435-563-A401



**BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. of India Undertaking)
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P
INDIA**

**TITLE****2X660 MW UDANGUDI STPS
WEIGH BRIDGE****CONTENTS**

SPECIFICATION NO. PE-TS-435-563-A401

SECTION

REV 00

Sub Section

Date

Page 1 of 1

CONTENTS

Section	Title	Page No.
I	Specific Technical Requirement	1-7
IA	Specific Technical Requirement (Mechanical).	
IB	Data Sheet - A.	8-16
II	Standard Technical Requirement.	16-48
IIA	Standard Technical Requirement (Mechanical).	
III	Documents to be submitted by the bidder.	49
IIIA	List of documents to be submitted with the bid.	50
IIIB	Compliance cum Confirmation Certificate.	51-52
IIIC	Electrical Load data	53
IIID	Pre-bid Clarification Schedule	54



TITLE

**2X660 MW UDANGUDI STPS
WEIGH BRIDGE**

SPECIFICATION NO. PE-TS-435-563-A401

Section I

REV 00

Sub Section IA

Date

SPECIFIC TECHNICAL REQUIREMENTS

Page 1 of 2

SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS

SUB-SECTION IA – Specific Technical Requirement (Mechanical)

SUB-SECTION IB – Data Sheet A



TITLE

TECHNICAL SPECIFICATION FOR
WEIGH BRIDGE
2X660 MW ENNORE SEZ

SPECIFICATION NO. PE-TS-435-563-A401

SECTION

Sub SECTION

REV 00

Page 1 of 2

1.0 SCOPE OF ENQUIRY/ INTENT OF SPECIFICATION

- 1.1 The specification is intended to cover design, engineering, manufacture, inspection and testing at vendor's/ sub-vendor's works, painting, forwarding, proper packing and shipment and delivery at site, unloading, handling & transportation at site, Erection & Commissioning, minor civil works as required on FOR site basis, Demonstration Test and handing over of **WEIGH BRIDGE** as per details in different sections / volumes of this specification for 2X660 MW UDANGUDI STPS.
- 1.2 The contractor shall be responsible for providing all material, equipment & services, which are required to fulfil the intent of ensuring operability, maintainability, reliability and complete safety of the complete work covered under this specification, irrespective of whether it has been specifically listed herein or not. Omission of specific reference to any component / accessory necessary for proper performance of the equipment shall not relieve the of the responsibility of providing such facilities to complete the supply, erection and commissioning of Weigh Bridge.
- 1.3 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to purchaser who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material which in his judgement is not in full accordance herewith.
- 1.4 The extent of supply under the contract includes all items shown in the drawings, notwithstanding the fact that such items may have been omitted from the specification or schedules. Similarly, the extent of supply also includes all items mentioned in the specification and /or schedules, notwithstanding the fact that such items may have been omitted in the drawing.
- 1.5 The general term and conditions, instructions to tenderer and other attachment referred to elsewhere are made part of the tender specification. The equipment materials and works covered by this specification is subject to compliance to all attachments referred to in the specification. The bidder shall be responsible for and governed by all requirements stipulated herein.
- 1.6 While all efforts have been made to make the specification requirement complete & unambiguous, it shall be bidders' responsibility to ask for missing information, ensure completeness of specification, to bring out any contradictory / conflicting requirement in different sections of the specification and within a section itself to the notice of BHEL and to seek any clarification on specification requirement in the format enclosed under Vol-III of the specification. In absence of any such clarifications, in case of any contradictory requirement, the more stringent requirement as per interpretation of Purchaser/Customer shall prevail and shall be complied by the bidder without any commercial implication on account of the same. Further in case of any missing information in the specification not brought out by the prospective bidders as part of pre-bid clarification, the same shall be furnished by Purchaser/ Customer as and when brought to their notice either by the bidder or by purchaser/ customer themselves. However, such requirements shall be binding on the successful bidder without any commercial & delivery implication.



TITLE

TECHNICAL SPECIFICATION FOR
WEIGH BRIDGE
2X660 MW ENNORE SEZ

SPECIFICATION NO. PE-TS-435-563-A401

SECTION

Sub SECTION

REV 00

Page 2 of 2

- 1.7 The bidder's offer shall not carry any sections like clarification, interpretations and /or assumptions.
- 1.8 Deviations, if any, should be very clearly brought out clause by clause in the enclosed schedule; otherwise, it will be presumed that the vendor's offer is strictly in line with NIT specification.
- 1.9 In case all above requirements are not complied with, the offer may be considered as incomplete and would become liable for rejection.
- 1.10 Unless specified otherwise, all through the specification, the word contractor shall have same meaning as successful bidder /vendor and Customer/ Purchaser/Employer will mean BHEL and /or CUSTOMER including their consultant as interpreted by BHEL in the relevant context.

Note:

Bidder to note that BHEL reserves the right for drawing/document submission through web based Document Management System. Bidder would be provided access to the DMS for drawing/document approval and adequate training for the same. Detailed methodology would be finalized during the kick-off meeting. Bidder to ensure following at their end.

- Internet explorer version – Minimum Internet Explorer 7.
- Internet speed – 2 mbps (Minimum preferred).
- Pop ups from our external DMS IP (124.124.36.198) should not be blocked.
- Vendor's internal proxy setting should not block DMS application's link (<http://dms-server.bhelpem.com/Wrench%20Web%20Access/Login.aspx>).



TITLE

**2X660 MW UDANGUDI STPS
WEIGH BRIDGE**

SPECIFIC TECHNICAL REQUIREMENTS

SPECIFICATION NO. PE-TS-435-563-A401

Section I

REV 00

Sub Section IA

Date

Page 1 of 4

SUB-SECTION IA – Specific Technical Requirement (Mechanical)

**TITLE****2X660 MW UDANGUDI STPS
WEIGH BRIDGE****SPECIFIC TECHNICAL REQUIREMENTS**

SPECIFICATION NO. PE-TS-435-563-A401

Section I

REV 00

Sub Section IA

Date

Page 2 of 4

GENERAL TECHNICAL SPECIFICATION**1.0.0 GENERAL**

This document provides the specific technical requirement for Road Weighbridge for 2 X 660 MW UDANGUDI STPS.

2.0.0 PLANT DESCRIPTION & DESIGN REQUIREMENTS

2.1.0 Incoming materials shall be received in the plant by road trucks / tractor trailers.

2.2.0 The trucks / trailers are weighed with material before unloading in store area in the power plant and tare weighed after unloading.

2.3.0 The receipt of material in the power plant will be in either of the following:

1. Normal trucks
2. Tractor trailers

2.4.0 Design Requirements

2.4.1 The weigh bridge shall be suitable for 24 hrs. of operation per day.

2.4.2 The weigh bridge shall be suitable for operation during rainy season.

2.4.3 The weigh bridge shall be capable of withstanding dynamic load imparted by the vehicle movement and braking.

2.4.4 The weigh bridge shall calibrate automatically the variation due to rains and other errors.

2.4.5 The weigh bridge equipment shall be electronic load cell with microprocessor based type.

2.4.6 The weigh bridges shall be pit less type

2.4.7 Approximately 100 weighments per day are expected to be made using the weigh bridge.

2.4.8 Load cells

The Load Cells shall be of multi column compression / double ended shear beam type, indigenously manufactured, shall operate on strain gauge principle and hermetically sealed and must be vibration resistant. The number of load cells to be used should be minimum 10 nos. with each load cells having maximum safe over load protection capacity. Suitable compensation must be built in for temperature variation. Maximum safe over load protection shall be provided upto 150% of the rated capacity and maximum load for mechanical damage must be 200% of the rate capacity. Overall system accuracy shall be $\pm 0.25\%$. The system accuracy shall be repeatable. The system shall have in built accuracy Recheck capability. The fixing of the load cells must be such as to facilitate easy access for replacement in case of fault. Load cell should conform to IP 68 protection and should be tested by a National Test House for the same and have overload parameters.

	TITLE 2X660 MW UDANGUDI STPS WEIGH BRIDGE SPECIFIC TECHNICAL REQUIREMENTS	SPECIFICATION NO. PE-TS-435-563-A401	
		Section I	
		REV 00	
		Sub Section IA	Date
		Page 3 of 4	

2.4.9 **Weighing Equipment – (Digital Weight Indicator)**

The weighing equipment shall be desk top type and shall be suitable for working in dusty and hot condition. Digital weight indicator shall be microprocessor based and shall be protected against all forms of Electro Magnetic and Radio frequency interference.

3.0.0 **SCOPE OF WORK**

3.1.0 **Scope of supply**

All materials supplied under this contract shall be new and unused.

3.1.1 One (1) no. of complete weigh bridge platform with load cells, digital weight indicator and test weight for calibration.

3.1.2 Provision of interfacing with PC to be given with necessary software and user manual. PC shall be provided with configuration as mentioned in Sub Section IB of Section I of this specification. Laser printer (coloured) A3 size shall be provided.

3.1.3 Printer, UPS industrial type with one-hour backup facility.

3.1.4 The weigh bridge shall be tested for full capacity and certified to be accurate before received at the site. After erection at site vendor shall arrange for the inspection of the weigh bridge by the Inspector of weights and measures and get the weigh bridge stamped by him. The requisite fees for such first stamping shall be paid by the vendor. The requisite test loads for stamping shall also be arranged by the Bidder.

3.1.5 All necessary cables from load cells up to digital weight indicator, totalizer and PC.

3.1.6 All other accessories and limits required to complete the weighing system.

3.1.7 All the instruments/equipment/electrical items shall be provided & designed with maximum star rating as available in line with energy conservation policies notified by BEE, GOI

3.1.8 Painting shall be as per mentioned in Sub Section IB of Section I in this specification. Final finish paint shall be applied after erection.

3.2.0 **Civil**

Civil are not in bidder’s scope of work. However, Bidder has to furnish recommended civil drawing of weigh bridge, control room as well as foundation drawing of equipment shall be submitted by the bidder.

3.3.0 **Electrical**

3.3.1 Electrical power of 240 Volts A.C. ± 10%, 50 Hz, +3%, -5% will be made available in the weigh bridge control room by purchaser.

3.4.0 **Scope of Services**

3.4.1 Packing, forwarding and transportation to site.

3.4.2 Development of storage space including ward & watch of the equipment and handling at site.

Page 6 of 54

	TITLE 2X660 MW UDANGUDI STPS WEIGH BRIDGE SPECIFIC TECHNICAL REQUIREMENTS	SPECIFICATION NO. PE-TS-435-563-A401	
		Section I	
		REV 00	
		Sub Section IA	Date
		Page 4 of 4	

3.4.3

Erection, site testing and commissioning of all items covered under scope of supply.

3.4.4

Submission of all interface data required for design and engineering of the system which are included in the scope of supply defined above.

3.4.5

Preparation and submission of drawings / documents for approval / information to purchaser as per the drawings / documents submission schedule.

3.4.6

Quality plan, inspection and testing of equipment at works submission of test certificate.

3.4.7

Training of Client's personnel in operation and maintenance of the complete system.

3.4.8

Certification / stamping of the weigh bridge by authorities of weights and measures.

3.5.0

Consumables

3.5.1

Specification including brand names and quantities of all consumable materials such as lubricants, flushing oil, hydraulic fluids etc. required for start-up, initial filling, commissioning are to be submitted by the Bidder.

3.5.2

Supply of all consumables (mentioned at S. No. 3.5.1) required for initial fill, commissioning and demonstration test is included in the scope of bidder.

3.6.0

Maintenance Tools and Tackles

3.6.1

One (1) set of special tools and tackles required for operation, maintenance, inspection and repair neatly packed in steel boxes completes with operating instructions for the equipment shall be furnished.

4.0.0

EXCLUSIONS FROM BIDDER'S SCOPE OF WORK

4.1.0

Access and approaches to the weigh bridge.

4.1.1

Air conditioner for control room.

Page 7 of 54



TITLE

**2X660 MW UDANGUDI STPS
WEIGH BRIDGE**

SPECIFIC TECHNICAL REQUIREMENTS

SPECIFICATION NO. PE-TS-435-563-A401

Section I

REV 00

Sub Section IB

Date

Page 1 of 5

**SECTION – IB
DATA SHEET - A**



TITLE

2X660 MW UDANGUDI STPS WEIGH BRIDGE

SPECIFIC TECHNICAL REQUIREMENTS

SPECIFICATION NO. PE-TS-435-563-A401

Section I

REV 00

Sub Section IB

Date

Page 2 of 5

SYSTEM DESCRIPTION

Sl.no	Description	Details
1	Weigh Bridge Type	Electronic Pit Less Type, Microprocessor based.
2	Quantity	One (1) No.
3	Codes & Standards	IS-1436, IS- 9281 & OIML for Load cell.
4	Weighing Capacity	60 Tonnes, 18000 mm X 3000 mm platform size of anti-skid steel
5	Type of trucks / trailers for weighment	6 wheeler or 8 wheeler
6	Control Room Size	3 M X 3 M X 4 M (Ht.)
7	Load Cells Type	Compression type with multi columns or double ended shear beam type hermetically sealed & vibration resistant Working on strain gauge principle
8	Load Cell Capacity	Minimum capacity of each load cell shall be (2 x capacity of weigh scale) / number of load cells
9	Over load, Safe	150 % of rated capacity
10	Over load, Ultimate	300 % of rated capacity
11	Digital weight indicator	To be provided to display weight (Microprocessor), At least 20 mm high character display for backlight LCD display, Kg or Tonne
12	UPS	1 KVA of industrial type with 1 hour backup.
13	Printer	Coloured Laser Printer Printing Speed 20 ppm (min.) Resolution 1200 X 600 dpi Memory 128 MB (min.) External Port 1 no. USB 2.0 port, and TCP/IP 10/100 Ethernet, Blue tooth interface Duty Cycle 40,000 pages per month Pages size A3, A4, and Transparency etc. with automatic duplex printing facility.
14	Accuracy of system	±0.05 % of rated output (full scale)
15	Load cell protection	IP 68 and tested by a national test house and


TITLE
**2X660 MW UDANGUDI STPS
WEIGH BRIDGE**
SPECIFIC TECHNICAL REQUIREMENTS
SPECIFICATION NO. PE-TS-435-563-A401
Section I
REV 00
Sub Section IB
Date
Page 3 of 5

		also have overload parameters
16	Visual display unit	Based on SMT technology to be provided in weight indicator
17	Location of PC / Printer	In the control room near weigh bridge
18	Totaliser	Minimum 6 digit type to be provided in the weigh bridge
19	Digital weight indicator	At least 20 mm high character display for backlight LCD display
20	Display modes	Weight and 16 mm for message with a) Indicate weight b) Indicate calibration-Auto zero tracking
21	Indicator	Kg or Tonne
22	Protection	From electromagnetic and radio interference
23	PC Configuration	a) Processor: Core i7 Processor, 3.2 GHz b) RAM: 4GB DDR2 RAM c) Hard Drive: 1TB HDD d) DVD R/W Combo e) Serial Port (RS232): 2 Nos. f) Parallel Port: 1 no. g) USB Port: 4 nos. h) Peripherals: 1 no. USB Optical Mouse, 1 no. USB Multimedia QWERTY Keyboard, 1 no. 22" Colour TFT/LCD Monitor i) OS: Windows 8 j) MS office k) Standard Weighing Software capable of providing details like net weight, tare


TITLE
**2X660 MW UDANGUDI STPS
WEIGH BRIDGE**
SPECIFIC TECHNICAL REQUIREMENTS
SPECIFICATION NO. PE-TS-435-563-A401
Section I
REV 00
Sub Section IB
Date
Page 4 of 5

		weight, total weight etc. 1) Consumable like DVD (R/W), Print Cartridges & Paper Rims
24	Consumables	DVD (Rewritable) - 5 nos. Print Cartridges – 5 Sets Papers- 5 Rims
25	Weighment & printouts	1. Name of contractor 2. Date and Time 3. Serial Number 4. Product Code 5. Customer Code 6. Truck Registration Number 7. First (Gross) Weight (I) 8. Second (Tare) Weight (II) 9. Net (Pay load) Weight (III) 10. LXBXH (M) Weigh slip after every weighment (i.e.) I & II weighments. Built in clock provide date and time to printer. Facility for totalizing the different material received.
26	Automatic, Manual tare and zero facility	To be provided in digital weight indicator. Provision for interfacing with a PC & Printer.
27	Control room	Air conditioned.
28	Surge Protection	Surge protection is to be provided by bidder, same is shown in UPS scheme.
29	Test Weight for Calibration	1 Ton Capacity to be provided by bidder.
30	Furniture in control room (Chair and Table)	Table, Chair is to be provided by bidder. Printer table drawing is attached with

**TITLE****2X660 MW UDANGUDI STPS
WEIGH BRIDGE****SPECIFIC TECHNICAL REQUIREMENTS**

SPECIFICATION NO. PE-TS-435-563-A401

Section I

REV 00

Sub Section IB

Date

Page 5 of 5

		specification.
31	MATERIAL OF CONSTRUCTION	
a.	Platform supporting structure and platform	As per IS 2062 Gr A
b.	Load Cell	Alloy Steel
32	Performance at Site	Performance of weigh bridge is to be carried out by bidder at site.

PAINTING SCHEDULE (Only for Weigh Bridge platform)**Surface Preparation:**

Degreasing and Mechanical cleaning with wire brushing and machine brushing as per St2.

Prime coat: -

Two (2) coats of HB Zinc phosphate (alkyd Medium as per IS:2074, DFT :35-40 micron per coat.

Finish coat:

Two (2) coats of synthetic enamel (alkyd med) as per IS:2932, DFT: 20-25 micron per coat.
Total Dry-film thickness 110-130 microns.
Final shade of paint shall be as per manufacturer's standard only.



3.4.0 Road Weigh Bridge

The Electronic Weigh Bridge shall be suitable for weighing loaded Road Trucks and Trailers and for 24 hours of operation per day.

The weigh bridge shall be capable of withstanding dynamic loads imparted by the vehicle movement and braking.

The weigh bridge shall calibrate automatically the variation due to rains and other errors.

The weigh bridge equipment shall be electronic load cell with micro processor based type.

The weigh bridge shall be suitable for operation during rainy season.

Sensing equipment for positioning of road vehicles shall be provided.

3.4.1 Equipment – Road Weigh Bridge

SL.NO.	Description	Data
I	GENERAL	
1.0.	Weigh bridge type	Pit less type microprocessor based Road Weigh



SL.NO.	Description	Data
		Bridge
2.0.	Quantity	Two (2) no. One (1) no.
3.0.	Codes and Standards	IS: 1432 - General requirements for weighing instruments IS: 1436 - Weigh Bridge- Specification. IS : 9281 - Specification for Electronic Weighing Systems - Part 2 Methods of Measurements IS: 9777 - Data sheet for selection of weigh bridges for bulk handling equipment. Load Cells- Organisation International Monetary League(OIML) standard
4.0.	Weighing capacity - Gross	60MT capacity - Stores. 100MT capacity - Silo area
5.0.	Platform size	18000 x 3000 mm
6.0.	Platform MOC	Anti skid steel
7.0.	No. of trucks / trailers for weighment	Minimum 200 trucks / tractor trailers per day.
8.0.	Type of trucks / trailers for weighment	All type
9.0.	Maximum safe over load protection	150% of rated capacity.
10.0.	Maximum load for mechanical damage	300% of rated capacity.
11.0.	Standards for load cells	OIML (Organisation international monetary league)
12.0.	Load cells type	Rocker pin (Compression type) / Shear beam type
13.0.	Load cell protection	IP 68 and tested by a national test house and also have overload parameters.
14.0.	Number of load cells per weigh bridge	Minimum 6 Nos. Each with rating of maximum safe over load capacity. Suitable compensation must be built for temperature variation.
14.1.	Accuracy required	$\pm 0.05\%$
14.2.	Repeatability	$< \pm 0.010\%$ FSO
15.0.	Resolution	10 kg
16.0.	Indicator	kg or tone
17.0.	Totaliser	Yes, minimum 6 digit type to be provided in the weight indicator.
18.0.	Weighing equipment	Desk top type and compact should be suitable for dusty, hot, humid conditions without an air conditioner.
19.0.	Digital weight indicator	Atleast 20 mm high character display for backlit LCD display.
20.0.	Display modes	Weight and 16 mm for messages with a) Indicate weight b) Indicate calibration – Calibration to be



SL.NO.	Description	Data
		checked automatically every 5 minutes.
21.0.	Display of key board entered values	10 mm high characters
22.0.	Protection	From electro magnetic and radio interference
23.0.	Auto calibration	Calibrations check facility to be provided.
24.0.	Digital filtering system	To ensure correct weighment when weighing oscillatory loads.
25.0.	Annunciators	To indicate over capacity.
26.0.	Push button balance	To weigh $\pm 1/4$ of a scale interval of 200
27.0.	Front panel controls	For balance, lamp test, semi auto tare, cancel tare and key board enable
28.0.	Automatic, manual tare and zero facility	To be provided in digital weight indicator Provision for interfacing with a PC & printer
29.0.	Weighment & printouts	1. Name of the contractor 2. Date and Time 3. Serial Number 4. Product Code 5. Customer Code 6. Truck Registration Number 7. First (Gross) Weight (I) 8. Second (Tare) Weight (II) 9. Net (pay load) Weight (III) 10. LxBxH (m) Weigh slip after every weighment (i.e) I & II weighments. Real time clock required to provide date and time to printer. Facility for totalising the different material received.
30.0.	Control Room	Air conditioned
31.0.	Side post and post marking at entry and exit of weigh platform	Required
32.0.	Painting of Weigh bridge	Surface preparation : Degreasing and Mech. Cleaning with wire brushing and machine brushing as per St2. Primer: Two (2) coats of HB Zinc Phosphate (alkyd Medium as per IS:2074, DFT:35-40 microns per coat. Finish Paint: Two (2) coats of synthetic enamel (alkyd med) as per IS: 2932, DFT: 20-25 microns per coat. Total DFT:110 – 130 microns Final Colour of Paint: As per manufacturer's standard
II	VIDEO DISPLAY UNIT	
1.0	Operator's Station (PC based)	One (1) no for each Weigh Bridge
2.0	Processor	Core 2 Duo or better
3.0	Hard drive	320GB
4.0	System Memory	2GB
5.0	DVD Drive	DVD Read & Writer



SL.NO.	Description	Data
6.0	Operating system	WIN 2007 or higher
7.0	Graphic accelerator	8MB (Minimum)
8.0	Communication ports	04 nos. (min.) with two pen drive and other ports as required
9.0	Monitor	TFT Type
10.0	Screen diagonal	21" flat
11.0	Resolution	1024 X 768 or better
12.0	Degree of protection	IP-30
13.0	External Controls	Brightness, contrast, Horizontal /Vertical amplification & shift
14.0	Keyboard	One (1) no for each weigh bridge
15.0	Mouse	One (1) no for each weigh bridge
16.0	UPS	One (1) no for each weigh bridge with a power backup facility of 1 Hr for the total system.
17.0	Printer	One (1) no for each weigh bridge – DOT MATRIX PRINTER – 136 Column

Note:

1. The dimensions with GA drawing shall be submitted further after awarding the same.
2. Facility for auto calibration to be provided.



TITLE

2X660 MW UDANGUDI STPS

WEIGH BRIDGE

STANDARD TECHNICAL REQUIREMENTS

SPECIFICATION NO. PE-TS-435-563-A401

VOLUME: II B

REV 00

Section C

Date

Page 1 of 1

SUB-SECTION – IIA

STANDARD TECHNICAL REQUIREMENTS (MECHANICAL)

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS - 435 - 563 – A401	
		SECTION II	
		SUB SECTION II A	
		REV	0
		SHEET OF	

SUB SECTION-IIA

Demonstration Guarantee

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS – 435 - 563 – A401	
		SECTION	II
		SUB SECTION	IIA
		REV	0
		Page 1 of 2	

1.0.0 DEMONSTRATION TEST

The values of demonstrate parameters that are to be guaranteed are furnished elsewhere in this specification.

The equipment shall be guaranteed to meet performance requirements required by this specification and rectification shall be carried out until satisfactory results are obtained. The Purchaser reserves the right to reject the equipment should the performance values fall short of those indicated in the Data Sheet-A (Section-I).

In case of such option of rejection being exercised by the Purchaser the tender shall replace the equipment which shall meet the guaranteed values.

2.0.0 GUARANTEE AND PENALTY FOR SHORTFALL IN PERFORMANCE

2.1.0 The Bidder shall provide guaranteed performance for the entire package in the format schedule of demonstration test and the values provided therein shall be binding on the Bidder.

2.2.0 The terms under guarantee shall be as follows:

Items for which shortfall in demonstration is not acceptable and which must be corrected at no extra cost to the Client within guarantee period.

All items specified in Schedule of demonstration test shall not be accepted for any shortfall in performance.

2.3.0 For these items above, the Bidder shall carry out modifications even before commencement of trial operation to obtain the guaranteed performance. These parameters must remain stable throughout the period of trial run. All work related to correction and subsequent trial run to prove stability/reliability shall be completed within the guarantee period at no extra cost to the Client.

2.4.0 If finally, inspite of all practicable effort on the part of the Bidder, the stipulated guarantees on these parameters are not established, the Client retains the option to reject the equipment. In case the option to reject is exercised by the Client, the Bidder shall replace the rejected equipment within a reasonable period of time as will be indicated by the Client and achieve the performance as guaranteed in the document.

3.0.0 Test Codes

The provisions outlined in the international or Indian codes shall generally be used as a guide for all above test procedure unless otherwise specified in Detailed Technical Specification.

4.0.0 Taking over

Upon successful completion of all the Client Acceptance Tests, the Client shall issue to the Bidder a Taking over Certificate as a proof of the final acceptance of the equipment. Such certificate shall not relieve the Bidder of any of his obligations which otherwise survive, by the terms and conditions of the Contract after issuance of such certificate.

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS – 435 - 563 – A401	
		SECTION	II
		SUB SECTION	IIA
		REV	0
		Page 2 of 2	

SCHEDULE OF DEMONSTRATION TEST

S. No.	DESCRIPTION	UNIT	DATA
1.	Weighing capacity	Tons	
2.	Platform size	M X M	
3.	Accuracy	Kg	

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS - 435 - 563 – A401	
		SECTION II	
		SUB SECTION IIA	
		REV	0
		SHEET	OF

SUB SECTION IIA
Quality Assurance

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS - 435 - 563 – A401	
		SECTION II	
		SUB SECTION IIA	
		REV	0
		SHEET OF	

1.0.0 QUALITY ASSURANCE PROGRAMME, TESTING AND INSPECTION

1.1.0 Quality Assurance

- 1.1.1 **The** detailed Quality Plans for manufacturing and field activities should be drawn up by the Bidder, separately in the format attached under Section Technical data sheets and schedules and will be submitted to Consultant/Client for approval. Such quality plans will be finalized before award.
- 1.1.2 These approved documents shall form a part of the contract. In these approved quality plans, Client shall identify customer hold points (CHP), i.e. test/checks which shall be carried out in presence of the Client's Engineer or his authorized representative and beyond which the work will not proceed without consent of Client/Authorized representative in writing.
- 1.1.3 No material shall be despatched from the manufacturer's works before the same is accepted subsequent to pre-despatch final inspection including verification of records of all previous tests/inspections by Client's Engineer/Authorised representative, and duly authorised for despatch issuance of MDCC.
- 1.1.4 For all spares and replacement items, the quality requirements as agreed for the main equipment supply shall be applicable.
- 1.1.5 The equipment shall be guaranteed to meet performance requirements required by this specification and rectification shall be carried out until satisfactory results are obtained. The Client reserves the right to reject the equipment should the performance values fall short of those indicated in the schedule of Technical data sheets.

In case of such option of rejection being exercised by the Client the Bidder shall replace the equipment which shall meet the guaranteed values.

1.2.0 Inspection, Testing and Inspection Certificates

- 1.2.1 **The** Bidder shall give the Client/Inspector fifteen (15) days written notice of any material being ready for testing. Such tests shall be to the Bidder's account except for the expenses of the inspector's. The Client/Inspector, unless the witnessing of the tests is virtually waived, will attend such tests within fifteen (15) days of the date on which the equipment is noticed as being ready for tests/inspection failing which the Bidder may proceed with test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of test reports.

1.3.0 CLIENT ACCEPTANCE TESTS, TRIAL OPERATION AND DEMONSTRATION TEST

- 1.3.1 After the pre-commissioning tests are satisfactorily over, the complete equipment shall be placed on initial Operation during which period the complete equipment shall be operated integral with sub-systems and supporting equipment as a complete plant.

Manufacturing Quality Plan of Weigh Bridge along with Sub Vendor List of 60 Ton capacity

MANUFACTURES NAME & ADDRESS					MANUFACTURING QUALITY PLAN				Rev. 00 sheet 1 of 3			
					Owner :		Drg. No. :					
					Customer :							
					Project:		DATE :					
S.No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY		REMARKS	
									M	C		
1	2	3	4	5	6	7	8	9	10		11	
1	Material	Surface Defect	Major	Visual	100%	IS:2062	IS:2062	Vender Insp.Report	✓	P	V	
		Dimensional Conformity	Major	Measurement	100%	Componont Drg.	Componont Drg.	Vender Insp.Report	✓	P	V	
		Chemical	Major	Chemical Analysis	SAMPLE	IS2062-06, GR-E250A.	IS2062-06, GR-E250A.	Test Report	✓	P	V	
		Mechanical	Major	Tensile Bending	SAMPLE SAMPLE	IS2062-06, GR-E250A.	IS2062-06, GR-E250A.	Test Report	✓	P	V	
2	Welding Back Chipping	Weld Quality Surface Defect	Major Major	Visual	SAMPLE	IS3658	IS3658	Inspection	✓	P	V	
3	Final Inspection of Febricated Platform structure	Dimensional Measurement	Major	Dimensional Measurement	100%	G.A.Drawing	G.A.Drawing	Vender Insp.	✓	P	V	
4	Load Cell	General Data	Major	Material Capacity Excitation Insual Res.	100%	As per Standard	As per Standard	Genaral Data	✓	P	V	
		LEGEND : Records Identified With Tick (✓) Shall Be Essentially Included By Contractor in QA Documentation. "M" Manufacturer / Subcontractor C-BHEL / Third party Indicate "P" Perform , "W " Witness And "V" Verify.					For Customer Use					
Contractor												
Signature							Received By		Name & Sign Of Approving authority & Seal.			

MANUFACTURES NAME & ADDRESS					MANUFACTURING QUALITY PLAN							
					Owner :							
					Customer :							
					Project:		Drg. No. :		Rev. 00 sheet 2 of 3			
S.No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									M	C		
1	2	3	4	5	6	7	8	9	10			11
5	Load Cell	Calibration Data	Mjor	Sensitivity Zero input Insulation Resis. Input Resistance Output Resistance	100%	OIMLR60/2000	OIMLR60/2000 CLASS-C 3	Calibration Certificate	✓	P	V	
6	Personal Computer (PC) CPU , Ram, Hard Disk, Flopy Drive , Monitor, Key Board, Mouse.	As per specification	Major	Visual Review Mfr'Tc	100%	As per Approved Data Sheet	As per Approved Data Sheet	Vender Insp. Report	✓	P	V	
7	Digital Weight Indicator	Self Test Unit Kg / Tons Auto Calibration	Major	Visual	100%	As per Approved Data Sheet	As per Approved Data Sheet	Vender Insp. Report	✓	P	V	
8	Weighment & Printout Of Weigh Slip	As per weigh slip Specification	Major	Visual	100%	As per Approved Data Sheet	As per Approved Data Sheet	Demo Software CD	✓	P	W	
9	Cleaning & Painting	By hand Application	Major	Visual	100%	As per Approved Data Sheet	As per Approved Data Sheet	Vender Insp. Report	✓	P	V	
		LEGEND :					For Customer Use					
Contractor		Records Identified With Tick (✓) Shall Be Esssentially Included By Contractor in QA Documentation. "M" Manufacturer / Subcontractor C-BHEL / Third Party Indicate "P" Perform , "W " Witness And "V" Verify.										
Signature							Received By		Name & Sign Of Approving authority & Seal.			

MANUFACTURES NAME & ADDRESS					MANUFACTURING QUALITY PLAN						
					Owner :						
					Customer :		Drg. No. :				
					Project:		DATE :		Rev. 00 sheet 3 of 3		
S.No	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY		REMARK
									M	C	
1	2	3	4	5	6	7	8	9	10		11
10	Inspection at works Assembly of weighbridge Platform structure along with load testing at calibrated load	Span, Dimensional Check, Load Test	Major	Measurement	100%	G.A.Drawing / Data Sheet	G.A.Drawing / Data Sheet	Vender Insp. Report	✓	P	W
11	Standard Weight	Standard CI Weight	Major	Visual	100%	Std of weight & Major act. 1976	Std of weight & Major act. 1976	Verification Certificate		P	V
Note No. 1 Note No. 2		Original TCS/ Photocopies certified in original by mill shall br furnished for review. Perfomance Test shall be Carried Out at site after complete installation of weighbridge on finished, level, fooundation as per Drawing.									
		LEGEND :					For Customer Use				
		Records Identified With Tick (✓) Shall Be Esssentially Included By									
Contractor		Contractor in QA Documentation. "M" Manufacturer / Subcontractor C-BHEL / Third party Indicate "P" Perform , "W" " Witness And "V" Verify.									
Signature							Received By		Name & Sign Of Approving authority & Seal.		

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS – 435 - 563 -A401	
		SECTION II	
		SUB SECTION IIA	
		REV 0	
		Page 1 of 1	

MAKES OF SUB VENDORS ITEMS OF WEIGH BRIDGE

S.N.	ITEM	MAKES
1.0	STEEL	SAIL / JINDAL / ESSAR / TISCO
2.0	LOAD CELL	ZEMIC (USA) / KELI (SINGAPORE) / OEM
3.0	OVS / PC	HP / COMPAQ / DELL / HCL / IBM / LENOVO
4.0	PRINTER	HP / CANON / EPSON / XEROX / IBM / LEXMARK
5.0	UPS	HITACHI-HIREL / APC / DELTA / EMERSON / DB POWER / APLAB
6.0	UPS BATTERY	EXIDE/AMCO
7.0	DIGITAL WEIGHT INDICATOR WITH TOTALIZER	GOSSEN/CAMILLE BAUER/ METRAWATT, GERMANY, YOKDGAWA,JAPAN(YOKOGAWA INDIA LTD,BANGALORE), ABB,GERMANY/FARIDABAD, MASIBUS,GANDHINAGAR, PYROTECH,UADIPUR, LEKTROTEK,PUNE,OEM
8.0	JUNCTION BOX	AJMERA INDUSTRIAL & ENGINEERING WORKS, FLEXPRO ELECTRICALS PVT. LTD. (Metal type junction box only), K.S.INSTRUMENTS PVT.LTD., SUCHITRA INDUSTRIES, SHRENIK & COMPANY

Note:

1. Make is indicative, subject to customer's / consultant approval during detail engineering. Acceptance/non acceptance of same shall not have any impact on manufacturing, delivery schedule and on cost of the weigh bridge.

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS – 435 - 563 – A401	
		SECTION II	
		SUB SECTION IIA	
		REV 0	
		Page 1 of 1	

DRAWINGS, DATA / DOCUMENTS TO BE FURNISHED BY THE SUCCESSFUL BIDDER

S. No.	Drawing No.	Drawing Title	Sch Submission of week (From date of LOI /PO)
1	PE-V0-435-563-A405	O & M Manual OF WEIGH BRIDGE	8
2	PE-V0-435-563-A404	GA of weigh bridge with painting details	3
3	PE-V0-435-563-A402	Data sheet of weigh bridge with detailed BOM	3
4	PE-V0-435-563-A407	Electrical load	4
5	PE-V0-435-563-A401	Manufacturing Quality Plan of weigh bridge	3

NOTE:-

1. ALL RESUBMISSIONS SHALL BE MADE WITHIN 10 DAYS OF RECEIVING COMMENTS FROM BHEL / CUSTOMER.
2. INCOMPLETE DRAWINGS/DOCUMENTS SHALL NOT BE TREATED AS SUBMITTED.

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS – 435 - 563 – A401	
		SECTION	II
		SUB SECTION	IIA
		REV	0
		Page 1 of 2	

Instruction Manuals

The Bidder shall submit to the Consultant/Client, draft Instruction Manuals for all the equipment covered under the Contract prior to despatch of equipment to site. The Instruction manuals shall contain full details required for erection, commissioning, operation and maintenance of each equipment. The manual shall be specifically compiled for this project and shall be approved by Client / Consultant. The Contract shall not be considered to be completed for purposes of taking over until the final Instructions manuals have been supplied to the Client. The Instruction Manuals shall comprise of the following.

A) Erection Manuals

The erection manuals shall be submitted at least three (3) months prior to the commencement of erection activities of particular equipment / system. The erection manual should contain the following as a minimum.

- a) Erection strategy
- b) Sequence of erection
- c) Erection instructions
- d) Critical checks and permissible deviation / tolerances
- e) List of tool, tackles, heavy equipment like cranes, dozers, dredgers etc.
- f) Bills of Materials
- g) Procedure for erection
- h) Procedure for initial checking after erection
- i) Procedure for testing and acceptance norms
- j) Procedure / Check list for pre-commissioning activities
- k) Procedure / Check list for commissioning of the system
- l) Safety precautions to be followed in electrical supply distribution during erection.

B) Operation & Maintenance Manuals

- i) The manuals shall include the following:
 - a) List of spare parts along with their drawing and catalogues and procedure for ordering spares.
 - b) Lubrication Schedule including carts shown lubrication checking, testing and

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS – 435 - 563 – A401	
		SECTION II	
		SUB SECTION IIA	
		REV 0	
		Page 2 of 2	

replacement procedure to be carried daily, weekly, monthly & at longer intervals to ensure trouble free operation.

- c) Where applicable, fault location charts shall be included to facilitate finding the cause of mal-operation or break down.
- ii) Detailed specifications for all the consumables including lubricant oils, greases, chemicals etc. required for the complete pumping system.
- iii) On completion for erection, a complete list of bearings / equipment giving their location, and identification marks etc. shall also be furnished to the Consultant/Client.
- iv) Design and performance data.
- v) Process and Instrumentation diagrams (as applicable).
- vi) Single line diagrams.
- vii) Sequence & Protection Interlock Schemes (as applicable).
- viii) Alarm and trip values.
- ix) Performance Curves.
- x) Important Do's and Don'ts

Check List for Operation & Maintenance Manual

Project name :

Project number :

Package Name :

PO reference :

Document number :

Revision number :

Sl.no. & Sections	Description	Tick (√)if included in Manual			Remarks
		Yes	No	Not Applicable	
1.	Cover page				
1.1	Project Name				
1.2	Customer/consultant Name				
1.3	Name of Package				
1.4	Supplier details with phone, FAX ,email address , Emergency Contact number				
1.5	Name and sign of prepared by , checked by & approved by				
1.6	Revision history with approval Details				
2.0	Index				
2.1	showing the sections & related page nos All the pages should be numbered section wise				
3.0	Description of Plant/System				
3.1	Description /write up of operating principle of system equipment/ associated sub-systems & accessories/controls system , operating conditions, performance parameters under normal , start up and special cases				
3.2	Equipment list and basic parameter with Tag numbers				
3.3	Data sheets approved by Customer/for information and catalogues provided by original manufacturer				
3.4	Associated other packages and Interface /terminal points				
3.5	P&ID & Process Diagrams				
3.6	GA Layout drawings, As-built drawings , Actual photograph of items/system (Drawings of A2 & bigger sizes are to be attached in the last)				
3.7	Single line/wiring diagrams				
3.8	Control philosophy /control write-ups				

4.0	Commissioning Activities (if not covered in separate document i.e. erection manual, commissioning manual)				
4.1	Pre-Commissioning Checks				
4.2	handling of items at site				
4.3	Storage at site				
4.4	Unpacking & Installation procedure				
5.0	Operation Guidelines for plant personal/user/operator				
5.1	Interlock & Protection logic along with the limiting values of protection settings for the equipment along with brief philosophy behind the logic, drawings etc. to be provided.				
5.2	Start up, normal operation and shut down procedure for equipments along with the associated systems in step by step mode. Valve sequence chart, step list, interlocks etc. with Equipment isolating procedures to be mentioned.				
5.3	Do's & Don't of the equipments.				
5.4	Safety precautions to be taken during normal operation. Safety symbols, Emergency instructions on total power failure condition/lubrication failure/any other condition				
5.5	Parameters to be monitored with normal values and limiting values				
5.6	Trouble shooting with causes and remedial measures				
5.7	Routine operational checks, recommended logs & records				
5.8	Changeover schedule if more than one auxiliary for the same purpose is given				
5.9	Painting requirement and schedule				
5.10	Inspection, repair , Testing and calibration procedures				
6.0	Maintenance guidelines for plant personal				
6.1	List of Special Tools and Tackles required for Overhaul/Trouble shooting including special testing equipment required for calibration etc.				
6.2	Stepwise dismantling and re-assembly procedure clearly specifying the tools to be used, checks to be made, records to be maintained, clearances etc. to be mentioned. Tolerances for fitment of various components to be given.				
6.3	Preventive Maintenance & Overhauling schedules linked with running hours/calendar period along with checks to be given				

6.4	Long term maintenance schedules especially for structural, foundations etc.				
6.5	Consumable list along with the estimated quantity required during commissioning, normal running and during maintenance like Preventive Maintenances and Overhaul. Storage/handling requirement of consumables/self-life.				
6.6	List of lubricants with their Indian equivalent, Lubrication Schedule, Quantity required for each equipment for complete replacement is to be given				
6.7	List of vendors & Sub-vendors with their latest addresses, service centres ,Telephone Nos., Fax Nos., Mobile Nos., e-mail IDs etc.				
6.8	List of mandatory and recommended spare parts list				
6.9	Tentative Lead time required for ordering of spares from the equipment supplier				
6.10	Guarantee and warranty clauses				
7.0	Statutory and other specific requirements considerations.				
8.0	List of reference documents				
9.0	Binding as per requirement				

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS - 435 - 563 – A401	
		SECTION II	
		SUB SECTION IIA	
		REV 0	
		SHEET	OF

Site Storage and Preservation

SITE STORAGE AND PRESERVATION GUIDELINES

FOR

MECHANICAL BOPs

(Doc No: PE-DC-SSG-A001 REV.00)



PROJECT ENGINEERING MANAGEMENT, POWER SECTOR
BHARAT HEAVY ELECTRICALS LIMITED-NOIDA

CONTENT

- 1 SCOPE OF THE DOCUMENT
- 2 PURPOSE OF STORAGE & PRESERVATION
- 3 MEASURES TO BE TAKEN FOR STORAGE AND PRESERVATION
 - a) GENERAL STORAGE REQUIREMENTS
 - b) GENERAL PRESERVATION REQUIREMENTS
 - c) GENERAL INSPECTION REQUIREMENTS
- 4 TYPE OF STORAGE FOR VARIOUS EQUIPMENT
5. CONCLUSION
6. STACKING ARRANGEMENT FOR PLATES AND STRUCTURAL STEEL

1. SCOPE OF THE DOCUMENT

This guideline is prepared in intent to provide proper site storage and preservation of the Mechanical, Electrical and C & I items / equipment supplied under various bought out packages/items. This storage procedure shall be followed at different power plant sites by concerned agency for storage and preservation from the date of equipment received at site until the same are erected and handed over to the customer.

2. PURPOSE OF STORAGE & PRESERVATION

Many of the items may be required to be kept in stores for long period. It shall therefore be essential that proper methods of storage and preservation be applied so that items do not deteriorate, loose some of their properties and become unusable due to atmospheric conditions and biological elements.

3. MEASURES TO BE TAKEN FOR STORAGE, HANDLING & PRESERVATION

a) GENERAL STORAGE REQUIREMENTS

1. To the extent feasible, materials should be stored near the point of erection. The storage areas should have adequate unloading and handling facilities with adequate passage space for movement of material handling equipment such as cranes, fork lift trucks, etc. The storage of materials shall be properly planned to minimise time loss during retrieval of items required for erection.
2. The outdoor storage areas as well as semi-closed stores shall be provided with adequate drainage facilities to prevent water logging. Adequacy of these facilities shall be checked prior to monsoon.
3. The storage sheds shall be built in conformity with fire safety requirements. The stores shall be provided with adequate lights and fire extinguishers. 'No smoking' signs shall be placed at strategic locations. Safety precautions shall be strictly enforced.
4. Adequate lighting facility shall be provided in storage areas and storage sheds and security personnel positioned to ensure enforcement of security measures to prevent theft and loss of materials.
5. Adequate number of competent stores personnel and security staff shall be deployed to efficiently store and maintain the equipment / material.
7. The equipment shall be stored in an orderly manner, preserving their identification slips, tags and instruction booklets, etc., required during erection. The storage of materials shall be equipment-wise. Loose parts shall be stored in sheds on racks,

preserving the identification marks and tags in good condition. The group codes shall be displayed on the racks

6. At no time shall any materials be stored directly on ground. All materials shall be stored minimum 200 mm above the ground preferably on wooden sleepers

b) GENERAL PRESERVATION REQUIREMENTS

1. All special measures to prevent corrosion shall be taken like keeping material in dry condition, avoiding the equipment coming in contact with corrosive fluid like water, acid etc.
2. Materials which carry protective coating shall not be wrapped in paper, cloth, etc., as these are liable to absorb and retain moisture. The material shall be inspected and in case of signs of wear or damages to protective coating, that portion shall be cleaned with approved solution and coated with an approved protective paint. Complete record of all such observations and protective measures taken shall be maintained.
3. Generally equipment supplied at site are properly greased or rust protective oil is applied on machined/ fabricated components. However periodic inspection shall be carried out to ensure that protection offered is intact.
4. While handling the equipment, no dragging on the ground is permitted. Avoid using wire rope for lifting coated components. Use polyester slings (if possible) otherwise protective material (e.g. clothes, wood block etc.) should be used while handling the components with rope / slings
5. For Equipment supplied with finished paint, touch paint shall be done in case any surface paint gets peeled off during handling. Otherwise such surfaces shall necessarily be wrapped with polythene to avoid any corrosion. Further for equipment wherein finish coat is to be applied at site, site to ensure that equipment is received with primer coat applied.
6. It shall be ensured by periodic inspection that plastic inserts are intact in tapped holes, wherever applicable.
7. Pipes shall be blown with air periodically and it shall be ensured that there is no obstruction.
8. Silica gel or approved equivalent moisture absorbing material in small cotton bags shall be placed and tied at various points on the equipment, wherever necessary.
9. Heavy rotating parts in assembled conditions shall be periodically rotated to prevent corrosion/jamming due to prolonged storage.

10. All the electrical equipment such as motors, generators, etc. shall be tested for insulation resistance at least once in three months and a record of such measured insulation values shall be maintained.
11. Following preservatives/preservation methods can be used depending upon type of equipment
 - a. Rust preventive fluid (RPF)
 - b. Rust protective paints
 - c. Tarpaulin covers, in case of outdoor storage
 - d. De-oxy aluminate for weld-ments

c) GENERAL INSPECTION REQUIREMENTS

1. Period inspection of materials with specific reference to –
 - Ingress of moisture and corrosion damages.
 - Damage to protective coating.
 - Open ends in pipes, vessels and equipment -
 - In case any open ends are noticed, same shall be capped.
2. Any damages to equipment / materials.
 - In case of any damages, these shall be promptly notified and in all cases, the repairs / rectification shall be carried out.
 - Any items found damaged or not suitable as per project requirements shall be removed from site. If required to store temporarily, they shall be clearly marked and stored separately to prevent any inadvertent use.

4. TYPE OF STORAGE FOR VARIOUS EQUIPMENT

The types of storage are broadly classified under the following heads:

i **Closed storage with dry and dust free atmosphere. (C)**

The closed shed can be constructed by using cold-rolled / tubular components for structure and corrugated asbestos sheets / galvanised iron sheets for roofing. Brick walls / asbestos sheets can be used to cover all the sides. The floor of the shed can be finished with plain cement concrete suitably glazed. The shed shall be provided with proper ventilation and illumination.



ii **Semi-closed storage. (S)**

The semi closed shed can be constructed by using cold-rolled / tubular components for structure and corrugated / asbestos sheets for roofing. The floor shall be brick paved. If required a small portion of sides can be covered to protect components from rainwater splashing onto the components.





iii Open storage (O)

The open yard shall be levelled, well consolidated to achieve raised ground with the provision of feeder roads for crane approach along with access roads running all sides. One part of the open yard shall be stone pitched, levelled and consolidated with raised ground suitable for storing / stacking heavier and critical components with due space to handle them by cranes etc . Adequate number of sleepers, concrete block etc. to be provided to make raised platforms to stack critical materials.

A separate yard to be identified as “scrap yard” slightly away from main open yard to store wooden/steel scraps, which are to be disposed off. This is required to avoid mix up with regular components as well as to avoid fire hazard.

Some of the components, which are having both machined & un-machined surfaces and are bulky, shall be stored in open storage area on a raised ground and suitably covered with water proof / fire retardant tarpaulin.



The equipment listed below shall be stored and inspected as per requirement mentioned in the table below.

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
Raw material /mechanical items like pipes, plates, structure sections etc.)				
1.	Steel pipes (lined/unlined)	S	Damage , paint, corrosion, rubber lining peeling	Provide end cap
2.	MS Plates	S	Damage, paint, corrosion	
3.	SS Plates	S	Damage	
4.	Non-metallic pipes	S	Damage, cracks	Provide end cap
5.	Stainless steel pipes	S	Damage ,	Provide end cap
6.	MS sections, beams	S	Damage, paint, corrosion	
7.	Cable trays	S	Damage, condition of preservations	
8.	Insulation sheets	S	Damage	
9.	Insulation	C	Damage, packing	
10.	Hangers Rods	S	Damage, paint, packing	
11.	Tubes	S	Damage, paint , packing	Provide end cap
12.	Hume pipes	O	Damage	
13.	Castings	O	Damage, paint, corrosion	
Fabricated mechanical items (pressure vessels, tanks etc.)				
14.	Pressure vessels (unlined)	O	Damage, paint, corrosion,	Covered nozzles
15.	Atmospheric storage tanks (unlined)	O	Damage, paint, corrosion	Covered nozzles

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
16.	Pressure vessels (lined)	S	Damage, paint, corrosion, rubber lining	
17.	Atmospheric storage tanks(lined)	S	Damage, paint, corrosion, rubber lining	
18.	Support structures	O	Damage , paint, corrosion	
19.	Flanges	C	Damage , paint, corrosion	
20.	Fabricated pipes	S	Damage , paint, corrosion	Provide end cap
21.	Vessels internals	C	Damage , paint, corrosion ,packing	
22.	Grills	S	Damage , paint, corrosion	
23.	Angles	S	Damage , paint, corrosion	
24.	Bridge mechanism/clarifier mechanism	O	Damage , paint, corrosion	
25.	Cranes, rails	S	Damage , paint, corrosion	
26.	Stair cases	O	Damage , paint, corrosion	
27.	Ladders/handrails	O	Damage , paint, corrosion	
28.	Fabricated ducts	S	Damage , paint, corrosion	
29.	Isolation Gates	O	Damage , paint, corrosion	
30.	Fabricated boxes/panels	S	Damage , paint, corrosion	
Mechanical components like valves, fittings, cables glands, spares etc.)				
31.	Valves	S	Damage , packing	

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
32.	Fittings	S	Damage , packing	Provide end cap
33.	Cable glands	C	Damage , packing	
34.	Tools & tackles	C	Damage , packing	
35.	Nut , bolts, washers,	C	Damage , packing	
36.	Gasket & Packings	C	Damage , packing	
37.	Copper tubes	C	Damage , packing, corrosion	Provide end cap
38.	SS tubing	C	Damage , packing	Provide end cap
Rotating assemblies (pumps, blowers, stirrers, fans, compressors etc.)				
39.	Pumps	S	Damage , packing, corrosion	Shaft rotation
40.	Blowers/Compressors	S	Damage , packing, corrosion	Shaft rotation
41.	Agitators/stirrers/radial launders	C	Damage , packing, corrosion	Shaft rotation
42.	Rollers for chlorine tonner mounting	C	Damage , packing, corrosion	
43.	Centrifuge	S	Damage , packing,	
44.	Gear box	C	Damage , packing, corrosion	
45.	Bearings	C	Damage , packing, corrosion	
46.	Fans	S	Damage , packing, corrosion	
47.	Dosing skids	S	Damage , packing, corrosion	
48.	Pump assemblies	S	Damage , packing, corrosion	
49.	Air washers(INTERNALS)	S	Damage , packing	
50.	Air conditioners (split)	C	Damage , packing	

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
51.	Elevators(CONTAINERIZED)	O	Damage , packing, corrosion	
52.	Chillers/VA machines	S	Damage , packing	
53.	Air handling Unit/Package unit	S	Damage , packing	
54.	Chlorinators & Evaporators	C	Damage , packing	
55.	Ejectors	C	Damage , packing	
56.	Electrolyser	C	Damage , packing	
Miscellaneous items like chain pulley blocks, hoists etc.				
57.	Chain pulley blocks	S	Damage, Packing	
58.	Electric hoists	S	Damage, Packing	
59.	Fire extinguishers	C	Damage, expiry date	
60.	Fork Lift Truck	S	Damage, Packing	
61.	Hydraulic Mobile Crane	O	Damage, Packing	
62.	Mobile Pick Up & Carry Crane	O	Damage, Packing	
63.	Motor boats	O	Damage, Packing	
64.	Safety showers	S	Damage, Packing	
65.	Diffusers/dampers	S	Damage, Packing	
Chemicals and consumables (acid, alkali, paints, oils, reagents and special chemicals)				
66.	Hydro Chloric Acid (HCl)	Store in canes/ storage tank in dyke area	Date of production/ leakage/fumes	hazardous chemical
67.	Sulphuric acid (H ₂ SO ₄)	Store in canes/ storage tank in dyke area	Date of production/ leakage/fumes	hazardous chemical

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
68.	Sodium hydroxide (NaOH)	Store in canes/ storage tank in dyke area	Date of production/ leakage/ fumes/ breather	hazardous chemical ,breather to be checked for air ingress
69.	Sodium hypo chlorite	To be stored under shed	Date of production/ leakage/ fumes	hazardous chemical ,self-life normally 15-30 days after which strength of chemical decays
70.	Ammonia	S	Date of production/ leakage/ fumes	Store in closed storage tanks, hazardous chemical
71.	CW treatment chemicals	S	Date of production , Self-life	Store in closed canes
72.	RO/UF cleaning chemicals	S	Date of production , Self-life	Store in closed canes
73.	Lime	C	Damage to packing , seepage	Prevent moisture, rain
74.	Alum bricks	C	Damage to packing	Prevent moisture, rain
75.	Poly electrolyte	S		Store in closed storage tanks
76.	Laboratory chemicals(powder)	C	Damage, Packing self-life	
77.	Laboratory chemicals(liquid)	C	Damage, Packing self-life	
78.	Lubrication oils	C	Leakage	
79.	Paints	S	Leakage ,air tightness	
80.	Sand	O	Damage of packing	No hooks
81.	Salt (NaCl)	C	Damage of packing, water ingress	Prevent moisture, rain
82.	Anthracite	S	Damage of packing	
83.	Activated carbon	S	Damage of packing	

Sl. No.	Description of the equipment	Type of Storage	Check for	Remarks
84.	Thermal insulation	S	Damage of packing	
85.	Cement	C	Damage of packing	Prevent moisture, rain
86.	Gravels	O	Damage of packing	
87.	ION exchange resins	C	Damage , packing	Refer manufacturer guidelines
88.	RO membranes	C	Damage , packing	Refer manufacturer guidelines
89.	UF membranes	C	Damage , packing	Refer manufacturer guidelines
90.	Cleaning chemicals	C	Damage , packing	Refer manufacturer guidelines
91.	Chemicals for analysers/calibration	C	Damage , packing	Refer manufacturer guidelines
Electrical and C & I items (motors, cables etc.)				
92.	Motors	C	Damage , packing	
93.	Cable drums	O	Damage	
94.	Control Panel /control desk, UPS ,JB	S	Damage, Packing	
95.	Instruments(gauges/analysers)	C	Damage	
Special items		As per Manufacturer's item, like Hydrogen cylinders, Ozonator, Analyser, Chlorine dioxide generators etc.		

5. CONCLUSION

Concerned storage agency at site should make sure that loss in equipment performance and wear & tear are minimised through proper storage and preservation. The above are broad guidelines and cover major equipment / materials. However specific storage practices shall be followed as per manufacturer recommendation. All the necessary measures even in addition to the ones mentioned above, if found necessary, should be taken to achieve the objective.

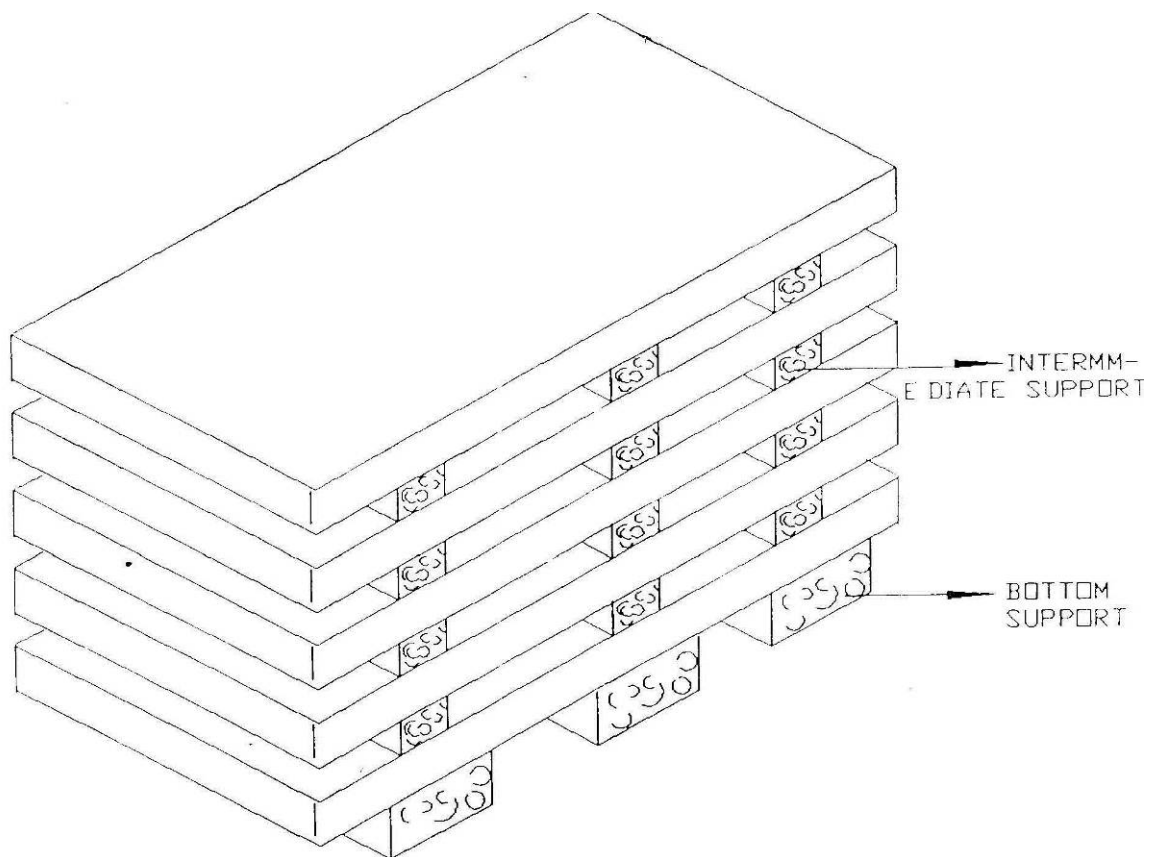


Figure – 1 – PLATE STACKING ARRANGEMENT

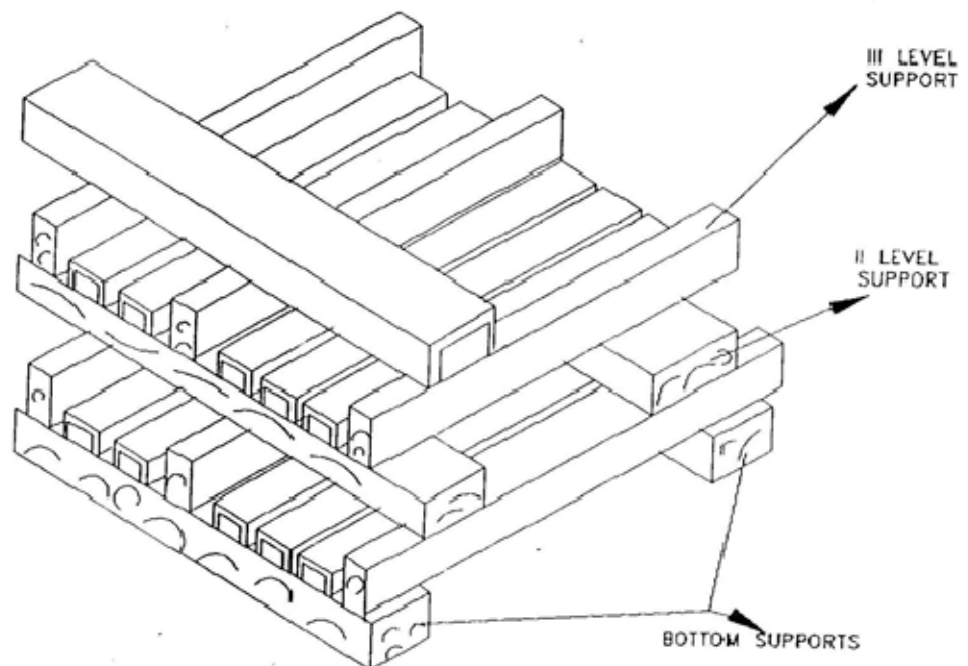


Figure – 2 – STRUCTURAL STEEL STACKING ARRANGEMENT

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS – 435 - 563 – A401	
		SECTION III	
		SUB SECTION	
		REV 0	
		Page 1 of 1	

Documents to be submitted by the bidder

	TITLE TECHNICAL SPECIFICATION FOR WEIGH BRIDGE 2X660 MW UDANGUDI STPS	SPECIFICATION NO. PE – TS – 435 - 563 – A401	
		SECTION	III
		SUB SECTION	IIIA
		REV	0
		Page 1 of 1	

LIST OF THE DOCUMENTS FURNISHED ALONG WITH THE BID

VENDOR HAS TO SUBMIT ONLY FOLLOWING DOCUMENTS ALONG WITH THE OFFER, FOR TECHNICAL EVALUATION OF THE BID:-

- 1) SCHEDULE OF TECHNICAL DEVIATION (IF ANY) / NO DEVIATION AS PER GCC REV 06
- 2) SIGNED AND STAMPED COPY OF COMPLIANCE CUM CONFIRMATION CERTIFICATE.
- 3) SIGNED AND STAMPED COPY OF ELECTRICAL LOAD DATA.
- 4) Unpriced format, duly mentioned 'Quoted' against each Sl.no. below each column.

Note1:- Any other standard document/ details furnished by the bidder i.e. Data sheet / GA Drawing/ QAP etc. shall not be taken in to consideration for evaluation.

Note 2:- Bidder to note that if the bidder does not submit the documents mentioned in Sl. No. 1.0 to 3.0 along with their offer then their offer is liable to be rejected.



TITLE:
**TECHNICAL SPECIFICATION FOR WEIGH
BRIDGE
2X660 MW UDANGUDI STPS
COMPLIANCE CUM CONFIRMATION
CERTIFICATE**

SPEC. NO.: PE-TS-435-563-A401

SECTION: III

SUB SECTION: IIIB

REV. NO. 0

COMPLIANCE CUM CONFIRMATION CERTIFICATE

The bidder shall confirm compliance with following by signing/ stamping this compliance certificate (every sheet) and furnish same with the offer.

- a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions other than those mentioned under "exclusion" in section C and those resolved as per 'Schedule of Deviations', if applicable, with regard to same.
- b) There are no other deviations w.r.t. specifications other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'.
- c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/ CUSTOMER approval & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. This shall be within the contracted price with no extra implications to BHEL after award of the contract.
- d) All drawings/ data-sheets/ calculations etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ CUSTOMER approval in the event of order.
- e) The offered materials shall be either equivalent or superior to those specified in the specification & shall meet the specified/ intended duty requirements. In case the material specified in the specifications is not compatible for intended duty requirements then same shall be resolved by the bidder with BHEL during the pre - bid discussions, otherwise BHEL/ Customer's decision shall be binding on the bidder whenever the deficiency is pointed out.

For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.

- f) The commissioning spares shall be supplied on 'As Required Basis' & prices for same included in the base price itself.
- g) All sub vendors shall be subject to BHEL/ CUSTOMER approval in the event of order.
- h) Guarantee for plant /equipment shall be as per relevant clause of GCC /SCC /Other Commercial Terms & Conditions.
- i) In the event of order, all the material required for completing the job at site shall be supplied by the bidder within the ordered price and within purview of the tender specification even if the same are additional to approved billing break up, approved drawing or approved Bill of quantities. This clause will apply in case during site commissioning additional requirements emerges due to customer and/ or consultant's comments. No extra claims shall be put on this account.
- j) Schedule of drawings submissions, comment incorporations & approval shall be as stipulated in the specifications. The successful bidder shall depute his design personnel to BHEL's/ Customer's/ Consultant's office for across the table resolution of issues and to get documents approved in the stipulated time.



TITLE:
**TECHNICAL SPECIFICATION FOR WEIGH
BRIDGE
2X660 MW UDANGUDI STPS
COMPLIANCE CUM CONFIRMATION
CERTIFICATE**

SPEC. NO.: PE-TS-435-563-A401
SECTION: III
SUB SECTION: IIIB
REV. NO. 0

- k) As built drawings shall be submitted as and when required during the project execution.
- l) The bidder has not tempered with this compliance cum confirmation certificate and if at any stage any tempering in the signed copy of this document is noticed then same shall be treated as breach of contract and suitable actions shall be taken against the bidder.

LOAD TITLE	RATING (KW / A)		UNIT (U)/STN (S)	Nos.		VOLTAGE CODE*	FEEDER CODE**	EMER. LOAD (Y)	CONT.(C)/ INTT.(I)	STARTING TIME >5 SEC (Y)	LOCATION	BOARD NO.	CABLE		BLOCK CABLE DRG. No.	CONTROL CODE	REMARKS	LOAD No.
	NAME PLATE	MAX. CONT. DEMAND (MCR)		RUNNING	STANDBY								SIZE CODE	Nos				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
PC, Printer, UPS, Indicator, Load Cell for weigh bridge	1.5 KW		S	1	0	E	S		C		Weigh Bridge Control room (Indoor)							
NOTES: 1. COLUMN 1 TO 12 & 18 SHALL BE FILLED BY THE REQUISITIONER (ORIGINATING AGENCY); REMAINING COLUMNS ARE TO BE FILLED UP BY PEM (ELECTRICAL) 2. ABBREVIATIONS : * VOLTAGE CODE (7):- (ac) A=11 KV, B=6.6 KV, C=3.3 KV, D=415 V, E=240 V (1 PH), F=110 V (cc): G=220 V, H=110 V, J=48 V, K=+24V, L=-24 V : ** FEEDER CODE (8):- U=UNIDIRECTIONAL STARTER, B=BI-DIRECTIONAL STARTER, S=SUPPLY FEEDER, D=SUPPLY FEEDER (CONTACTER CONTROLLED)																		
	LOAD DATA (ELECTRICAL)	JOB NO.		435				ORIGINATING AGENCY				PEM (ELECTRICAL)						
		PROJECT TITLE		2X660 MW UDANGUDI STPS Weigh Bridge				NAME				DATA FILLED UP ON						
		SYSTEM / S		Weigh Bridge				SIGN.				DATA ENTERED ON						
		DEPTT. / SECTION		MAUX/MH				SHEET 1 OF 1		REV. 00		DE'S SIGN. & DATE						



TITLE

TECHNICAL SPECIFICATION FOR
WEIGH BRIDGE
2X660 MW UDANGUDI STPS

SPECIFICATION NO. PE-TS-435-563-A401

SECTION III

SUB SECTION III D

REV 00

SHEET 1 OF 1

PRE-BID CLARIFICATION SCHEDULE

S. No.	Section/Clause /Page No.	Statement of the referred clause	Clarification Required

The bidder hereby certifies that above mentioned are the only clarifications required on the technical specification for the subject package.

SIGNATURE: _____

NAME: _____

DESIGNATION: _____

COMPANY: _____

DATE: _____

COMPANY SEAL