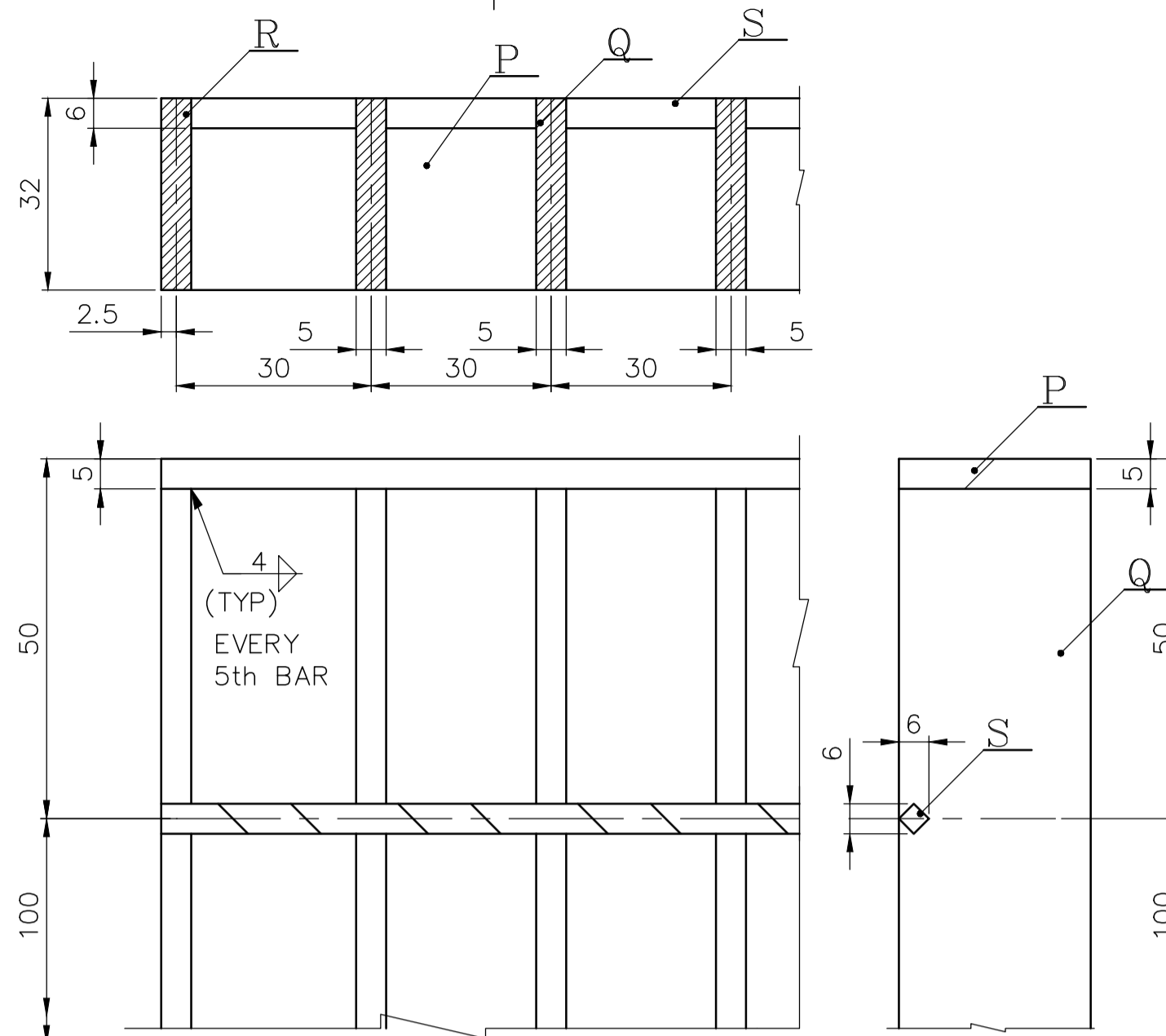


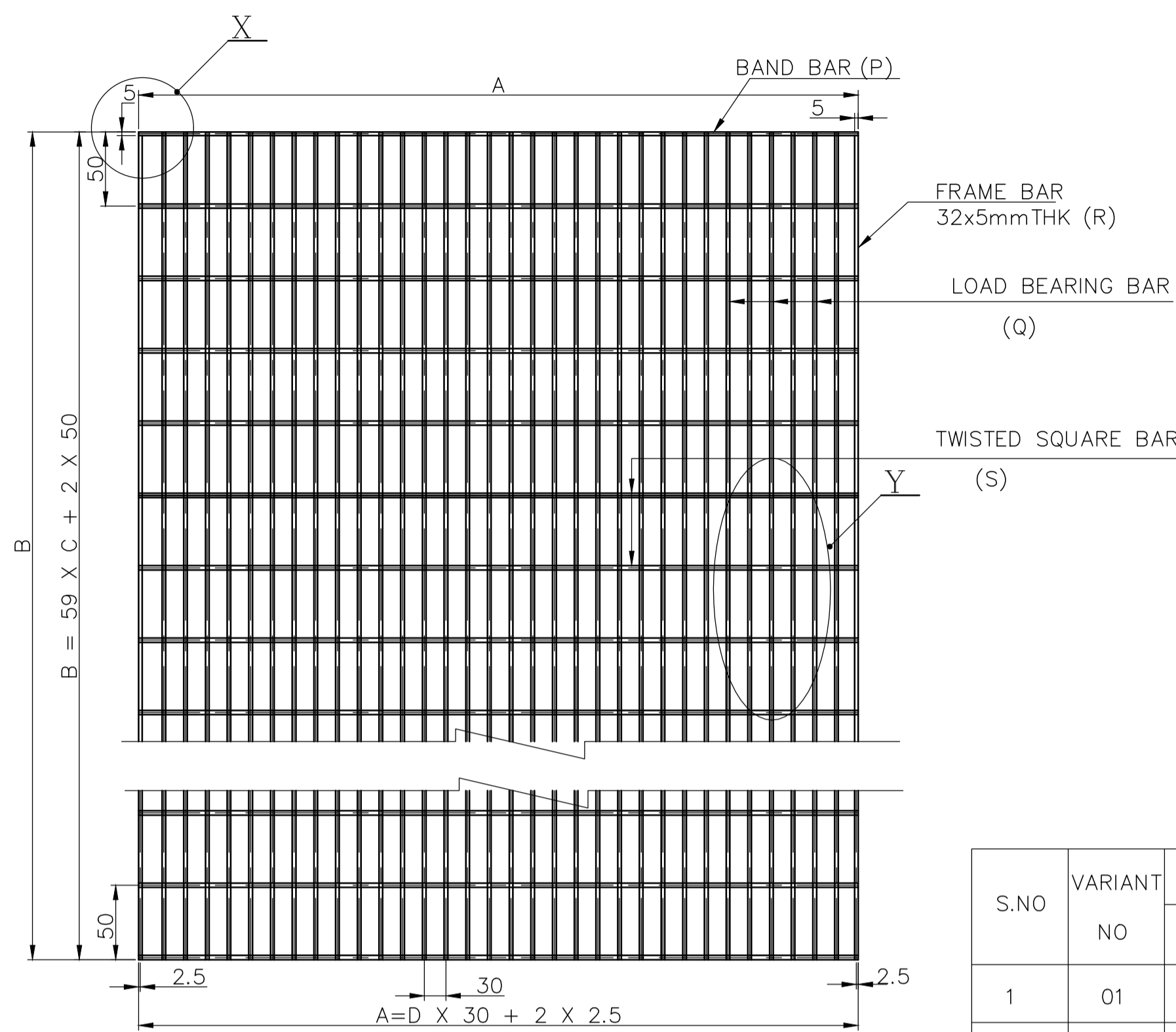
1-35-811-02525

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD. NO TP 023 0299

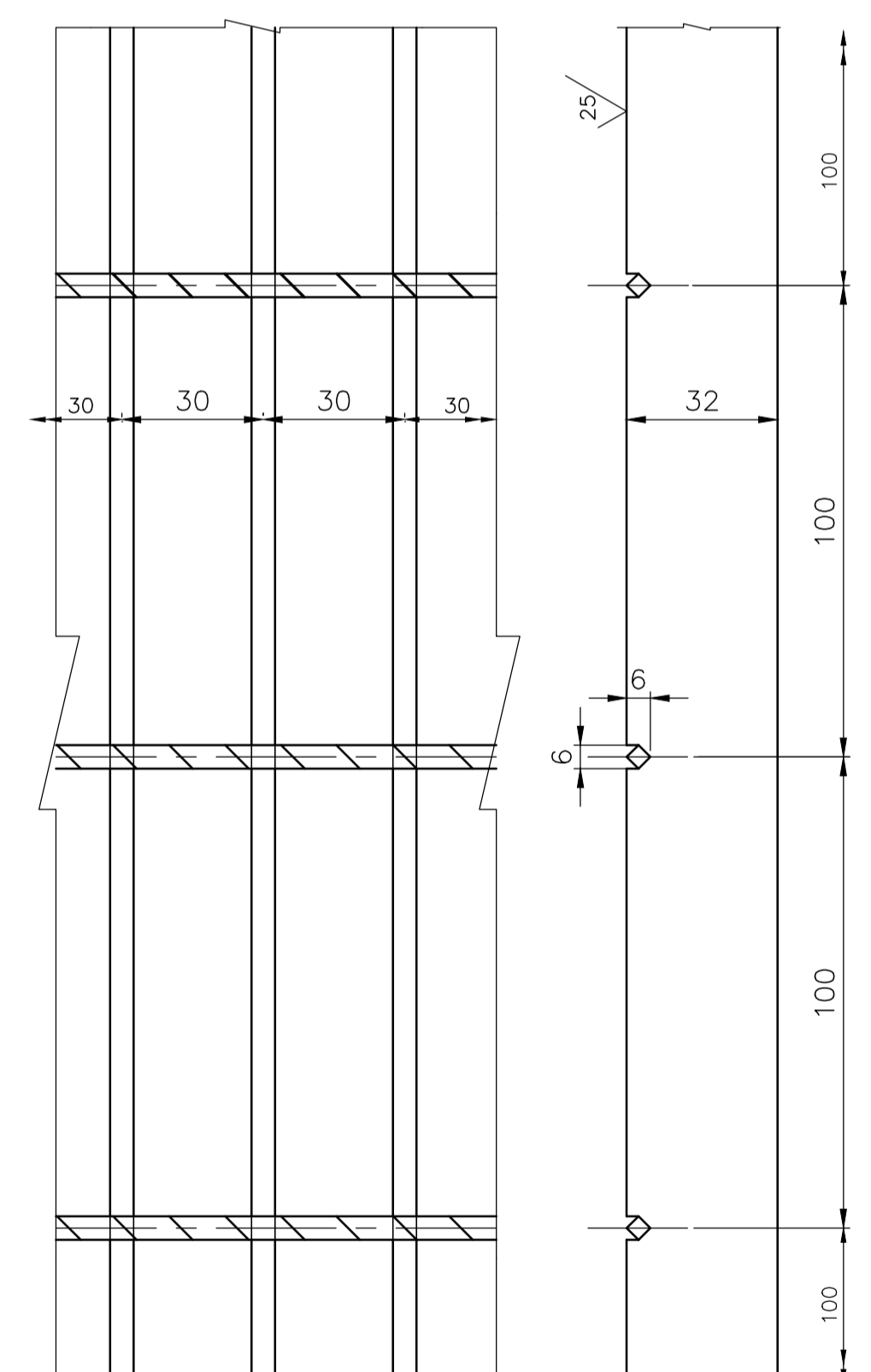
TYPE & SIZE OF WELD	TYPE OF ELECTRODE
4 Δ	E7018 (SMAW/GMAW)



DETAIL-X



S.NO	VARIANT NO	SIZE OF FLOOR GRILL				ITEM NO/NO.OFF								WT. PER FLOOR GRILL BEFORE GALVANISING IN KG	WT. PER FLOOR GRILL AFTER GALVANISING IN KG
		WIDTH A	LENGTH B	C	D	P	Q	R	S						
1	01	305	6000	100	10	01	2	02	9	03	2	04	60	86.099	89.288
2	02	515	6000	100	17	05	2	06	16	07	2	08	60	141.088	146.319
3	03	995	6000	100	33	09	2	10	32	11	2	12	60	266.742	276.639



DETAIL-Y

NOTES:-

- FLOOR GRATINGS ARE TO BE GALVANISED BY HOT DIP PROCESS AFTER CLEANING BY PICKLING PROCESS. MINIMUM AVERAGE WEIGHT OF ZINC COATING SHALL BE 610 GRAMS PER SQ. METRE.
- STRUCTURAL STEEL CONFORMING TO SPECIFICATION IS 2062 E250A ONLY ARE TO BE USED
- GALVANISING TO BE DONE AFTER ALL WORKS ARE COMPLETED.
- ALL SCRATCHED SURFACES AND AREAS DAMAGED BY SITE WELDING SHALL RECEIVE ATLEAST TWO COATS OF COLD GALVANISING USING ZINC RICH PRIMER /PAINTS. THE TOTAL DRY FILM THICKNESS OF SUCH TOUCH UP COLD GALVANISING SHALL NOT BE LESS THAN 150 MICRONS.
- DESIGN LIVE LOAD FOR FLOOR GRILL = 1000 KG/SQ.M
- ALL GRATING MEMBERS ARE TO BE ELECTROFORGED EXCEPT BAND BARS.
- WEIGHT OF FLOOR GRILL INDICATED DOES NOT INCLUDE WEIGHT OF WELD, WHICH IS NEGLIGIBLE.
- FLOOR GRATINGS ARE SUPPORTED BY INTERMITTENT FLOOR BEAMS SUCH THAT, FLOOR GRATINGS TAKE LIVE LOAD AS PER NOTE NO. 05 AND MAXIMUM DEFLECTION IS LIMITED TO L /250 OR 6MM WHICHEVER IS MINIMUM WHERE THE SPAN OF SUPPORTS (L) WILL BE 1.5M MAXIMUM.
- FRAME AND LOAD BEARING BAR WELDING : ALL FOUR CORNERS TO BE FULL WELDED TO BAND BARS AND EVERY FIFTH LOAD BEARING BAR TO BE WELDED TO BAND BAR BY MANUAL WELDING FULL DEPTH, AT BOTH ENDS FROM ONE SIDE.
- GRATINGS (32mm THICK) ARE FOR OUT DOOR APPLICATION
- TOLERANCE FOR LENGTH AND WIDTH OF GRATINGS SHALL BE ±5 mm

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	UNIT	UNIT WEIGHT	QTY	ZONE
03	12	TWISTED SQ. BAR 6mm (DIAGONAL)X 995				IS1786 Fe500		0.141		
03	11	FLAT 5 X 32 X 5990				IS2062 E250A		7.523	2	
03	10	FLAT 5 X 32 X 5990				IS2062 E250A		7.523	32	
03	09	FLAT 5 X 32 X 995				IS2062 E250A		1.250	2	
02	08	TWISTED SQ. BAR 6mm (DIAGONAL)X 515				IS1786 Fe500		0.073		
02	07	FLAT 5 X 32 X 5990				IS2062 E250A		7.523	2	
02	06	FLAT 5 X 32 X 5990				IS2062 E250A		7.523	16	
02	05	FLAT 5 X 32 X 515				IS2062 E250A		0.647	2	
01	04	TWISTED SQ. BAR 6mm (DIAGONAL)X 305				IS1786 Fe500		0.043		
01	03	FLAT 5 X 32 X 5990				IS2062 E250A		7.523	2	
01	02	FLAT 5 X 32 X 5990				IS2062 E250A		7.523	9	
01	01	FLAT 5 X 32 X 305				IS2062 E250A		0.383	2	

REV	DATE	ALTD.	CHD	APPD	REV	DATE	ALTD.	CHD	APPD	REV	DATE	ALTD.	CHD	APPD
06	03.01.08	kesavan	PENCHAL	RJK	05	10-06-05	KARTHIK	PENCHAL	RJK	04	20-05-05	KARTHIK	PENCHAL	RJK
09	12.02.2013	PRAKASH	MPR	MPR	08	22.02.12	PRAKASH	MPR	RRS	07	04-05-08	kesavan	PENCHAL	RJK
03	10.09.'03	SKR	SKR	RRS	02	21.08.03	SKR	SKR	RRS	01				

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BHARAT HEAVY ELECTRICALS LTD	DEPT CODE	DRN	S.MANIVANNIAN	SIGN	DATE
UNIT-HIGH PRESSURE BOILER PLANT	ST122	CHD	S.K.RAMAN		31/05/03
TIRUCHIRAPPALLI-620 014	APPD	R.RAMASAMY			31/05/03

TITLE: **LONG SPAN FLOOR GRILL - 32MM**
(6 TWISTED SQUARE - GALVANISED)

BHEL DRG NO. **1-35-811-02525** SCALE:

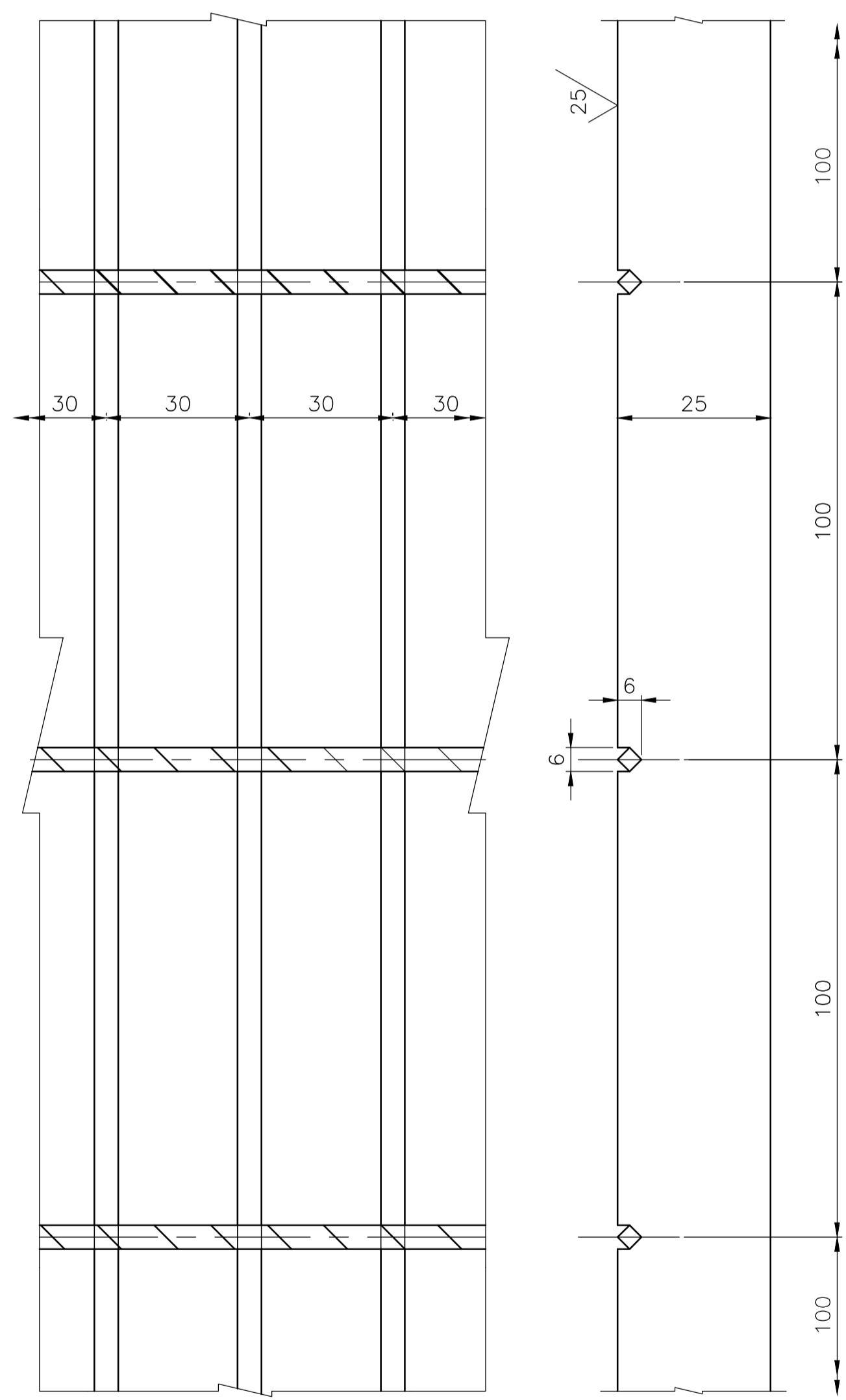
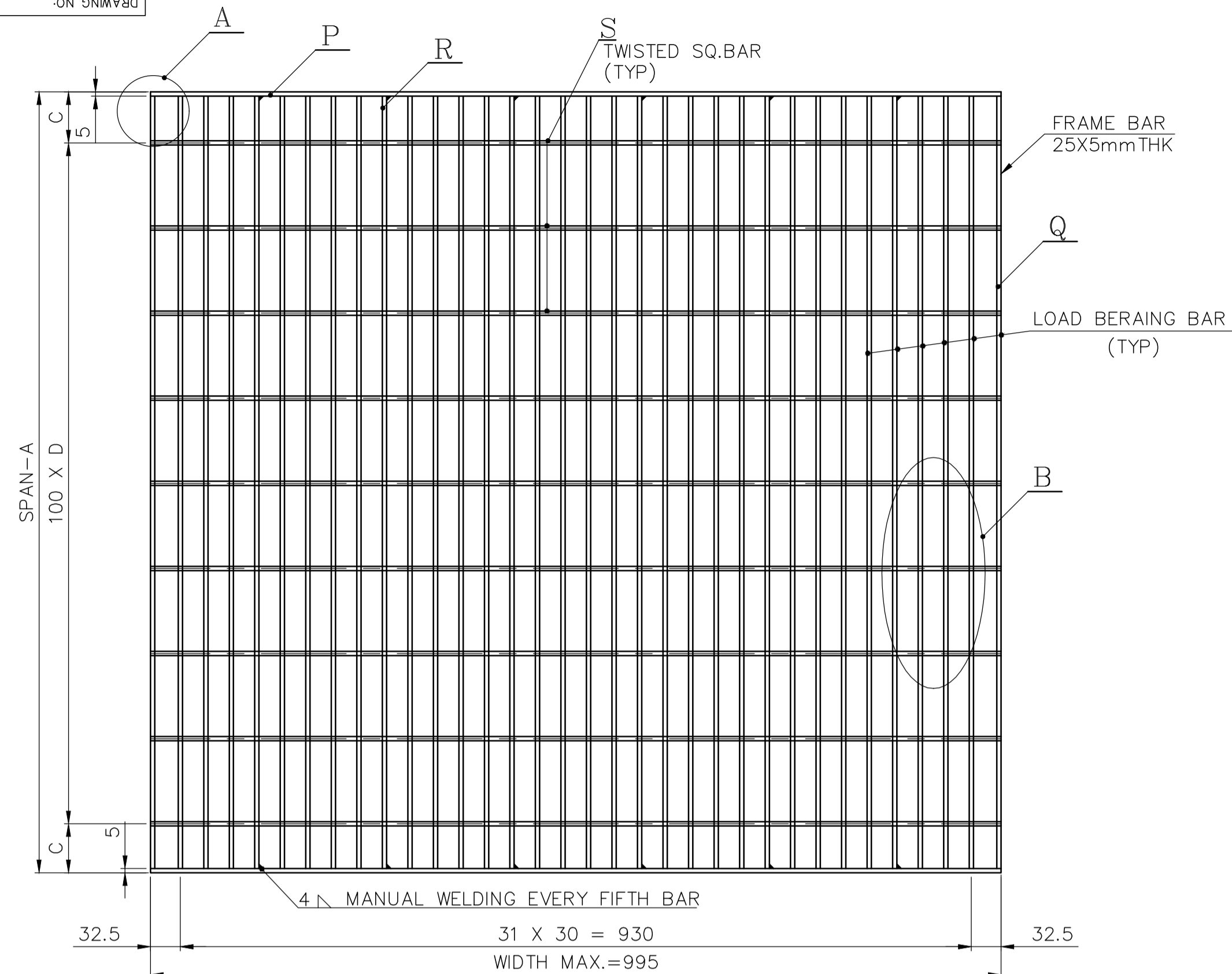
REV. 09

88201-118-93-I

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD. NO TP 023 0299

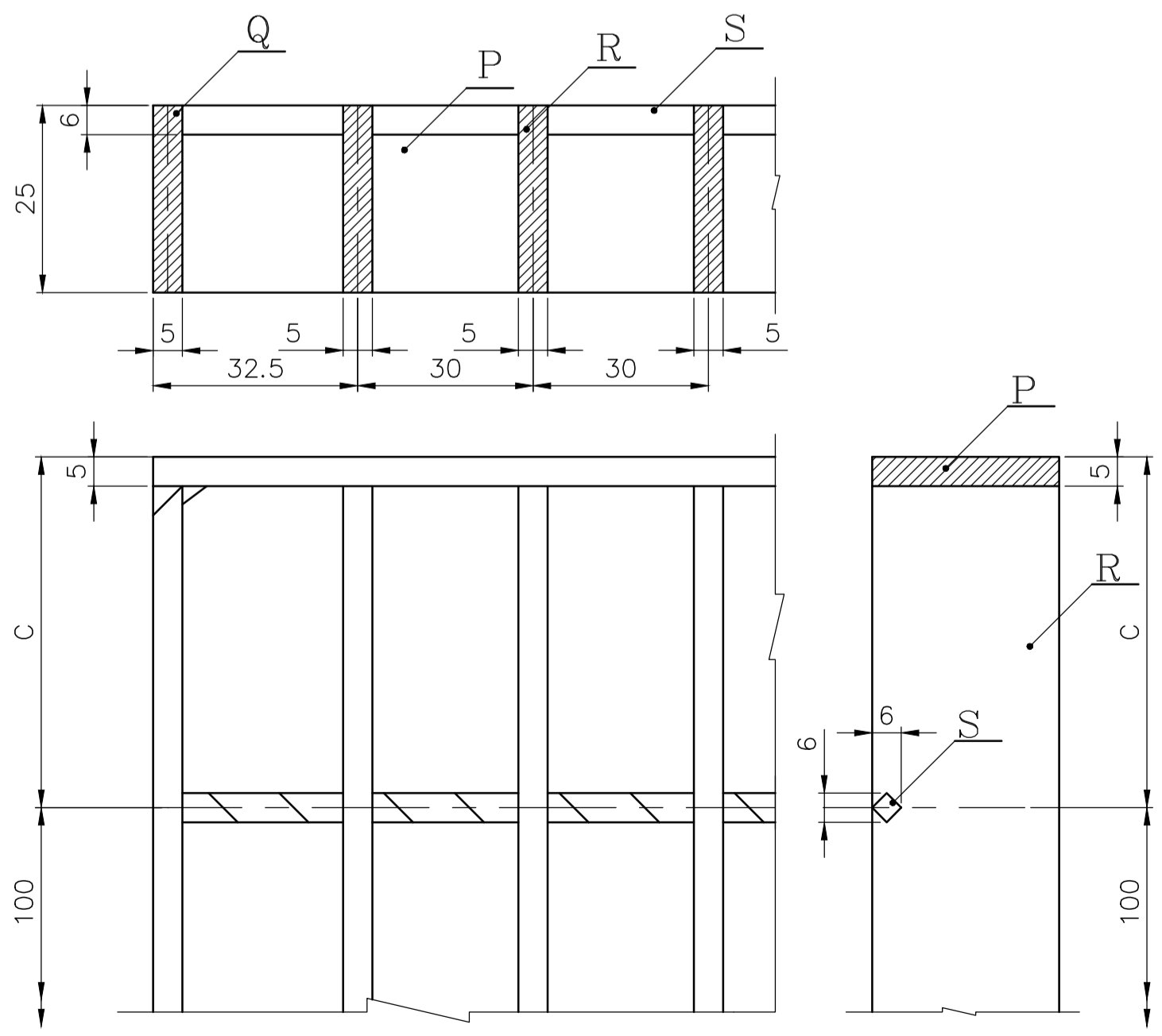
NOTES: -

- FLOOR GRATINGS ARE TO BE GALVANISED BY HOT DIP PROCESS AFTER CLEANING BY PICKLING PROCESS. MINIMUM AVERAGE WEIGHT OF ZINC COATING SHALL BE 610 GRAMS PER SQ. METER.
- STRUCTURAL STEEL CONFORMING TO SPECIFICATION IS 2062 Fe410A ONLY ARE TO BE USED
- GALVANISING TO BE DONE AFTER ALL WORKS ARE COMPLETED.
- ALL SCRATCHED SURFACES AND AREAS DAMAGED BY SITE WELDING SHALL RECEIVE ATLEAST TWO COATS OF COLD GALVANISING USING ZINC RICH PRIMER /PAINTS. THE TOTAL DRY FILM THICKNESS OF SUCH TOUCH UP COLD GALVANISING SHALL NOT BE LESS THAN 150 MICRONS.
- DESIGN LIVE LOAD FOR FLOOR GRILL = 1000 KG/SQ.M IN OPERATING FLOORS AND 500 KG/SQ.M IN NON- OPERATING FLOORS.
- ALL GRATING MEMBERS ARE TO BE ELECTROFORGED EXCEPT BAND BARS.
- WEIGHT OF FLOOR GRILL INDICATED DOES NOT INCLUDE WEIGHT OF WELD, WHICH IS NEGLIGIBLE.
- FLOOR GRILLS ARE SUPPORTED BY INTERMITTENT FLOOR BEAMS SUCH THAT, FLOOR GRILLS TAKE LIVE LOAD AS PER NOTE NO.05 AND THEIR DEFLECTION IS WITHIN L /325.
- FRAME AND LOAD BEARING BAR WELDING : ALL FOUR CORNERS TO BE FULL WELDED TO BAND BARS AND EVERY FIFTH LOAD BEARING BAR TO BE WELDED TO BAND BAR BY MANUAL WELDING FULL DEPTH, AT BOTH ENDS FROM ONE SIDE.
- TOLERANCE FOR LENGTH AND WIDTH ±5 mm



DETAIL-B

S.NO	VARIANT NO	STANDARD SIZE OF FLOOR GRILL				ITEM NOS				WT. PER FLOOR GRILL BEFORE GALVANIZING IN KG	MAX. DEF. IN CM	WT. PER FLOOR GRILL AFTER GALVANIZING IN KG
		SPAN A	LENGTH B	C	D	P	Q	R	S			
1	01	400	995	50	3	01	02	03	04	15.538	0.011	16.155
2	02	900	995	50	8	05	06	07	08	32.902	0.204	34.214
3	03	1000	995	50	9	09	10	11	12	36.376	0.347	37.827
4	04	1100	995	50	10	13	14	15	16	39.883	0.497	41.481
5	05	1200	995	50	11	17	18	19	20	43.356	0.816	45.084
6	06	1300	995	50	12	21	22	23	24	46.829	0.816	48.697



DETAIL-A

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	GS	ZONE
					VAR NO	MATERIAL SPECN		DI	QUANTITY		
24	TWISTED SQ.BAR 6mm X 995					IS1786			No 0.141		
						15011029			13		
23	PLATE 5 25 X 1290					IS2062Fe410A			No 1.266		
						15011029			32		
22	PLATE 5 25 X 1290					IS2062Fe410A			No 1.266		
						15011029			2		
21	PLATE 5 25 X 995					IS2062Fe410A			No 0.976		
						15011029			2		
20	TWISTED SQ.BAR 6mm X 995					IS1786			No 0.141		
						15011029			12		
19	PLATE 5 25 X 1190					IS2062Fe410A			No 1.168		
						15011029			32		
18	PLATE 5 25 X 1190					IS2062Fe410A			No 1.168		
						15011029			2		
17	PLATE 5 25 X 995					IS2062Fe410A			No 0.976		
						15011029			2		
16	TWISTED SQ.BAR 6mm X 995					IS1786			No 0.141		
						15011029			11		
15	PLATE 5 25 X 1090					IS2062Fe410A			No 1.070		
						15011029			32		
14	PLATE 5 25 X 1090					IS2062Fe410A			No 1.070		
						15011029			2		
13	PLATE 5 25 X 995					IS2062Fe410A			No 0.976		
						15011029			2		
12	TWISTED SQ.BAR 6mm X 995					IS1786			No 0.141		
						15011029			10		
11	PLATE 5 25 X 990					IS2062Fe410A			No 0.971		
						15011029			32		
10	PLATE 5 25 X 990					IS2062Fe410A			No 0.971		
						15011029			2		
09	PLATE 5 25 X 995					IS2062Fe410A			No 0.976		
						15011029			2		
08	TWISTED SQ.BAR 6mm X 995					IS1786			No 0.141		
						15011029			9		
07	PLATE 5 25 X 890					IS2062Fe410A			No 0.873		
						15011029			32		
06	PLATE 5 25 X 890					IS2062Fe410A			No 0.873		
						15011029			2		
05	PLATE 5 25 X 995					IS2062Fe410A			No 0.976		
						15011029			2		
04	TWISTED SQ.BAR 6mm X 995					IS1786			No 0.141		
						15011029			4		
03	PLATE 5 25 X 390					IS2062Fe410A			No 0.383		
						15011029			32		
02	PLATE 5 25 X 390					IS2062Fe410A			No 0.383		
						15011029			2		
01	PLATE 5 25 X 995					IS2062Fe410A			No 0.976		
						15011029			2		

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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DRN: A.P.SELVAM
CHD: K.KESAVAN
APPD: R.JEYAKUMAR

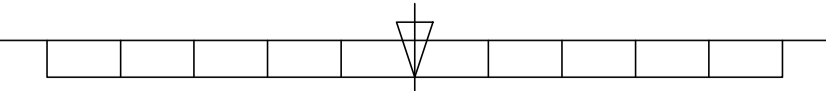
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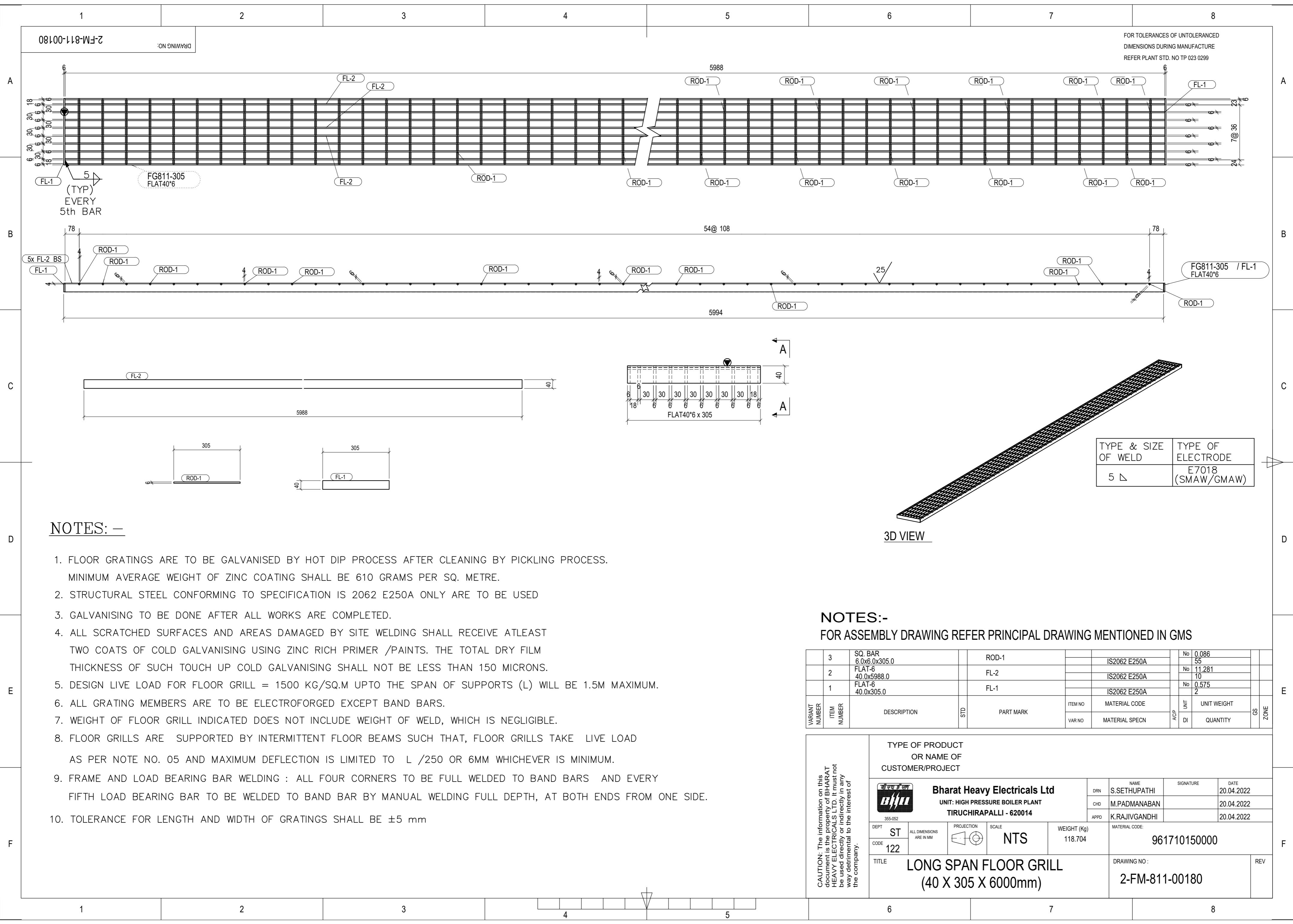
DEPT: 355-053
SCALE: NTS
WEIGHT (Kg): REF TO ASSY / OLD DWG

TITLE: 25MM THICK ELECTROFORGED FLOOR GRILL GALVANISED-610 GMS/SQM

DRAWING NO: 1-35-811-10783

REV: 00





TYPE & SIZE OF WELD	TYPE OF ELECTRODE
5 ∇	E7018 (SMAW/GMAW)

3D VIEW

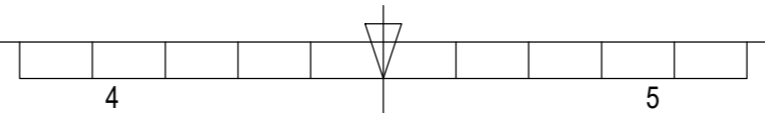
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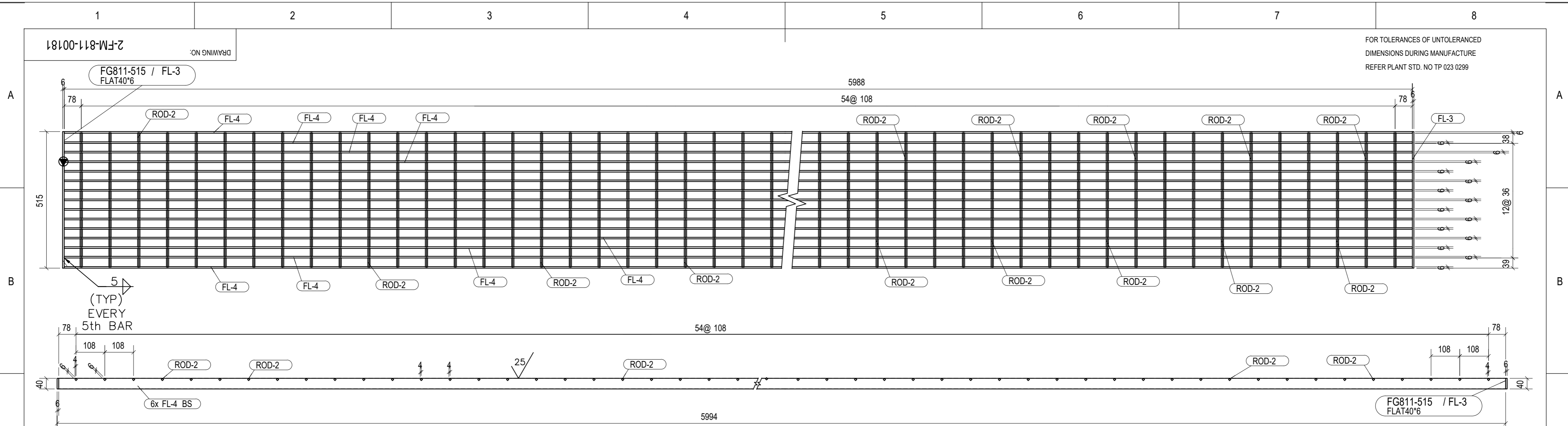
- FLOOR GRATINGS ARE TO BE GALVANISED BY HOT DIP PROCESS AFTER CLEANING BY PICKLING PROCESS. MINIMUM AVERAGE WEIGHT OF ZINC COATING SHALL BE 610 GRAMS PER SQ. METRE.
- STRUCTURAL STEEL CONFORMING TO SPECIFICATION IS 2062 E250A ONLY ARE TO BE USED
- GALVANISING TO BE DONE AFTER ALL WORKS ARE COMPLETED.
- ALL SCRATCHED SURFACES AND AREAS DAMAGED BY SITE WELDING SHALL RECEIVE ATLEAST TWO COATS OF COLD GALVANISING USING ZINC RICH PRIMER /PAINTS. THE TOTAL DRY FILM THICKNESS OF SUCH TOUCH UP COLD GALVANISING SHALL NOT BE LESS THAN 150 MICRONS.
- DESIGN LIVE LOAD FOR FLOOR GRILL = 1500 KG/SQ.M UPTO THE SPAN OF SUPPORTS (L) WILL BE 1.5M MAXIMUM.
- ALL GRATING MEMBERS ARE TO BE ELECTROFORGED EXCEPT BAND BARS.
- WEIGHT OF FLOOR GRILL INDICATED DOES NOT INCLUDE WEIGHT OF WELD, WHICH IS NEGLIGIBLE.
- FLOOR GRILLS ARE SUPPORTED BY INTERMITTENT FLOOR BEAMS SUCH THAT, FLOOR GRATINGS TAKE LIVE LOAD AS PER NOTE NO. 05 AND MAXIMUM DEFLECTION IS LIMITED TO $L / 250$ OR 6MM WHICHEVER IS MINIMUM.
- FRAME AND LOAD BEARING BAR WELDING : ALL FOUR CORNERS TO BE FULL WELDED TO BAND BARS AND EVERY FIFTH LOAD BEARING BAR TO BE WELDED TO BAND BAR BY MANUAL WELDING FULL DEPTH, AT BOTH ENDS FROM ONE SIDE.
- TOLERANCE FOR LENGTH AND WIDTH OF GRATINGS SHALL BE ± 5 mm

NOTES:-
FOR ASSEMBLY DRAWING REFER PRINCIPAL DRAWING MENTIONED IN GMS

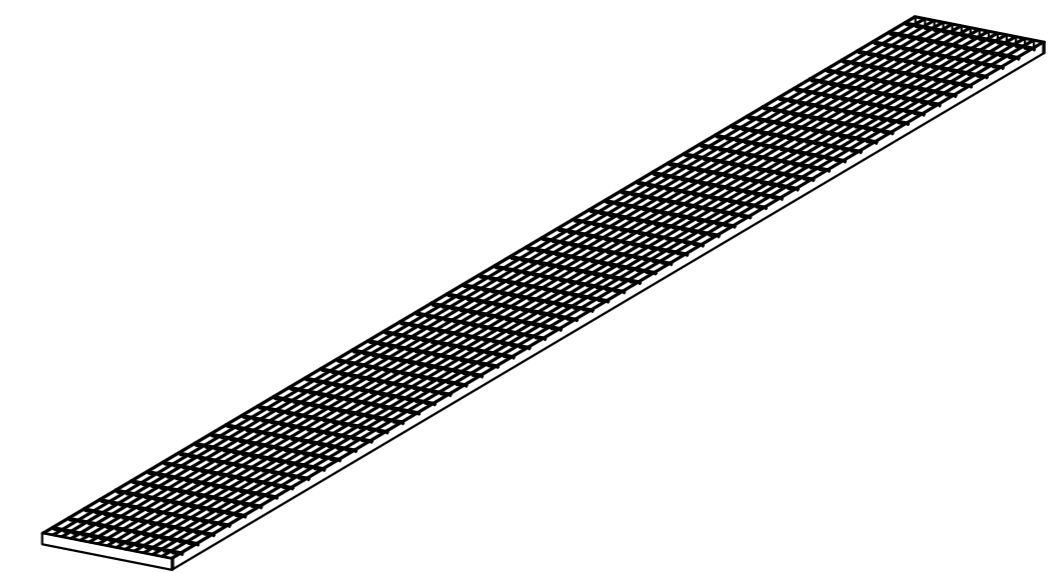
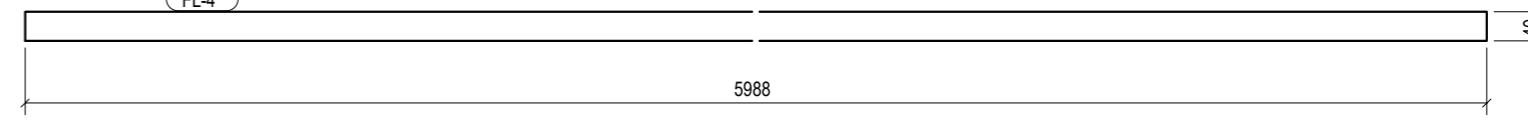
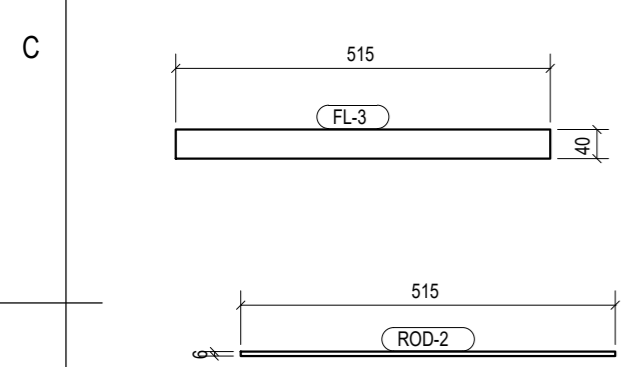
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	PART MARK	ITEM NO	MATERIAL CODE	UNIT	UNIT WEIGHT	QTY	ZONE
3		SQ. BAR 6.0x6.0x305.0		ROD-1		IS2062 E250A	No	0.086		
2		FLAT-6 40.0x5988.0		FL-2		IS2062 E250A	No	11.281		
1		FLAT-6 40.0x305.0		FL-1		IS2062 E250A	No	0.575		
					VAR NO	MATERIAL SPECN	ACP	DI	QUANTITY	

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	Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	S.SETHUPATHI	SIGNATURE	DATE	
			CHD	M.PADMANABAN		20.04.2022	
			APPD	K.RAJIVGANDHI		20.04.2022	
	DEPT	ST	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	MATERIAL CODE:
CODE	122		NTS	118.704	961710150000		
TITLE					DRAWING NO. : 2-FM-811-00180		REV
LONG SPAN FLOOR GRILL (40 X 305 X 6000mm)							

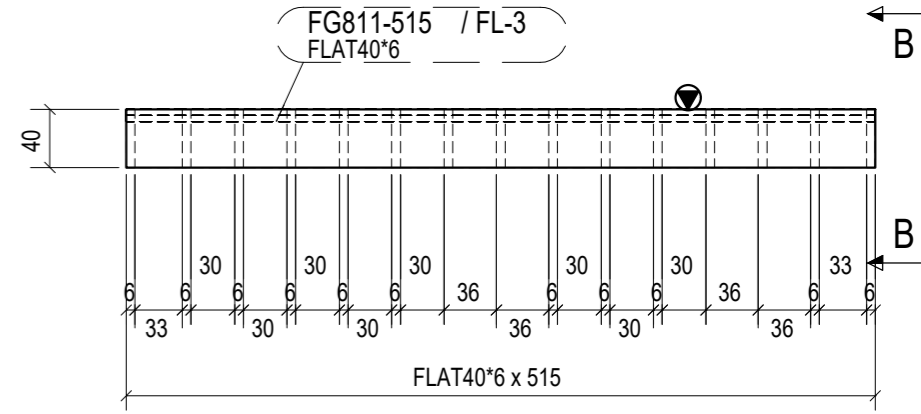




B - B



3D VIEW



TYPE & SIZE OF WELD	TYPE OF ELECTRODE
5 ∇	E7018 (SMAW/GMAW)

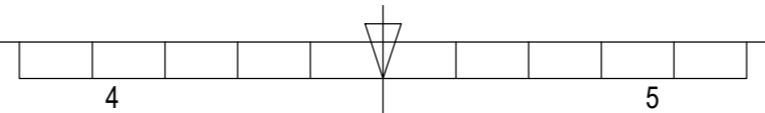
NOTES: -

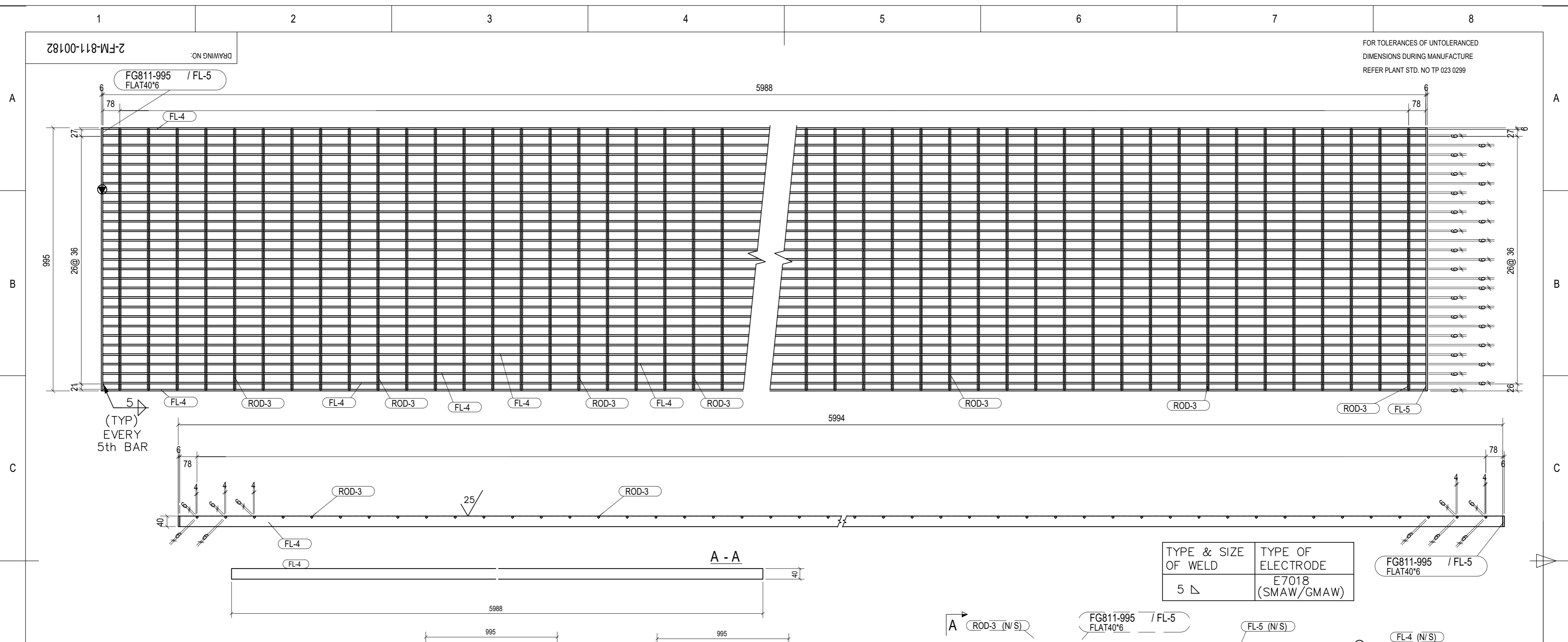
- FLOOR GRATINGS ARE TO BE GALVANISED BY HOT DIP PROCESS AFTER CLEANING BY PICKLING PROCESS. MINIMUM AVERAGE WEIGHT OF ZINC COATING SHALL BE 610 GRAMS PER SQ. METRE.
- STRUCTURAL STEEL CONFORMING TO SPECIFICATION IS 2062 E250A ONLY ARE TO BE USED
- GALVANISING TO BE DONE AFTER ALL WORKS ARE COMPLETED.
- ALL SCRATCHED SURFACES AND AREAS DAMAGED BY SITE WELDING SHALL RECEIVE ATLEAST TWO COATS OF COLD GALVANISING USING ZINC RICH PRIMER /PAINTS. THE TOTAL DRY FILM THICKNESS OF SUCH TOUCH UP COLD GALVANISING SHALL NOT BE LESS THAN 150 MICRONS.
- DESIGN LIVE LOAD FOR FLOOR GRILL = 1500 KG/SQ.M UPTO THE SPAN OF SUPPORTS (L) WILL BE 1.5M MAXIMUM.
- ALL GRATING MEMBERS ARE TO BE ELECTROFORGED EXCEPT BAND BARS.
- WEIGHT OF FLOOR GRILL INDICATED DOES NOT INCLUDE WEIGHT OF WELD, WHICH IS NEGLIGIBLE.
- FLOOR GRILLS ARE SUPPORTED BY INTERMITTENT FLOOR BEAMS SUCH THAT, FLOOR GRILLS TAKE LIVE LOAD AS PER NOTE NO. 05 AND MAXIMUM DEFLECTION IS LIMITED TO $L/250$ OR 6MM WHICHEVER IS MINIMUM.
- FRAME AND LOAD BEARING BAR WELDING : ALL FOUR CORNERS TO BE FULL WELDED TO BAND BARS AND EVERY FIFTH LOAD BEARING BAR TO BE WELDED TO BAND BAR BY MANUAL WELDING FULL DEPTH, AT BOTH ENDS FROM ONE SIDE.
- TOLERANCE FOR LENGTH AND WIDTH OF GRATINGS SHALL BE ± 5 mm

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	PART MARK	ITEM NO	MATERIAL CODE	ACQ	UNIT	UNIT WEIGHT	QTY	ZONE
3	SQ.BAR 6.0x6.0x515.0	ROD-2				IS2062 E250A		No	0.146	55	
2	FLAT-6 40.0x5988.0	FL-4				IS2062 E250A		No	11.281	15	
1	FLAT-6 40.0x515.0	FL-3				IS2062 E250A		No	0.970	2	

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT						
Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	S.SETHUPATHI	SIGNATURE	DATE	
		CHD	M.PADMANABAN		20.04.2022	
		APPD	K.RAJIVGANDHI		20.04.2022	
DEPT	ST	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	MATERIAL CODE:
CODE	122			NTS	179.166	961710160000
TITLE					DRAWING NO :	REV
LONG SPAN FLOOR GRILL (40 X 515 X 6000mm)					2-FM-811-00181	

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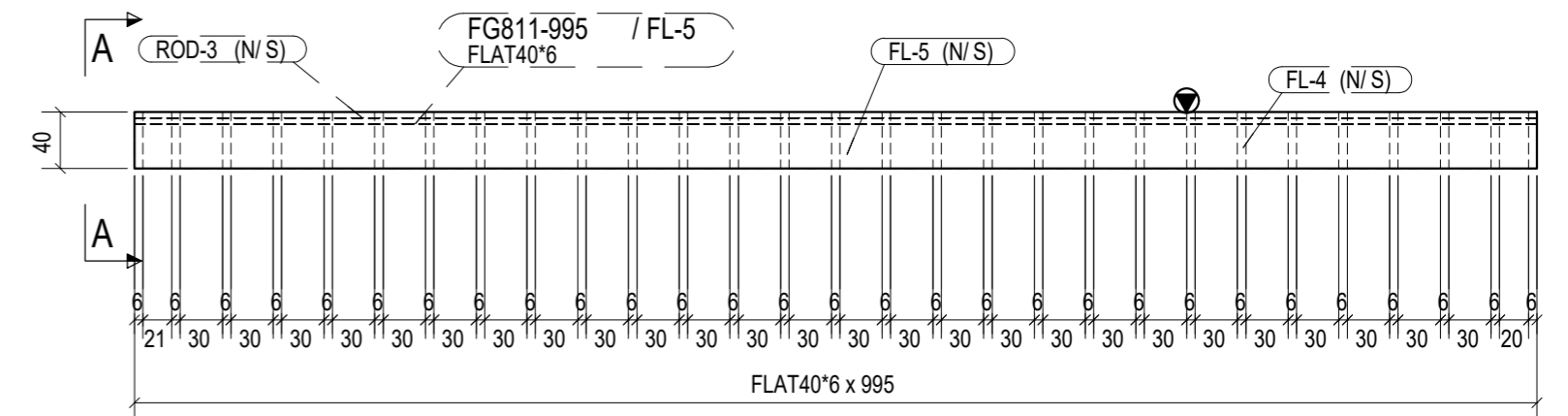




TYPE & SIZE OF WELD	TYPE OF ELECTRODE
5 ∇	E7018 (SMAW/GMAW)

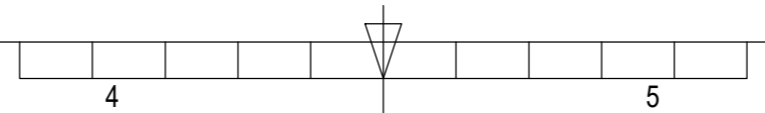
NOTES: -

- FLOOR GRATINGS ARE TO BE GALVANISED BY HOT DIP PROCESS AFTER CLEANING BY PICKLING PROCESS. MINIMUM AVERAGE WEIGHT OF ZINC COATING SHALL BE 610 GRAMS PER SQ. METRE.
- STRUCTURAL STEEL CONFORMING TO SPECIFICATION IS 2062 E250A ONLY ARE TO BE USED
- GALVANISING TO BE DONE AFTER ALL WORKS ARE COMPLETED.
- ALL SCRATCHED SURFACES AND AREAS DAMAGED BY SITE WELDING SHALL RECEIVE ATLEAST TWO COATS OF COLD GALVANISING USING ZINC RICH PRIMER /PAINTS. THE TOTAL DRY FILM THICKNESS OF SUCH TOUCH UP COLD GALVANISING SHALL NOT BE LESS THAN 150 MICRONS.
- DESIGN LIVE LOAD FOR FLOOR GRILL = 1500 KG/SQ.M UPTO THE SPAN OF SUPPORTS (L) WILL BE 1.5M MAXIMUM.
- ALL GRATING MEMBERS ARE TO BE ELECTROFORGED EXCEPT BAND BARS.
- WEIGHT OF FLOOR GRILL INDICATED DOES NOT INCLUDE WEIGHT OF WELD, WHICH IS NEGLIGIBLE.
- FLOOR GRILLS ARE SUPPORTED BY INTERMITTENT FLOOR BEAMS SUCH THAT, FLOOR GRILLS TAKE LIVE LOAD AS PER NOTE NO. 05 AND MAXIMUM DEFLECTION IS LIMITED TO $L / 250$ OR 6MM WHICHEVER IS MINIMUM.
- FRAME AND LOAD BEARING BAR WELDING : ALL FOUR CORNERS TO BE FULL WELDED TO BAND BARS AND EVERY FIFTH LOAD BEARING BAR TO BE WELDED TO BAND BAR BY MANUAL WELDING FULL DEPTH, AT BOTH ENDS FROM ONE SIDE.
- TOLERANCE FOR LENGTH AND WIDTH OF GRATINGS SHALL BE ± 5 mm



VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	PART MARK	ITEM NO	MATERIAL CODE	ACQ	UNIT	UNIT WEIGHT	QTY	ZONE
3	SQ.BAR 6.0x6.0x995.0		ROD-3			IS2062 E250A		No	0.281	55	
2	FLAT-6 40.0x995.0		FL-5			IS2062 E250A		No	1.875	2	
1	FLAT-6 40.0x5988.0		FL-4			IS2062 E250A		No	11.281	29	
					VAR NO	MATERIAL SPECN		DI	QUANTITY		

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	Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014		DRN	S.SETHUPATHI	SIGNATURE	DATE
			CHD	M.PADMANABAN		20.04.2022
			APPD	K.RAJIVGANDHI		20.04.2022
DEPT	ST	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	MATERIAL CODE:
CODE	122			NTS	346.375	961710170000
TITLE LONG SPAN FLOOR GRILL (40 X 995 X 6000mm)					DRAWING NO : 2-FM-811-00182	
						REV



	MANUFACTURER'S NAME & ADDRESS BHEL: TIRUCHIRAPPALLI	STANDARD QUALITY PLAN						QP NO.: CQP 4731				
	APPROVED SUB-CONTRACTOR	ITEM: ELECTROFORGE FLOOR GRILLS & STEP TREADS						REV.NO.00 DATE: 21/06/2012				
		SUB-SYSTEM : Steam Generator and Auxiliaries,						PAGE: 1 OF 1				
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
1	2	3	4	5	6	7	8	9	D*	**	10	11

1.0 RAW MATERIAL:												
1.1	Bearing Bar. Square Twisted Bar Chequered Plate & other Support plates	Chemical Properties Mechanical Properties Physical Properties	B	Verification of Record	100%	As per BHEL Purchase order(PO)/ BHEL drawing/Material Specification//Laboratory test report./ Test certificate..	MTC	√	P	V	V	Witness of raw material for BHEL Purchase order requirement by BHEL/BHEL AIA. Refer Note-1
			B	Lab analysis	1 No per / PO			√	P	W	W	
			B	Visual, Dimensions Straightness Surface finish	At random			IR	√	P	W	
2.0 IN PROCESS CONTROL:												
2.1	Checks on EF weld machines	Weld parameters, Weld quality Straightness of bars Mesh size and other Dimensions of grating	B	Machine setting Measurement & Visual checks. (Projection & Fusion of weld)	6 times per Shift	WPS / PQR(ASME Sec-1) / BHEL Drawing	IR / Log book	√	P	W	V	Square twisted bar welding shall be properly fused with Bearing bar.
		Weld Strength	B	Load test	Once ** per Shift	By applying 20Kg Pull load on weld joint.	Log book	√	P	W	V	** Random
2.2	Pull out test on EF Weld. And Macro Etch test	Strength test	B	Lab test	1 No per / PO	Manufacturers practice	LTC	√	P	W	W	Shall be carried out in a NABL appd.lab./ Manufacturers own lab.
2.3	Manual welds in Step treads	Weld parameters, Weld Size & quality	B	Visual inspection for weld defects	100%	WPS / PQR(ASME Sec-1) / AWS D 1.1/ BHEL Drawing /Free from defects	Log book	√	P	W	V	
2.4	Dimensions	Physical	B	Measurement	100%	As per BHEL Purchase order & BHEL drawing	DR	√	P	W	V#	#Witness by BHEL AIA - 2%/ Per size/ PO.
3.0 TESTS												
3.1	Deflection Load test (Before galvanizing)	Physical / Dial gauge	B	Measurement	1No./ Per size/ PO.	BHEL Purchase order/ BHELAppd Drawing.	IR	√	P	W	W	Refer Note: 2
3.2	Galvanizing	1.Visual 2.Mass of zinc 3.Adhesion 4.Preece Test 5.Coating Thickness	B	Visual, Lab test Measurement	As per Standard IS2629, IS 4759, IS2633	As per BHEL Purchase order, BHEL drawing.	Log Book, IR	√	P	W	V*	* Witness of testing on One sample per PO identified by BHEL / BHEL AIA.
4.0	PACKING, CRATING AND IDENTIFICATION	Bundling / Identification /Protection	B	Visual	100%	Shall be tied with steel strip/Compact packing BHEL PO.No & Item No shall be stenciled.	IR		P	V	V	

LEGEND:

J. Nanthini 21/06/2012 J.NANTHINI	 21/6/12 V.KALYANARAMAN	Note: (1) Samples shall be selected by BHEL/BHEL AIA for the offered inspection lot. Testing shall be done in a NABL approved lab / Suppliers own lab in the presence of BHEL/BHEL AIA. (2) Deflection shall be measured with a dial gauge by applying a Uniformly Distributed Load-1000Kg.per Sq. meter. Floor Grill shall be placed on two vertical supports-1200mm. apart. Deflection=1200/325 = 3.69mm.
PREPARED	APPROVED	Legend: * Records, indentified with "Tick" (√) shall be essentially included by SUPPLIER in QA documentation. ** M: Manufacturer
SIGNATURE		C: MANUFACTURERS ' QC N: BHEL / BHEL AIA P: PERFORM. W: witness. V: verification , CHP: customer shall identify in column N "N" AS ' W'
CLASS : A - CRITICAL ; B - MAJOR ; C - MINOR . MTC: Mill test certificate. LTC: Lab test certificate. IR: Inspection Report. DR: Dimension Report.		

BHEL/TRICHY
MM/BOI/PURCHASE

Pre-Qualification requirements (PQR) for the procurement of Floor Grills as per specification through Open Tender

A: Organizational Capability & Technical Competence:

Sl. No.	Pre –Qualification Criteria	Bidder acceptance / Bidder remarks
1	Offers from bidders having basic in house manufacturing facilities for the enquired items are only eligible to participate. Offer from Traders, Distributors are not acceptable and will not be considered for evaluation. Vendor to indicate the nature of the Firm. (Trader/Distributor/Manufacturer). Product catalogue shall be submitted.	
2	Manufacturing plant address & available equipment's for manufacturing the tendered items shall be provided along with offer.	
3	Suppliers shall submit Quality Management System certificate or Written down procedure.	

B: Past Experience/ Performance:

Sl. No.	Pre –Qualification Criteria	Bidder acceptance / Bidder remarks
1.	The supplier shall have supplied same or similar items for 50% of the bid quantity (in terms of Metric Tonnes) for the respective Package. PO Copies with corresponding proof of supply shall be furnished.	

C. Financial Soundness:

Sl. No.	Pre –Qualification Criteria	Bidder acceptance / Bidder remarks
1.	Indigenous suppliers shall submit copies of annual reports (balance sheets), profit & Loss Statement for the last three years (or from date of incorporation whichever is less) and GST Certificate.	

Necessary supporting documents shall be submitted for meeting each of the above Pre-Qualification Criteria for technical evaluation of the offers.

BHEL reserves the right to consider/Not-consider the offers based on the evaluation of documents submitted for the above Pre-Qualification Criteria. If required, BHEL also reserves the right to verify information submitted by vendor. In case the information is found false/incorrect, the offer shall be rejected. BHEL also reserves the right to carry out audit checks for confirming the material properties on the supplied material during material receipt at BHEL. Supplies found defective during check or subsequent processing at BHEL will be rejected.



CORPORATE QUALITY ASSURANCE
SUB-VENDOR QUESTIONNAIRE

<i>i.</i>	<i>Item/Scope of Sub-contracting</i>	
<i>ii.</i>	<i>Address of the registered office</i> 	<i>Details of Contact Person</i> <i>(Name, Designation, Mobile, Email)</i>
<i>iii.</i>	<i>Name and Address of the proposed Sub-vendor's works where item is being manufactured</i> 	<i>Details of Contact Person:</i> <i>(Name, Designation, Mobile, Email)</i>
<i>iv.</i>	<i>Annual Production Capacity for proposed item/scope of sub-contracting</i>	
<i>v.</i>	<i>Annual production for last 3 years for proposed item/scope of sub-contracting</i>	
<i>vi.</i>	<i>Details of proposed works</i>	
1.	<i>Year of establishment of present works</i>	
2.	<i>Year of commencement of manufacturing at above works</i>	
3.	<i>Details of change in Works address in past (if any)</i>	
4.	<i>Total Area</i>	
	<i>Covered Area</i>	
5.	<i>Factory Registration Certificate</i>	<i>Details attached at Annexure – F2.1</i>
6.	<i>Design/ Research & development set-up</i> <i>(No. of manpower, their qualification, machines & tools employed etc.)</i>	<i>Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design</i> <i>Details attached at Annexure – F2.2</i> <i>(if applicable)</i>
7.	<i>Overall organization Chart with Manpower Details</i> <i>(Design/Manufacturing/Quality etc)</i>	<i>Details attached at Annexure – F2.3</i>
8.	<i>After sales service set up in India, in case of foreign sub-vendor</i> <i>(Location, Contact Person, Contact details etc.)</i>	<i>Applicable / Not applicable</i> <i>Details attached at Annexure – F2.4</i>
9.	<i>Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any</i>	<i>Details attached at Annexure – F2.5</i>
10.	<i>Sources of Raw Material/Major Bought Out Item</i>	<i>Details attached at Annexure – F2.6</i>
11.	<i>Quality Control exercised during receipt of raw material/BOI, in-process , Final Testing, packing</i>	<i>Details attached at Annexure – F2.7</i>



CORPORATE QUALITY ASSURANCE
SUB-VENDOR QUESTIONNAIRE

12.	Manufacturing facilities (List of machines, special process facilities, material handling etc.)	<i>Details attached at Annexure – F2.8</i>					
13.	Testing facilities (List of testing equipment)	<i>Details attached at Annexure – F2.9</i>					
14.	If manufacturing process involves fabrication then-	<i>Applicable / Not applicable</i>					
	List of qualified Welders	<i>Details attached at Annexure – F2.10</i>					
	List of qualified NDT personnel with area of specialization	<i>(if applicable)</i>					
15.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses	<i>Applicable / Not applicable</i> <i>Details attached at Annexure. –F2.11</i> <i>(if applicable)</i>					
16.	Supply reference list including recent supplies	<i>Details attached at Annexure – F2.12</i> <i>(as per format given below)</i>					
Project/ package	Customer Name	Supplied Item (Type/Rating/Model /Capacity/Size etc)	PO ref no/date	Supplied Quantity	Date of Supply		
17.	Product satisfactory performance feedback letter/certificates/End User Feedback	<i>Attached at annexure - F2.13</i>					
18.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) <i>Note:- Reports need not to be submitted</i>	<i>Applicable / Not applicable</i> <i>Details attached at Annexure – F2.14</i> <i>(if applicable)</i>					
19.	Statutory / mandatory certification for the proposed product	<i>Applicable / Not applicable</i> <i>Details attached at Annexure – F2.15</i> <i>(if applicable)</i>					
20.	Copy of ISO 9001 certificate (if available)	<i>Attached at Annexure – F2.16</i>					
21.	Product technical catalogues for proposed item (if available)	<i>Details attached at Annexure – F2.17</i>					
Name:		Desig:		Sign:		Date:	

Company's Seal/Stamp:-