

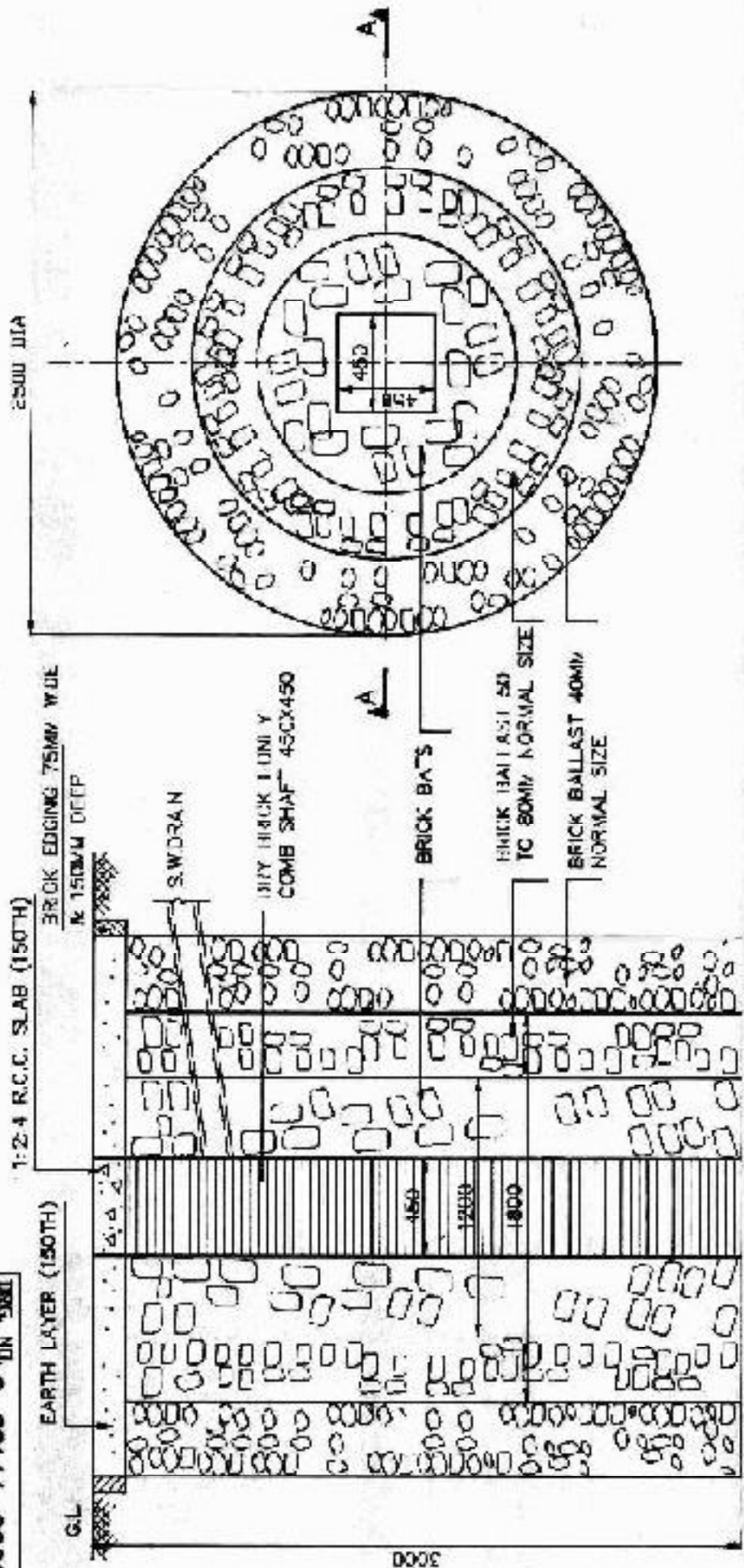
STANDARD CIVIL DRGS. AVAILABLE IN PED.

S.NO	DRAWING	TITLE	NO. OF SHEETS	COM FILE NAME.
1	3-38144-00009	SEPTIC TANK (25 USERS)	01	301
2	3-38144-00001	TYP. DETAILS OF BOUNDARY WALL	01	303
3	3-38144-00003	SOAK PIT DETAILS	01	304
4	3-38144-00004	DETAILS OF ANCHOR BOLTS	01	
5	4-38144-00003	STANDARD GRATING DETAILS	10	
6	4-38144-00005	MS HANDRAIL DETAIL	07	409S2
7	4-38144-00009	REINF. DET. AT CIRCULAR CUT OUT IN SLAB	02	
8	4-38144-00010	CRANERAIL FIXING DETAILS	02	41IS13
9	4-38144-00011	METAL INSERT PLATES	13	
10	4-38144-00021	GEN.NOTES ON CONCRETE WORKS	03	
11	4-38144-00014	GEN.NOTES ON STRUCTURAL STEEL WORKS	04	415
12	4-38144-00015	COLUMN EXPANSION JOINT DETAILS	01	
13	4-38144-00022	PRE-CAST ROOFING PANELS	02	43S58
14	4-38144-00035	REIN WALL FOUNDATION FOR STORAGE TANKS	08	436
15	4-38144-00036	STANDARD LUGS	01	437
16	4-38144-00037	GRATING DETAIL FOR CATCH BASIN	01	438
17	4-38144-00038	FOOT PATHS	01	439
18	4-38144-00039	PEDESTAL FOR STAIRS & LADDERS	01	440S6
19	4-38144-00040	WELDING SYMBOLS	06	44IS5
20	4-38144-00041	STD. LAPS & HOOKS FOR REINFORCEMENT	05	442S2
21	4-38144-00042	RCC PAVEMENT DETAILS	02	443
22	4-38144-00043	DETAILS OF M.S. RUGS	01	446S17
23	4-38144-00046	CABLE TRENCH	17	
24	4-38144-00047	TYPICAL ROAD DRAIN DETAIL	01	
25	4-38144-00048	TYPICAL MANHOLES	01	
26	4-38144-00049	TYPICAL DETAILS OF COLUMN ENCASING	01	
27	4-38144-00012	DETAIL OF HALF ROUND DRAINS	01	
28	4-38144-00053	DRAIN FUNNEL DETAIL FOR O.W.S	01	
29	4-38144-00054	BRANCH PIPE TO HEADER CONNECTION DETAILS FOR O.W	01	
30	4-38144-00055	DRAIN FUNNEL DETAIL FOR O.W.S	01	
31	4-38144-00056	BRANCH PIPE TO DETAIL FOR O.W.S	01	
32	3-38144-00015	BARED WIRE FENCING	01	
33	2-38144-00007	RCC DETAIL OF LINTELS		

3-38144-00008 IN DWG

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM



PLAN

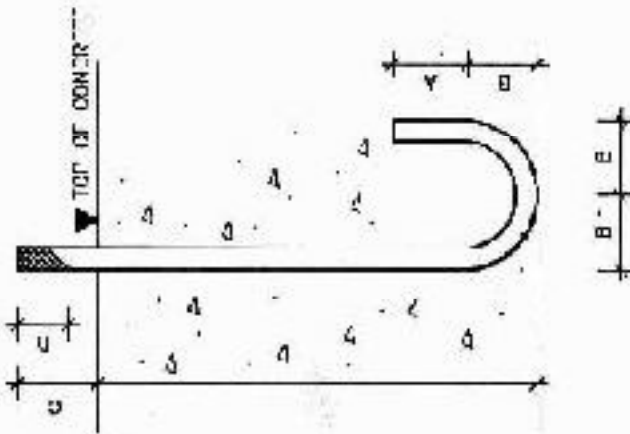
SECTION A-A

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		STANDARD		DATE		REV. NO.	
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		IS: 10000		20/01/2008		01	
DRAWING NO. 3-38144-00008		SCALE 1:20		REF. TO ARCH. DRG.		ITEM NO.	
TITLE SOAK PIT DETAILS		VALUATION		DATE		REV.	
DRAWING NO. 3-38144-00008		100		20/01/2008		01	

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

10000-11188-6 IN SWG

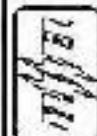


BOLT DIA mm	DIMENSIONS (mm)		
	A	B	E
12	48	48	200
16	61	61	260
20	60	60	320
22	69	69	350
28	100	100	400
38	112	140	475
32	128	160	530
36	144	180	600
40	160	240	700
45	180	270	800
50	200	300	900

NOTES :-

1. D = ϕ WHERE ϕ IS THE BOLT DIA
2. C = T+G+D WHERE T IS BASE PLATE THICKNESS AND G IS GROUT THICKNESS
3. THE BOLT DIMENSIONS ARE VALID FOR M20 & ABOVE SIZES OF CONCRETE ONLY.
4. BOLT TO BE BENT AND TREATED FROM MS ROUND BAR CONFORMING TO S 432.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT STANDARD



BHARAT HEAVY ELECTRICALS LTD
HYDRABAD

NO. OF SHEETS	DATE	SCALE	WEIGHT (KG)	DATE	NO. OF SHEETS
44	10/10/20	NIS		10/10/20	1
DATE	SCALE	WEIGHT (KG)	DATE	NO. OF SHEETS	
10/10/20	NIS		10/10/20	1	
DRAWING NO.			PART CODE		
9-30144-00004			100		
DRAWING NO.			PART CODE		
9-30144-00004			100		
DRAWING NO.			PART CODE		
9-30144-00004			100		

RET. TO ASBY 266
DATE 10/10/20
NO. 1

DRIVING INL
9-30144-00004
100

DETAILS OF ANCHOR BOLTS

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

CIVIL ENGINEERING

NO

DATE

REVISIONS

DRN

CHD

APPD

0

05/02/83

ISSUED AS STANDARD

[Signature]

[Signature]

[Signature]

CONTENTS

SHEET NO

1. NOTES

2 & 3

2. LOADING TABLE

4

3. GRATING LAYOUT : ELECTROFORGED

5

4. GRATING LAYOUT : HAND WELDED

6

5. SERRATED LOAD BEARING BAR DETAIL

7

6. FIXING DETAIL

8

7. TYPICAL DETAIL AT OPENINGS

9

8. STEP TREAD

10

SHEET 1 OF 10



PROJECT ENGINEERING
BHEL HYDERABAD

STANDARD GRATING
DETAIL

DRAWING NO

4-38144-00003

REV

0

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED
IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

CIVIL ENGINEERING

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

NOTES

1. THIS STANDARD GIVES THE LOAD CARRYING CAPACITY AND FABRICATION DETAILS OF ELECTROFORGED AND HAND WELDED MILD STEEL FLOOR GRATINGS INCLUDING STEP TREADS.
2. ALL DIMENSIONS ARE IN MM.
3. THE TYPE OF GRATING TO BE USED SHALL BE CALLED OUT ON THE DESIGN DRAWING. MATERIAL FOR THE GRATING SHALL CONFORM TO THE FOLLOWING STANDARDS:
FLATS - IS: 226, ROUNDS - IS: 432 (GR-1)
4. ROLLED FLATS ARE PREFERRED FOR THE MANUFACTURE OF FLOOR GRATINGS. IF SHEARED PLATES ARE USED SHARP EDGES SHOULD BE ROUNDED OFF AND SHALL BE FREE FROM BURRS. COMMERCIAL QUALITY MATERIAL WILL BE ALLOWED ONLY AFTER ASCERTAING WELDABILITY.
5. TOLERANCE :-
 - (a) PITCH OF MAIN MEMBERS — ± 1 mm
 - (b) SQUARENESS OF THE PANEL CHECKED BY DIFFERENCE IN DIAGONALS — ± 5 mm
 - (c) PERMISSIBLE LONGITUDINAL/ TRANSVERSE UNILATERAL DEVIATION FROM STRAIGHTNESS (BOW) — 3 mm / METRE
 - (d) ROLLED FLAT DIMENSIONS - AS PER IS 1852
6. THE STANDARD PANEL OVERALL WIDTH AS SHOWN IN SHTS 5 AND 6 IS 1005. IT MAY BE INCREASED OR DECREASED AS REQUIRED TO SUIT THE GEOMETRY OF THE PLATFORM AND CONVENIENCE OF HANDLING.
7. IN CASE OF PANELS WITH CUT OUTS, ADEQUATE WORKING LOAD CAPACITY SHALL BE ENSURED BY PROVISION OF

SHT 2 OF 10



PROJECT ENGINEERING
BHEL HYDERABAD

STANDARD GRATING
DETAIL

DRAWING NO
4-38144-00003

REV
0

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

CIVIL ENGINEERING

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

- ADDITIONAL SUPPORTING MEMBERS WHEREVER REQUIRED.
8. FABRICATION OF THE FLOOR GRATINGS ARE TO BE DONE BY ELECTROFORGING METHOD UNLESS STATED OTHERWISE ELSEWHERE IN DESIGN DRAWINGS, TENDER DOCUMENT, ETC.
9. FINISH SHALL BE ONE OF THE FOLLOWING, TO BE SPECIFIED SEPARATELY. :-

(a) RED OXIDE PRIMER - FOR NORMAL CONDITIONS

(b) GALVANISED - FOR CORROSIVE AND DAMP SITUATIONS

GALVANISING SHALL BE AS PER IS:2629 WHICH GUARANTEES A MINIMUM COATING OF ZINC OF 86 MICRONS. FURTHER, THE SPELTER USED IN THE HOT DIP PROCESS SHOULD NOT CONTAIN LESS THAN 98% PURE ZINC. GALVANISING SHOULD ALSO CONFORM TO

ASTM: 123 GIVING A COATING OF 610 gms/Sq mtr OF ZINC. GALVANISING SHALL BE DONE AFTER ALL WELDING WORKS ARE COMPLETED. ALL EXPOSED AREAS WHERE SITE WELDING IS EMPLOYED SHALL RECEIVE TWO COATS OF ALUMINUM PAINT OVER A PRIMER COAT/COLD GALVANISING PASTE PAINTED.

SHT 3 OF 10



PROJECT ENGINEERING
BHEL HYDRABAD

STANDARD GRATING
DETAIL

DRAWING NO
4-38144-00003

REV
0

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

CIVIL ENGINEERING

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

LOAD TABLE FOR STEEL GRATING

40mm CENTRE OF LOAD BEARING BARS (ELECTROFOR660)

BEARING BAR SIZE IN mm		SPAN							
		300	450	600	750	900	1050	1200	1350
25 X 3 (TYPE 1)	U	11000	4880	2740	2750	1230	900	680	
	D	0.6	1.4	2.6	3.9	5.9	7.9	10.0	
	C	1660	1100	820	660	550	470	410	
	D	0.5	1.1	2.0	3.1	4.3	6.1	8.0	
25 X 5 (TYPE 2)	U	18300	8100	4560	2920	2020	1490	1150	850
	D	0.6	1.4	2.5	3.9	5.6	7.5	10.0	12.7
	C	2740	1820	1370	1100	910	780	690	570
	D	0.5	1.1	2.0	3.1	4.3	6.1	8.0	10.5

UNIT STRESS 1650 Kg/sq m.

U - UNIFORMLY DISTRIBUTED LOAD IN Kg/sq m

C - CONCENTRATED LOAD IN Kg/METRE WIDTH AT MID SPAN

D - DEFLECTION IN MILLIMETERS

SPANS TO LEFT OF HEAVY LINE PRODUCE A DEFLECTION OF 6mm OR LESS UNDER A UNIFORM LOAD OF 500 Kg/sq m.

THIS DEFLECTION IS RECOMMENDED AS PER BS : 4592 - 1970.

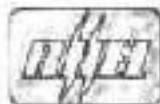
NOTE :

AVERAGE WEIGHT OF GRATINGS BASED ON SIZE 900^{LENGTH}X1005^{WIDTH} ARE AS FOLLOWS :

TYPE 1 : 22.76 Kg/sq m

TYPE 2 : 34.32 Kg/sq m

SHT 4 OF 10



PROJECT ENGINEERING
BHEL HYDERABAD

STANDARD GRATING
DETAIL

DRAWING NO

4-38144-00003

REV

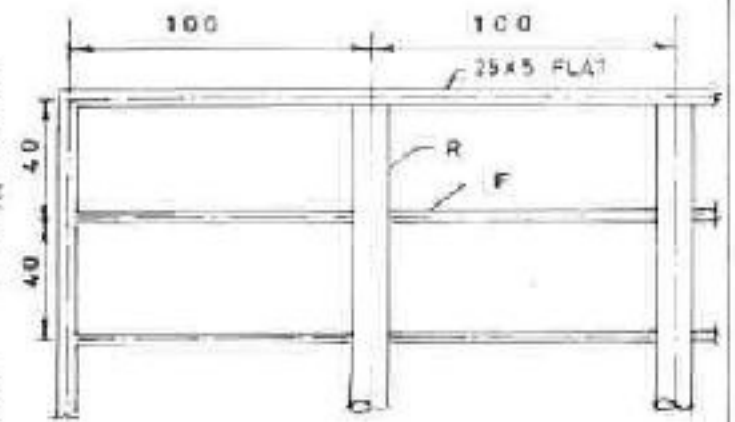
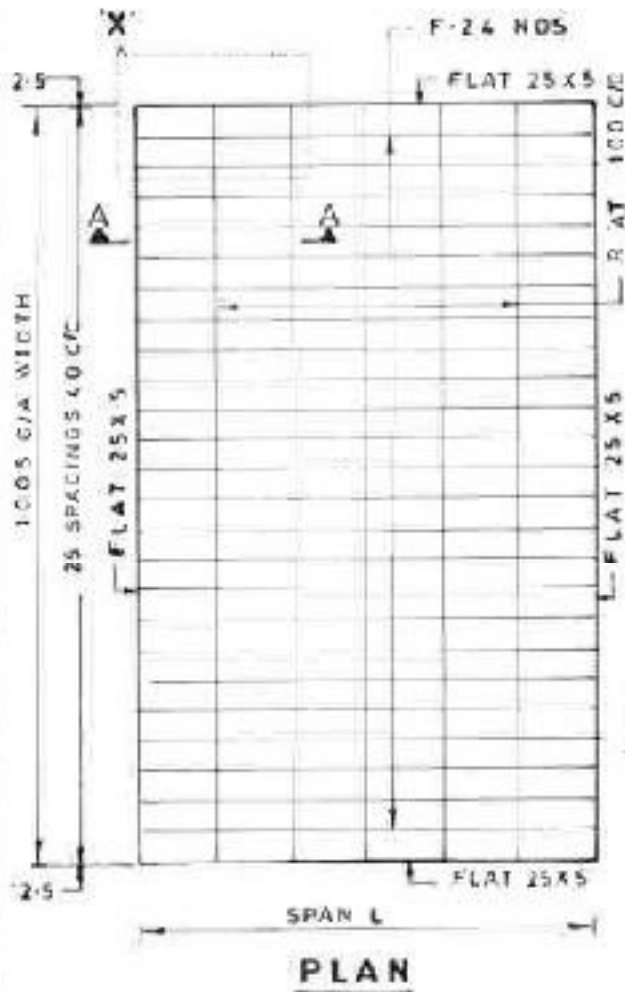
0

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

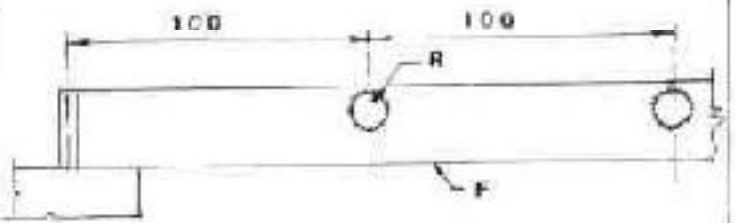
CIVIL ENGINEERING

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

GRATING LAYOUT (ELECTROFORGED)



DETAIL 'X'



SECTION A-A

		F	R	
TYPE 1	ORD.	25X3	10 φ	FOR LIGHT LOADS
	ANTISKID	25X3 SERRATED	10 φ TWISTED	FOR LIGHT LOADS
TYPE 2	ORD.	25X5	12 φ	FOR MEDIUM LOADS
	ANTISKID	25X5 SERRATED	12 φ TWISTED	FOR MEDIUM LOADS

SHT 5 OF 10



PROJECT ENGINEERING
BHEL HYDERABAD

STANDARD GRATING
DETAIL

DRAWING NO

4-38144-00003

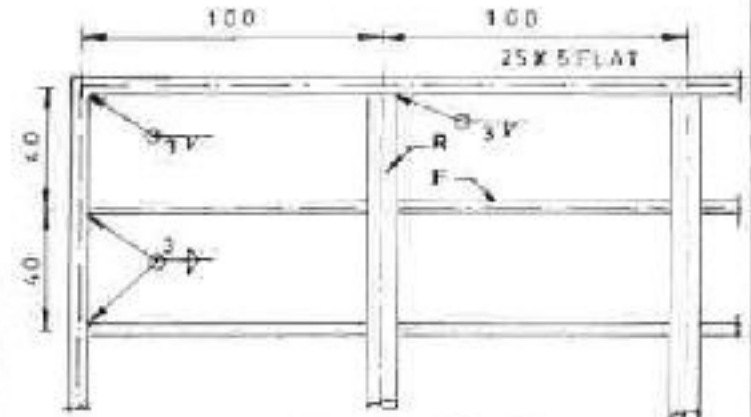
REV

0

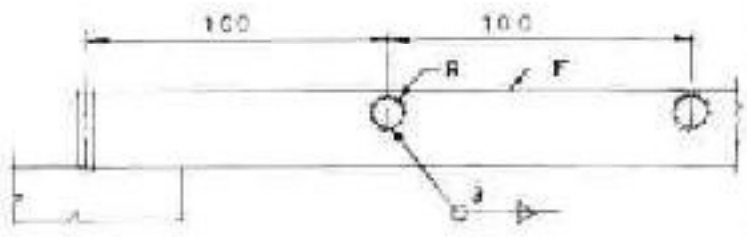
NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

GRATING LAYOUT (HAND WELDED)

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY



SECTION X



SECTION A-A

		F	R	
TYPE 1	ORD	25X3	10 Ø	FOR LIGHT LOADS
	ANTISKID	25X3 SERRATED	10 Ø TWISTED	FOR LIGHT LOADS
TYPE 2	ORD	25X5	12 Ø	FOR MEDIUM LOADS
	ANTISKID	25X5 SERRATED	12 Ø TWISTED	FOR MEDIUM LOADS

SHT 6 OF 10



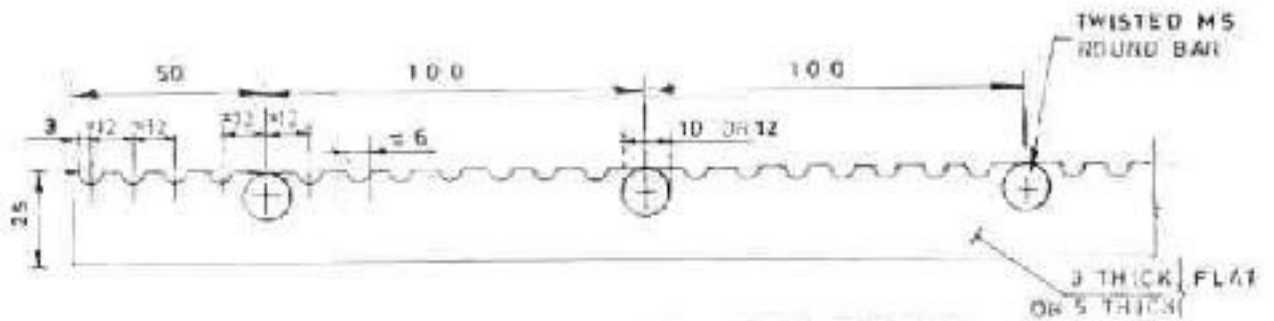
PROJECT ENGINEERING
BHEL HYDERABAD

STANDARD GRATING
DETAIL

DRAWING NO	REV
4-38142-00003	0

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



SERRATED LOAD BEARING BAR DETAIL

NOTES:-

1. THESE ARE TO BE USED FOR FABRICATION OF ANTI SKID GRATINGS.
2. FURTHER DETAILS AS PER SHIS 5 & 6

SHT 7 OF 10



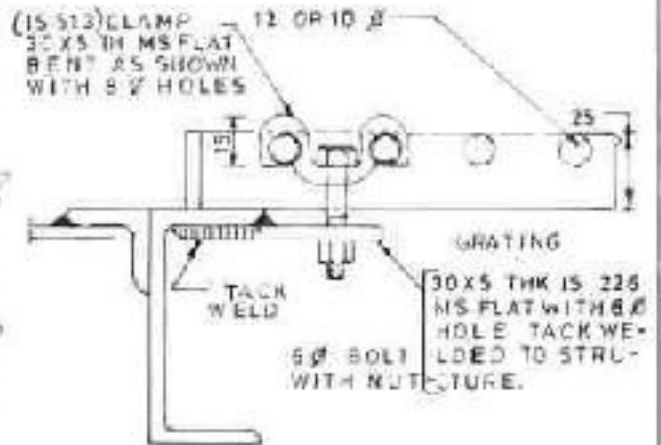
PROJECT ENGINEERING
BHEL HYDERABAD

STANDARD GRATING
DETAIL

DRAWING NO	REV
4-38144-00003	0

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

CIVIL ENGINEERING	NO	DATE	REVISIONS	DRN	CHD	APPD
	0	05/02/93	ISSUED AS STANDARD			



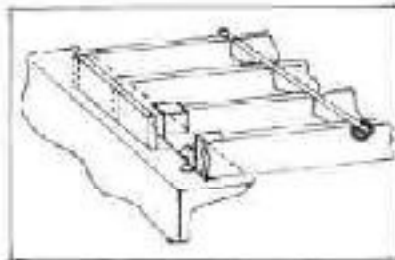
TYPICAL CLAMP DETAIL (TYPE)

(GRATING TO BE CLAMPED AT EVERY 300mm WITH ATLEAST 4 NOS OF CLAMPS PER GRATING UNIT)

REMOVABLE

FIXED

FIXING DETAIL

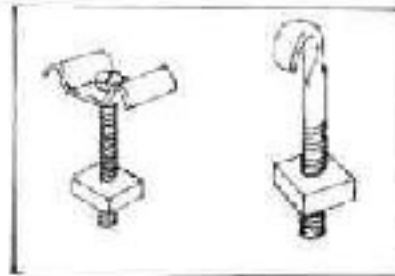


CLAMP TYPE 2

STUD BOLTS ARE CENTERED BETWEEN TWO MAIN BEARS AND WELDED TO SUPPORTING MEMBERS. U-SHAPED CLIP ENGAGING TWO MAIN BEARING BARS IS PLACED OVER STUD BOLT AND THEN HEX NUT IS TIGHTENED.

CLAMP TYPE 3

HOLES ARE DRILLED IN THE BEAM TO SUIT 6mm SCREWS THE CLIP FITTED FROM ABOVE ON TWO ADJACENT BEARING BARS. THE SCREW IS FITTED AFTER WHICH THE NUT CAN BE SCREWED ON FROM BELOW.



CLAMP TYPE 4

HOLES ARE DRILLED IN THE BEAM TO SUIT 6mm SCREWS. THE HOOK IS PASSED OVER A BEARER AND THE NUT TIGHTENED FROM BELOW.

NOTE:-

REMOVABLE GRATING PANEL SHALL BE CLAMPED OR TACK WELDED TO SUPPORTING MEMBERS AS CALLED OUT ON DESIGN DROG. IN LATER CASE PANEL CAN BE REMOVED AFTER GAS CUTTING THE TACK WELDS!

FIXING DETAIL



THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED
 IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

CIVIL ENGINEERING

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>



RECTANGULAR



CIRCULAR

TYPICAL DETAIL AT OPENINGS

SHT 9 OF 10



PROJECT ENGINEERING
 BHEL HYDERABAD

STANDARD GRATING
 DETAIL

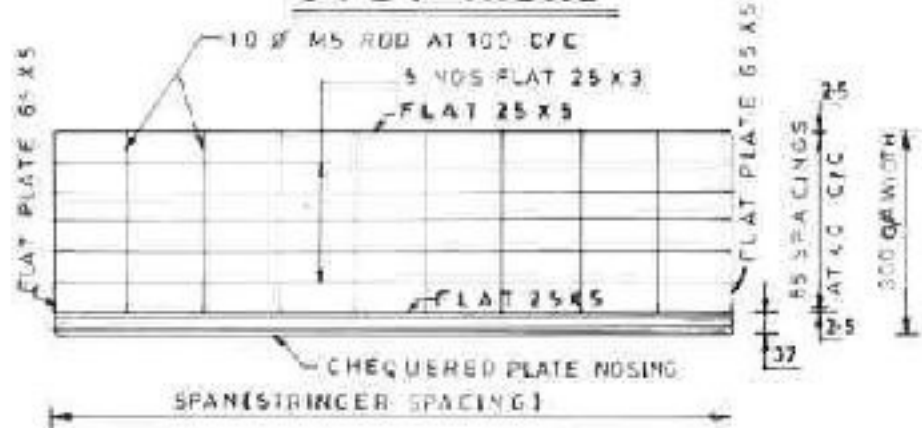
DRAWING NO	REV
4 38144 00003	0

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

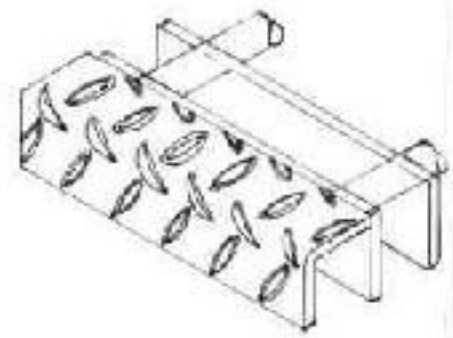
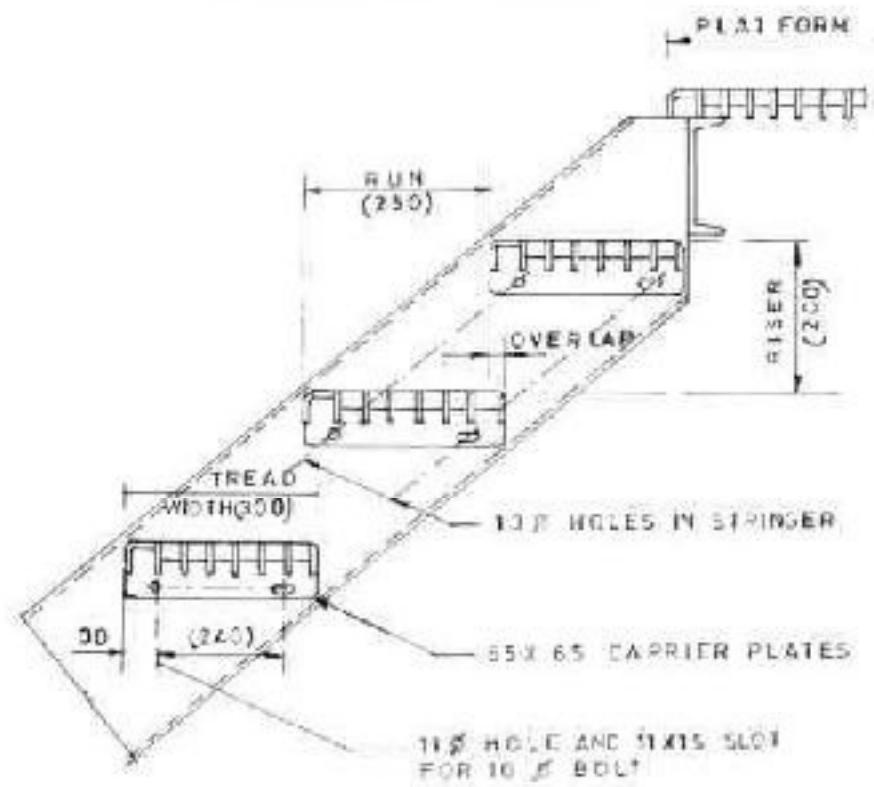
CIVIL ENGINEERING

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

STEP TREAD



PLAN OF STEP TREAD



STEEL CHECKERED PLATE NOSING FOR WELDED STYLE STEEL STAIR PLATFORMS AND TREADS (TO BE WELDED TO LEADING EDGE OF TREAD)

DETAIL OF STEP TREAD FIXING ON STAIRCASE STRINGER BEAM

NOTE

STEP TREAD FABRICATION DETAILS ARE AS FOR FLOOR GRATINGS SHEETS 5 & 6

SHT 10 OF 10



PROJECT ENGINEERING
BHEL HYDERABAD

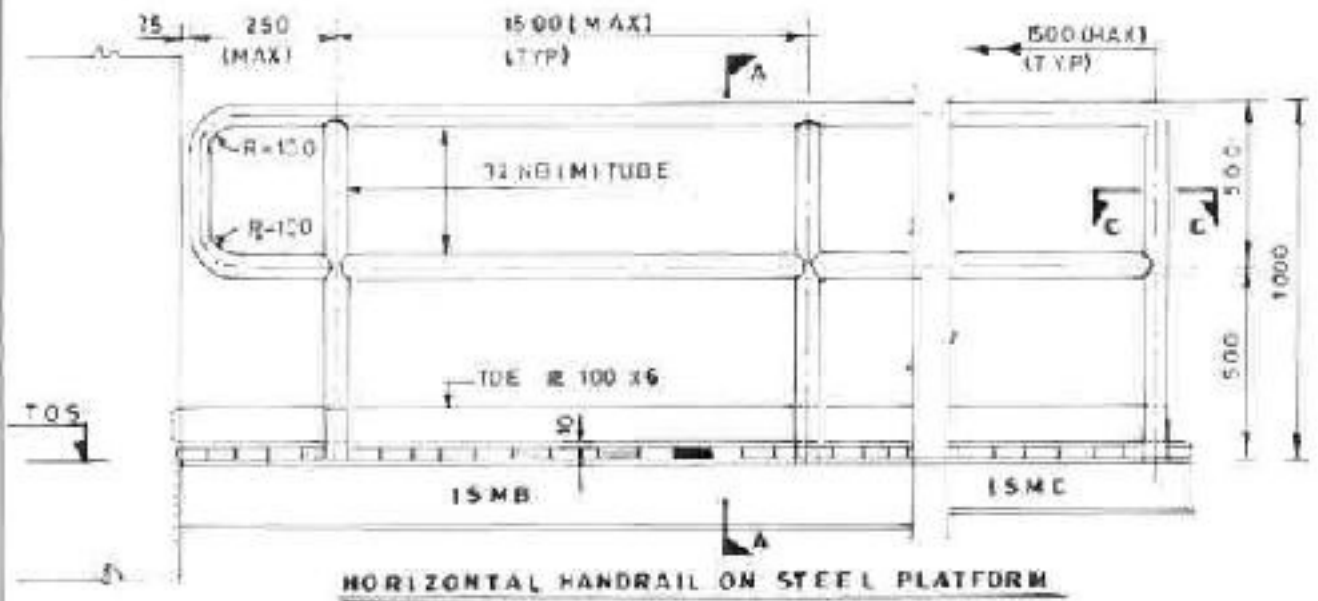
STANDARD GRATING
DETAIL

DRAWING NO	REV
4-38144-00003	0

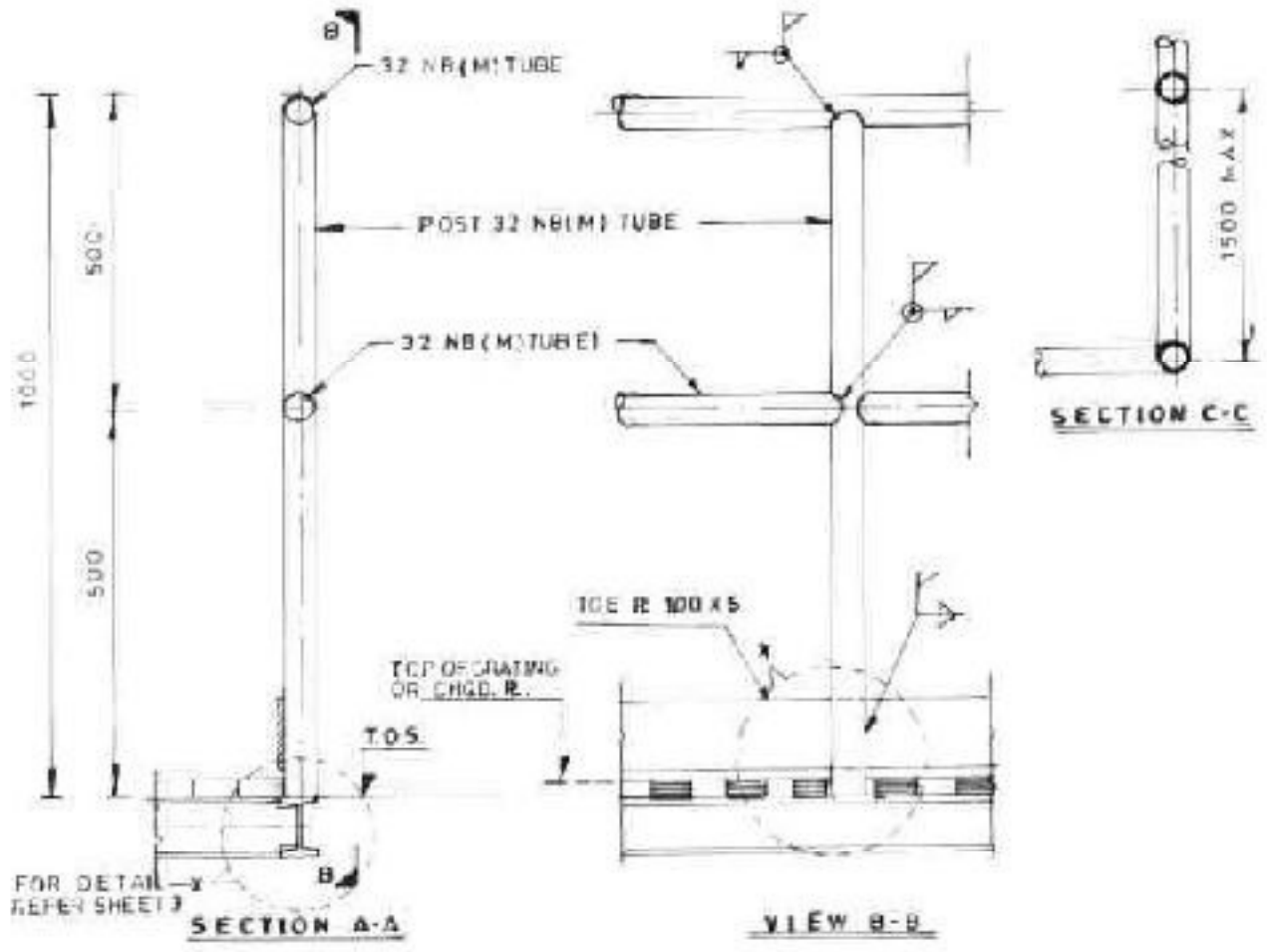
ARCHITECTURAL

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	G.E.S.	P. Balu	P. Balu

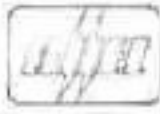
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



HORIZONTAL HANDRAIL ON STEEL PLATFORM



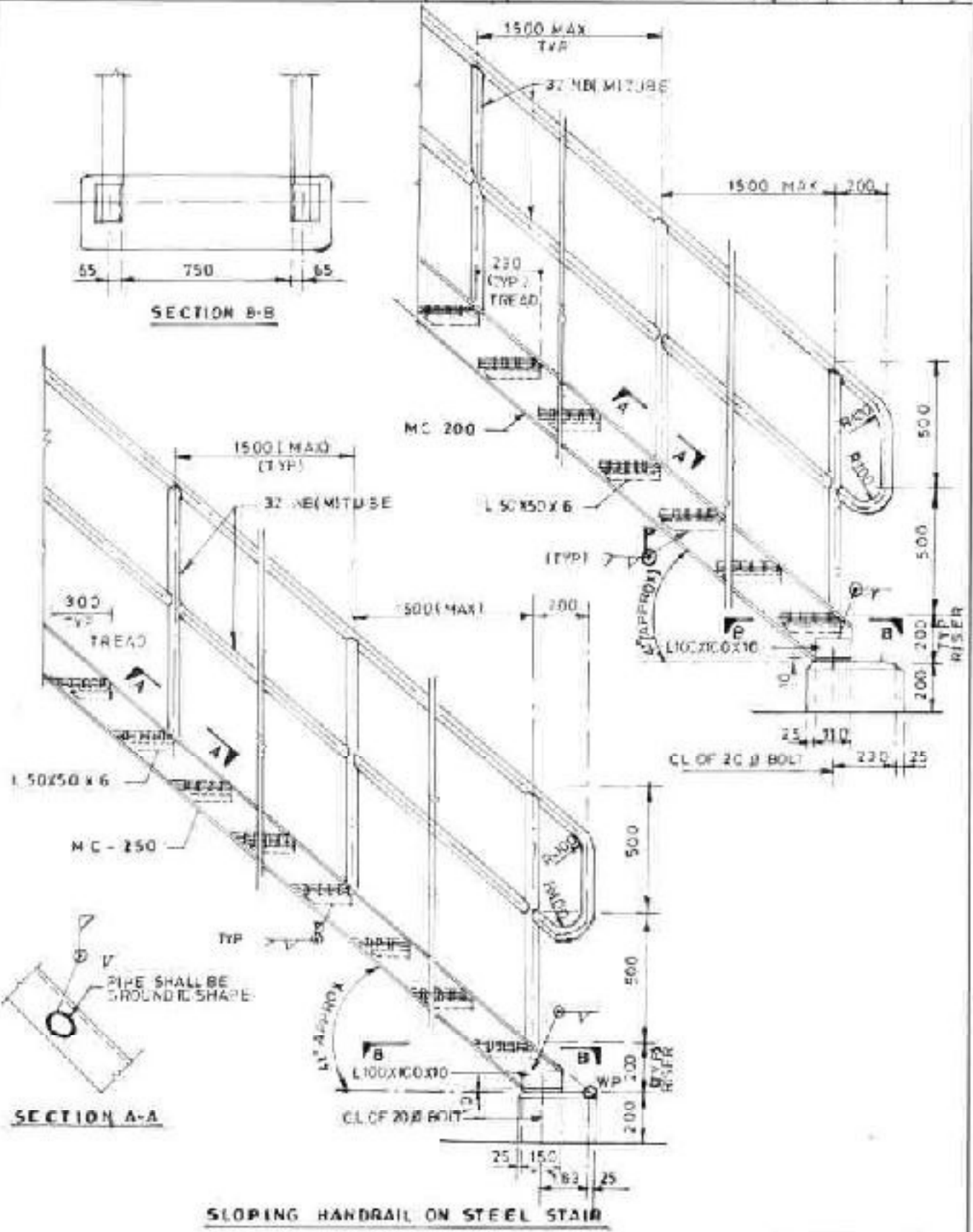
SHEET 1/7

	PROJECT ENGINEERING BHEL HYDERABAD	MS HAND RAIL DETAILS	DRAWING NO	REV
			4-38144-00005	0

ARCHITECTURAL

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/01/93	ISSUED AS STANDARD	Q.E.S.	<i>[Signature]</i>	<i>[Signature]</i>

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY



SHEET 2/7



PROJECT ENGINEERING
BHEL HYDERABAD

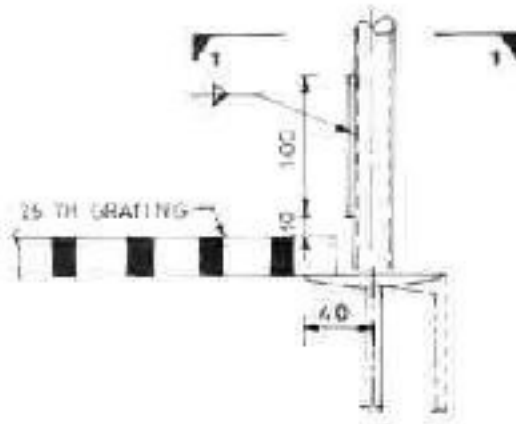
MS HAND RAIL
DETAILS

DRAWING NO	REV
4-38144-00005	0

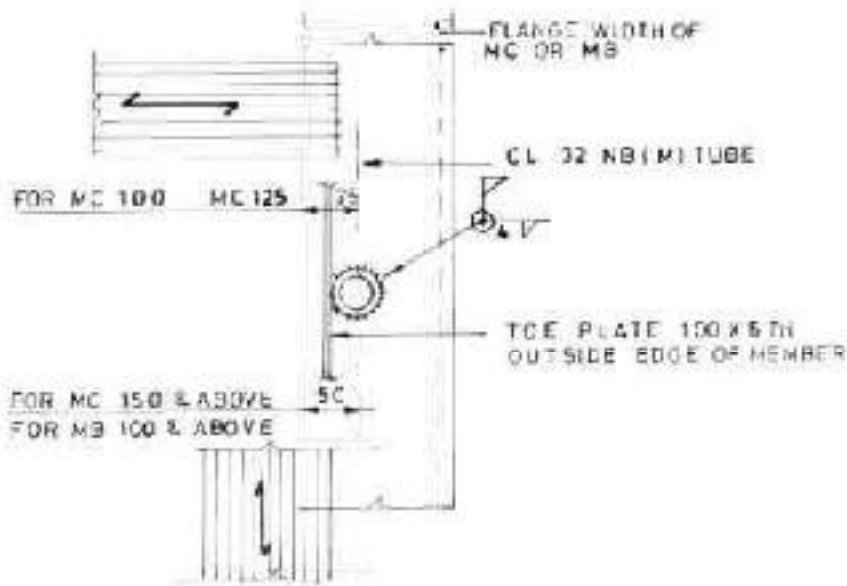
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

ARCHITECTURAL

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/53	ISSUED AS STANDARD	QES	<i>[Signature]</i>	<i>[Signature]</i>



DETAIL-X



PLAN 1-1

NOTES

1. CHG PLATES/GRATINGS SHALL BE SLIGHTLY NOTCHED TO ACCOMMODATE THE TUBE IN CASE OF BEAM MC-100 OR MC-125.

SHEET 3/7



PROJECT ENGINEERING
BHEL HYDERABAD

MS HAND RAIL
DETAILS

DRAWING NO

4-38144-00005

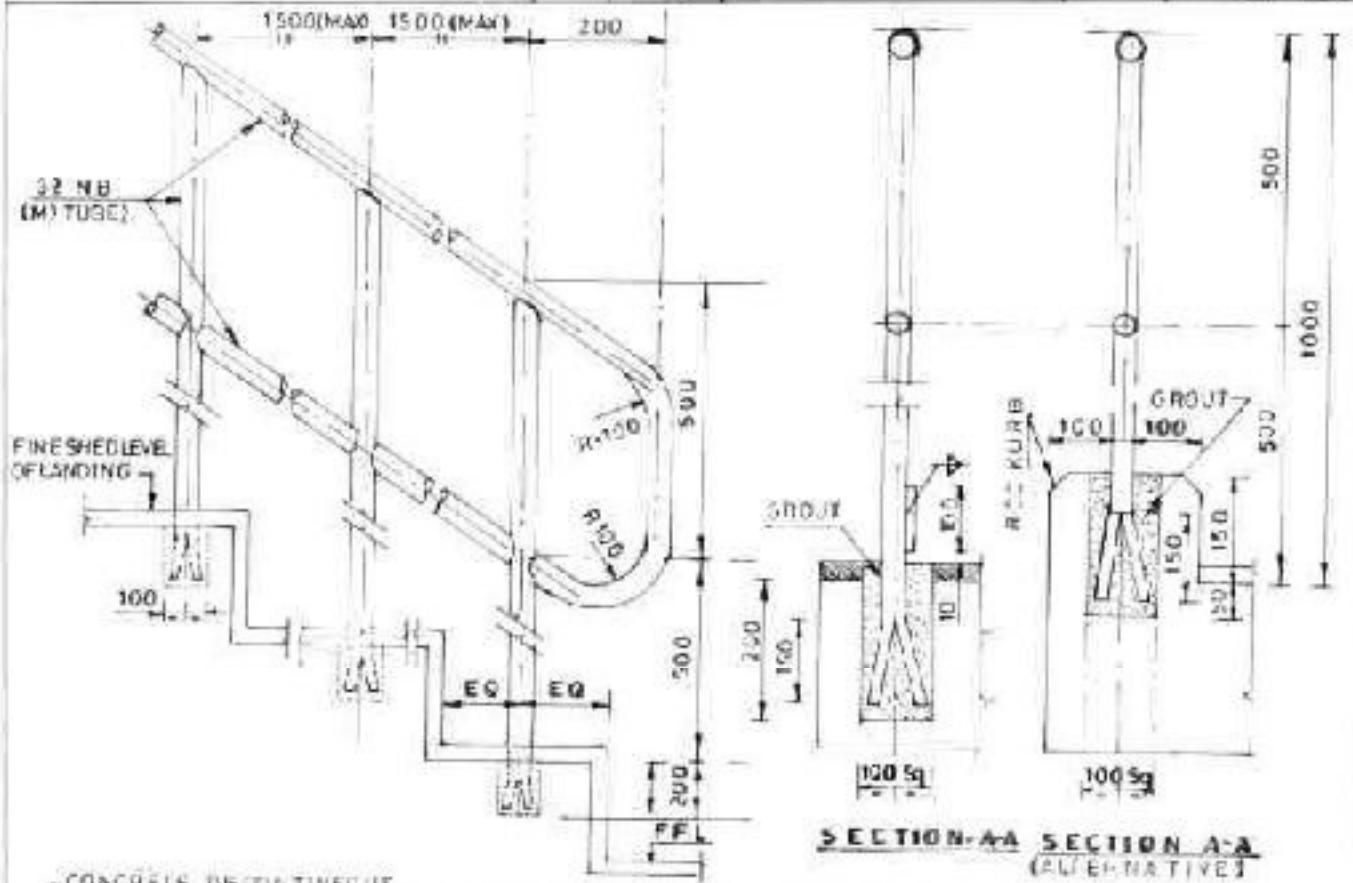
REV

0

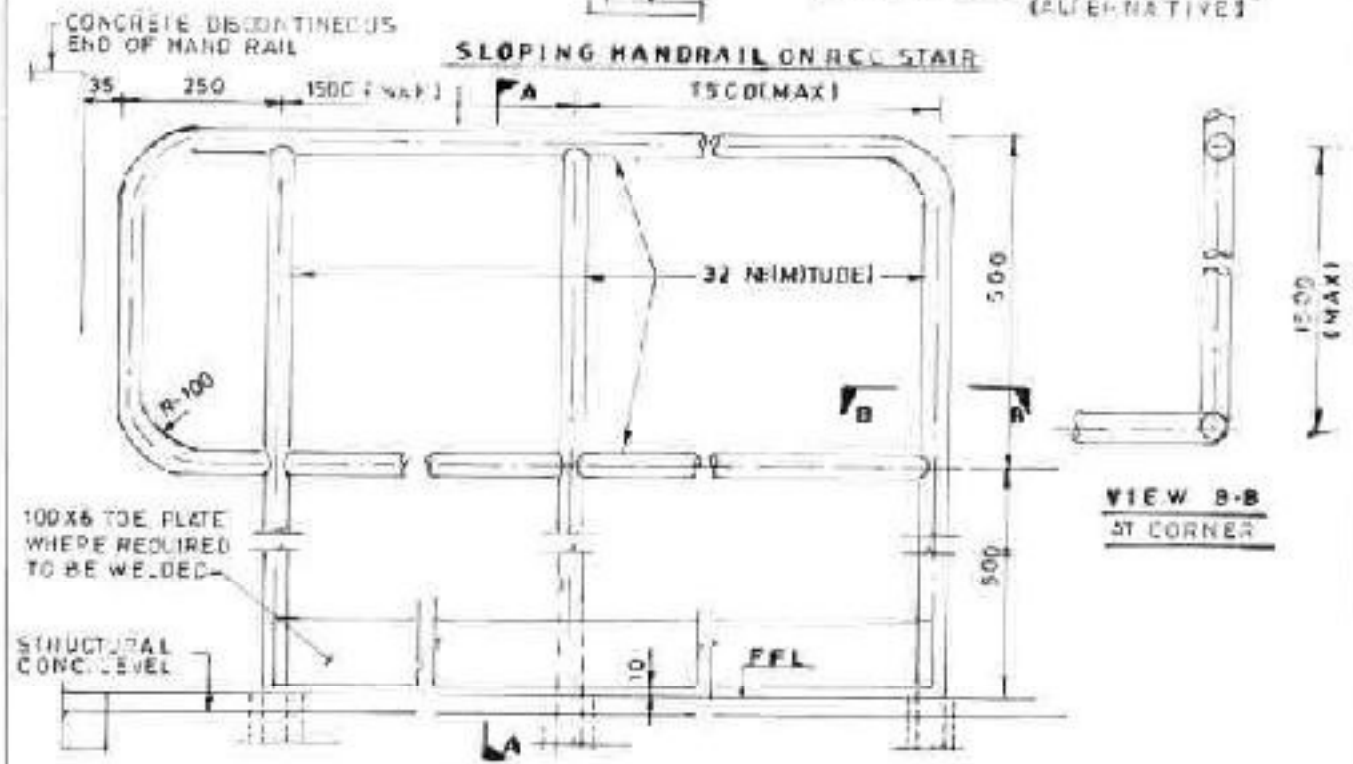
ARCHITECTURAL

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/93	ISSUED AS STANDARD	QES	<i>[Signature]</i>	<i>[Signature]</i>

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



SLOPING HANDRAIL ON RCC STAIR



HORIZONTAL HANDRAIL (ON RCC PLATFORM)

VIEW B-B AT CORNER

SHEET 4/7



PROJECT ENGINEERING
BHEL HYDERABAD

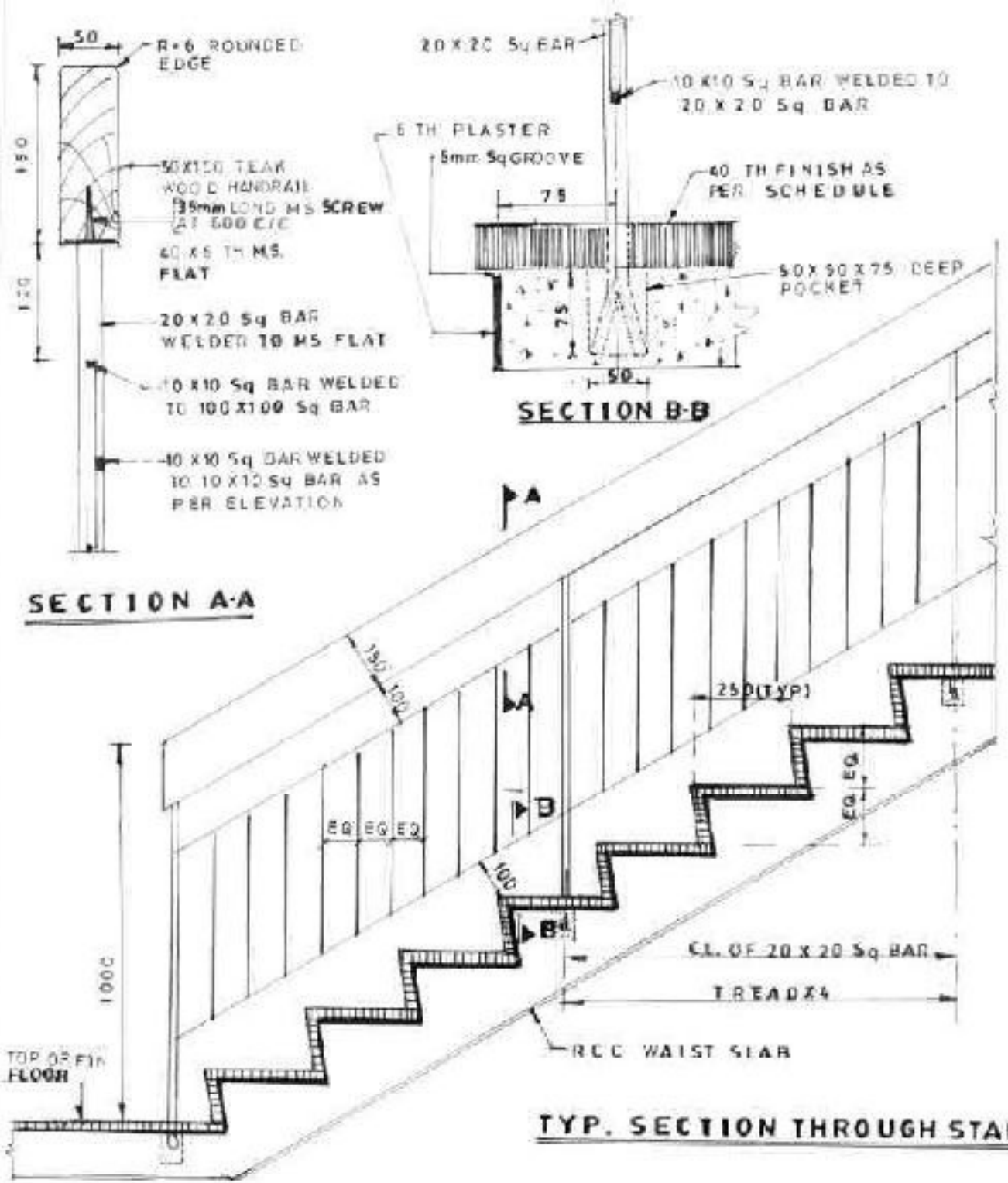
MS HAND RAIL
DETAILS

DRAWING NO	REV
4-38144-00005	0

ARCHITECTURAL

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/95	ISSUED AS STANDARD	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



ROUNDED TEAK HANDRAIL FOR CONCRETE STAIRS

SHEET 5 OF 7



PROJECT ENGINEERING
BHEL HYDERABAD

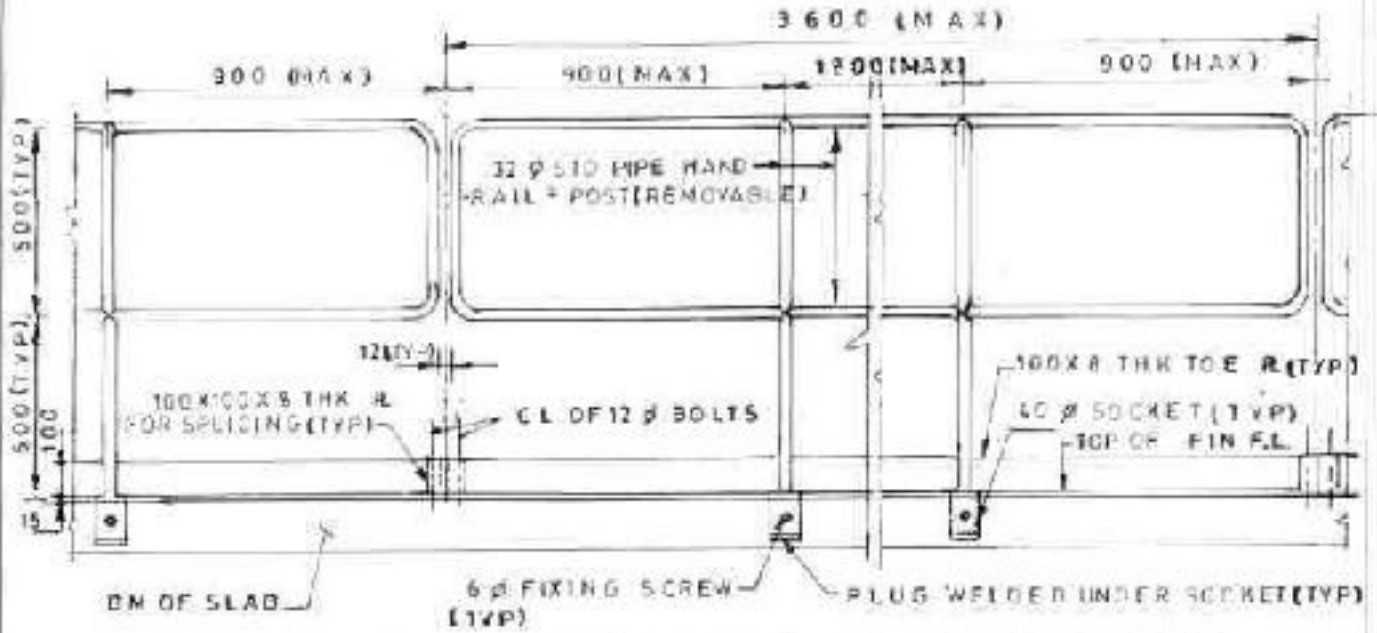
MS, HAND RAIL
DETAILS

DRAWING NO:
4-38144-00005

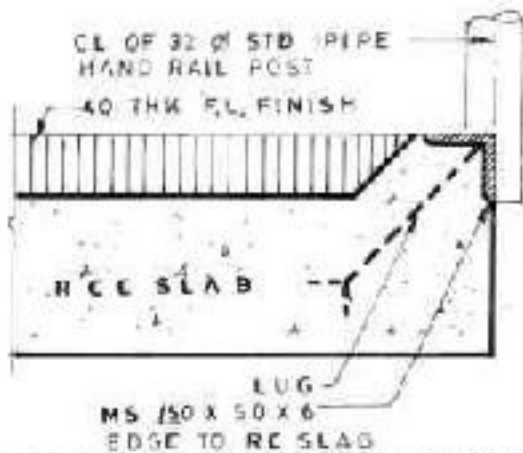
REV
0

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/02/95	ISSUED AS STANDARD			

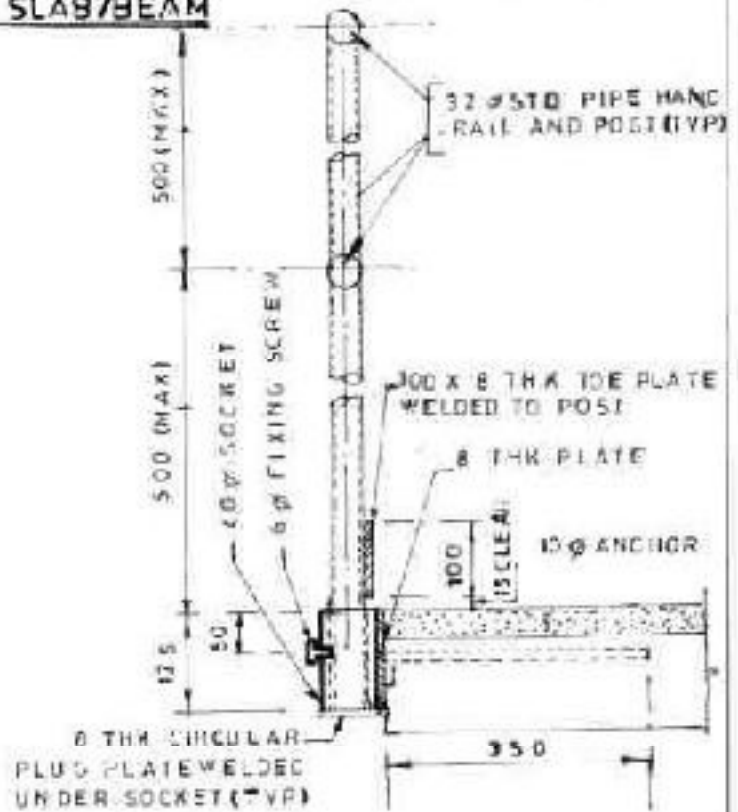
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY



**ELEVATION OF HANDRAIL (REMOVABLE)
FIXED TO R C C SLAB/BEAM**



**DETAIL OF FIXING HANDRAIL
POST TO R C C SLAB AS
ALTERNATIVE TO EMBEDMENT**



**DETAIL OF FIXING HANDRAIL
TO R C C SLAB / BEAM
[REMOVABLE TYPE]**

SHEET 6 OF 7



PROJECT ENGINEERING
BHEL HYDERABAD

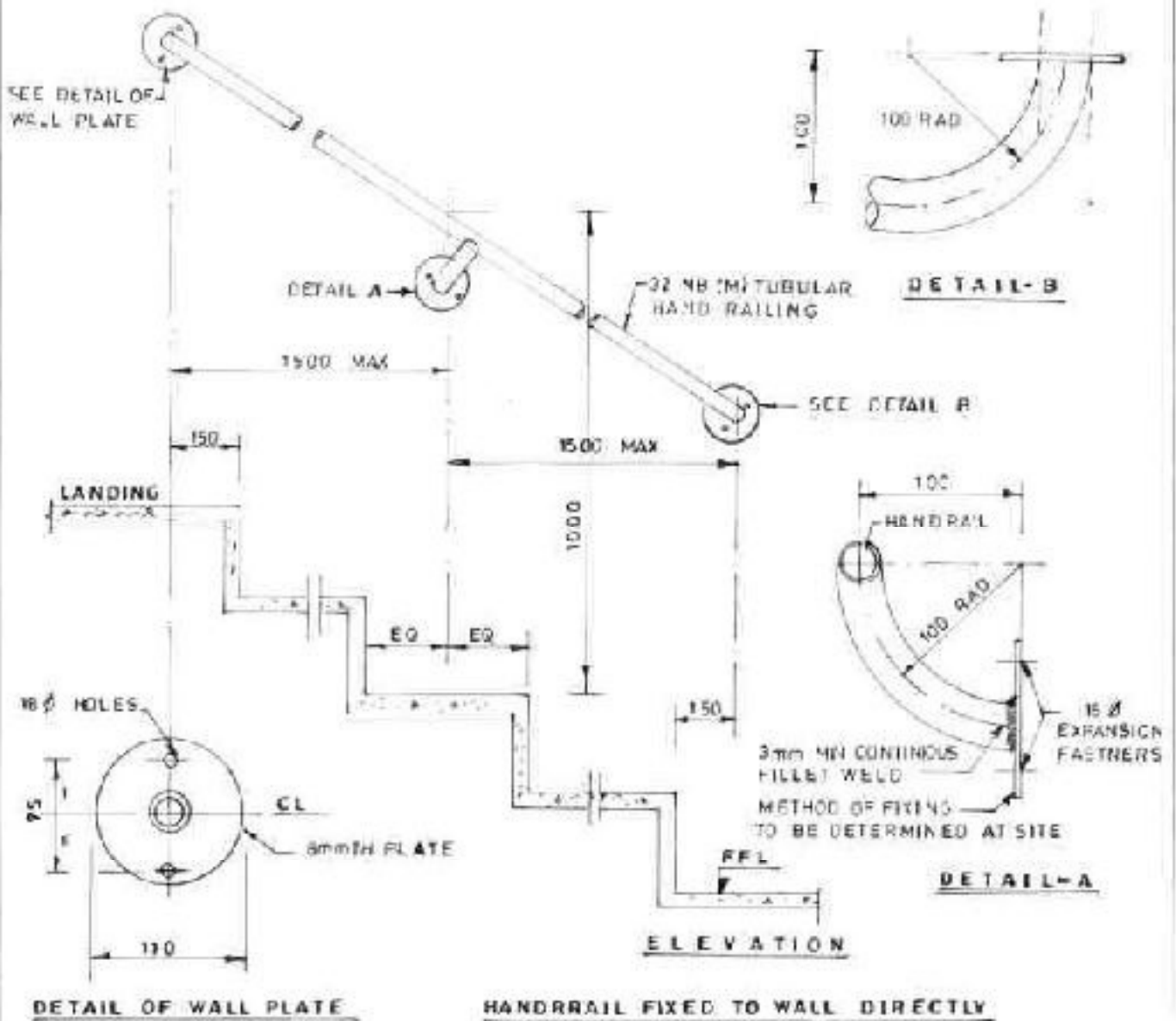
M.S. HANDRAILS
DETAILS

DRAWING NO	REV
4-38144-00005	0

ARCHITECTURAL

NO	DATE	REVISIONS	DRN	CHD	APPD
0	05/04/93	ISSUED AS STANDARD	G.E.S		

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



NOTES

1. ALL HANDRAILS AND UPRIGHT SHALL BE 32 NB (M)MS TUBE FOR LIGHT AND MEDIUM DUTY AND 40 NB FOR HEAVY DUTY.
2. ALL FILLET WELDS SHALL BE 3mm MIN CONTINUOUS UNLESS NOTED OTHERWISE.
3. JOINTS IN HANDRAILS SHALL BE PROVIDED AT SUITABLE POINTS WELDED AND GROUND FLUSH OR WITH SCREWED COUPLINGS.
4. POCKETS FOR UPRIGHTS SHALL BE 100x100 DEEP TO BE DROUTED AFTER ERECTION AND ALIGNMENT.
5. BOTTOM 150 OF ALL UPRIGHTS EMBEDDED IN CONC SHALL BE CUT AND ENDS SPLAYED OUT.
6. ALL MS TUBES AND FITTINGS SHALL CONFORM TO IS 1229.

SHEET 7/7



PROJECT ENGINEERING
BHEL HYDERABAD

MS HAND RAIL
DETAILS

DRAWING NO

4 38 144 00005

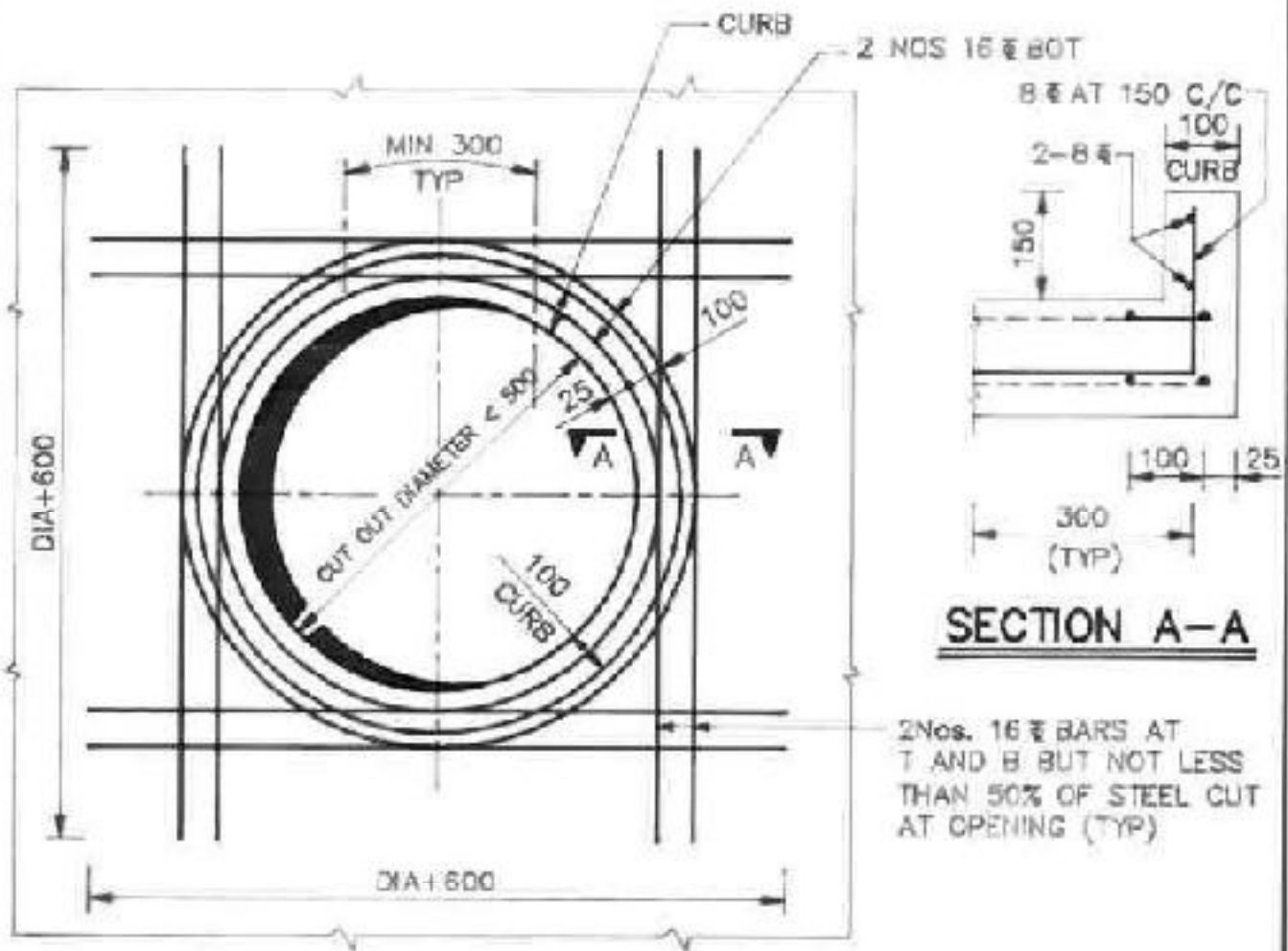
REV

0

CIVIL ENGINEERING

NO	DATE	REVISION	DRN	CHD	APPD
0		ISSUED AS STANDARD			

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY



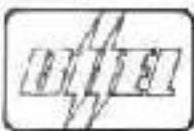
SECTION A-A

2Nos. 16mm BARS AT T AND B BUT NOT LESS THAN 50% OF STEEL CUT AT OPENING (TYP)

NOTES :

1. ALL DIMENSIONS ARE IN MM.
2. ALL THESE BARS SHALL BE EFFECTIVELY TIED WITH THE MAIN REINFORCEMENT. BARS TO BE CUT OR SPLAYED NEAR THE OPENING AS PER THE DIRECTION OF THE ENGINEER-INCHARGE.
3. THIS DETAIL APPLIES TO SLABS UP TO 200 THICK FOR THICKER SLABS SEE DESIGN DRAWINGS.
4. OMIT CURB WHERE SPECIFICALLY STATED ON DRAWINGS.

FILE NAME 609 S₂



PROJECT ENGINEERING
BHEL HYDERABAD

REINFORCEMENT
DETAILS AT CIRCULAR
CUT-OUT IN SLABS

DRAWING NO.

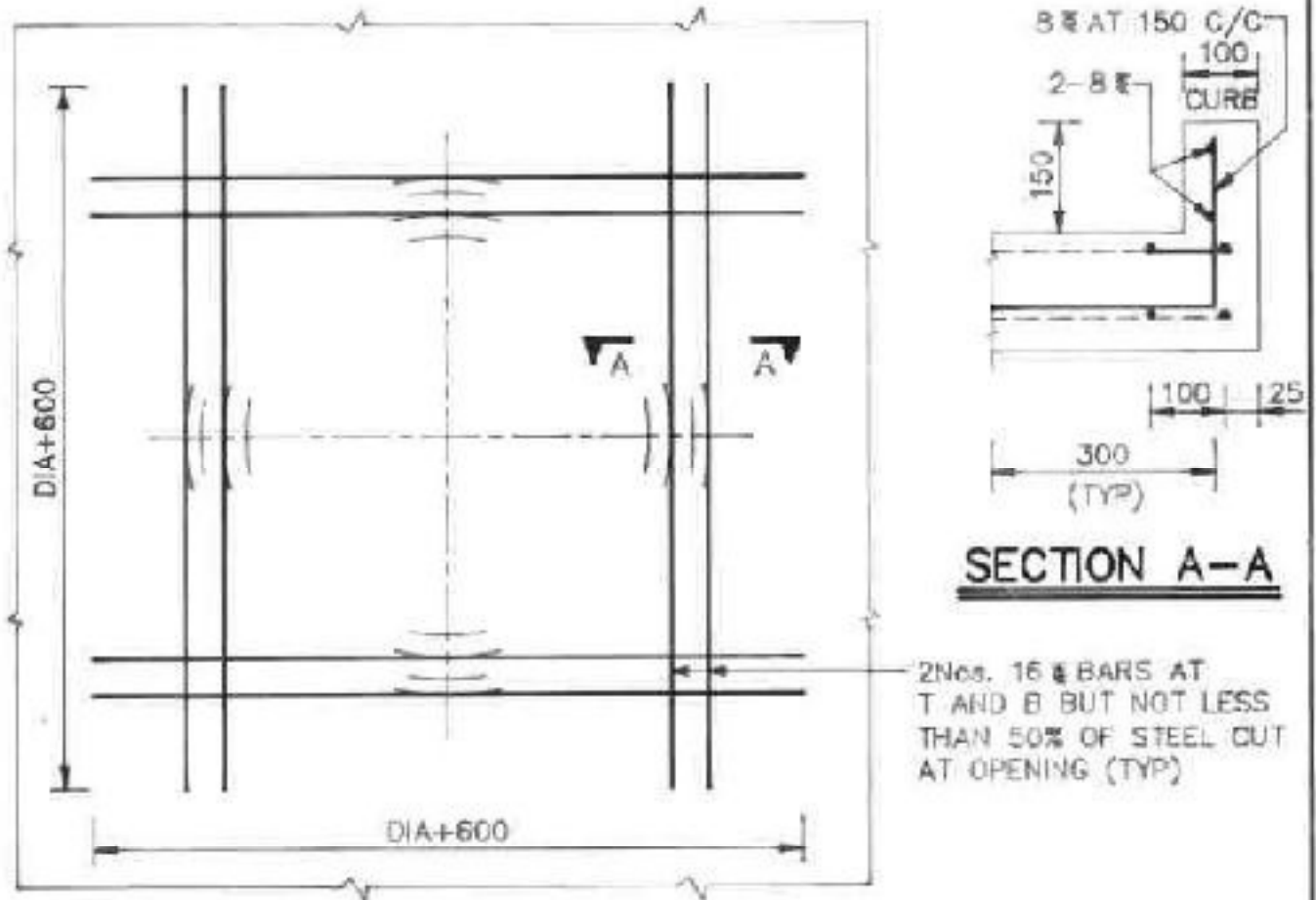
REV

4-38144-00009 00

CIVIL ENGINEERING

NO	DATE	REVISION	DRN	CHD	APPD
0		ISSUED AS STANDARD			

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY



SECTION A-A

NOTES :

1. ALL DIMENSIONS ARE IN MM.
2. ALL THESE BARS SHALL BE EFFECTIVELY TIED WITH THE MAIN REINFORCEMENT. BARS TO BE CUT OR SPLAYED NEAR THE OPENING AS PER THE DIRECTION OF THE ENGINEER-INCHARGE.
3. THIS DETAIL APPLIES TO SLABS UP TO 200 THICK FOR THICKER SLABS SEE DESIGN DRAWINGS.
4. OMIT CURB WHERE SPECIFICALLY STATED ON DRAWINGS.

FILE NAME 405 S9



**PROJECT ENGINEERING
BHEL HYDERABAD**

**REINFORCEMENT
DETAILS AT CIRCULAR
CUT-OUT IN SLABS**

DRAWING NO.

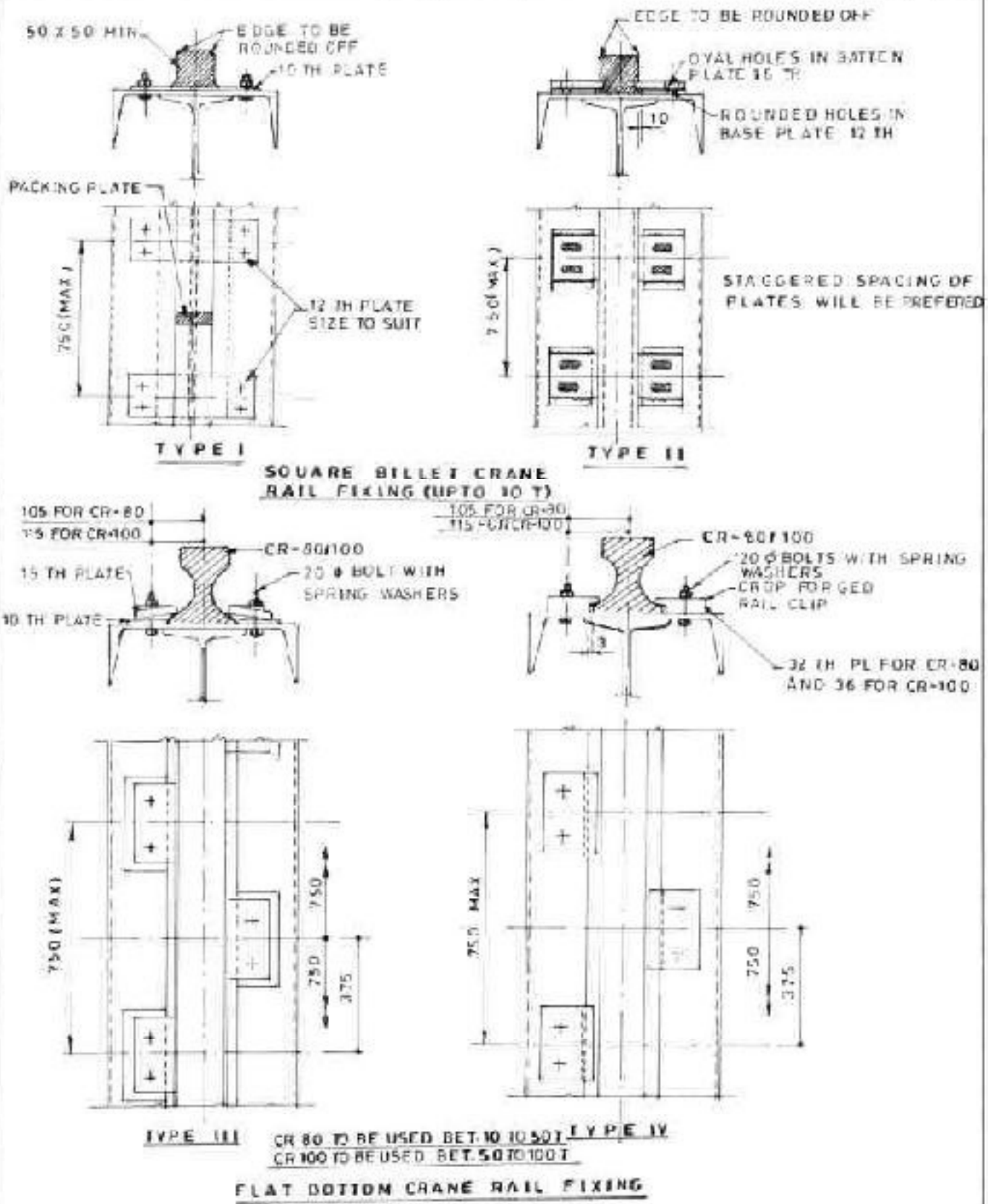
REV

4-38144-00009 00

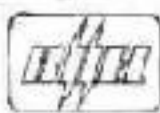
CIVIL ENGINEERING

NO	DATE	REVISIONS	DRN	CHD	APPD
0	2.07.1997	ISSUED AS STANDARD	RES	Plate	Plate

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED
 IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY



SHEET 1 OF 2



PROJECT ENGINEERING
 BHEL HYDERABAD

CRANE RAIL
 FIXING DETAILS

DRAWING NO.
 4-38144-00010

REV
 0