

DESIGN DATA

CODE OF CONSTRUCTION		ASME SEC. VIII DIV.1 2007 Edn. TEMA CLASS-R 9th EDITION, 2007		SHELL	CHANNEL
UNIT	SHELLSIDE TUBE SIDE	PWHT		YES	YES
DESIGN PRESSURE (SEE NOTE-32)	56.8 KPa	86.8/FV JOINT EFFICIENCY	100%	100%	
DESIGN TEMPERATURE (FOR 211-E-3A)	353 °C	8512/FV INSPECTION BY	AI/EIL	1.0	
DESIGN TEMPERATURE (FOR 211-E-3B)	320 °C	POSITION	HORIZONTAL	TYPE	DEU
HYDROTEST PRESSURE (SEE NOTE-41)	86.84 KPa	DUTY	MM Kcal/hr	9.95x1.1	
TUBE EXTERNAL DESIGN PRESSURE	3516 KPa	ADDITIONAL LOADING AS PER UG-22	NOZZLE LOADS	IS 875	
TUBE INTERNAL DESIGN PRESSURE	4021 KPa	CODE STAMPING REQUIRED	YES 'U'		
HYDROTEST PRESSURE	5198 KPa	TOLERANCE	TEMA CLASS R & EIL STD. 7-15-0019 REV1		

MECHANICAL DATA OF EXCHANGER

MIN. HYDROTEST TEMPERATURE	20 °C	EFFECTIVE SURFACE AREA (PER SHELL)	261 m ²
OPERATING PRESSURE	9.5 KPa	TOTAL WEIGHT (EMPTY)	29000 (EACH) Kg
OPERATING TEMPERATURE (IN/OUT)	324/279 °C	HYDROTEST WEIGHT	22000 (EACH) Kg
INSIDE DIAMETER	1200 mm	OPERATING WEIGHT	35304 (EACH) Kg
NO. OF PASSES	ONE	NO. OF 'U' TUBES	412
FLUID CIRCULATED	STRIPPER FEED	TUBE OD	25
INSULATION	75 mm	TUBE THK. (Min.)	2.5
CORRN. ALLOWANCE	SEE NOTE-26	TUBE EFF. LENGTH	4008
IMPACT TESTED PART NO.	SEE NOTE No. 40		(SHELL SIDE FACE OF T/SHT. 10 FULL SUPP. PL. INSIDE FACE)

TUBE SIDE ADDITIONAL CONDITIONS :- Δ * WITH CHANNEL ASSEMBLY

DEPRESSURIZATION PRESSURE	74.2 Kg/cm ²
DEPRESSURIZATION TEMPERATURE	389 °C

* AS PER GENERAL NOTE-33

T2B	CHANNEL OUTLET	400	-	16.66+5 W.D.	900#	WN	RTJ
T2A~T1B	CHANNEL INTERMEDIATE	450	-	19.05+5 W.D.	900#	WN	RTJ
T1A	CHANNEL INLET	450	-	19.05+5 W.D.	900#	WN	RTJ
S2A	SHELL OUTLET	300	FORG.	14.27+5 W.D.	600#	WN	RF
S2B~S1A	SHELL INTERMEDIATE	300	FORG.	14.27+5 W.D.	600#	WN	RF
S1B	SHELL INLET	250	FORG.	12.7+5 W.D.	600#	WN	RF
NOZZ. No.	SERVICE	SIZE DN	SCH	THK	CLASS	TYPE	REMARK
			NOZZLE SCHEDULE	ASME B16.5 2003 FLANGES			

HEAT TREATMENT PROCEDURE :-

ITEM DESCRIPTION	HEATING METHOD	LOADING TREATMENT	TEMP. (°C)	RATE OF HEATING (°C/HOUR)	SOAKING TEMP (°C)	SOAKING TIME	RATE OF COOLING (°C/HOUR)
HEMI HEAD DISH AFTER FORMING.	IN CLOSED FURNACE	NORMALIZING	300	100	920-930	25 Minutes	IN STILL AIR
MAIN SHELL ASSEMBLY WITH COMPANION FLG. S1B & S2A AFTER W.D.	IN CLOSED FURNACE	SR	300	100	620-640	2.5 Hours.	100
CHANNEL ASSEMBLY WITH COMPANION FLG. T1A & T2B AFTER W.D. & BUTTERING	IN CLOSED FURNACE	SR	300	55	680-700	4.5 Hours.	55
'U' TUBE AFTER FORMING FROM TL (R1 TO R4)	IN CLOSED FURNACE	SR	300	150	665-685	15 Minutes	150

FOR EQPT. No. :- 211-E-3 A ONLY

MAWP FULLY CORRODED (AT DESIGN TEMP.)	8551 kPag AT 353 °C SHELL SIDE
MAWP FULLY CORRODED (AT AMBIENT TEMP.)	8512 kPag AT 381 °C TUBE SIDE
MAWP UNCORRODED (AT DESIGN TEMP.)	6551 kPag AT 30 °C SHELL SIDE
MAWP UNCORRODED (AT AMBIENT TEMP.)	8512 kPag AT 30 °C TUBE SIDE
MDMT	15 °C AT 8551 kPag SHELL SIDE
	15 °C AT 8512 kPag TUBE SIDE

FOR EQPT. No. :- 211-E-3 B ONLY

MAWP FULLY CORRODED (AT DESIGN TEMP.)	6551 kPag AT 320 °C SHELL SIDE
MAWP FULLY CORRODED (AT AMBIENT TEMP.)	8512 kPag AT 367 °C TUBE SIDE
MAWP UNCORRODED (AT DESIGN TEMP.)	6551 kPag AT 30 °C SHELL SIDE
MAWP UNCORRODED (AT AMBIENT TEMP.)	8512 kPag AT 30 °C TUBE SIDE
MDMT	15 °C AT 6551 kPag SHELL SIDE
	15 °C AT 8512 kPag TUBE SIDE

3	13.02.2010	AS BUILT DIMENSIONS ARE SHOWN IN BKT (---) AS MARKED Δ AND OTHER CHANGES AS MARKED Δ THUS.	AHS
2	09.01.2009	DRAWING IS REVISED AS PER EIL COMMENTS AS MKD. Δ THUS.	BSB
1	08.09.2008	DRAWING IS REVISED AS PER EIL COMMENTS AS MKD. Δ THUS.	BSB
0	05.05.2008	SUBMITTAL FOR APPROVAL	BSB

REV.	DATE	DESCRIPTION	DRWN	CHKD	APPD
			VDP	VED	GDP

DHDT, EURO-IV

ENGINEERING & MANUFACTURER:

"AS BUILT DRAWING"



ENGINEERS INDIA LIMITED

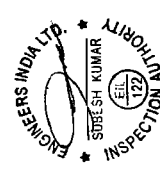
CONSULTANT: ENGINEERS INDIA LIMITED

CLIENT: CPCL REFINERY III. 315

TITLE: REACTOR EFFLUENT/ STRIPPER FEED EXCHANGER

W.O. No.	07-386
EQPT. NO.	211-E-3 A/B
JOB NO.	EIL 6879
	TEMA T/E/071206
SCALE	NTS
DWG. No.	SDB/E/071206
SHT. NO.	1 of 21
Rev.	3

1	2	3	4	5	6	7	8																																
<p>GENERAL NOTES :-</p> <p>1] ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.</p> <p>2] ALL BOLT HOLES SHALL STRADDLE THE PRINCIPAL CENTRE LINE.</p> <p>3] ALL SHARP CORNERS SHALL BE ROUNDED OFF TO MINIMUM RADIUS.</p> <p>4] IF BACK CHIPPING IS NOT POSSIBLE THEN ROOT RUN SHALL BE DONE BY TIG.</p> <p>5] ALL ACCESSABLE WELDS TO BE BACK CHIPPED & WELDED FROM OTHER SIDE.</p> <p>6] STANDOUTS FOR NOZZLES WELDED ON SHELL & CHANNEL SHALL BE MEASURED FROM THE CENTRE LINE OF THE EXCHANGER.</p> <p>7] ALL INTERNAL WELDS IN THE SHELL SHALL BE GROUND FLUSH IN ORDER TO INSERT AND REMOVE TUBE BUNDLE; ALSO ALL INTERNAL WELDS SHALL BE GROUND FLUSH TO THE EXTENT OF FACILITATING DRAINING OF COMPLETE EQUIPMENT. ALL OTHER WELD MAY BE LEFT IN THE DESCALED CONDITION ONLY.</p> <p>8] ALL WELDS SHALL BE D.I.P. CHECKED OR MAGNETIC PARTICLE (MT) TESTED AFTER BACK CHIPPING.</p> <p>9] ALL FORGINGS SHALL BE ULTRASONICALLY EXAMINED AS PER ASME Sec. II, SA-388. ACCEPTANCE STANDARD SHALL BE IN ACCORDANCE WITH PARA 3.3.4 OF ASME Sec. VIII Div. 2 CODE. SCANNING SHALL BE 100%.</p> <p>10] ALL FORGINGS SHALL BE IN NORMALISED AND TEMPERED CONDITION.</p> <p>11] INSIDE EDGES OF TUBE HOLES IN TUBESHEET SHALL BE FREE OF BURRS TO PREVENT CUTTING OF THE TUBES.</p> <p>12] ALL FABRICATION, INSPECTION & TESTING REQUIREMENT SHALL BE AS PER PR & APPROVED QAP. PROJECT SPECIFICATION & ASME. CODE</p> <p>13] SUPPORT PLATE & BAFFLE PLATE DISTANCES ARE GIVEN FROM CENTER TO CENTER.</p> <p>14] HEMI SPHERICAL HEAD SHALL BE IN SINGLE PIECE CONSTRUCTION</p> <p>15] HEMISPHERICAL HEADS SHALL BE SUBJECTED TO DYE PENETRANT TEST (BOTH INSIDE & OUTSIDE) AFTER HEAT TREATMENT.</p> <p>16] APPROVAL ON WPS AND PQR SHALL BE OBTAINED PRIOR TO FABRICATION.</p> <p>17] ALL GASKET SHALL BE MADE IN SINGLE PIECE CONSTRUCTION.</p> <p>18] ALL SPIRAL WOUND GASKET FOR SHELL SIDE SHALL BE 6.35 MM THK AISI 321 WITH GRAFOIL FILLER AND 4.5 THK AISI 321 OUTER RING.</p> <p>19] 'T' DENOTES MATCH MARK FOR ASSEMBLY AND SHALL BE PUNCHED ON ALL MATING PARTS.</p> <p>20] ALL MATERIALS SHALL BE SUPPLIED WITH MILL TEST CERTIFICATE DULY CERTIFIED BY IPI.</p> <p>21] REFER PARA 2.1.2 OF 6-15-0001 REV.3.</p> <p>22] DELETED</p> <p>23] THE HEAT EXCHANGER SHALL BE PROVIDED WITH PRESSURE GAUGE TO MONITOR N₂ PRESSURE (0.25 Kg/cm²) AND 1/2" NON RETURN VALVE AS PER 6-15-0001 REV.3. PARA 9.1.</p> <p>24] EQPT. SHALL BE DRIED & THOROUGHLY CLEANED BOTH INSIDE AND OUTSIDE AND ALL WATER, DIRT, SAND, WELD METAL, SPATTER, WELD ELECTRODES, STUB & FOREIGN MATERIALS SHALL BE REMOVED.</p> <p>25] FOR CONSTRUCTION DETAILS AND NOMENCLATURES REFER EIL STANDARDS.</p> <p>26] EIL PR NO. 6879-211-EE-MR-6020 REV.B EIL THERMAL DATASHEET 6879-211-05-45-DS-001 REV.2, GENERAL SPEC. 6-15-0001 REV.3, 6-15-0003 REV.2, 6-15-0006 REV.3, 6-15-0021 REV.3, 6-15-91 REV.1, 6-12-0018 REV.2, 6-81-0001 REV.0 & 6-81-009 REV.1, 7-15-0001 REV.2, 7-15-0002 REV.2, 7-15-0005 REV.2, 7-15-0007 TO 0009 REV-2, 7-15-0016 REV.2, 7-15-0017 REV.2, 7-15-0018 REV.2, 7-15-0019 REV.2, 7-76-0101 REV.3, 7-15-0016 REV.2, 7-15-0017 REV.2, 7-15-0018 REV.2, 7-15-0019 REV.2, 7-76-0101 REV.3.</p> <p>27] ALL OF THE REMOVABLE PARTS SHALL BE STAMPED WITH THE ITEM NUMBER.</p> <p>28] a) ALL CHANNEL SURFACES INTERNAL OVERLAP WITH STAINLESS STEEL SHALL BE MACHINED. SHELL SIDE STAINLESS STEEL OVERLAP INTERNAL SURFACES SHALL BE MACHINED ONLY AT TUBE SHEET SIDE. OVER A LENGTH OF 4 INCHES BEYOND THE GASKET FACE, EXCEPT IF INDICATED OTHERWISE.</p> <p>29] b) PAINTING (SHOP PRIMER) OF EXCHANGERS SHALL BE AS FOLLOWS. :- THE EXTERNAL SURFACE SHALL BE PREPARED FOR PAINTING BY BLAST CLEANING TO NEAR WHITE FINISH AS PER SSPC-SP-10 [SA 2 1/2 SWEDISH STANDARD (SIS-05-5900)]. SHOP PRIMER SHALL BE INORGANIC ZINC SILICATE COATING 65-75 MICRONS DFT. c) GASKET CONTACT SURFACES SHALL BE PROTECTED WITH RUST PREVENTIVE COMPOUND.</p>	<p>25] SPARE PARTS :- MANDATORY SPARES STUD BOLTS/NUTS :- (ONE SET OF EACH SIZE OF NOZZLE WITH BLIND FLG.) GASKET :- 400% (EACH NOZZLE WITH BLIND FLG. & GIRTH JOINTS) GASKET RETAINER :- 100% (DIAPHRAGMS) PUSH RODS :- 100%</p> <p>26] SPARE PARTS :- COMMISSIONING SPARES GASKET :- 200% (EACH NOZZLE WITH BLIND FLG. & GIRTH JOINTS)</p> <p>27] CORROSION ALLOWANCE</p> <table border="1" data-bbox="383 604 446 1008"> <tr> <td>SHELL SHELL COVER</td> <td>NIL</td> </tr> <tr> <td>CHANNEL</td> <td>NIL</td> </tr> </table>	SHELL SHELL COVER	NIL	CHANNEL	NIL	<p>28] ANCHOR BOLT MATERIAL HAVE BEEN DESIGNED CONSIDERING A SHEAR STRESS OF 865 Kg/cm² (SCOPE OF SUPPLY BY OTHERS)</p> <p>29] ALL BOLTING AND THREADS ON THE BARREL SHALL BE LUBRICATED WITH HIGH TEMPERATURE THREAD LUBRICANT VIZ. NI-GRAPHITE COMPOUND TO PREVENT SEIZURE.</p> <p>30] REQUIREMENTS OF ALL PR SPECIFICATION DOCUMENTS SHALL BE COMPLIED WITH UNLESS OTHERWISE AGREED BETWEEN EIL & TEMA INDIA LIMITED.</p> <p>31] CHANNEL BARREL THREADS AND LOCK RING THREADS SHALL BE 100% DP EXAMINED.</p> <p>32] THE MINIMUM TUBE WALL THICKNESS AT THE BEND PORTION AS PER TEMA CLAUSE RCB-2.31.</p> <p>33] a) SHELL SIDE AND TUBE SIDE WILL BE SUBJECTED TO STEAMING OUT AT 0.5 Kg/cm²g & 190°C b) WNRTJ NOZZLE FLANGES GASKET FINISH SHALL BE 63-125 AARH. c) WNRF NOZZLE FLANGES GASKET FINISH SHALL BE 125-250 AARH.</p> <p>34] GASKET FACE TO BE MACHINED AFTER FINAL HEAT TREATMENT.</p> <p>35] NO WELDING OR HEATING IS PERMITTED AFTER PWHT OPERATION.</p> <p>36] ALL FABRICATION TOLERANCES SHOULD BE AS PER TIL-MFG-WI-26 REV.0 PAGE 1 TO 10. UNLESS OTHERWISE SPECIFIED.</p> <p>37] ALL MATERIAL AND FABRICATION REQUIREMENTS SPECIFIED IN AXEN'S SPECIFICATION IN 42.1 SHALL BE COMPLIED WITH. THIS INCLUDES REQUIREMENTS SPECIFIED FOR CLAD MATERIALS, WELDING CONSUMABLES AND WELDING ETC.</p> <p>38] TORQUE TABLE (MAX. ALLOWABLE TORQUE)</p> <table border="1" data-bbox="351 1411 399 1523"> <thead> <tr> <th rowspan="2">SIZE</th> <th colspan="2">LOAD / BOLT (KN)</th> <th colspan="2">TORQUE / BOLT</th> </tr> <tr> <th>M40</th> <th>349</th> <th>KN-M</th> <th>Lbf-ft</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td>2.35</td> <td>1733.27</td> </tr> </tbody> </table> <p>39] IMPACT TEST SHALL BE CARRIED OUT FOR PART NO. 119 TO 132 AT -18°C PART NO. 151 TO 159 AT -46°C PART NO. 202,203,204,219 AT -29°C PART NO. 201,205,206,207 AT -29°C</p> <p>40] SHELL SIDE HYDRO TEST PRESSURE WITHOUT TUBE SIDE FLUID SHALL NOT EXCEED 53 Kg/cm²g AT ANY TIME.</p>	SIZE	LOAD / BOLT (KN)		TORQUE / BOLT		M40	349	KN-M	Lbf-ft				2.35	1733.27	<p>39] TORQUE TABLE (MAX. 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"AS BUILT DRAWING"
W.O. No. : 07-386
EQPT. NO. : 211-E-3AB

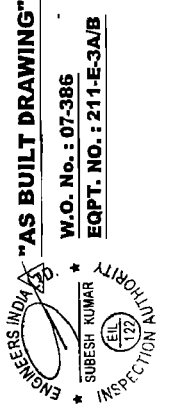
TEMA INDIA LTD.
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SCALE	REV	SHT
NTS	3	2 of 21
DWG NO.	SDB/E/071206	

P.No.	DESCRIPTION	SIZE	MATERIAL	QTY	REMARK
145	GUSSET PL. FOR SH. SIDE SADD. SUPP. (BIM.)	2238x280x28THK	SA516 Gr.60	2	211-E-3 B
144	GUSSET PL. FOR SH. SIDE SADD. SUPP. (TOP)	495x126x28THK	SA516 Gr.60	4	211-E-3 B
143	GUSSET PL. FOR SH. SIDE SADD. SUPP. (TOP)	755x126x28THK	SA516 Gr.60	4	211-E-3 B
142	GUSSET PL. FOR SH. SIDE SADD. SUPP. (BIM.)	580x126x28THK	SA516 Gr.60	4	211-E-3 B
141	GUSSET PL. FOR SH. SIDE SADD. SUPP. (BIM.)	840x126x28THK	SA516 Gr.60	4	211-E-3 B
140	SUPP. PL. FOR SH. SIDE SADD. SUPP. (BIM.)	2338x1394x28THK	SA516 Gr.60	1	211-E-3 B
139	PAD PL. FOR SH. SIDE SADD. SUPP. (BIM.)	4116 ⁰ x300x20THK	SA516 Gr.60	4	211-E-3 A
138	GUSSET PL. FOR SH. SIDE SADD. SUPP. (TOP)	563x126x28THK	SA516 Gr.60	4	211-E-3 A
137	GUSSET PL. FOR SH. SIDE SADD. SUPP. (TOP)	825x126x28THK	SA516 Gr.60	4	211-E-3 A
136	SUPP. PL. FOR SH. SIDE SADD. SUPP. (TOP)	1450x1024x34THK	SA516 Gr.60	1	211-E-3 A
135	PAD PL. FOR SH. SIDE SADD. SUPP. (TOP)	1765 ⁰ x300x20THK	SA516 Gr.60	2	211-E-3 A/B
134	BASE PLATE FOR SH. SIDE SADD. SUPP. (BIM.)	1470x300x40THK	SA516 Gr.60	1	211-E-3 B
133	EARTHING CLEAT (CHANNEL SIDE)	100x75x10THK	SA387 Gr.11 CL-2	2	211-E-3 B
131	GUSSET PL. FOR CH. SIDE SADD. SUPP. (BIM.)	2338x280x28THK	SA387 Gr.11 CL-2	2	211-E-3 B
130	GUSSET PL. FOR CH. SIDE SADD. SUPP. (BIM.)	290x126x28THK	SA387 Gr.11 CL-2	4	211-E-3 B
129	GUSSET PL. FOR CH. SIDE SADD. SUPP. (BIM.)	494x126x28THK	SA387 Gr.11 CL-2	4	211-E-3 B
128	GUSSET PL. FOR CH. SIDE SADD. SUPP. (BIM.)	372x126x28THK	SA387 Gr.11 CL-2	4	211-E-3 B
127	GUSSET PL. FOR CH. SIDE SADD. SUPP. (BIM.)	575x126x28THK	SA387 Gr.11 CL-2	4	211-E-3 B
126	SUPP. PL. FOR CH. SIDE SADD. SUPP. (BIM.)	2338x180x28THK	SA387 Gr.11 CL-2	1	211-E-3 B
125	PAD PLATE FOR CH. SIDE SADD. SUPP. (BIM.)	5357 ⁰ x300x20THK	SA387 Gr.11 CL-2	1	211-E-3 B
124	GUSSET PL. FOR CH. SIDE SADD. SUPP. (TOP)	358x126x28THK	SA387 Gr.11 CL-2	4	211-E-3 A
123	GUSSET PL. FOR CH. SIDE SADD. SUPP. (TOP)	562x126x28THK	SA387 Gr.11 CL-2	4	211-E-3 A
122	SUPP. PL. FOR CH. SIDE SADD. SUPP. (TOP)	1860x765x28THK	SA387 Gr.11 CL-2	1	211-E-3 A
121	PAD PLATE FOR CH. SIDE SADD. SUPP. (TOP)	1836 ⁰ x300x20THK	SA387 Gr.11 CL-2	1	211-E-3 A
120	BASE PLATE FOR CH. SIDE SADD. SUPP. (BIM.)	1890x300x40THK	SA387 Gr.11 CL-2	1	211-E-3 A
119	BASE PLATE FOR CH. SIDE SADD. SUPP. (TOP)	1890x300x34THK (6THK)	SA387 Gr.11 CL-2	2	211-E-3 A/B
118	GASKET RETAINER	Ø1325x20THK	SA240 Gr.321	2+2	
117	PARTITION COVER PLATE	18THK AS PER DETAIL	SA240 Gr.321	2	
116	BOLTING BAR FOR PARTITION PL.	18THK AS PER DETAIL	SA240 Gr.321	2	
115	BOLTING BAR FOR PARTITION PL.	18THK AS PER DETAIL	SA240 Gr.321	2	
114	PARTITION RIB PL. FOR CHANNEL	1290x665x18THK	SA240 Gr.321	2	
113	SEALING STRIP	2164x120Wx8THK	SA240 Gr.321	4	
112	SEALING STRIP	2464x120Wx8THK	SA240 Gr.321	4	
111	SEALING STRIP	4047x75Wx8THK	SA240 Gr.321	4	
110	SLIDING STRIP	4047x70Wx20THK	SA240 Gr.321	4	
109	SUPPORT PLATE 'C'	14THK AS PER DETAIL	SA240 Gr.321	2	
108	PARTIAL SUPPORT PLATE 'S1'	14THK AS PER DETAIL	SA240 Gr.321	2	
107	PARTIAL SUPPORT PLATE 'S'	14THK AS PER DETAIL	SA240 Gr.321	2	
106	BAFFLE PLATE 'D'	14THK AS PER DETAIL	SA240 Gr.321	2	
105	BAFFLE PLATE 'A1'	14THK AS PER DETAIL	SA240 Gr.321	2	
104	BAFFLE PLATE 'B'	14THK AS PER DETAIL	SA240 Gr.321	8	
103	BAFFLE PLATE 'A'	14THK AS PER DETAIL	SA240 Gr.321	8	
102	HEMI. HEAD DISHED END	24x53THK (Norm.)	SA516 Gr.60	2	(25+5THK) Δ
101	MAIN SHELL	3911 ⁰ x3988x42+3THK Δ	SA240 Gr.321	2	(53+3THK) Δ

BILL OF MATERIALS (FOR 211-E-3A/B)

317
INDIA LTD.
ENGINEERS INDIA
W.O. No. : 07-386
EQPT. NO. : 211-E-3A/B
INSPECTION AUTHORITY
SUBESH KUMAR
SCALE NTS
REV 3
SHT 3of21
DWG NO. SDB/E/071206



P.No	DESCRIPTION	SIZE	MATERIAL SPECIFIED	QTY	REMARK
703	CAP FOR T1A (FOR HYDRO)	550DN x SCH.80	SA234 Gr.WPB	1	
702	CAP FOR T2B (FOR HYDRO)	500DN x SCH.80	SA234 Gr.WPB	1	
701	CAP FOR S2A (FOR HYDRO)	400DN x SCH.80	SA234 Gr.WPB	1	
613	ASME NAME PLATE	175x175x2THK	AISI 304	1	FOR 211-E-3 'B'
612	WARNING PLATE	160x105x2THK	AISI 304	1	FOR 211-E-3 'B'
611	NAME PLATE	150x136x2THK	AISI 304	1	FOR 211-E-3 'B'
610	ASME NAME PLATE	175x175x2THK	AISI 304	1	FOR 211-E-3 'A'
609	WARNING PLATE	160x105x2THK	AISI 304	1	FOR 211-E-3 'A'
608	NAME PLATE	150x130x2THK	AISI 304	1	FOR 211-E-3 'A'
607	HANDLE FOR PARTITION COVER	ø16x350LG.	AISI 321	4	
606	SEAL ROD	ø25x2464LG.	AISI 321	82	
605	DOWEL PIN	ø20x40LG.	IS : 2062	4	
604	PUSH ROD	ø25x195LG.	SA193 Gr.B16	14+14	
603	IMPINGEMENT ROD	ø25x1083LG.	AISI 321	21	FOR 211-E-3 'B'
602	IMPINGEMENT ROD	ø25x664LG.	AISI 321	21	FOR 211-E-3 'A'
601	TIE ROD	ø12x4070LG.	AISI 321	32	

BILL OF MATERIALS (FOR 211-E-3A/B)

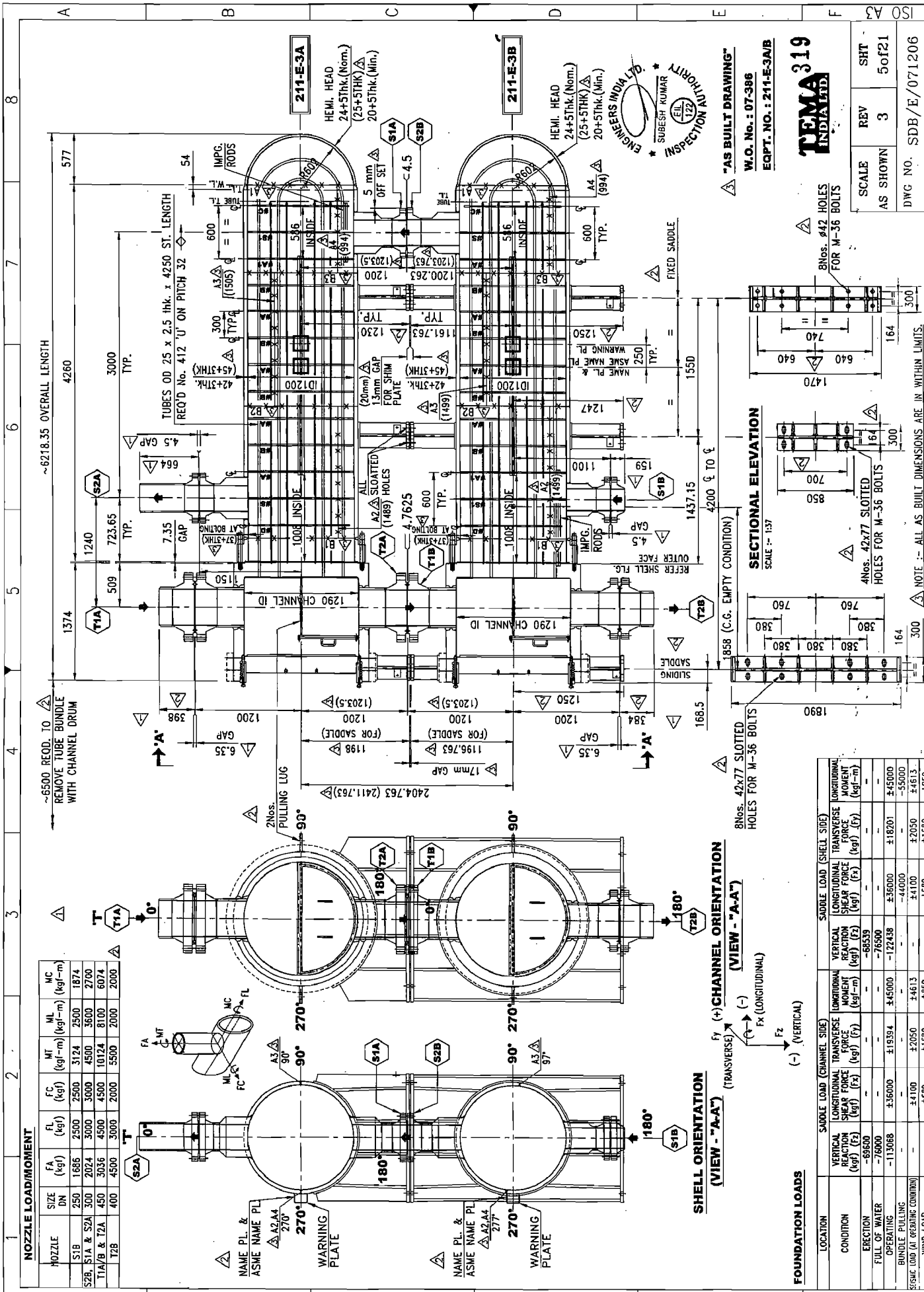
P.No	DESCRIPTION	SIZE	MATERIAL SPECIFIED	QTY	REMARK
302	SPACER	ø025x2.5THKxLG.	AISI 304	824	
301	'U' TUBES (SEAMLESS)	ø025x2.5THK(Min.)	AISI 304	824	
409	GASKET FOR NOZZLE T2A-T1B	450DNx900#ASME	AISI 347	1+4+2	HARDNESS TOBRIN M2 (OCTAGONAL RING)
408	GASKET FOR NOZZLE S1A-S2B	300DNx600#x4.5	AISI 304 SPWD	1+4+2	
407	GASKET FOR T2B COMP. FLG.	400DNx900#ASME	AISI 347	1+4+2	HARDNESS TOBRIN M2 (OCTAGONAL RING)
406	GASKET FOR T2A COMP. FLG.	450DNx900#ASME	AISI 347	1+4+2	HARDNESS TOBRIN M2 (OCTAGONAL RING)
405	GASKET FOR S2A COMP. FLG.	300DNx600#x4.5	AISI 304 SPWD	1+4+2	
404	GASKET FOR S1B COMP. FLG.	250DNx600#x4.5	AISI 304 SPWD	1+4+2	
403	GASKET FOR PARTITION	3THK AS PER	NON ASBESTOS WITH ARAMIDE FIBRE	2+8+4	
402	RING GASKET	øD1326xID1306	SA240 Gr.321	2+8+4	
401	GASKET FOR SHELL FLANGE	øD1266xID1226	AISI 321 SPWD	2+8+4	
509	DELETED				
508	HEX. HD. BOLT FOR LIFTING DEVICE	M-24x68LG.	SA193 Gr.B7	4	
507	HEX. SOCKET SET SCREW	M-10x25LG.	SA193 Gr.B7	6	
506	JACK SCREW (HEX. HEAD.)	M-20x265LG.	SA193 Gr.B7	8	LOOSE SUPPLY
505	HEX. HEAD. SET SCREW	1/2" UNBx89LG. FL.	SA193 Gr.B16	144	
504	STUD WITH 1 NUT, 1-FLAT WASHER & 1-LOCKWASHER	M-12x55LG. FU.	SA193 Gr.B8 T CL-2/	36	
503	STUD WITH 1 NUT, 1-FLAT WASHER & 1-LOCKWASHER	M-12x55LG. FU.	SA194 Gr. 8T	60	
502	NUTS FOR TIE ROD	M-12 STD.	SA194 Gr.8T	64	
501	STUD WITH 2 ROUND NUTS	M-40x410	SA193 Gr.B7/SA194 Gr.2H	112+24	
517	STUD-2NUTS FOR NOZZLE T2A-T1B	1 1/2" UNBx380LG.	SA193 Gr.B16/SA194 Gr.16	20+4	
516	STUD-2NUTS FOR NOZZLE S1A-S2B	1 1/2" UNBx250LG.	SA193 Gr.B7/SA194 Gr.2H	20+4	
515	BOLT WITH NUT & WASHER FOR SADD.	M-20x155LG.	SA193 Gr.B7/SA194 Gr.2H	8	
514	STUD-2NUTS FOR T2B COMP. FLG.	1 1/2" UNBx330LG.	SA193 Gr.B16/SA194 Gr.16	20+4	
513	STUD-2NUTS FOR T1A COMP. FLG.	1 1/2" UNBx380LG.	SA193 Gr.B16/SA194 Gr.16	20+4	
512	STUD-2NUTS FOR S2A COMP. FLG.	1 1/2" UNBx250LG.	SA193 Gr.B7/SA194 Gr.2H	20+4	
511	STUD-2NUTS FOR S1B COMP. FLG.	1 1/2" UNBx245LG.	SA193 Gr.B7/SA194 Gr.2H	16+4	
510	BOLT WITH NUT & WASHER FOR SADDLE	M-33x135LG.	SA193 Gr.2H / SA194 Gr.2H	12	

BILL OF MATERIALS (FOR 211-E-3A/B)

ENGINEERS INDIA LTD.
 SUBEESH KUMAR
 INSPECTION AUTHORITY
 W.O. No. : 07-386
 EQPT. NO. : 211-E-3A/B
 318
 TEMA INDIA LTD.
 SCALE NTS
 REV 3
 SHT 4 of 21
 DWG NO. SDB/E/071206

1 2 3 4 5 6 7 8

A B C D E F



NOZZLE LOAD MOMENT

NOZZLE	SIZE DN	FA (kgf)	FL (kgf)	FC (kgf)	MT (kgf-m)	ML (kgf-m)	MC (kgf-m)
S1B	250	1686	2500	2500	3174	2500	1874
S2B, S1A & S2A	300	2024	3000	3000	4500	3600	2700
T1A/B & T2A	450	3036	4500	4500	10124	8100	6074
T2B	400	4500	3000	2000	5500	2000	2000

SHELL ORIENTATION (VIEW - "A-A")
 fy (+) CHANNEL ORIENTATION (VIEW - "A-A")
 Fx (LONGITUDINAL)
 Fz (VERTICAL)

FOUNDATION LOADS

LOCATION	CONDITION	VERTICAL REACTION (kgf) (Fz)	LONGITUDINAL SHEAR FORCE (kgf) (Fx)	TRANSVERSE FORCE (kgf) (Fy)	LONGITUDINAL MOMENT (kgf-m)	TRANSVERSE MOMENT (kgf-m)
ERECTOR	FULL OF WATER	-76000	-68500	-	-	-
	OPERATING	-113068	-436000	+15394	+45000	-122438
BUNDLE PULLING	FULL OF WATER	-	+4100	-	+2050	+4613
	OPERATING	-	+680	-	+1680	+650

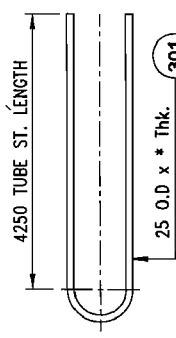
SECTIONAL ELEVATION SCALE 1:157

LOCATION	CONDITION	VERTICAL REACTION (kgf) (Fz)	LONGITUDINAL SHEAR FORCE (kgf) (Fx)	TRANSVERSE FORCE (kgf) (Fy)	LONGITUDINAL MOMENT (kgf-m)	TRANSVERSE MOMENT (kgf-m)
ERECTOR	FULL OF WATER	-76000	-68500	-	-	-
	OPERATING	-113068	-436000	+15394	+45000	-122438
BUNDLE PULLING	FULL OF WATER	-	+4100	-	+2050	+4613
	OPERATING	-	+680	-	+1680	+650

ENGINEERS INDIA LTD.
 SUBEESH KUMAR
 PROJECT ENGINEER
 W.L.O. No. : 07-386
 EQPT. NO. : 211-E-3A/B
TEMA 319
 INDIA LTD.
 SCALE AS SHOWN 3
 REV 50121
 SHEET 3
 DWG NO. SDB/E/071206

~6218.35 OVERALL LENGTH
 ~6500 REQD. TO REMOVE TUBE BUNDLE WITH CHANNEL DRUM
 TUBES OD 25 x 2.5 THK x 4250 ST. LENGTH REQD No. 412 'U' ON PITCH 32
 8Nos. 42x77 SLOTTED HOLES FOR M-36 BOLTS
 4Nos. 42x77 SLOTTED HOLES FOR M-36 BOLTS
 8Nos. 42x77 SLOTTED HOLES FOR M-36 BOLTS
 NOTE :- ALL AS BUILT DIMENSIONS ARE IN WITHIN LIMITS.

DOMES HEIGHT FOR TOP NOZZLE = 112.33
DOMES HEIGHT FOR BOTTOM NOZZLE = 67



* AS PER GENERAL NOTE No. - 31

No.	'R' RADIUS	QTY.	'U' TUBE TOTAL LENGTH
1	R1 = 45.25	25	8642
2	R2 = 67.877	24	8713
3	R3 = 90.505	25	8784
4	R4 = 113.132	24	8855
5	R5 = 135.760	23	8927
6	R6 = 158.387	22	8998
7	R7 = 181.015	22	9069
8	R8 = 203.642	24	9140
9	R9 = 226.270	23	9211
10	R10 = 248.897	22	9282
11	R11 = 271.524	21	9353
12	R12 = 294.152	22	9424
13	R13 = 316.779	21	9495
14	R14 = 339.406	18	9566
15	R15 = 362.034	19	9637
16	R16 = 384.661	18	9708
17	R17 = 407.289	17	9780
18	R18 = 429.916	16	9851
19	R19 = 452.544	15	9922
20	R20 = 475.171	11	9993

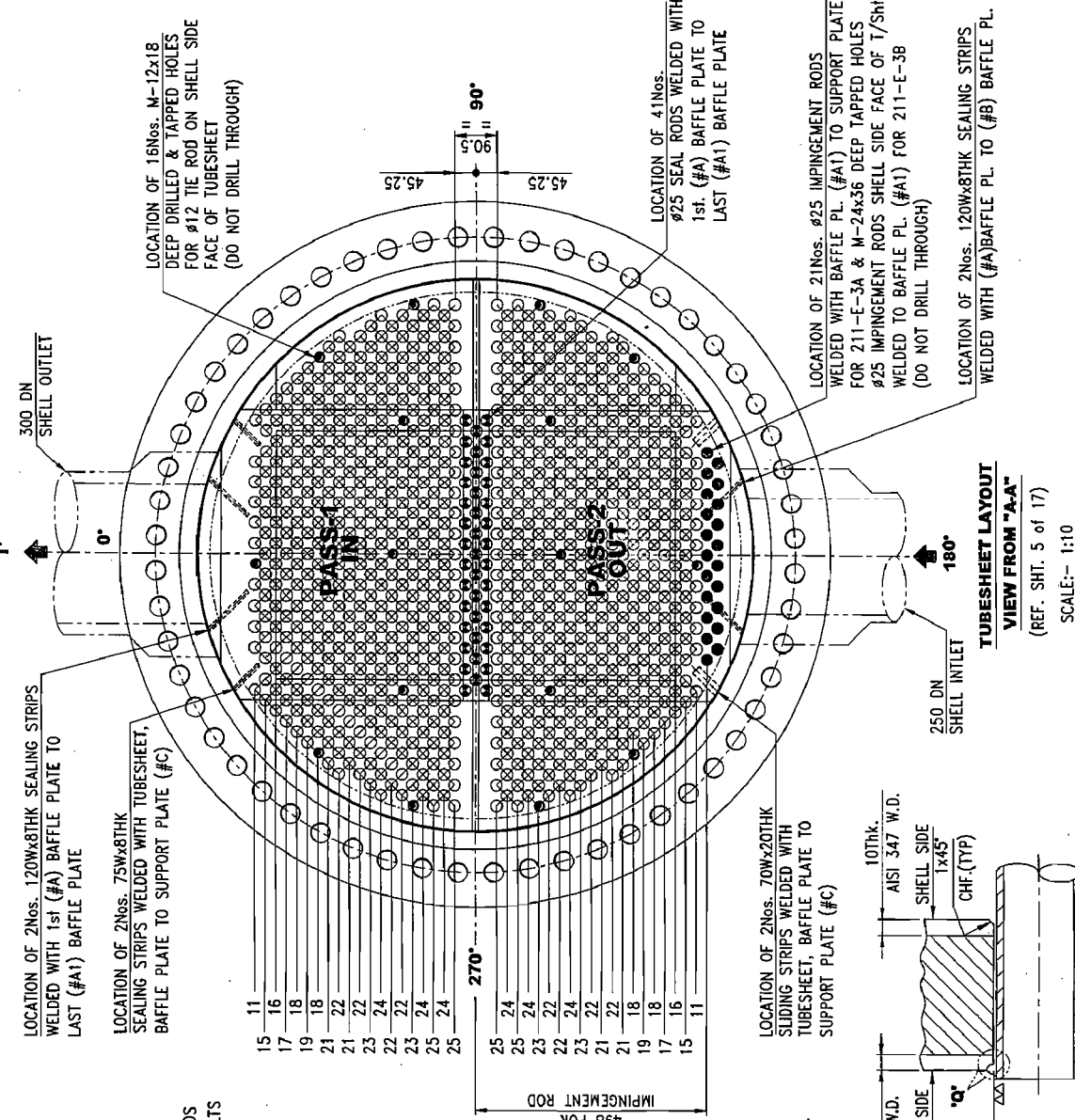
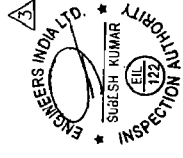
DETAIL OF "U" TUBES

320

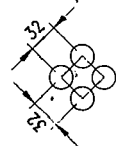
"AS BUILT DRAWING"
W.O. No. : 07-386
EQPT. NO. : 211-E-3A/B



SCALE	REV	SHT
AS SHOWN	3	6 of 21
DWG NO.		SDB/E/071206



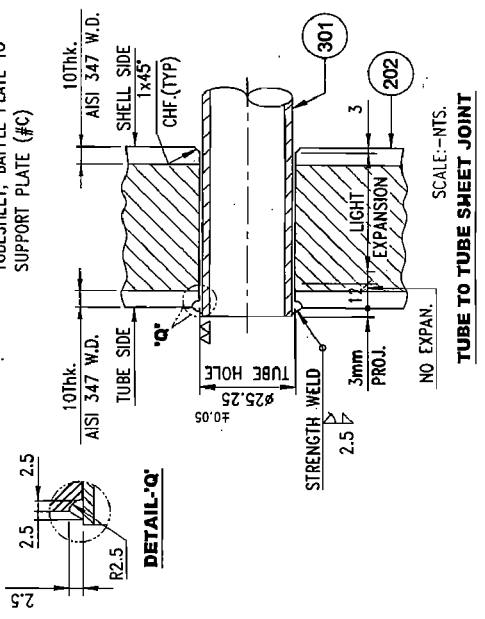
SHELL ID	: 1200
NO. OF TUBE HOLES	: 824 (412 'U' TUBES)
TUBE HOLE DIAMETER	: 25.25 mm ±0.05
OTL	: 1142.7
PITCH	: 32
LAYOUT	: 45° RT. SQUARE



TUBE PITCH

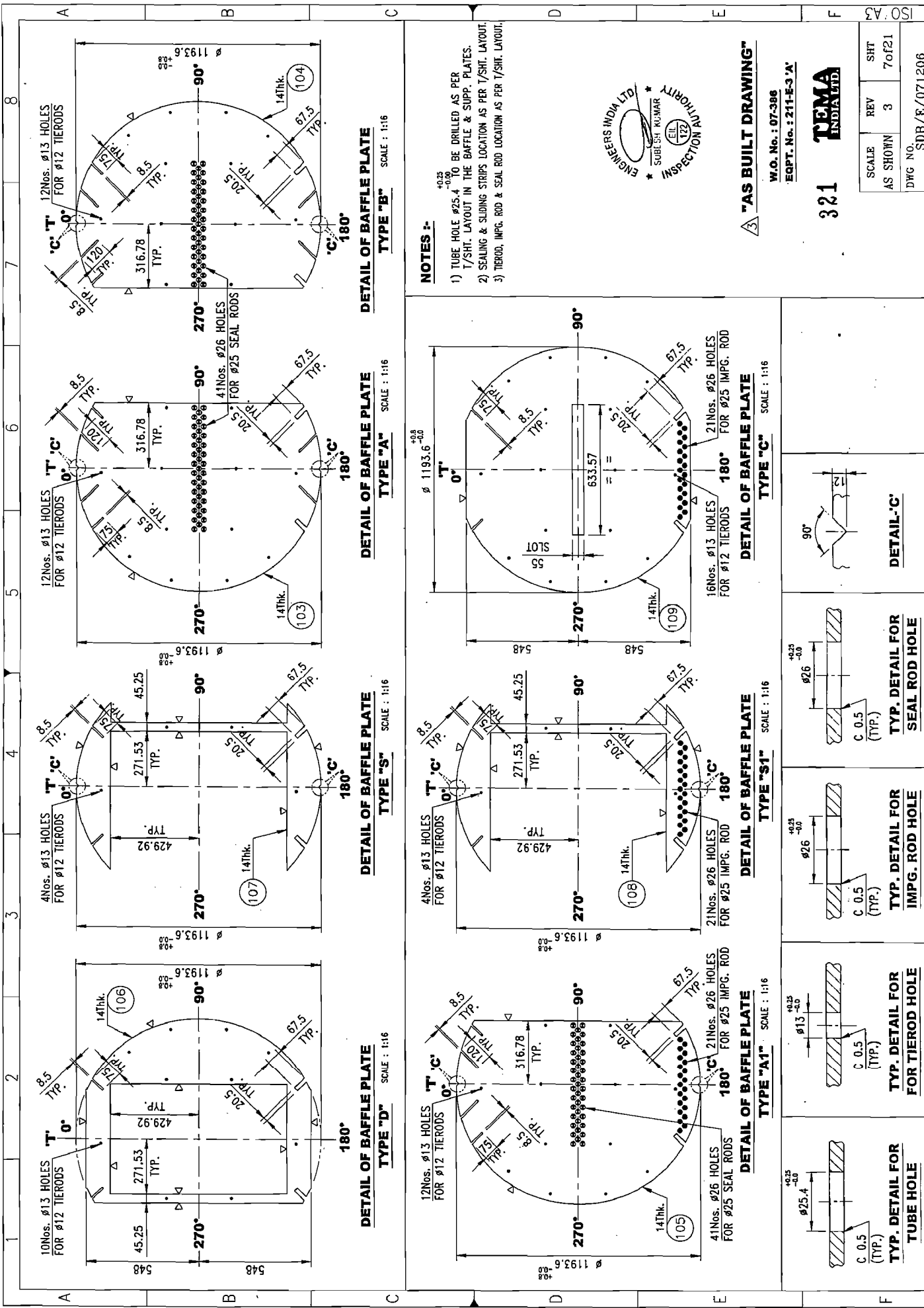
PASS	1	2
TUBE	412	412

- ⊕ DENOTE TUBE HOLES
- ⊕ DENOTE TIEROD HOLES
- ⊕ DENOTE SEAL RODS
- ⊕ DENOTE IMPINGEMENT RODS
- ⊕ DENOTE PULLING EYE BOLTS



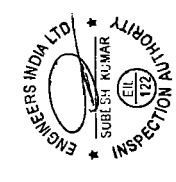
DETAIL-Q

TUBE TO TUBE SHEET JOINT
SCALE: - NTS.



NOTES :-

- 1) TUBE HOLE $\phi 25.4$ TO BE DRILLED AS PER T/SHT. LAYOUT IN THE BAFFLE & SUPP. PLATES.
- 2) SEALING & SLIDING STRIPS LOCATION AS PER T/SHT. LAYOUT.
- 3) TIERROD, IMPG. ROD & SEAL ROD LOCATION AS PER T/SHT. LAYOUT.



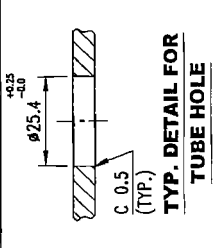
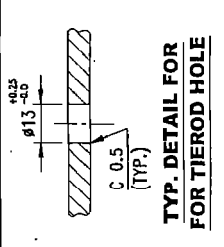
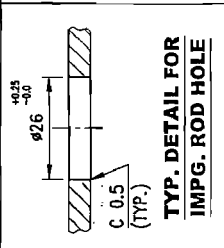
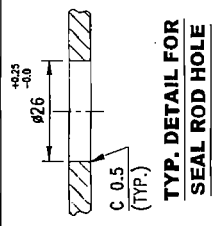
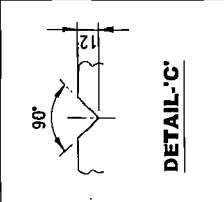
"AS BUILT DRAWING"

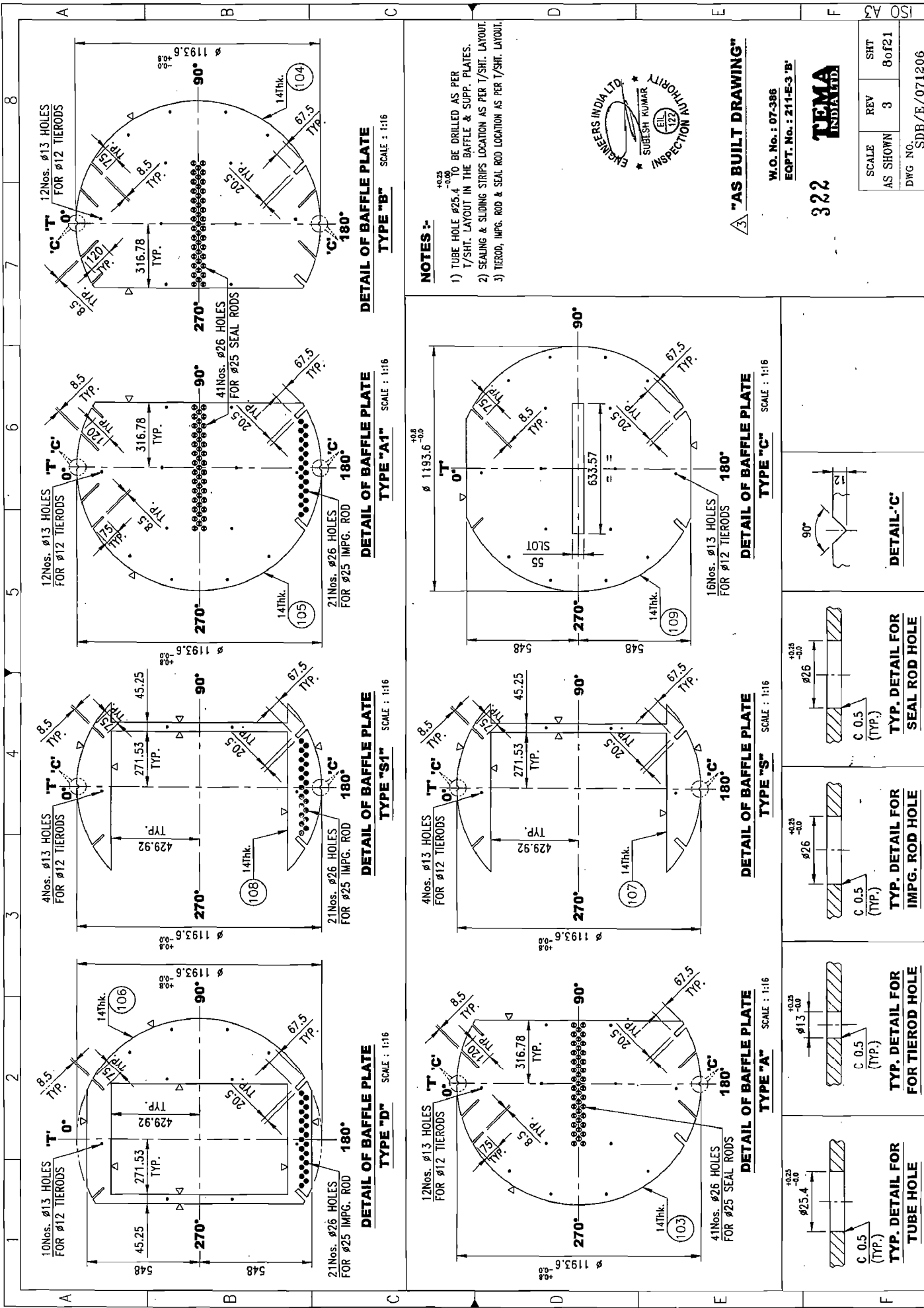
W.O. No. : 07-386
EQPT. No. : 211-E-3 'A'

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TEMA
INDIA LTD.

SCALE	REV	SHT
AS SHOWN	3	7 of 21
DWG NO.		SDB/Σ/071206





NOTES :-

- 1) TUBE HOLE $\phi 25.4$ TO BE DRILLED AS PER T/SHT. LAYOUT IN THE BAFFLE & SUPP. PLATES.
- 2) SEALING & SLIDING STRIPS LOCATION AS PER T/SHT. LAYOUT.
- 3) TIEROD, IMPG. ROD & SEAL ROD LOCATION AS PER T/SHT. LAYOUT.



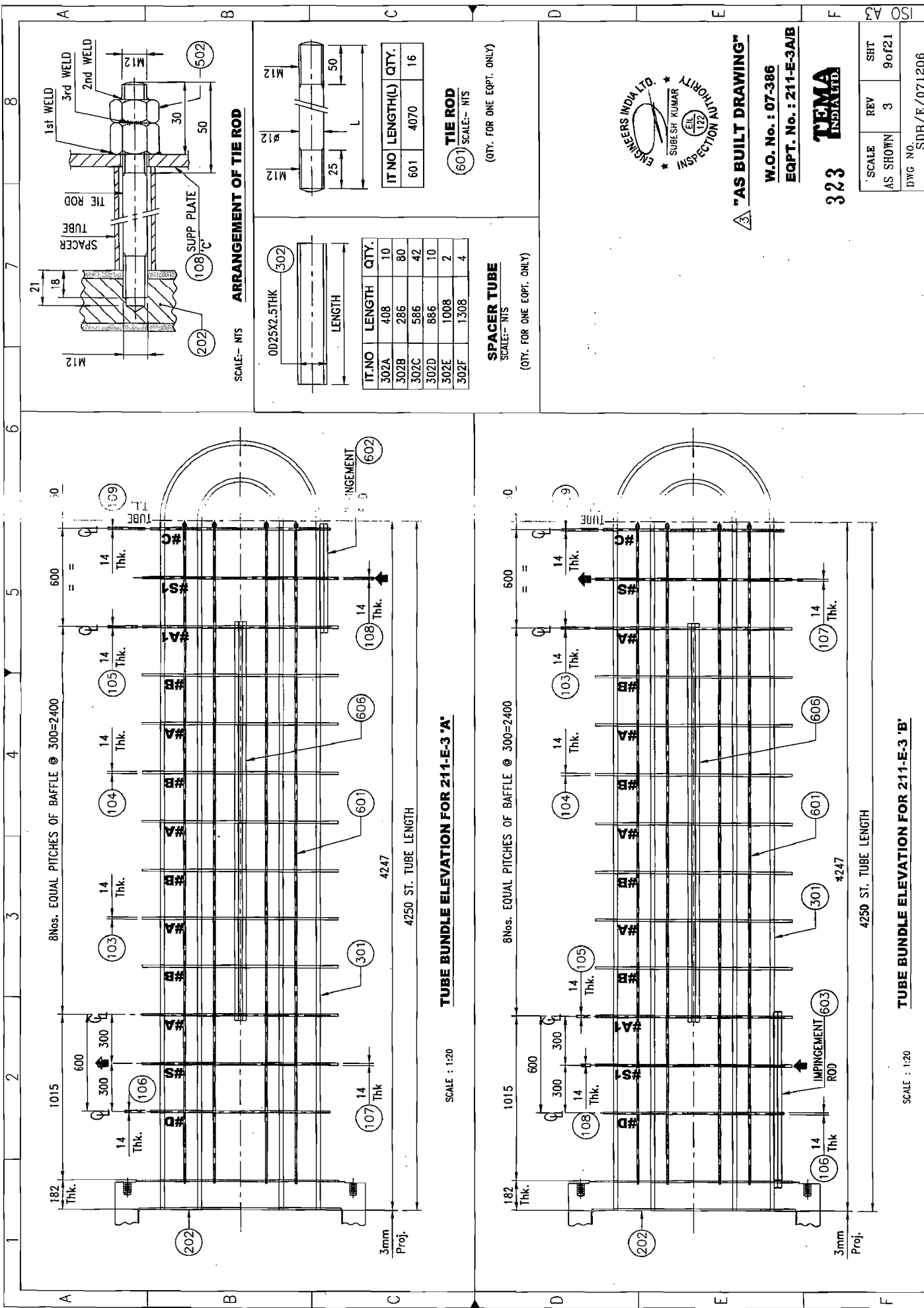
"AS BUILT DRAWING"

W.O. No. : 07-386
EQPT. No. : 211-E-3 'B'

322



SCALE	REV	SHT
AS SHOWN	3	8 of 21
DWG NO.		SDB/E/071206



8 Nos. EQUAL PITCHES OF BAFFLE @ 300=2400

TUBE BUNDLE ELEVATION FOR 211-E-3 'A'

SCALE : 1:20

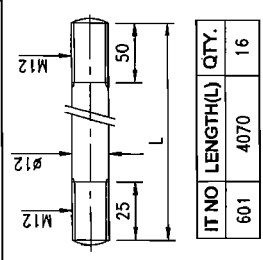
8 Nos. EQUAL PITCHES OF BAFFLE @ 300=2400

TUBE BUNDLE ELEVATION FOR 211-E-3 'B'

SCALE : 1:20

ARRANGEMENT OF TIE ROD

SCALE:- NTS



IT.NO	LENGTH	QTY.
302A	408	10
302B	286	80
302C	586	42
302D	886	10
302E	1008	2
302F	1308	4

TIE ROD

SCALE:- NTS

(QTY. FOR ONE EQPT. ONLY)

SPACER TUBE

SCALE:- NTS

(QTY. FOR ONE EQPT. ONLY)



"AS BUILT DRAWING"

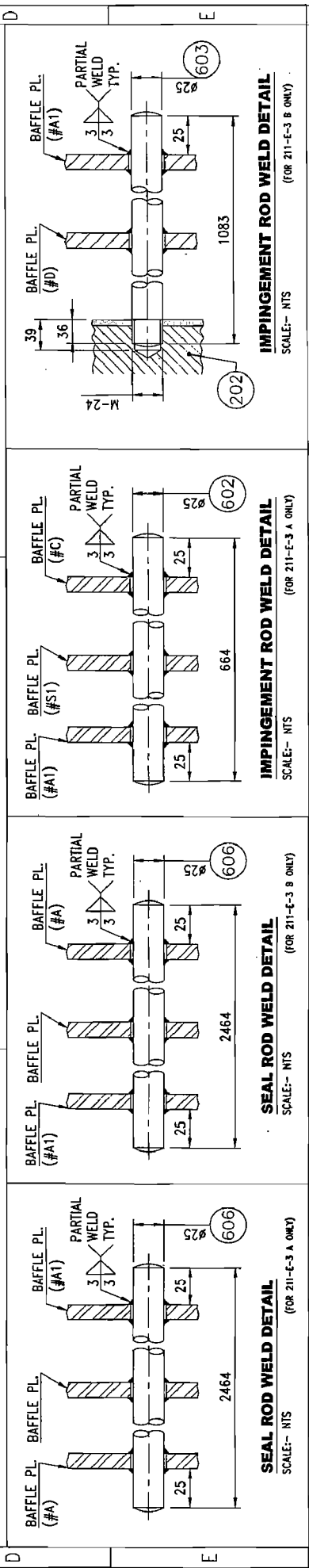
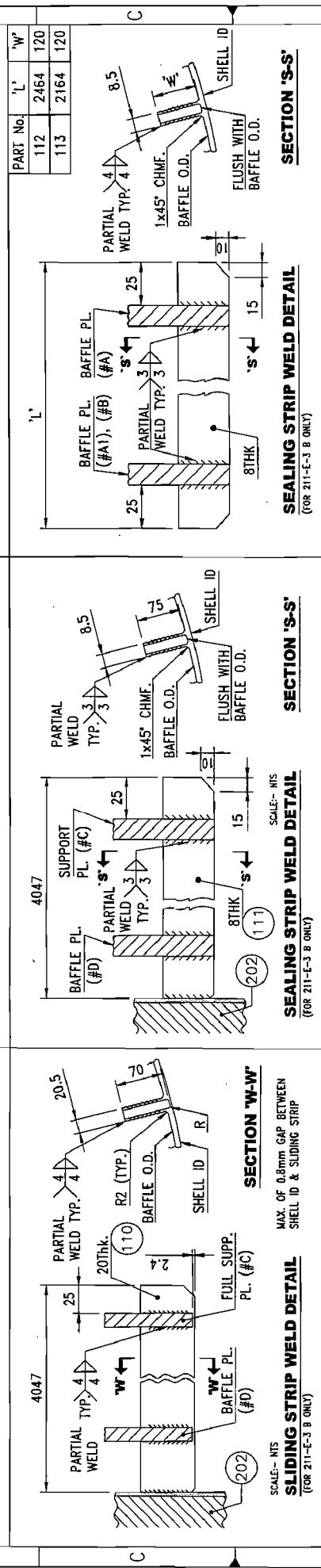
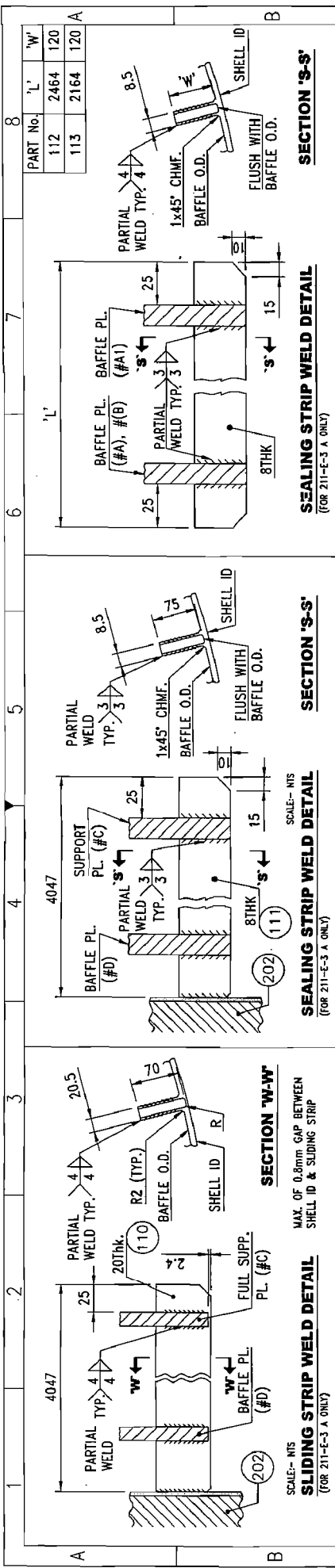
W.O. No. : 07-386
EQPT. No. : 211-E-3A/B



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SCALE	REV	SHT
AS SHOWN	3	9 of 21

DWG NO. SDB/E/071206



W.O. No. : 07-386
EQPT. No. : 211-E-3A/B

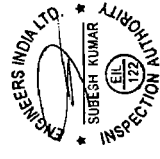
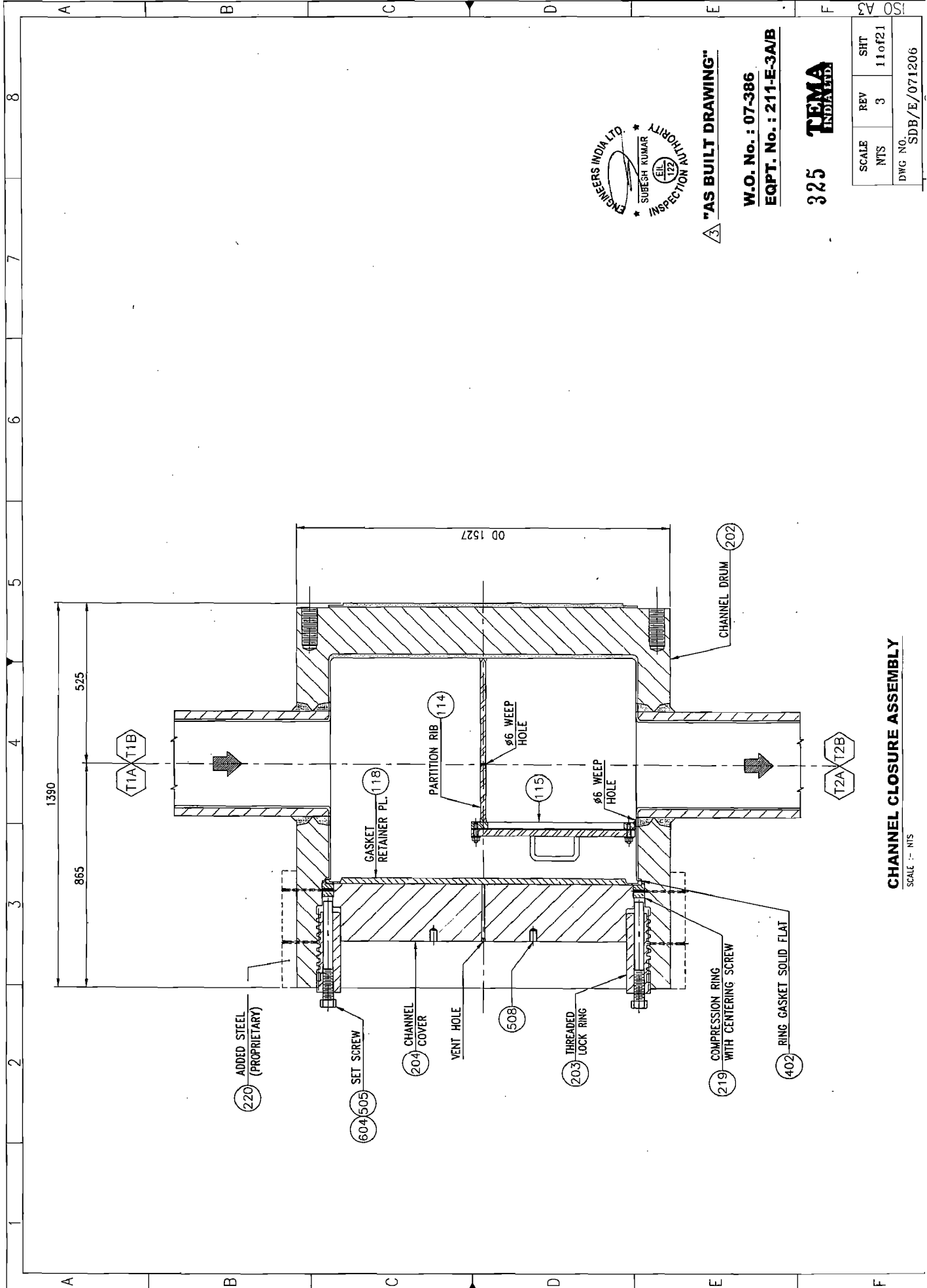
324

SCALE AS SHOWN 3
REV 10of21
SHT 10of21
DWG NO. SDB/E/071206

INSPECTION AUTHORITY
SUBESH KUMAR
ENGINEERS INDIA LTD.

TEMA INDIA LTD.

"AS BUILT DRAWING"



3 "AS BUILT DRAWING"

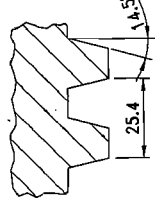
W.O. No. : 07-386
EQPT. No. : 211-E-3A/B

325 TEMA
INDIA LTD.

SCALE	REV	SHT
NTS	3	11 of 21
DWG NO.		SDB/E/071206

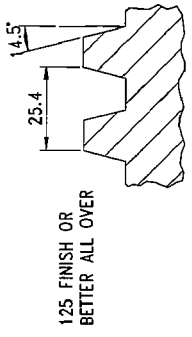
CHANNEL CLOSURE ASSEMBLY
SCALE :- NTS

1 TPT 29° ACME CLASS 2G
STD. THDS. AS PER ASME B1.5

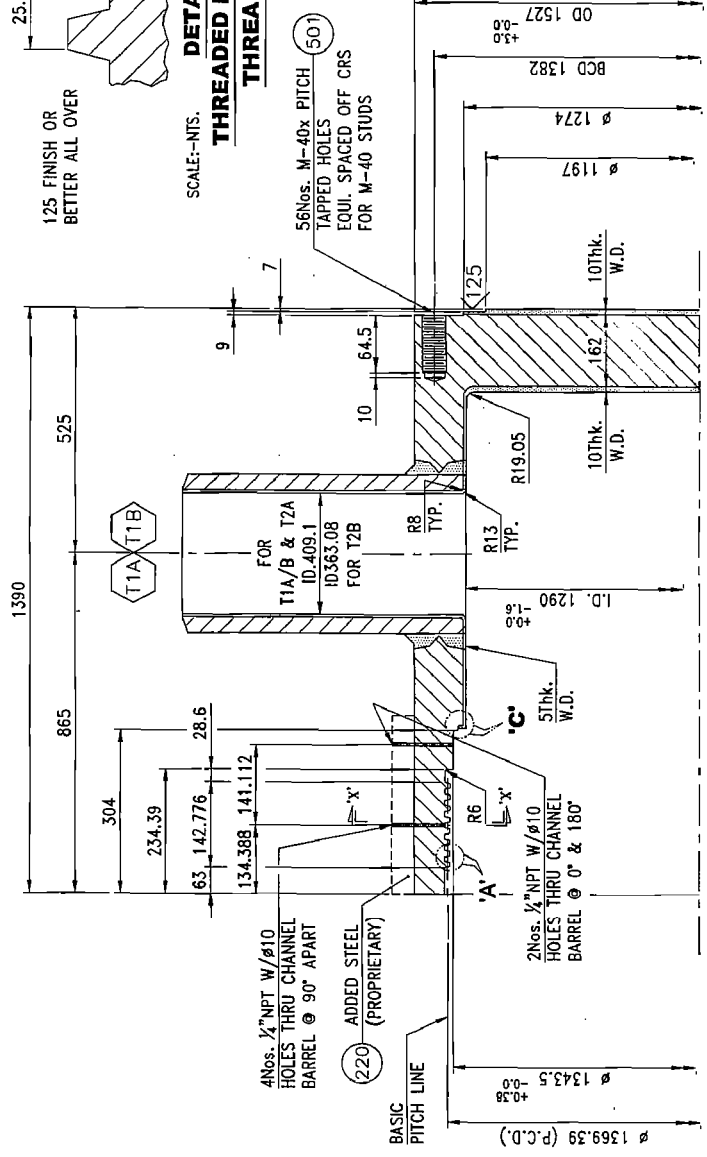


DETAIL 'A'
CHANNEL DRUM THREAD DETAIL
SCALE:-NTS.
125 FINISH OR BETTER ALL OVER

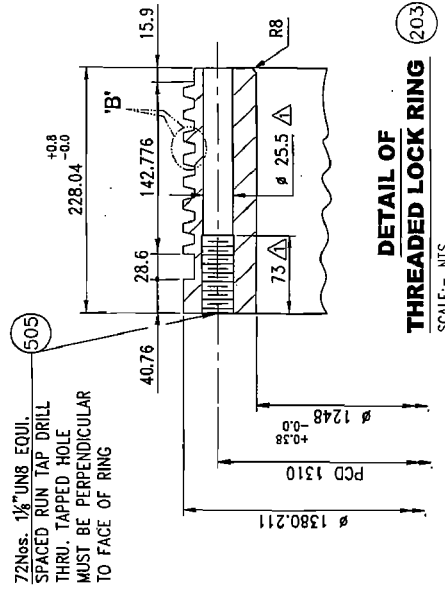
1 TPT 29° ACME CLASS 2G
STD. THDS. AS PER ASME B1.5



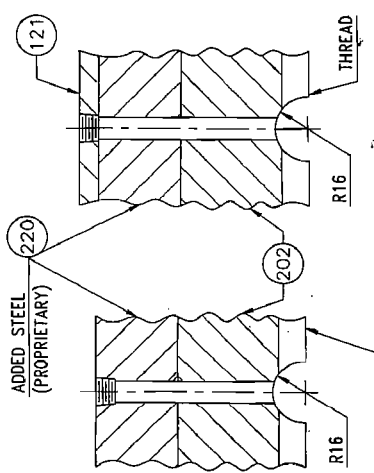
DETAIL 'B'
**THREADED LOCK RING
THREAD DETAIL**
SCALE:-NTS.



DETAIL OF CHANNEL DRUM
SCALE:- NTS



**DETAIL OF
THREADED LOCK RING**
SCALE:- NTS



SECTION 'X-X'
SCALE:- NTS
TYP. GREASE GROOVE 4-PLACES 90° APART

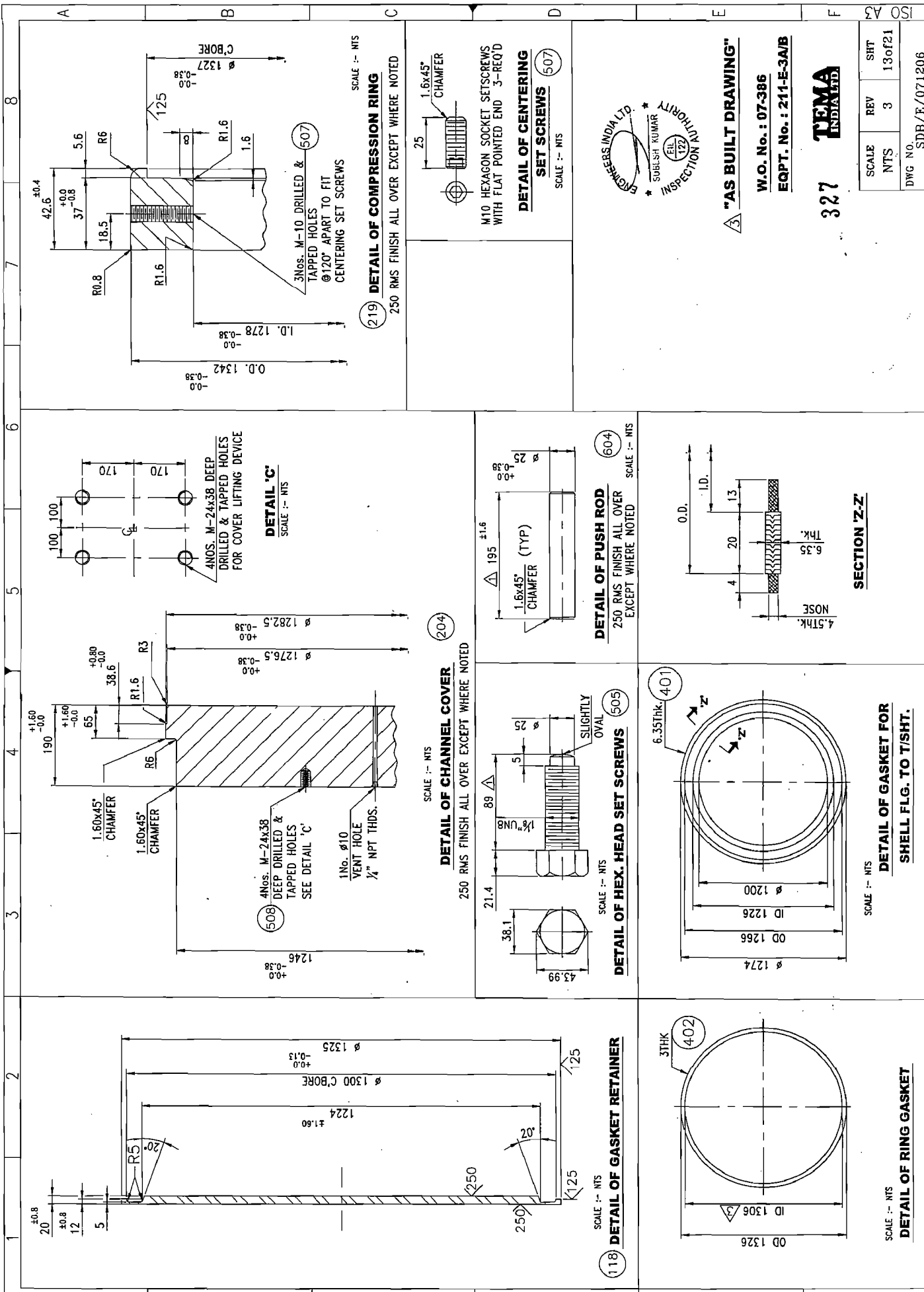


"AS BUILT DRAWING"

W.O. No. : 07-386
EQPT. No. : 211-E-3A/B

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TEMA
INDIA LTD.

SCALE	REV	SHT
NTS	3	12 of 21
DWC NO.		SDB/E/071206



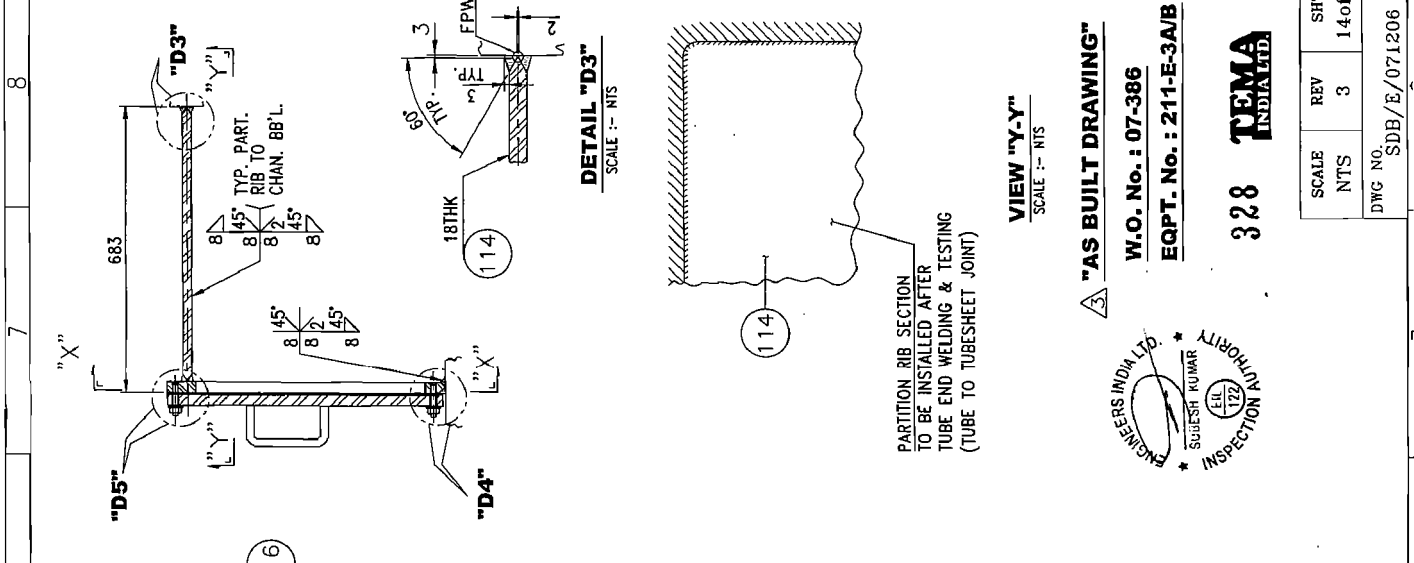
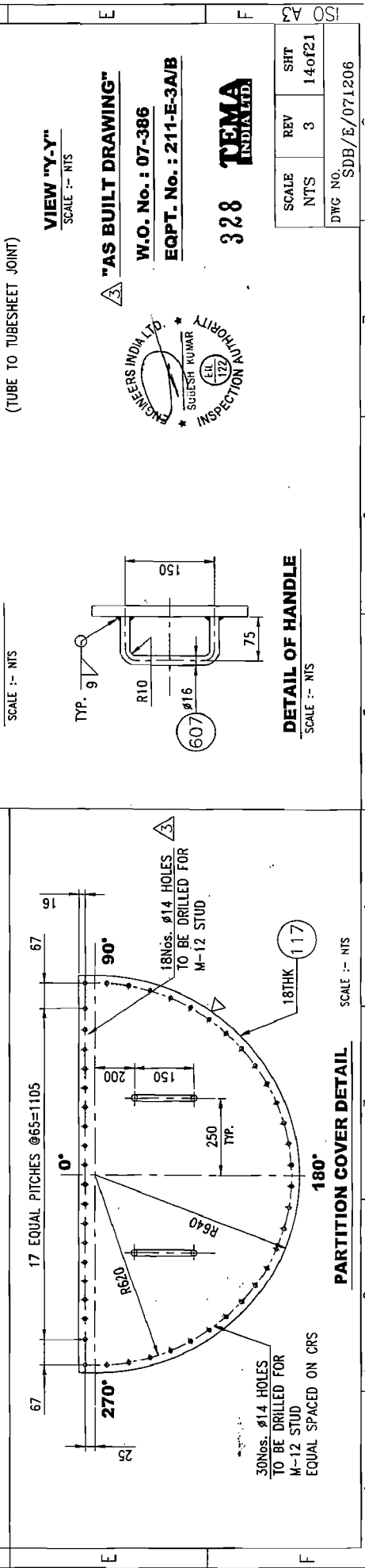
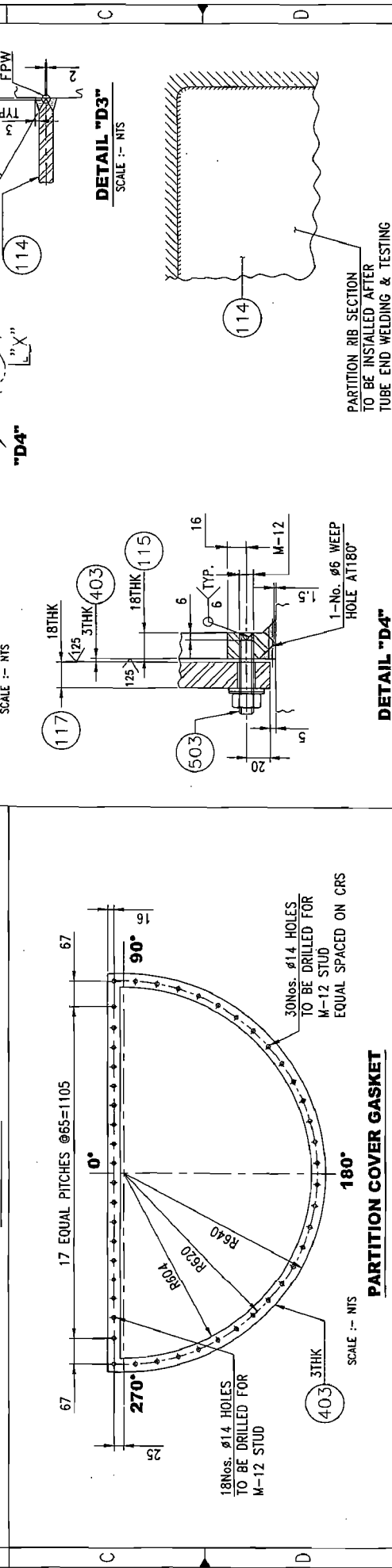
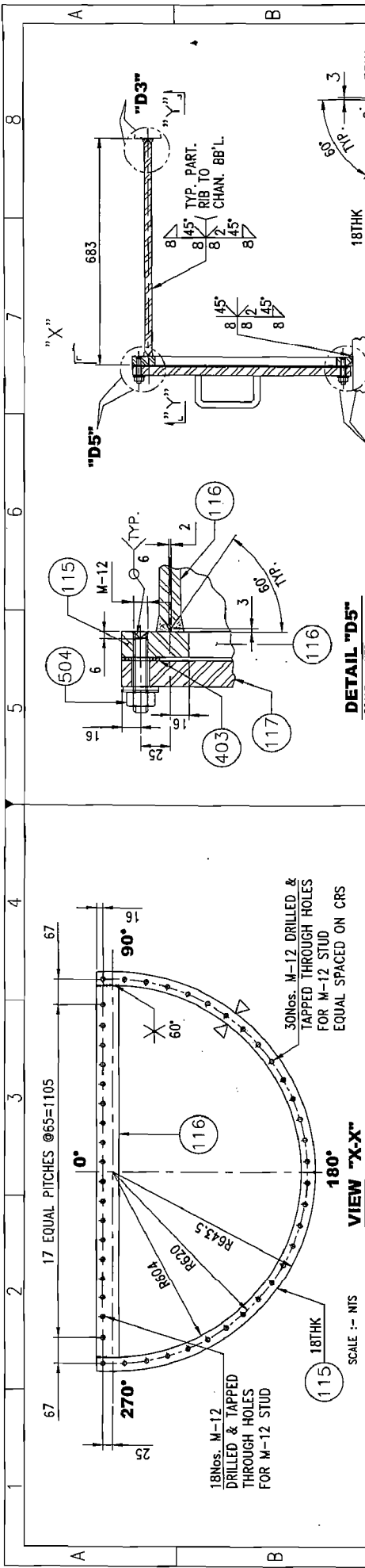
<p>118 DETAIL OF GASKET RETAINER SCALE :- NTS</p>	<p>204 DETAIL OF CHANNEL COVER SCALE :- NTS</p>	<p>604 DETAIL OF PUSH ROD SCALE :- NTS</p>	<p>505 DETAIL OF HEX. HEAD SET SCREWS SCALE :- NTS</p>	<p>401 DETAIL OF GASKET FOR SHELL FLG. TO T/SHT. SCALE :- NTS</p>	<p>219 DETAIL OF COMPRESSION RING SCALE :- NTS</p>
<p>2</p>	<p>3</p>	<p>4</p>	<p>5</p>	<p>6</p>	<p>7</p>
<p>8</p>	<p>A</p>	<p>B</p>	<p>C</p>	<p>D</p>	<p>E</p>
<p>1</p>	<p>2</p>	<p>3</p>	<p>4</p>	<p>5</p>	<p>6</p>



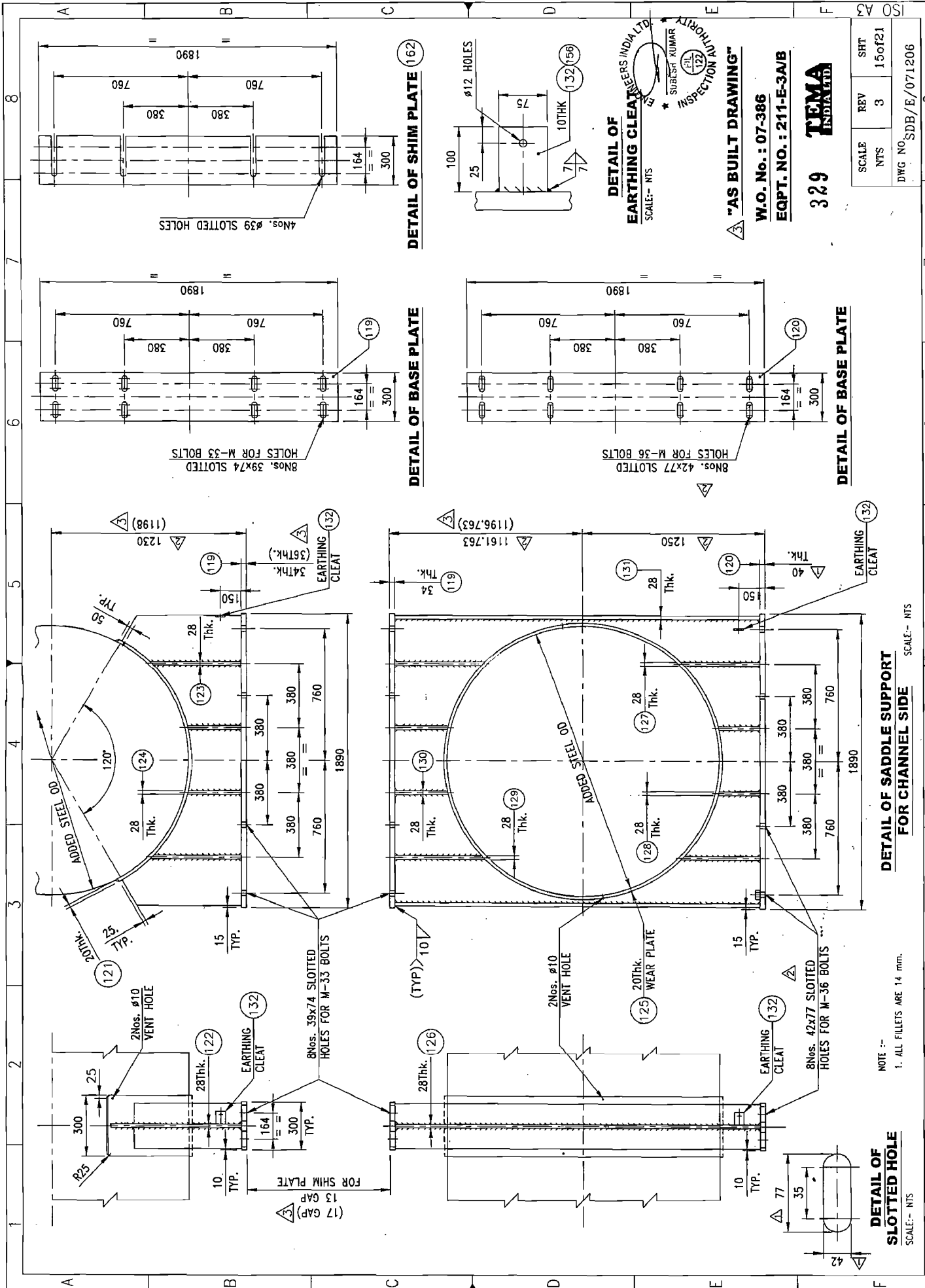
"AS BUILT DRAWING"
W.O. No. : 07-386
EQPT. No. : 211-E-3A/B

327
TEMA
INDIA LTD.

SCALE	REV	SHT
NTS	3	13 of 21
DWG NO.		SDB/E/071206



SCALE	REV	SHT
NTS	3	14 of 21
DWG NO.	SDB/E/07.L206	



DETAIL OF EARTHING CLEAT
 SCALE:- NTS
 ENGINEERS INDIA LTD.
 SUBJECT: KUMAR
 (132)
 INSPECTION AUTHORITY
"AS BUILT DRAWING"
 W.O. No. : 07-386
 EQPT. NO. : 211-E-3A/B

329
TEMA
 INDIA LTD.

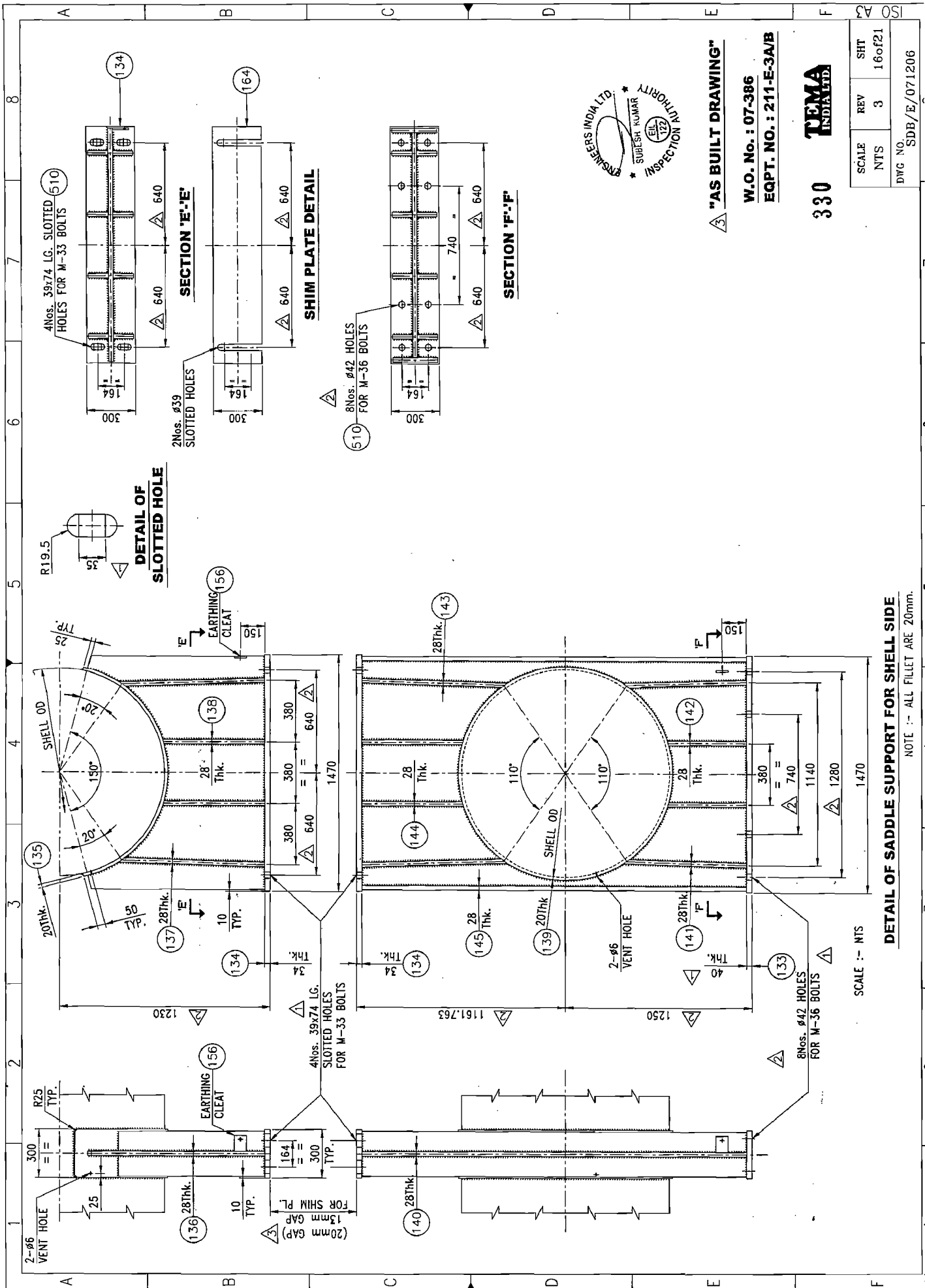
SCALE	REV	SHT
NTS	3	15 of 21

DWG NO. SDB/E/071206

NOTE :-
 1. ALL FILLETS ARE 14 mm.

DETAIL OF SLOTTED HOLE
 SCALE:- NTS

DETAIL OF SADDLE SUPPORT FOR CHANNEL SIDE
 SCALE:- NTS



"AS BUILT DRAWING"
W.O. No. : 07-386
EQPT. NO. : 211-E-3A/B

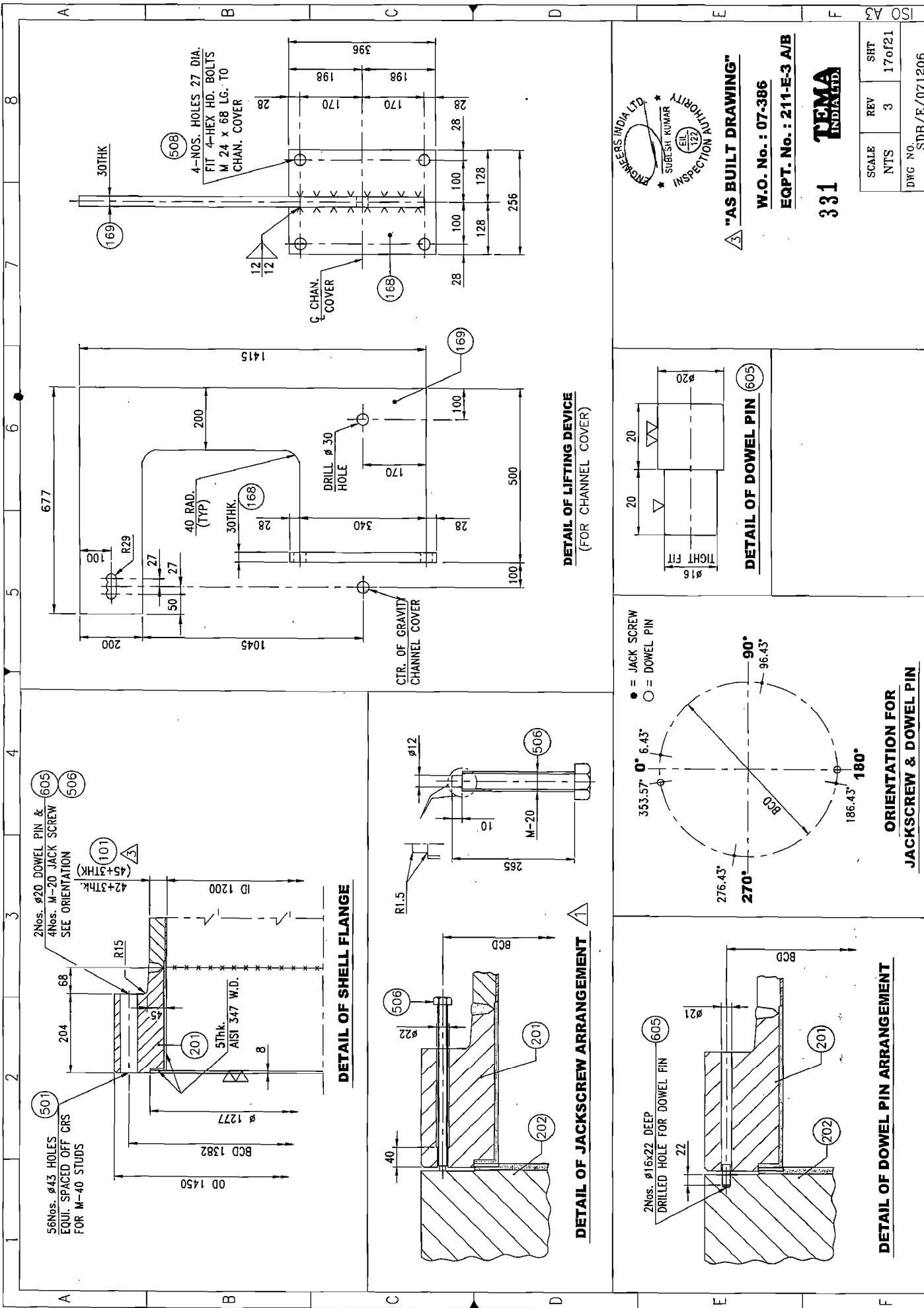


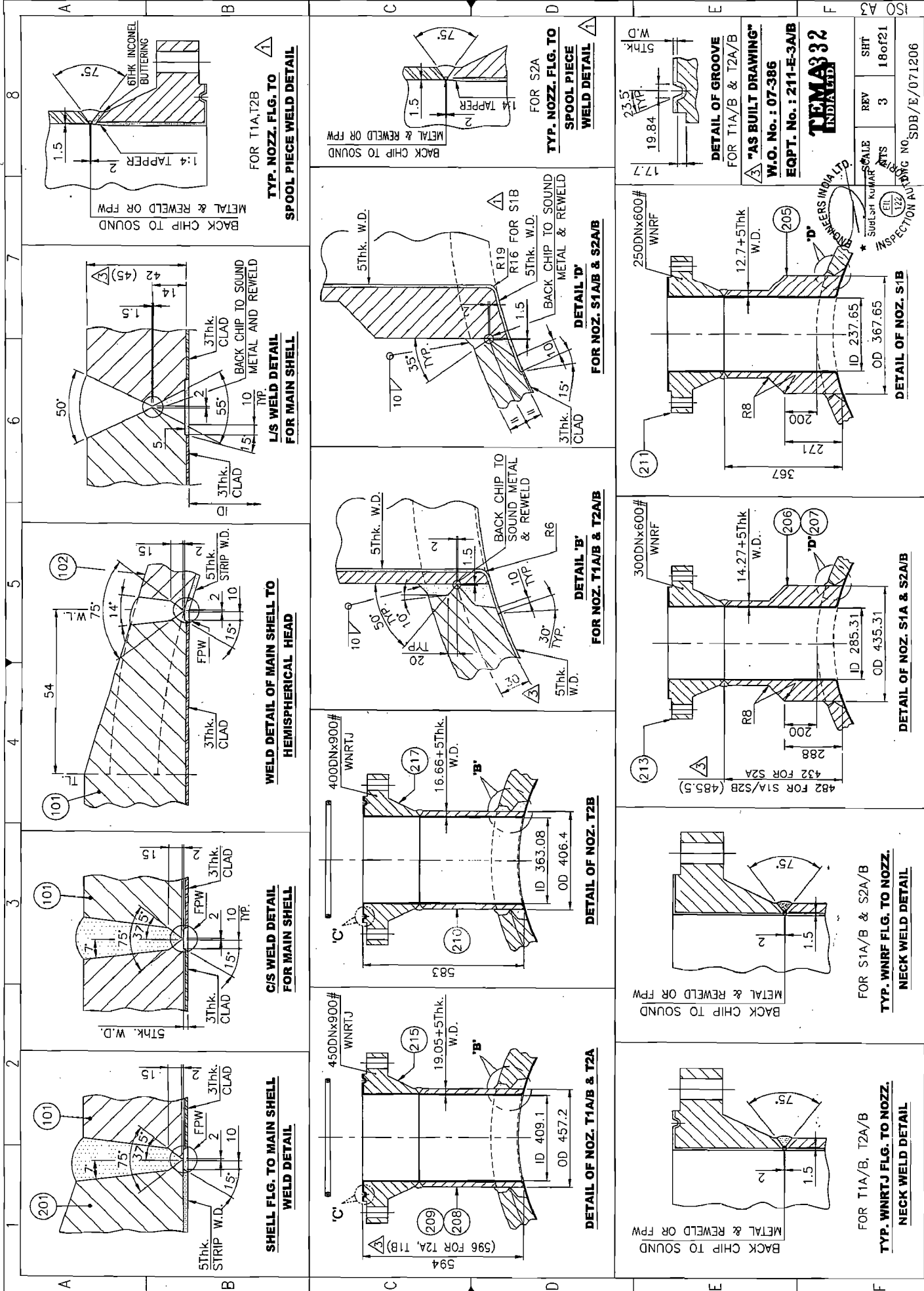
330

SCALE	REV	SHT
NTS	3	16 of 21
DWC NO.		SDB/E/071206

DETAIL OF SADDLE SUPPORT FOR SHELL SIDE
 NOTE :- ALL FILLET ARE 20mm.

SCALE :- NTS





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INDIA LTD.

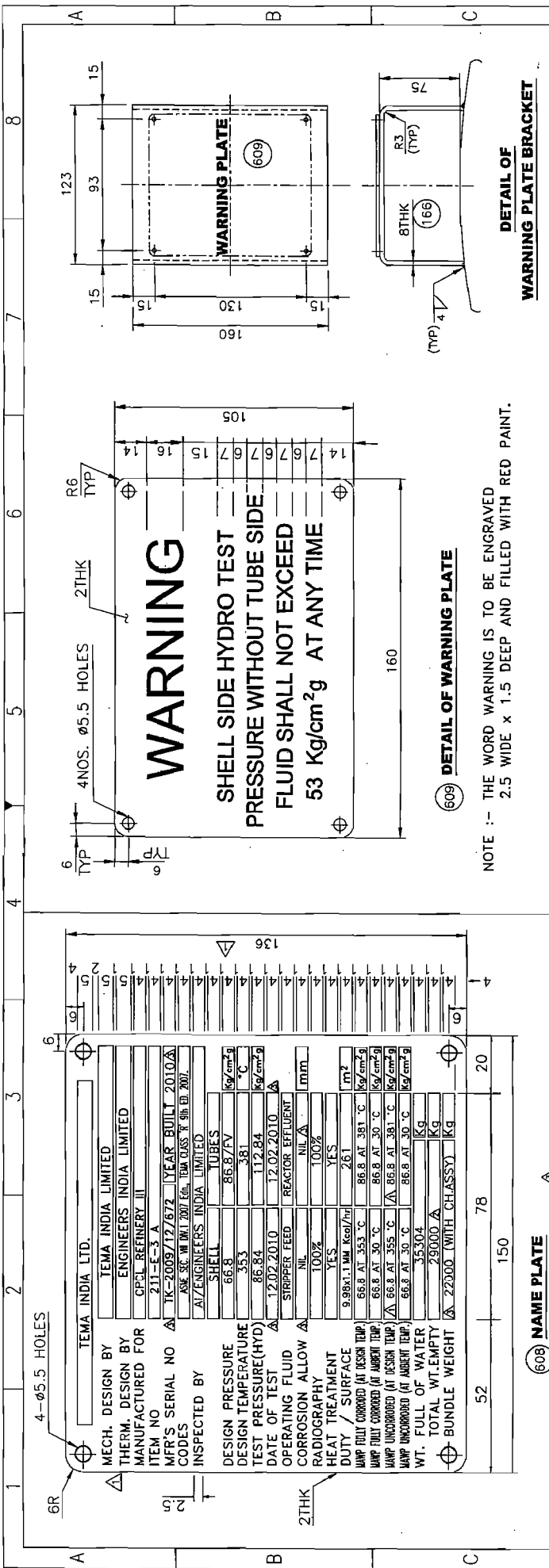
W.O. No. : 07-386
 EQPT. No. : 211-E-3A/B

INSPECTION AUTHORITY NO. 122
 SDB/E/071206

REV 3
 SHT 18 of 21

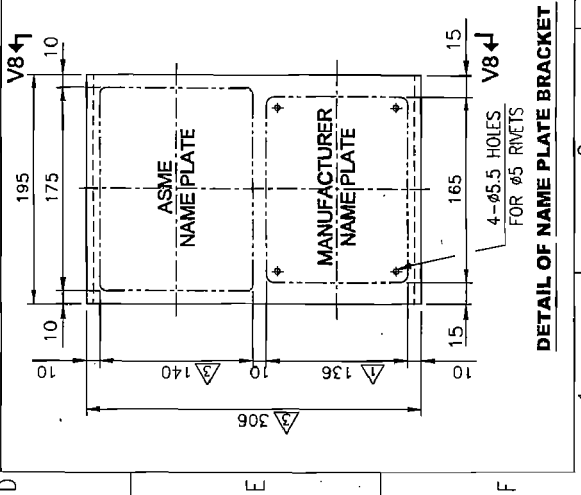
SCALE
 SUBLSH KUMAR

BRIDGEWELDERS INDIA LTD.



608 NAME PLATE

- NOTES:-**
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
 2. ALL LETTERS AND LETTER BLOCKS SHALL BE ENGRAVED IN BLACK.
 3. NAME PLATE SHALL BE RIVETED WITH Ø5 ALUMINIUM RIVETS AND TACK WELDED TO BRACKET ON ALL FOUR SIDES.
 4. NAME PLATE SHALL BE OF AISI 304 OF 2THK.

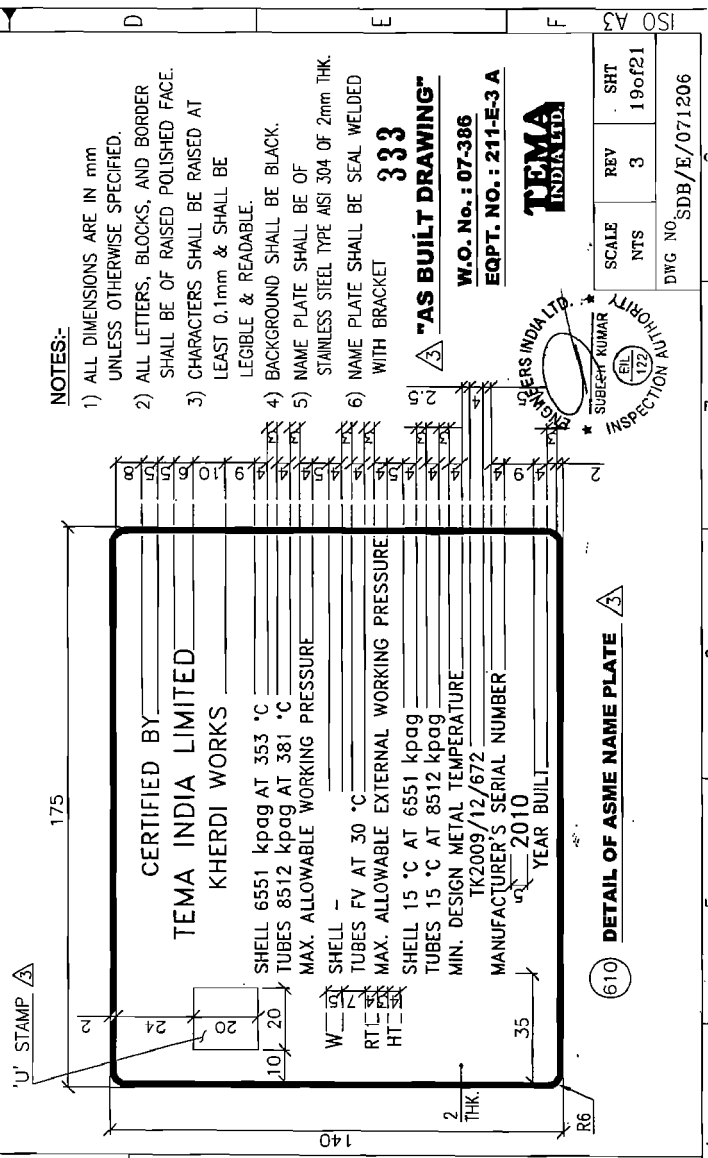


DETAIL OF NAME PLATE BRACKET

MECH. DESIGN BY		TEMA INDIA LTD.	
THERM. DESIGN BY		ENGINEERS INDIA LIMITED	
MANUFACTURED FOR		CPIL REFINERY II	
ITEM NO	211-E-3-A	YEAR BUILT	2010
MFR'S SERIAL NO	TK-2009/12/672	TEMA CLASS	Y SHI 2007
INSPECTED BY	AZ/ENGINEERS, INDIA LIMITED		
DESIGN PRESSURE	86.8 FV	kg/cm ²	
DESIGN TEMPERATURE	353	°C	
TEST PRESSURE (HYD)	112.84	kg/cm ²	
DATE OF TEST	12.02.2010		
OPERATING FLUID	REACTOR EFFLUENT		
CORROSION ALLOW	NIL	mm	
RADIOGRAPHY	100%		
HEAT TREATMENT	YES		
DUTY / SURFACE	9.99x1.1MM Kcal/hr	m ²	
WAMP FULLY CORRODED (AT DESIGN TEMP)	66.8 AT 353 °C	kg/cm ²	
WAMP FULLY CORRODED (AT AMBIENT TEMP)	66.8 AT 30 °C	kg/cm ²	
WAMP INCORRODED (AT DESIGN TEMP)	66.8 AT 353 °C	kg/cm ²	
WAMP INCORRODED (AT AMBIENT TEMP)	66.8 AT 30 °C	kg/cm ²	
WT. FULL OF WATER	35304	kg	
TOTAL WT. EMPTY	29000	kg	
BUNDLE WEIGHT	22000 (WITH CHASSIS)	kg	

609 WARNING PLATE

NOTE :- THE WORD WARNING IS TO BE ENGRAVED 2.5 WIDE x 1.5 DEEP AND FILLED WITH RED PAINT.



NOTES:-

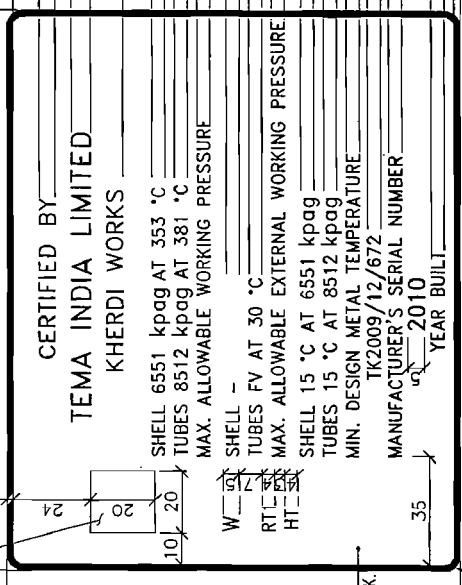
- 1) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
- 2) ALL LETTERS, BLOCKS, AND BORDER SHALL BE OF RAISED POLISHED FACE.
- 3) CHARACTERS SHALL BE RAISED AT LEAST 0.1mm & SHALL BE LEGIBLE & READABLE.
- 4) BACKGROUND SHALL BE BLACK.
- 5) NAME PLATE SHALL BE OF STAINLESS STEEL TYPE AISI 304 OF 2mm THK.
- 6) NAME PLATE SHALL BE SEAL WELDED WITH BRACKET

"AS BUILT DRAWING"
333
 W.O. No.: 07-386
 EQPT. NO.: 211-E-3 A

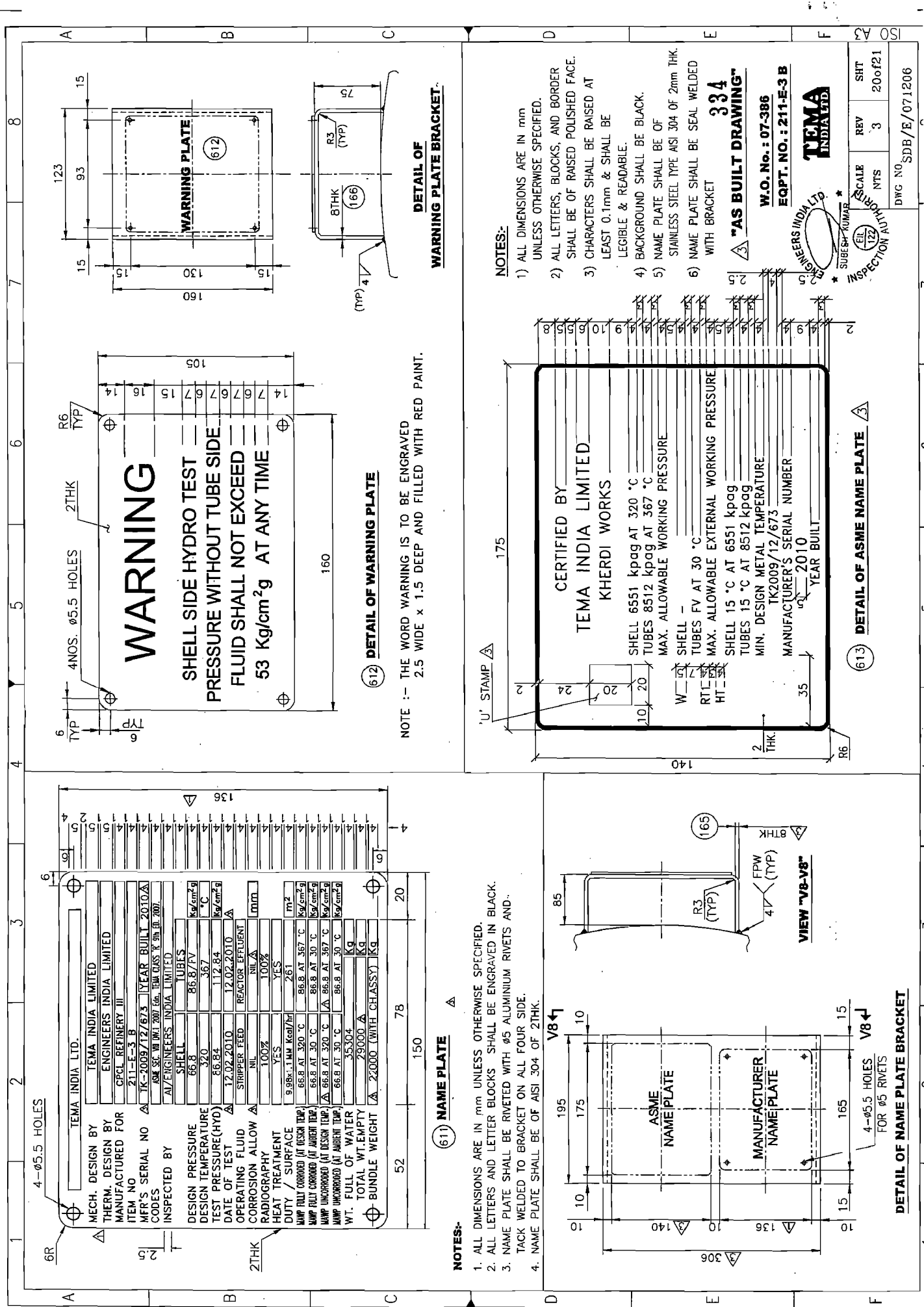


SCALE	REV	SHT
NTS	3	19 of 21
DWG NO.	SDB/E/071206	

610 DETAIL OF ASME NAME PLATE



ENGINEERS INDIA LTD.
 SUBJECT KUMAR
 INSPECTION AUTHORITY
 (12)



MECH. DESIGN BY TEMA INDIA LTD.
 THERM. DESIGN BY ENGINEERS INDIA LIMITED
 MANUFACTURED FOR GPCCL REFINERY III
 ITEM NO. 211-E-3 B
 MFR'S SERIAL NO. TK-2009/12/673 YEAR BUILT 2010
 CODES ASME SEC. VIII DIV. 2007 Edn. TEMA CLASS "R" DIV. 2007.
 INSPECTED BY AI/ENGINEERS INDIA LIMITED

DESIGN PRESSURE 66.8 TUBES 86.8 / FV 367
 DESIGN TEMPERATURE 320 °C
 TEST PRESSURE (HYD) 86.84 112.84
 DATE OF TEST 12.02.2010
 OPERATING FLUID REACTOR EFFLUENT
 STRIPPER FEED
 CORROSION ALLOW. NIL
 RADIOGRAPHY 100%
 HEAT TREATMENT YES
 DUTY / SURFACE 9.99x1.1 MM Kgcl/hr 261
 WMP FULLY CORRODED (AT DESIGN TEMP) 66.8 AT 320 °C 86.8 AT 367 °C
 WMP FULLY CORRODED (AT AMBIENT TEMP) 66.8 AT 30 °C 86.8 AT 30 °C
 WMP UNCORRODED (AT DESIGN TEMP) 66.8 AT 320 °C 86.8 AT 367 °C
 WMP UNCORRODED (AT AMBIENT TEMP) 66.8 AT 30 °C 86.8 AT 30 °C
 WT. FULL OF WATER 35304
 TOTAL WT. EMPTY 29000
 BUNDLE WEIGHT 22000 (WITH CHASSIS)

NOTE :- THE WORD WARNING IS TO BE ENGRAVED 2.5 WIDE x 1.5 DEEP AND FILLED WITH RED PAINT.

NOTE:- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.

CERTIFIED BY
 TEMA INDIA LIMITED
 KHERDI WORKS

SHELL 6551 kpag AT 320 °C
 TUBES 8512 kpag AT 367 °C
 MAX. ALLOWABLE WORKING PRESSURE

SHELL - TUBES FV AT 30 °C
 MAX. ALLOWABLE EXTERNAL WORKING PRESSURE

SHELL 15 °C AT 6551 kpag
 TUBES 15 °C AT 8512 kpag
 MIN. DESIGN METAL TEMPERATURE

TK2009/12/673
 MANUFACTURER'S SERIAL NUMBER 2010
 YEAR BUILT

W- RT- HT-
 10, 20, 35

U' STAMP

- NOTES:-**
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
 2. ALL LETTERS AND LETTER BLOCKS SHALL BE ENGRAVED IN BLACK.
 3. NAME PLATE SHALL BE RIVETED WITH Ø5 ALUMINIUM RIVETS AND TACK WELDED TO BRACKET ON ALL FOUR SIDE.
 4. NAME PLATE SHALL BE OF AISI 304 OF 2THK.

- NOTES:-**
- 1) ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
 - 2) ALL LETTERS, BLOCKS, AND BORDER SHALL BE OF RAISED POLISHED FACE.
 - 3) CHARACTERS SHALL BE RAISED AT LEAST 0.1mm & SHALL BE LEGIBLE & READABLE.
 - 4) BACKGROUND SHALL BE BLACK.
 - 5) NAME PLATE SHALL BE OF STAINLESS STEEL TYPE AISI 304 OF 2mm THK.
 - 6) NAME PLATE SHALL BE SEAL WELDED WITH BRACKET

AS BUILT DRAWING

W.O. No. : 07-386
 EQPT. NO. : 211-E-3 B

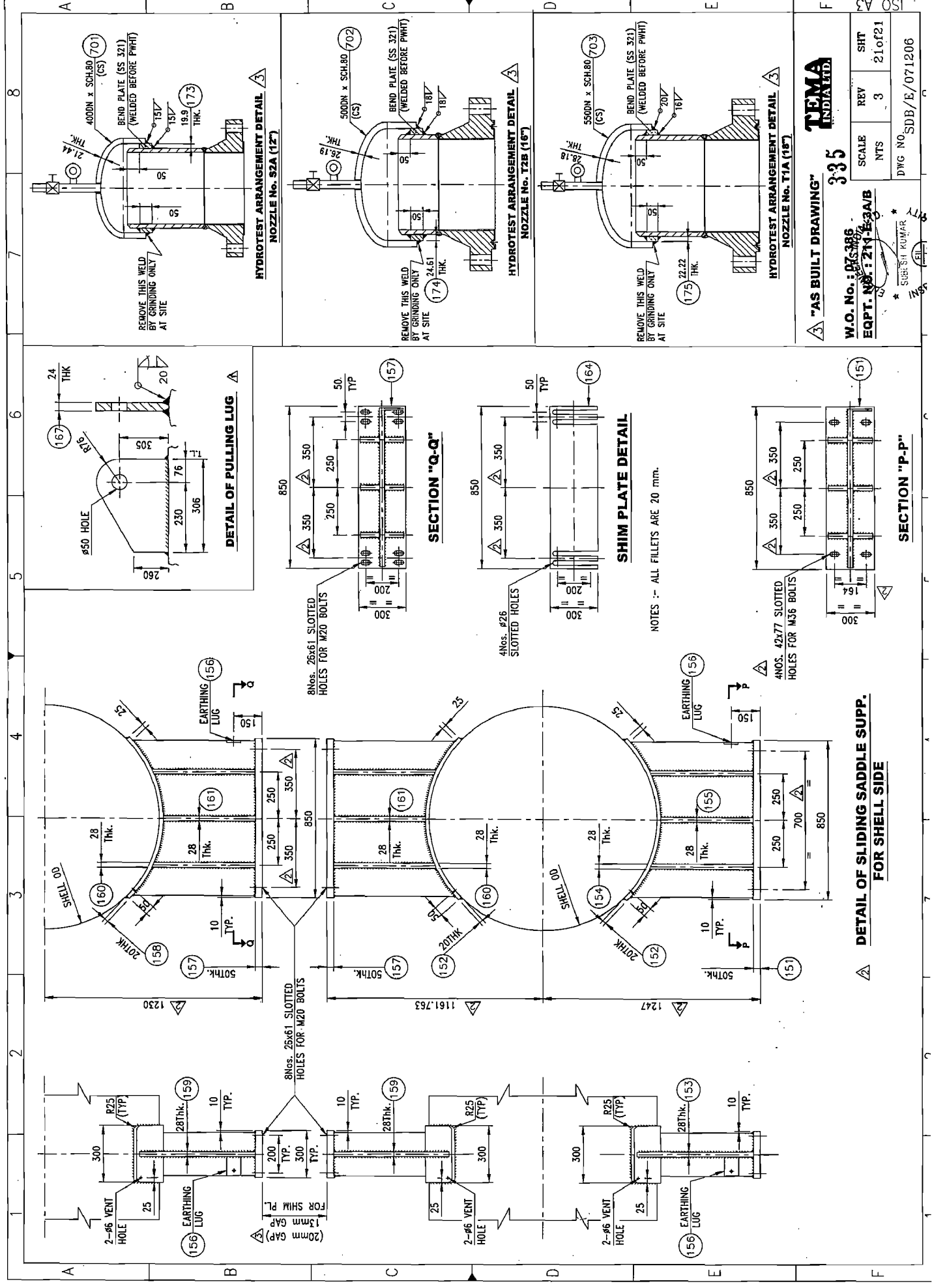
ENGINEERS INDIA LTD.
 SUBSIDIARY OF TEMA INDIA LTD.

INSPECTION AND APPROVAL

SCALE: NTS

REV: 3
 SHT: 20 of 21

DWG NO. SDB/E/071206



DETAIL OF SLIDING SADDLE SUPP. FOR SHELL SIDE

NOTES :- ALL FILLETS ARE 20 mm.

"AS BUILT DRAWING"

W.O. No. : 1076386
 EQPT. NO. : 214-E-34/B

SCALE : NTS

REV : 3

SHT : 21 of 21

DWG NO. : SDB/E/071206

INS : SUBASH KUMAR

TEMA INDIA LTD.

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