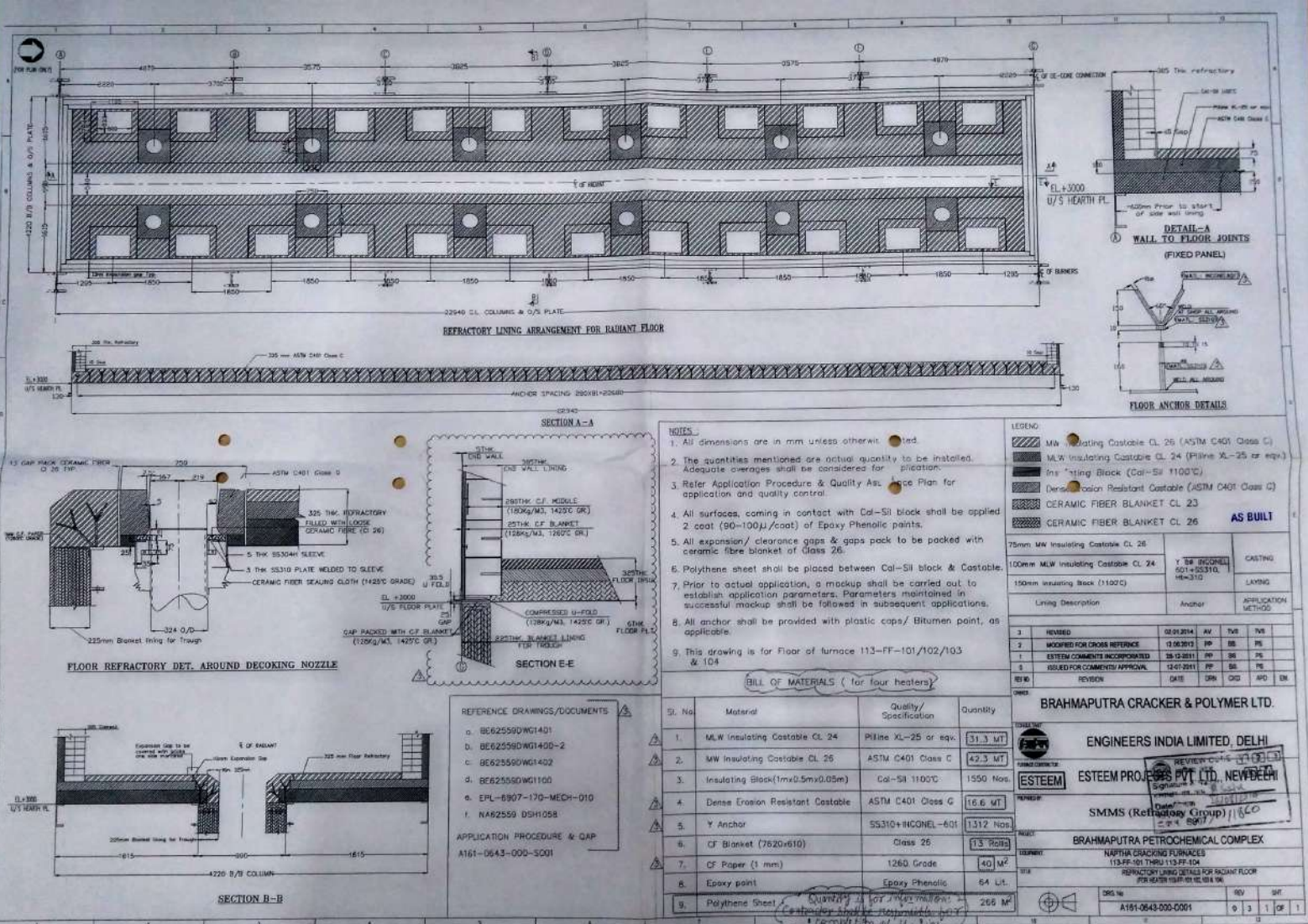




- NOTES**
1. All dimensions are in mm unless otherwise noted.
 2. The quantities mentioned are actual quantity to be installed. Adequate overages shall be considered for application.
 3. Refer Application Procedure & Quality Assurance Plan for application and quality control.
 4. All surfaces, coming in contact with Cal-Sil block & Castable, 2 coat (90-100µ/coat) of Epoxy Phenolic paints.
 5. All expansion/clearance gaps & gaps pack to be packed with ceramic fibre blanket of Class 26.
 6. Polythene sheet shall be placed between Cal-Sil block & Castable.
 7. Prior to actual application, a mockup shall be carried out to establish application parameters. Parameters mentioned in successful mockup shall be followed in subsequent applications.
 8. All anchor shall be provided with plastic caps/ Bitumen point, as applicable.
 9. This drawing is for Floor of furnace 113-FF-101/102/103 & 104.

BILL OF MATERIALS (for four heaters)

Sl. No.	Material	Quality/ Specification	Quantity
1.	MLW Insulating Castable CL 24	Piline XL-25 or eqv.	31.3 MT
2.	MW Insulating Castable CL 26	ASTM C401 Class C	42.3 MT
3.	Insulating Block (1mx0.5mx0.05m)	Cal-Sil 1100°C	1550 Nos.
4.	Dense Erosion Resistant Castable	ASTM C401 Class G	16.6 MT
5.	Y Anchor	SS316+INCONEL-601	1312 Nos.
6.	CF Blanket (7620x610)	Class 26	13.3 Bags
7.	CF Paper (1 mm)	1260 Grade	40 M ²
8.	Epoxy paint	Epoxy Phenolic	64 Lit.
9.	Polythene Sheet	For protection	268 M ²

LEGEND

- MLW Insulating Castable CL 26 (ASTM C401 Class C)
- MLW Insulating Castable CL 24 (Piline XL-25 or eqv.)
- Insulating Block (Cal-Sil 1100°C)
- Dense Erosion Resistant Castable (ASTM C401 Class G)
- CERAMIC FIBER BLANKET CL 23
- CERAMIC FIBER BLANKET CL 26

AS BUILT

75mm MW Insulating Castable CL 26	Y. S. INCONEL 601+SS316, 14x310	CASTING
100mm MLW Insulating Castable CL 24		LAYING
150mm Insulating Block (1100°C)		LAYING

REVISION

REV	NO	REVISION	DATE	BY	CHKD	APPD	EN
1	1	REVISION	02.01.2014	AV	PVS	PVS	
2	2	MODIFIED FOR CROSS REFERENCE	13.06.2013	PP	SS	PS	
3	3	ESTEEM COMMENTS INCORPORATED	25.12.2011	PP	SS	PS	
4	4	ISSUED FOR COMMENTS/ APPROVAL	12.01.2011	PP	SS	PS	

BRAHMAPUTRA CRACKER & POLYMER LTD.

ENGINEERS INDIA LIMITED, DELHI

ESTEEM PROJECTS PVT. LTD., NEW DELHI

SMMS (Refractory Group) 11/16/10

BRAHMAPUTRA PETROCHEMICAL COMPLEX

NAPHTHA CRACKING FURNACES

113-FF-101 THRU 113-FF-104

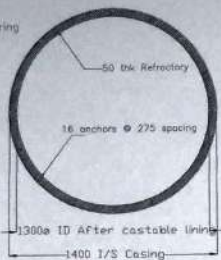
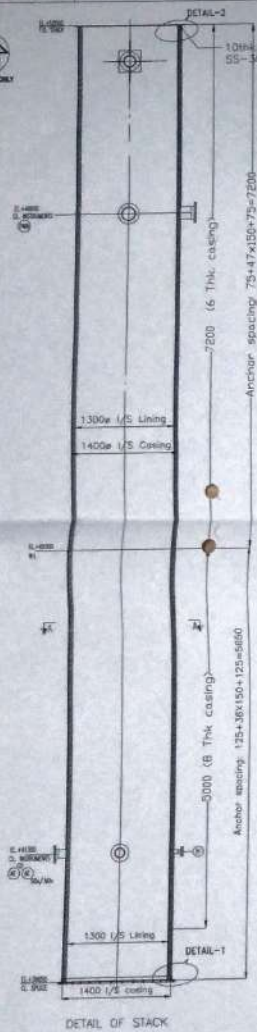
REFRACTORY LINING DETAILS FOR RADIANT FLOOR

FOR HEATER 113-FF-101, 102 & 103

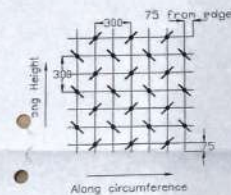
DWG No A161-0643-000-0001 **REV** 0 **SHT** 1 **OF** 1



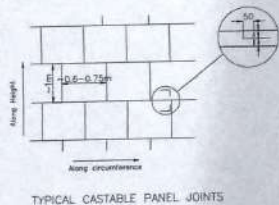
FOR PLUMB ONLY



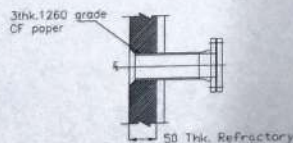
SECTION A - A



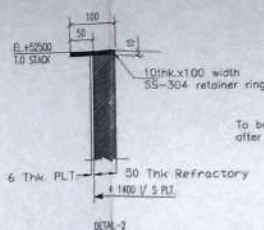
TYPICAL ANCHOR SPACING & WELDING PATTERN



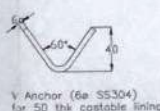
TYPICAL CASTABLE PANEL JOINTS



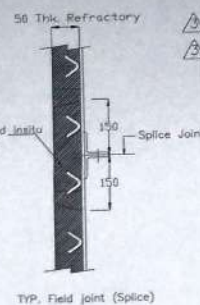
TYPICAL INSTRUMENT CONNECTION



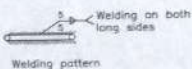
DETAIL-2



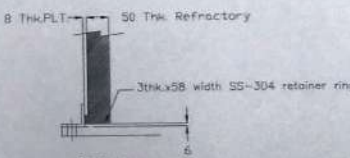
V Anchor (6e SS304) for 50 thk castable lining



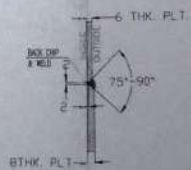
TYP. Field joint (Splice)



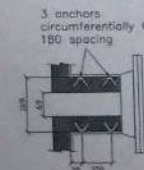
Welding pattern



DETAIL-1



6 THK. PLT



TYPICAL REFRACTORY DETAIL IN PMN CONNECTION

SUMMARY OF MATERIALS (for four vessels)

Sl. No.	Material	Quality/Specification	Quantity
1.	LW Insulating Castable	UHV 1:2:4	14 MT
2.	Anchor V	E dia. SS-304	5450 Nos
3.	Retainer plate (58x3)	SS-304	As per fabrication drawing
4.	Retainer ring (100x10)	SS-304	As per fabrication drawing
5.	CF Paper	1260 Grade	As required
6.	CF Blanket	1260 Grade	1 Roll

Quantity is for information; Contractor shall be responsible for completion of the job.

- NOTES:
- All dimensions are in mm unless otherwise noted.
 - The quantities mentioned are actual quality to be installed. Adequate overages shall be considered for application.
 - Refer Application Procedure & Quality Assurance Plan for application and quality control.
 - Stack segments shall be refractory lined at ground by rotation and heat dried out at 300°C before erection.
 - Castable application at splice joints shall be carried out after erection and welding.
 - All retainer plates shall have 3x36 expansion slot out of exposed edges at 150 centre.
 - Prior to actual application, a mockup shall be carried out to establish application parameters. Parameters mentioned in successful mockup shall be followed in subsequent applications.
 - All metal sleeves passing through refractory lining shall be wrapped with 3mm thk. CF paper 1260°C grade before application.
 - This drawing is for stack of furnace 113-FE-101/102/103 & 104.

50mm LW Insulating Castable	V 6e SS 304, 100x10 mm	CASTING
Lining Description	Anchor	APPLICATION METHOD

REFERENCE DRAWINGS/DOCUMENTS

- BRACSS5580W100
- BRACSS5580W100
- EPL-6907-170MECH-037-A
- EPL-6907-170MECH-037-B
- NAG2558 DSH1058

APPLICATION PROCEDURE & QAP
A161-0843-000-5001
(LEGEND)

LW Insulating Castable (UHV 1:2:4)

AS BUILT

3	REVISED	02.01.2014	RV	TVS	TVS
2	REVISED FOR CROSS REFERENCE	12.06.2013	PP	BS	PS
1	ESTEEM COMMENTS INCORPORATED	23.12.2011	PP	BS	PS
0	ISSUED FOR COMMENTS APPROVAL	08.07.2011	PP	BS	PS
0	REVISED	08/12	BS	BS	BS

BRAMAPUTRA CRACKER & POLYMER LTD.

ENGINEERS INDIA LIMITED, DELHI

ESTEEM PROJECTS PVT. LTD., NEW DELHI

SMMS (REFRACTORY GROUP)

BRAMAPUTRA PETROCHEMICAL COMPLEX

NAPHTHA CRACKING FURNACES

113-FE-101 THRU 113-FE-104

DETAIL OF STACK

113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104

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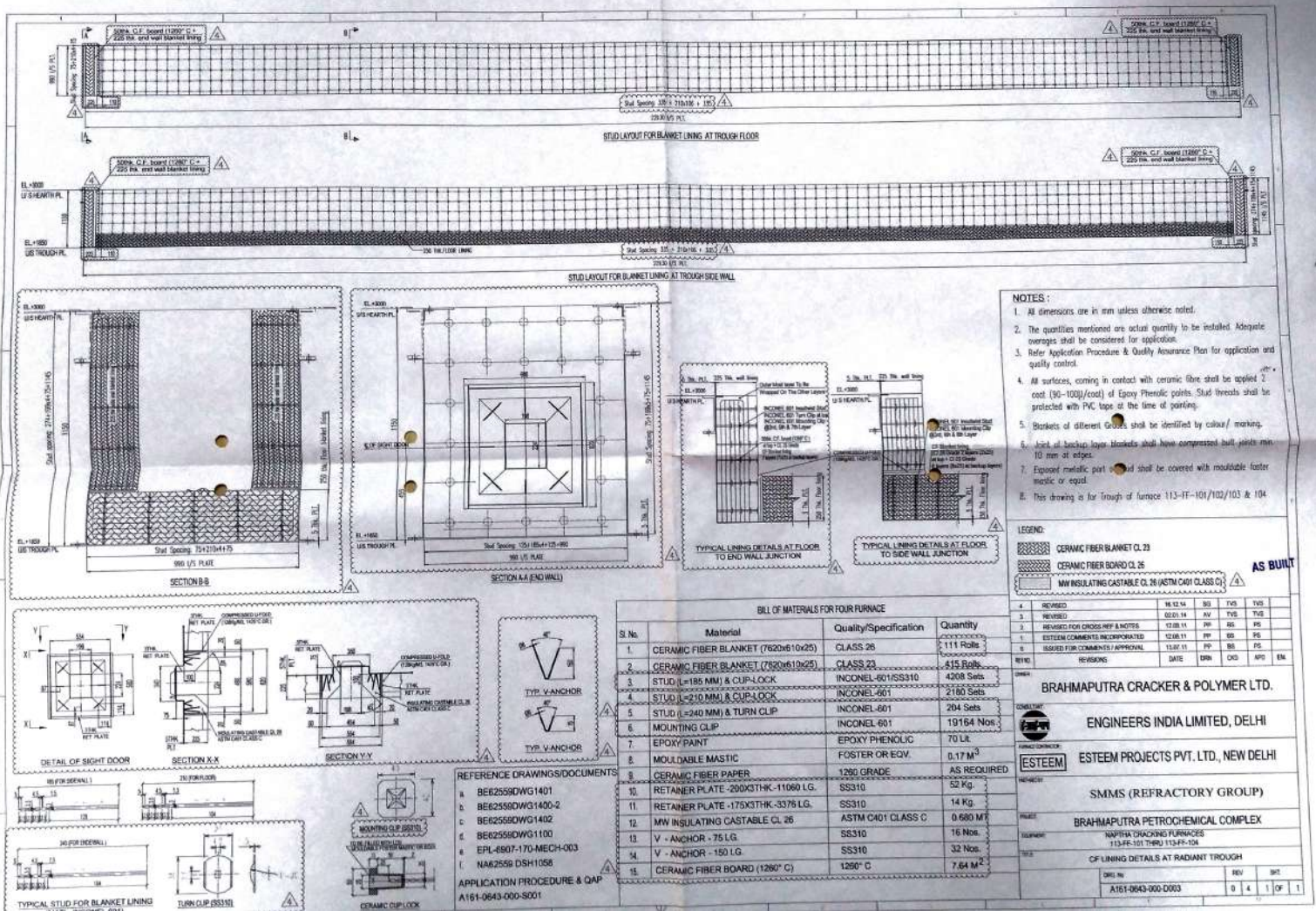
113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104

113-FE-101 THRU 113-FE-104



- NOTES:**
1. All dimensions are in mm unless otherwise noted.
 2. The quantities mentioned are actual quantity to be installed. Adequate overages shall be considered for application.
 3. Refer Application Procedure & Quality Assurance Plan for application and quality control.
 4. All surfaces, coming in contact with ceramic fibre shall be applied 2 coat (90-100/100) of Epoxy Phenolic. Stud threads shall be protected with PVC tape at the time of painting.
 5. Blankets of different Grades shall be identified by colour / marking.
 6. Kind of backup layer blankets shall have compressed built joints min. 10 mm at edges.
 7. Exposed metallic part shall be covered with mouldable leather mastic or equal.
 8. This drawing is for Trough of furnace 113-TT-101/102/103 & 104.

LEGEND:

CERAMIC FIBER BLANKET CL 23	AS BUILT
CERAMIC FIBER BOARD CL 26	
MW INSULATING CASTABLE CL 38 (ASTM C401 CLASS C)	

BILL OF MATERIALS FOR FOUR FURNACE

Sl. No.	Material	Quality/Specification	Quantity
1.	CERAMIC FIBER BLANKET (7620x610x25)	CLASS 26	2111 Rolls
2.	CERAMIC FIBER BLANKET (7620x610x25)	CLASS 23	415 Rolls
3.	STUD (L=185 MM) & CUP-LOCK	INCONEL-601/SS310	4208 Sets
4.	STUD (L=210 MM) & CUP-LOCK	INCONEL-601	2180 Sets
5.	STUD (L=240 MM) & TURN CLIP	INCONEL-601	204 Sets
6.	MOUNTING CLIP	INCONEL-601	19164 Nos.
7.	EPOXY PAINT	EPOXY PHENOLIC	70 LR
8.	MOLDBLE MASTIC	FOSTER OR EQV.	0.17 M ³
9.	CERAMIC FIBER PAPER	1296 GRADE	AS REQUIRED
10.	RETAINER PLATE -200X3THK-11060 LG.	SS310	52 Kg.
11.	RETAINER PLATE -175X3THK-3376 LG.	SS310	14 Kg.
12.	MW INSULATING CASTABLE CL 26	ASTM C401 CLASS C	0.680 M ³
13.	V - ANCHOR - 75 LG.	SS310	16 Nos.
14.	V - ANCHOR - 150 LG.	SS310	32 Nos.
15.	CERAMIC FIBER BOARD (1280° C)	1280° C	7.64 M ²

REFERENCE DRAWINGS/DOCUMENTS

- a. BEK2558DWG1401
- b. BEK2558DWG1400-2
- c. BEK2558DWG1402
- d. BEK2558DWG1100
- e. EPL-6807-170-MECH-003
- f. NAK2558 DSH1058

APPLICATION PROCEDURE & QAP
A161-0643-000-S001

AS BUILT

REVISIONS

NO.	REVISION	DATE	BY	CHKD	APPD	ENR.
1	ISSUED FOR CROSS CHECK & NOTES	12.08.11	PP	BS	PS	
2	ISSUED FOR COMMENTS / APPROVAL	11.07.11	PP	BS	PS	

CONTRACTOR: BRAHMAPUTRA CRACKER & POLYMER LTD.

ENGINEERS: ENGINEERS INDIA LIMITED, DELHI

CLIENT: ESTEEM PROJECTS PVT. LTD., NEW DELHI

PROJECT: SMMS (REFRACTORY GROUP)

LOCATION: BRAHMAPUTRA PETROCHEMICAL COMPLEX

UNIT: NAPPRA CRACKING FURNACES 113-FE-101 THRU 113-FE-104

CF LINING DETAILS AT RADIANT TROUGH

DATE: A161-0643-000-D003

REV: 0 4 1 OF 1

1. ☐ Altering name of firm without affecting liability
 2. General surface work is possible between refractory lining. Refer Application Procedure & Quality Assurance Plan for application
 3. Expansion joints are to follow size of bricks (210)

4. Bricks employed in low temperature setting. The bricks should be of the following size: (1000x1000x1000)

5. Bricks of light shades are to be used up to max temp. per day (1000)

REFERENCE LITERATURE (DRAWING):

104.753.000 - F100
 104.753.000 - A000
 104.753.000 - F100

REFERENCE REFRACTORY DRAWINGS & PROCEDURE:

1.01.1.004.3-0001-0001 Refractory brickwork
 1.01.1.004.3-0002-0002 Refractory brickwork
 1.01.1.004.3-0003-0003 Refractory brickwork
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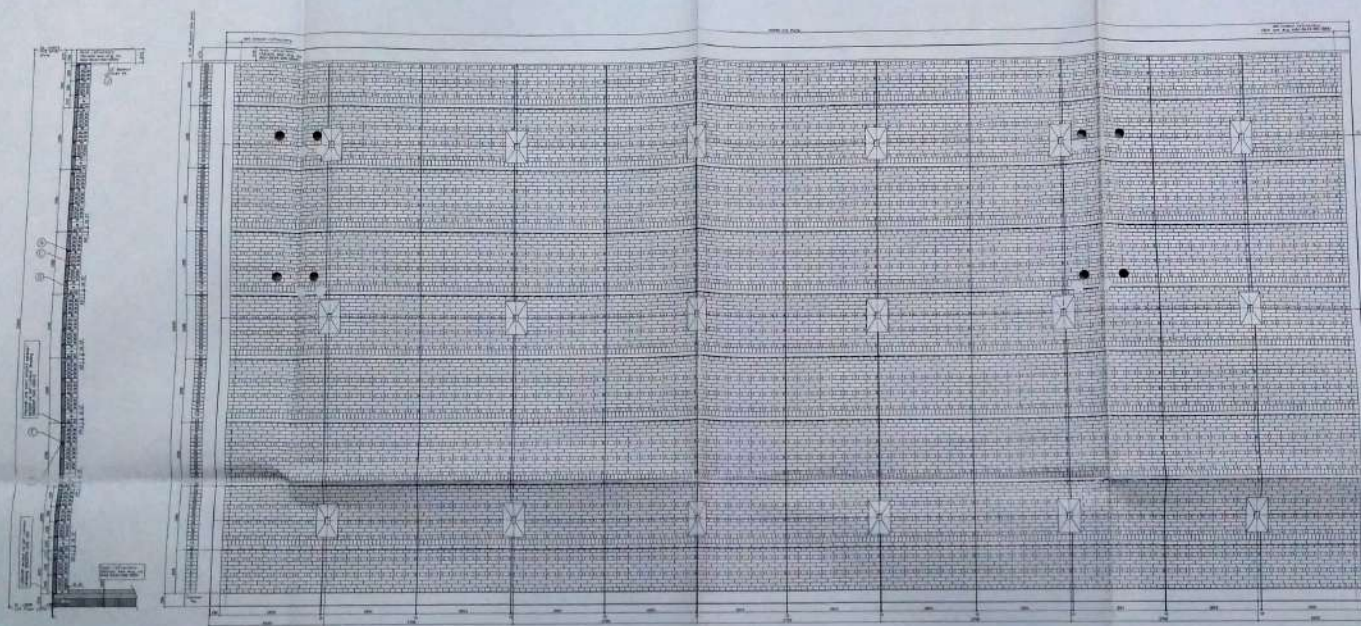
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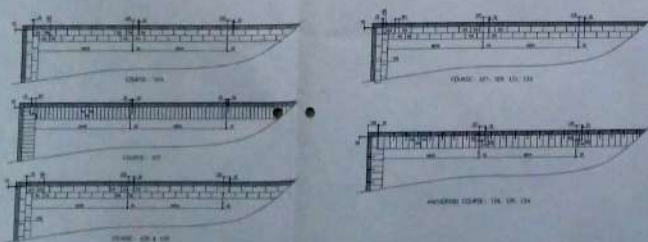
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BRICK COURSES IN ONE SPAN



NOTES

1. All dimensions are in mm, unless otherwise noted.
2. Internal surface shall be pointed before refractory lining. Refer Application Procedure & Quality Assurance Plan for installation and quality control.
3. Expansion gaps to be filled with CF blankets (J.26).
4. Bricks marked 'A' are anchored with casting by brick shape (Item-X, Dry, 0000).
5. Bricks at right doors are not to slope at site (ref. dry, 0000).

REFERENCE LUMAS DRAWINGS

HEC255 DWG 1103
HEC259 DWG 1405-1
HEC259 DWG 1405-2
HEC259 DWG 1401

REFERENCE REFRACTORY DRAWINGS & PROCEDURE

(ITEM) (A151-0643-000-0001) Agglomerate procedure
A151-0643-000-0001 Refractory floor of brick
A151-0643-000-0002 Refractory wall on brick
A151-0643-000-0003 Refractory wall
A151-0643-000-0004 Refractory wall
A151-0643-000-0005 Refractory wall
A151-0643-000-0006 Refractory wall

LEGEND

- 1 Insulating Firebrick C.26
- 2 Insulating Firebrick C.23
- 3 Insulating Brick (Cell-26 1100°C)

NO.	REVISION	DATE	BY	CHKD	APPD	SM
1	REVISED & ISSUED FOR APPROVAL	12.06.2012	PT	GS	PS	
2	ISSUED FOR COMMENTS APPROVAL	21.06.2012	PT	PS	PS	

CONTRACTOR **BRAHMAPUTRA CRACKER & POLYMER LTD.**

ENGINEERS INDIA LIMITED, DELHI

ESTEEM **ESTEEM PROJECTS PVT. LTD., NEW DELHI**

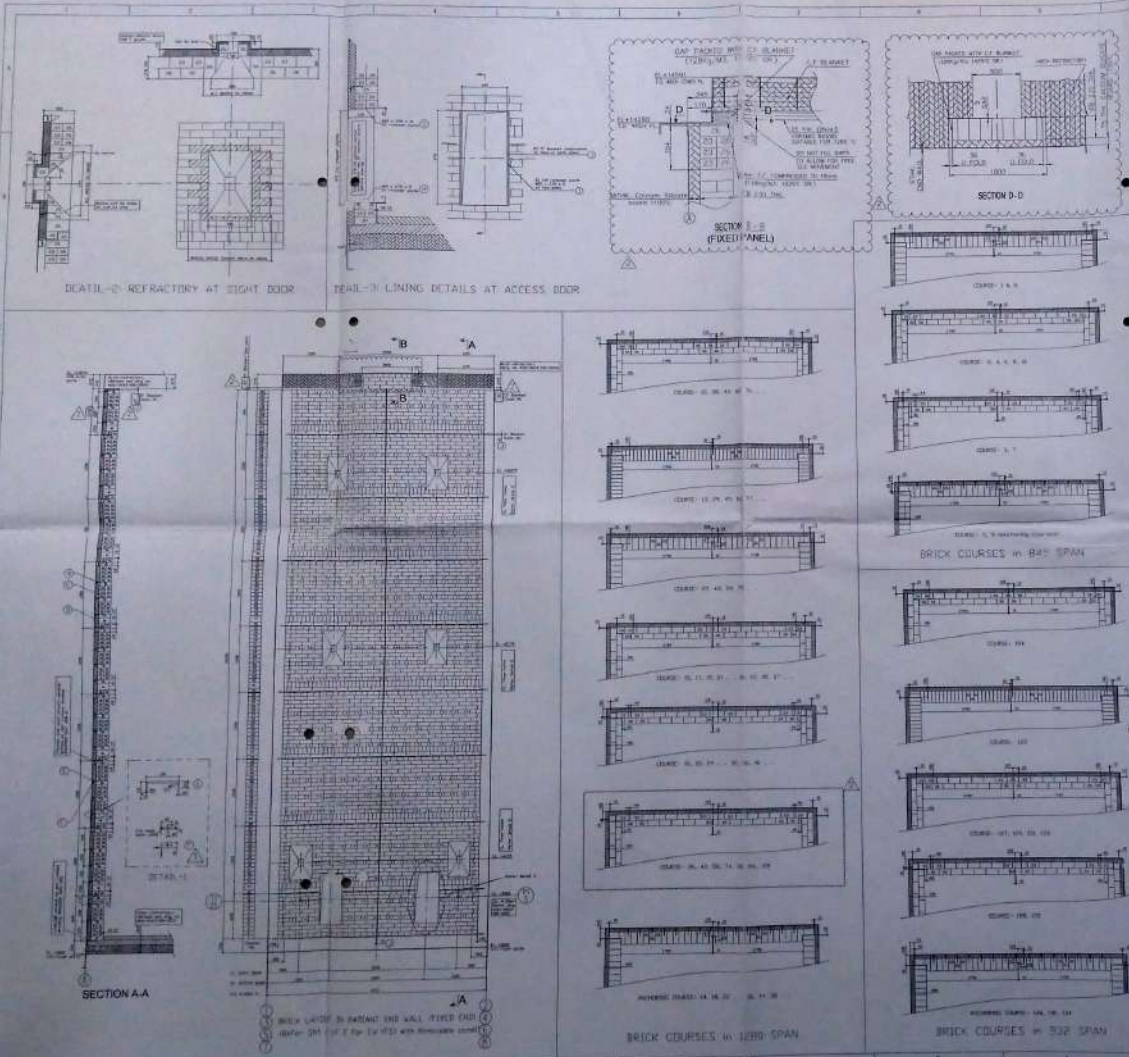
DESIGNED BY **SMMS (Refractory Group)**

PROJECT **BRAHMAPUTRA PETROCHEMICAL COMPLEX**

LOCATION **NAPHER CRACKING FURNACE**

ITEM **REFRACTORY DETAILS FOR REFRACTORY SIDEWALL IN UNIT 1 & 1.4.8**

DWG NO.	REV	BY	CHKD
A151-0643-000-0005	01	PT	GS



(BILL OF MATERIALS)

FOR BRICK LIVING IN REFRACTORY WALLS & FURNACES IN FOUR FURNACES

ITEM	DETAILS	REFERENCE	QTY	UNIT
A	FR 28 Green 230x110x75	MS25500011000	12.470	sqm
B	FR 28 Green 230x110x75	MS25500011000	12.470	sqm
C	FR 33 Green 230x110x75	MS25500011000	12.470	sqm
D	Refractory Slab 1100x1100 Grade 1000/200/40	MS25500011000	12.470	sqm
E	Refractory Slab 1100x1100 Grade 1000/200/40	MS25500011000	12.470	sqm
F	Refractory Slab 1100x1100 Grade 1000/200/40	MS25500011000	12.470	sqm
G	SS 310 plate 400x275x10	Detail-3	24	pc
H	SS 310 plate 400x275x10	Detail-3	24	pc
I	SS 310 plate 400x275x10	Detail-3	24	pc
J	CF Wetcast 1000/200/40	Detail-3	145	sqm
K	Mortar	Detail-3	145	sqm
L	SS 310 plate 400x275x10	Detail-3	24	pc
M	SS 310 plate 400x275x10	Detail-3	24	pc
N	SS 310 plate 400x275x10	Detail-3	24	pc
O	SS 310 plate 400x275x10	Detail-3	24	pc
P	SS 310 plate 400x275x10	Detail-3	24	pc
Q	SS 310 plate 400x275x10	Detail-3	24	pc
R	SS 310 plate 400x275x10	Detail-3	24	pc
S	SS 310 plate 400x275x10	Detail-3	24	pc
T	SS 310 plate 400x275x10	Detail-3	24	pc
U	SS 310 plate 400x275x10	Detail-3	24	pc
V	SS 310 plate 400x275x10	Detail-3	24	pc
W	SS 310 plate 400x275x10	Detail-3	24	pc
X	SS 310 plate 400x275x10	Detail-3	24	pc
Y	SS 310 plate 400x275x10	Detail-3	24	pc
Z	SS 310 plate 400x275x10	Detail-3	24	pc

NOTES:

- All dimensions are in mm unless otherwise noted.
- Internal surfaces shall be painted before refractory lining. Refer Application Procedure & Quality Assurance Plan for application and quality control.
- Expansion gaps to be filled with CF slabs 1000/200/40.
- Bricks marked 'A' are anchored with casting by brick staple (Item-E, Dwg. 1000/200/40).
- Shells of sight covers are cut to shape of site (Ref. Dwg. 1000/200/40).
- Refer Drawing 1000/200/40 for EW (15) with removable panel and BOM concerning CF materials.
- Quantities mentioned in B.O.M. are as indicated.

REFERENCE: LUMAS DRAWINGS

REFERENCE: REFRACTORY DRAWINGS & PROCEDURE

A161-0643-000-0001: Application procedure
A161-0643-000-0002: Refractory floor CF lining
A161-0643-000-0003: Refractory trough CF lining
A161-0643-000-0004: Refractory skirt on Grid-2, 3, 4, 5, 6
A161-0643-000-0005: Refractory skirt on Grid-1, 2, 3, 4, 5, 6
A161-0643-000-0006: Refractory skirt on Grid-1, 2, 3, 4, 5, 6
A161-0643-000-0007: Refractory skirt on Grid-1, 2, 3, 4, 5, 6
A161-0643-000-0008: Refractory skirt on Grid-1, 2, 3, 4, 5, 6

LEGEND:

- FR 28 Green 230x110x75
- FR 33 Green 230x110x75
- Refractory Slab 1100x1100 Grade 1000/200/40
- SS 310 plate 400x275x10
- CF Wetcast 1000/200/40
- Mortar

REVISION:

NO.	REVISION	DATE	BY	CHK	APP
1	ISSUED FOR COMMENTS APPROVAL	06/11/2013	PP	BA	PS
2	REVISION	06/11/2013	PP	BA	PS

APPROVED:

DATE: 06/11/2013

BY: PP

CHK: BA

APP: PS

BRAMHAPUTRA CRACKER & POLYMER LTD.

ENGINEERS INDIA LIMITED, DELHI

ESTEEM PROJECTS PVT. LTD., NEW DELHI

SMMS (Refractory Group)

BRAMHAPUTRA PETROCHEMICAL COMPLEX

150-2F-501 THRU 150-2F-104

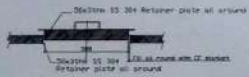
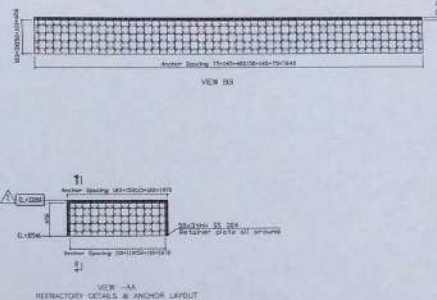
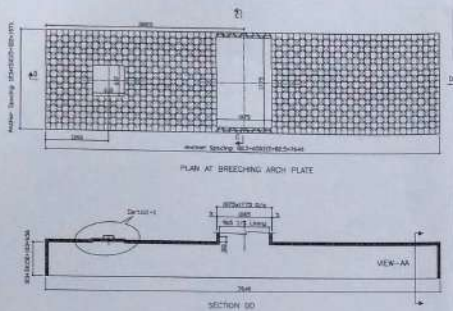
REFRACTORY DETAILS FOR ROCKET BURNAL IN GRID A & B FOR HEATER 150-2F-101, 102, 103, 104

DATE: 06/11/2013

BY: PP

CHK: BA

APP: PS



REFERENCE DRAWINGS/DOCUMENTS

- BO625590WG1440-1
- BO625590WG1440-2
- BE625590WG1401
- BE625590WG1402
- BE625590WG1100
- EPL-6907-170MECH-010
- 6907-113-05-42-SK-01
- NA62559 DSH1058

APPLICATION PROCEDURE & QAP
A161-0643-000-9001

NOTES

- All dimensions are in mm unless otherwise stated.
- The quantities mentioned are actual quantity to be installed. Adequate overages shall be considered for application.
- Refer Application Procedure & Quality Assurance Plan for application and quality control.
- All expansion/ clearance gaps & gaps pack to be packed with ceramic fibre blanket of Class 26.
- Polythene sheet shall be placed between Cal-Sil block & Castable.
- Prior to actual application, a mockup shall be carried out to establish application parameters. Parameters maintained in successful mockup shall be followed in subsequent applications.
- All anchor shall be provided with plastic caps/ Bitumen paint, as applicable.
- This drawing is for Breaching of Furnace 113-FF-101/102/103 & 104. Quantity to be for information only. It shall be responsible for completion of the job.

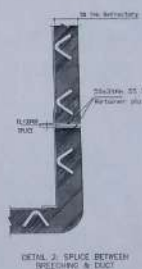
BILL OF MATERIALS (for four heaters)

Sl. No.	Material	Quality/ Specification	Quantity
1.	LW Insulating Castable	LHV 1:2:4 OR EQV.	5.64 MT
2.	V Anchor	Gr. SS304	5748 Nos
3.	CF Blanket (7520x610)	Class 26	1 Roll
4.	CF Paper (1 mm)	1260 Grade	As reqd

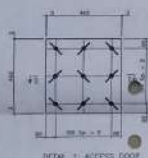
LEGEND:
LW Insulating Castable (LHV 1:2:4 or equivalent)



50mm LW Insulating Castable	Gr. SS304 V, H=37	CASTING
Listing Description	Anchor	APPLICATION METHOD
AS BUILT		
1. PERMITTED	16.01.2014	AV TNS TNS
2. ISSUED FOR COMMENTS/ APPROVAL	16.01.2014	PP SS PE
REVISION	DATE	DRN QCD AFD EN
BRAHMAPUTRA CRACKER & POLYMER LTD.		
ENGINEERS INDIA LIMITED, DELHI		
ESTEEM PROJECTS PVT. LTD., NEW DELHI		
SMMS (Refractory Group)		
BRAHMAPUTRA PETROCHEMICAL COMPLEX		
NAPHTHA CRACKING FURNACES		
113-FF-101 THROUGH 113-FF-104		
REFRACTORY LAYOUT DETAILS FOR BREACHING OF 113-FF-101 TO 113-FF-104		
DRG No.	REV	SHR
A161-0643-000-0010	0	1



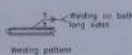
DETAIL 2: SPACE BETWEEN
SPRINKLING & DUCT



DATA: 1. APTSE



V Anchor (ba SS104)
for SS the castable lining

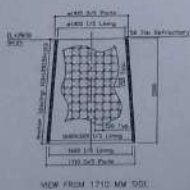


Weaving pattern

REFRACTORY & ANCHOR DETAIL FOR DUCT BETWEEN BREACHING AND ID FAN



DOI: 10.1002/for



VIEW FROM 1210 MW SDR.

REFRACTORY & ANCHOR DETAIL FOR DUCT BETWEEN ID FAN AND STACK

1. All dimensions are in mm unless otherwise noted.
2. The quantities mentioned are actual quantities to be installed. Adequate overages shall be considered for application.
3. Refer Application Procedure & Quality Assurance Plan for application and quality control.
4. All expansion/clearance gaps & gaps back to be packed with ceramic fibre blanket of Class 20.
5. Polyurethane sheet shall be placed between Co-Sil block & Castable.
6. Prior to actual application, a mockup shall be carried out to establish application parameters. Parameters mentioned in successful mockup shall be followed in subsequent applications.
7. All anchor shall be provided with plastic caps. Blunten point, as applicable.
8. Some approximations have been taken in draft dimension as actual dimension is not shown in reference drawing. Anchor spacing will be plotted at all site as per actual dimension.

(BILL OF MATERIALS (for four heaters))

Sl. No	Material	Quality/ Specification	Quantity
1.	LW Insulating Costable	100% 1-2.4 OR EQV	5 m
2.	V. Anchor	6a, SS304	5780 Nos
3.	CF Blanket (7620x610)	Class 36	1 Nos
4.	CF Paper (1 mm)	1260 Grade	As reqd
Overallly it is for super-maid, contractor should be responsible for the completion job.			

REFERENCE DRAWINGS/DOCUMENTS

- a. BD62559DWG1440-1
b. BD62559DWG1440-2
c. BD62559DWG1401
d. BD62559DWG1402
e. BD62559DWG1100
f. ID FAN DRG NO: 176338
g. EPL-6907-170MECH-010
h. 6907-113-05-42-SK-01
i. NA62558 DS41058

APPLICATION PROCEDURE & GAP
A161-0643-DDD-S001

1W (Rating: Costable (LHV 1:2.4 or equivalent))

50mm LW bounding distance 60 55304 V,
18-77

Using Description	Anchor
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2	REVISED	02-21-2014	AV	TYS	TYS
1	MODIFIED AS COMMENTED	11-11-2012	FP	BB	PS
0	ISSUED FOR COMMENTS/ APPROVAL	26-10-2012	FP	BB	PS
REV#	REVISION	DATE	DRN	CD	APD

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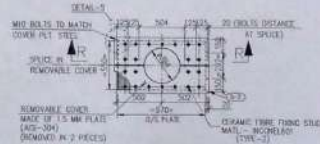
ESTEEM ESTEEM PROJECTS PVT. LTD., NEW DELHI

SMMS (Refractory Group)

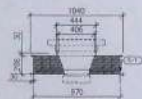
BRAHMAPUTRA PETROCHEMICAL COMPLEX

112	RETRACTOR LIFTING DETAILS OF DUCT BETWEEN BRUSHING AND STACK
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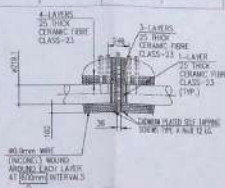
	ÖZGEÇMİŞİ	Adı	Öğrenim



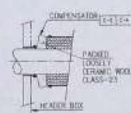
SECTION M-M



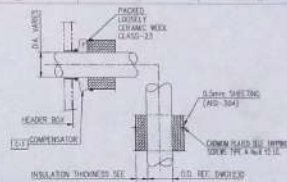
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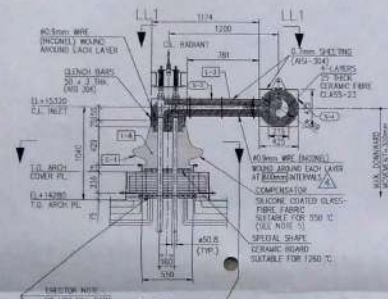
DETAIL-2



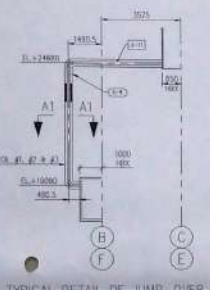
TYPICAL DETAIL OF COMPENSATOR FOR CROSS-OVER & DE-SUPERHEATER



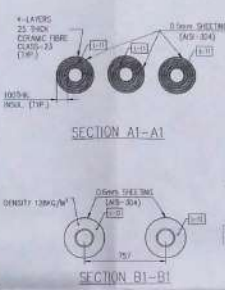
TYPICAL DETAIL OF COMPENSATOR FOR CONV. JUMPOVERS



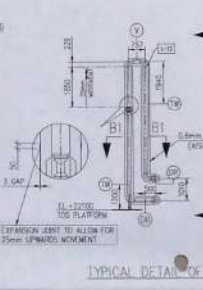
SECTION L-L



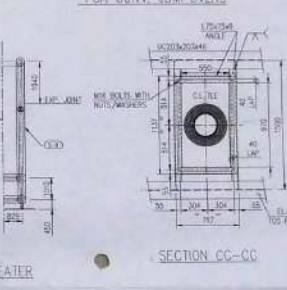
TYPICAL DETAIL OF JUMP-OVER



SECTION A1-A1



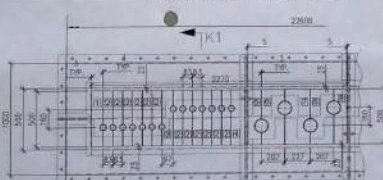
TYPICAL DETAIL OF DE-SUPERHEATER



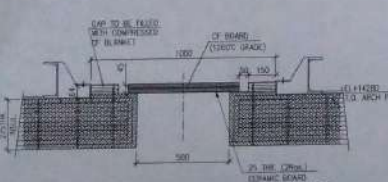
SECTION CC-CC



DETAIL-6



C.F. BOARD ARRANGEMENT DETAILS ON ARCH COVER PLATE



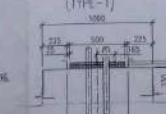
DETAIL-5



CERAMIC FIBRE FIXING STUD (TYPE-1)

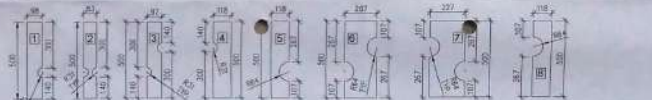


CERAMIC FIBRE FIXING STUD (TYPE-2)



SECTION K1-K1

MOUNTING CLIP

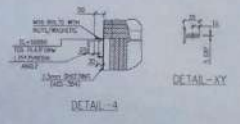


C.F. BOARD CUTTING DIMENSIONS (REFER NOTE - 7)

AS BUILT

REV	REVISION	DATE	BY	CHK	APP	SR
1	REVISED AS MARKED	26-08-14	SS	AV	TVS	
2	REVISED AS MARKED	26-08-14	SS	AV	TVS	
3	REVISED AS MARKED	26-08-14	SS	AV	TVS	
4	REVISED AS MARKED	26-08-14	SS	AV	TVS	
5	REVISED AS MARKED	26-08-14	SS	AV	TVS	
6	REVISED AS MARKED	26-08-14	SS	AV	TVS	
7	REVISED AS MARKED	26-08-14	SS	AV	TVS	
8	REVISED AS MARKED	26-08-14	SS	AV	TVS	
9	REVISED AS MARKED	26-08-14	SS	AV	TVS	
10	REVISED AS MARKED	26-08-14	SS	AV	TVS	

BRAHMAPUTRA CRACKER & POLYMER LTD.						
ENGINEERS INDIA LIMITED, DELHI						
ESTEEM PROJECTS PVT. LTD., NEW DELHI						
InSteel Engineers Pvt. Ltd., Mumbai						
BRAHMAPUTRA PETROCHEMICAL COMPLEX						
NAPHTHA CRACKING FURNACES						
113-FE-101 THRU 113-FE-104						
INSULATION DETAILS						
SCALE	1:50	DATE	26-08-14	BY	SS	
FILE NO.	EPL-6907-170-INS-001	REV	1	CHK	AV	



INSULATION

Description	Item No.	Tag No.	Type of Insulation	Thickness of Insulation in mm	No. of layers	Area of Insulation (sqm)	No. & Per Header	No. of Joints	Total Area of Insulation (sqm)	Volume of Insulation (m³)
Radiant Cold Outlet After Arch	L-1		Ceramic Fibre Class-23	25	8	0.44	6	4	85.10	
	L-5A		Ceramic Fibre Class-23	25	1	0.67	6	4	48.27	
	L-6B		Ceramic Fibre Class-23	25	4	1.08	6	4	133.57	
	L-6C		Ceramic Fibre Class-23	25	3	0.65	12	4	86.88	
	L-6D		Ceramic Fibre Class-23	25	1	1.54	6	4	36.46	
Radiant Cold Outlet After Arch	L-6D		Ceramic Fibre Class-23	25	3	0.57	24	4	152.85	
	L-6		Loosely packed ceramic wool	25	1	2.53	6	4	58.37	
	L-6		Loosely packed ceramic wool	125	1	0.38	6	4	9.15	1.60
	L-7		Ceramic Fibre Board	25	2	0.39	6	4	21.27	
	L-7A		Ceramic Fibre Board	25	1	0.55	12	4	32.37	
Arch Cover Plate	L-1A		Ceramic Fibre Class-23	35	10	31.95	1	4	523.69	
	L-1A		Ceramic Fibre Class-23	35	1	59.88	1	4	233.82	
	L-1B		Ceramic Fibre Board	25	2	12.18	1	4	100.30	
	L-1B		Ceramic Fibre Class-23	25	4	3.84	8	4	99.15	
	L-1		Ceramic Fibre Class-23	25	3	3.99	12	4	531.95	
Finger Tubes	L-6		Loosely packed ceramic wool	500	1	0.96	12	4	31.68	15.94
	L-1A		Ceramic Fibre Board	25	4	21.27	2	4	86.72	
	L-1B		Ceramic Fibre Board	35	4	17.26	2	4	527.21	
	L-1C		Ceramic Fibre Class-23	25	4	18.38	2	4	586.42	
	L-1D		Ceramic Fibre Class-23	25	2	2.34	2	4	74.86	
Crossover Tubes	L-1E		Ceramic Fibre Class-23	25	4	3.30	2	4	109.67	
	L-1E		Ceramic Fibre Class-23	25	4	3.80	2	4	121.70	
	L-11		Ceramic Fibre Class-23	25	4	9.80	8	4	748.64	
	L-12		Mineral Wool	100	1	13.82	8	4	52.76	5.21
	L-12		Mineral Wool	120	1	37.89	8	4	904.27	168.91
Crossover Tubes	L-12		Mineral Wool	80	1	26.81	1	4	114.44	3.72
	L-12		Mineral Wool	120	1	66.16	1	4	294.69	31.78
	L-12		Mineral Wool	100	1	18.40	2	4	147.17	14.72
	L-12		Mineral Wool	100	1	17.91	2	4	136.10	13.61
	L-12		Mineral Wool	100	1	16.89	2	4	133.55	13.56
Riser & Downcomer Pipes	L-12		Mineral Wool	100	1	11.42	2	4	51.37	5.91
	L-12		Mineral Wool	100	1	10.41	2	4	83.30	0.63
	L-12		Mineral Wool	100	1	8.62	2	4	70.57	0.71
	L-12		Mineral Wool	100	1	35	1	4	100	5.0
	L-12		Mineral Wool	100	1	35	1	4	100	5.0

CLADDING

Description	Item No.	Tag No.	Material	Thickness in mm	No. & Per Header	No. of Joints	Total Area of Cladding (sqm)	Volume of Cladding (m³)
Radiant Cold Outlet After Arch	R-1		Sheeting (AISI-304)	1.5	1	7.73	6	185.48
	R-2		Sheeting (AISI-304)	1.5	1	0.87	6	16.69
	R-3		Sheeting (AISI-304)	0.7	1	3.65	12	177.08
	R-4		Sheeting (AISI-304)	0.7	1	6.48	6	166.81
	R-5		Sheeting (AISI-304)	0.7	1	2.41	12	119.58
Crossover	Pipes #1 & #4		Sheeting (AISI-304)	0.7	1	32.55	2	263.13
	Pipes #1 & #6		Sheeting (AISI-304)	0.7	1	27.25	2	218.08
	Pipes #2 & #5		Sheeting (AISI-304)	0.7	1	28.81	2	214.48
	Pipes #3 & #4		Sheeting (AISI-304)	0.7	1	11.03	6	264.65
	Pipes #3 & #5		Sheeting (AISI-304)	0.7	1	0.52	6	15.54
Jumpover	Cover Colls To HX		Substrate Compensator (only at HX & Casing)	0.5	1	0.48	4	71.85
	Cover Colls To HX		Sheeting (AISI-304)	0.5	1	17.98	1	27.91
	Cover Colls To HX		Substrate Compensator (only at HX & Casing)	0.5	1	0.52	2	4.18
	Cover Colls To HX		Sheeting (AISI-304)	0.7	1	42.78	6	107.02
	Cover Colls To HX		Sheeting (AISI-304)	0.7	1	28.81	1	114.44
De-superheater	TLE To Steam Drum		Aluminum Cladding	0.7	1	71.06	1	254.21
	TLE To Steam Drum		Aluminum Cladding	0.7	1	29.25	2	350.02
	TLE To Steam Drum		Aluminum Cladding	0.7	1	29.35	2	186.83
	TLE To Steam Drum		Aluminum Cladding	0.7	1	22.82	2	193.15
	TLE To Steam Drum		Aluminum Cladding	0.7	1	13.88	2	125.43
Over Sea Oil Fan & Bleedoff	TLE To Steam Drum		Aluminum Cladding	0.7	1	14.28	2	114.38
	TLE To Steam Drum		Aluminum Cladding	0.7	1	12.11	2	88.87
	TLE To Steam Drum		Aluminum Cladding	1	1	25.00	1	180.08
	TLE To Steam Drum		Aluminum Cladding	0.7	1	14.28	2	114.38
	TLE To Steam Drum		Aluminum Cladding	0.7	1	12.11	2	88.87

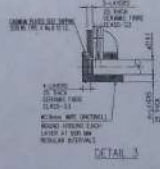
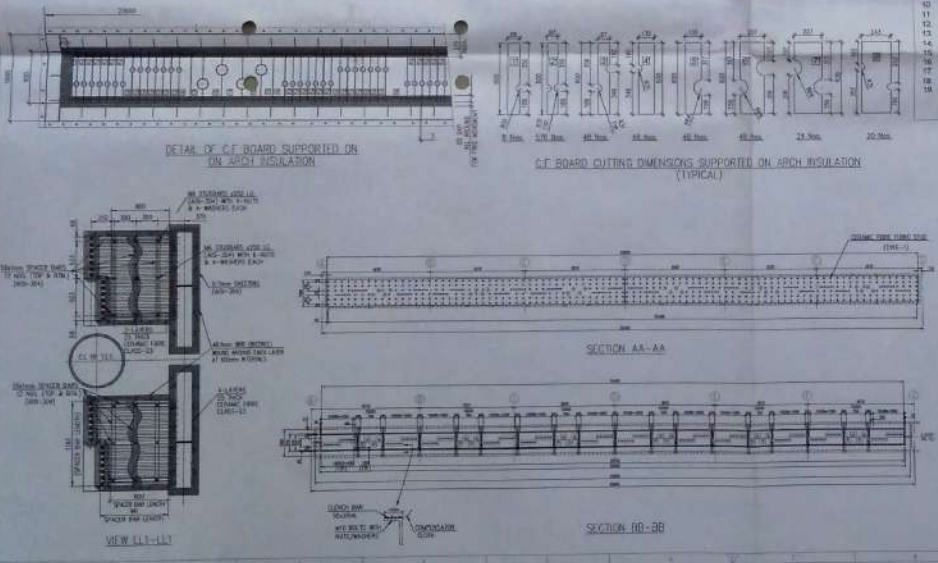
MISCELLANEOUS

1. CERAMIC FIBRE BOARD (TYPE 1) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
2. SPACER BAR (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
3. SPACER BAR (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
4. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
5. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
6. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
7. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
8. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
9. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
10. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
11. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
12. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
13. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
14. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
15. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
16. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
17. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
18. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
19. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.
20. STUDS (W/ 40mm x 10mm x 10mm) - 100 mm, EACH WITH 3 MOUNTING CLIPS.

NOTE: Self Tapping Screws shall be Stainless Steel Cadmium Plated Screws Type A No 8 12 LG.

DETAIL OF C.F. BOARD SUPPORTED ON ARCH INSULATION

C.F. BOARD CUTTING DIMENSIONS SUPPORTED ON ARCH INSULATION (TYPICAL)



AS BUILT

NO.	REVISION	DATE	BY	CHKD	APPD
1	REVISED AS BUILT	28.09.18	SD	TVS	PVS
2	REVISED AS BUILT	28.09.18	SD	AV	PVS
3	REVISED AS BUILT	14.05.18	SD	AV	PVS
4	INTERNAL REVISION	22.11.15	AV	SD	PVS
5	REVISED AS BUILT	19.02.15	SD	DC	PVS
6	REVISED FOR APPROVAL	31.12.12	SD	OK	PVS
7	REVISED FOR APPROVAL	31.12.12	SD	OK	PVS

BRAHMAPUTRA CRACKER & POLYMER LTD.

ENGINEERS INDIA LIMITED, DELHI

ESTEEM PROJECTS PVT. LTD., NEW DELHI

InSteel Engineers Pvt. Ltd., Mumbai

BRAHMAPUTRA PETROCHEMICAL COMPLEX

NAPHTHA CRACKING FURNACES

INSULATION DETAILS

EPL-4807-170-HIS-001