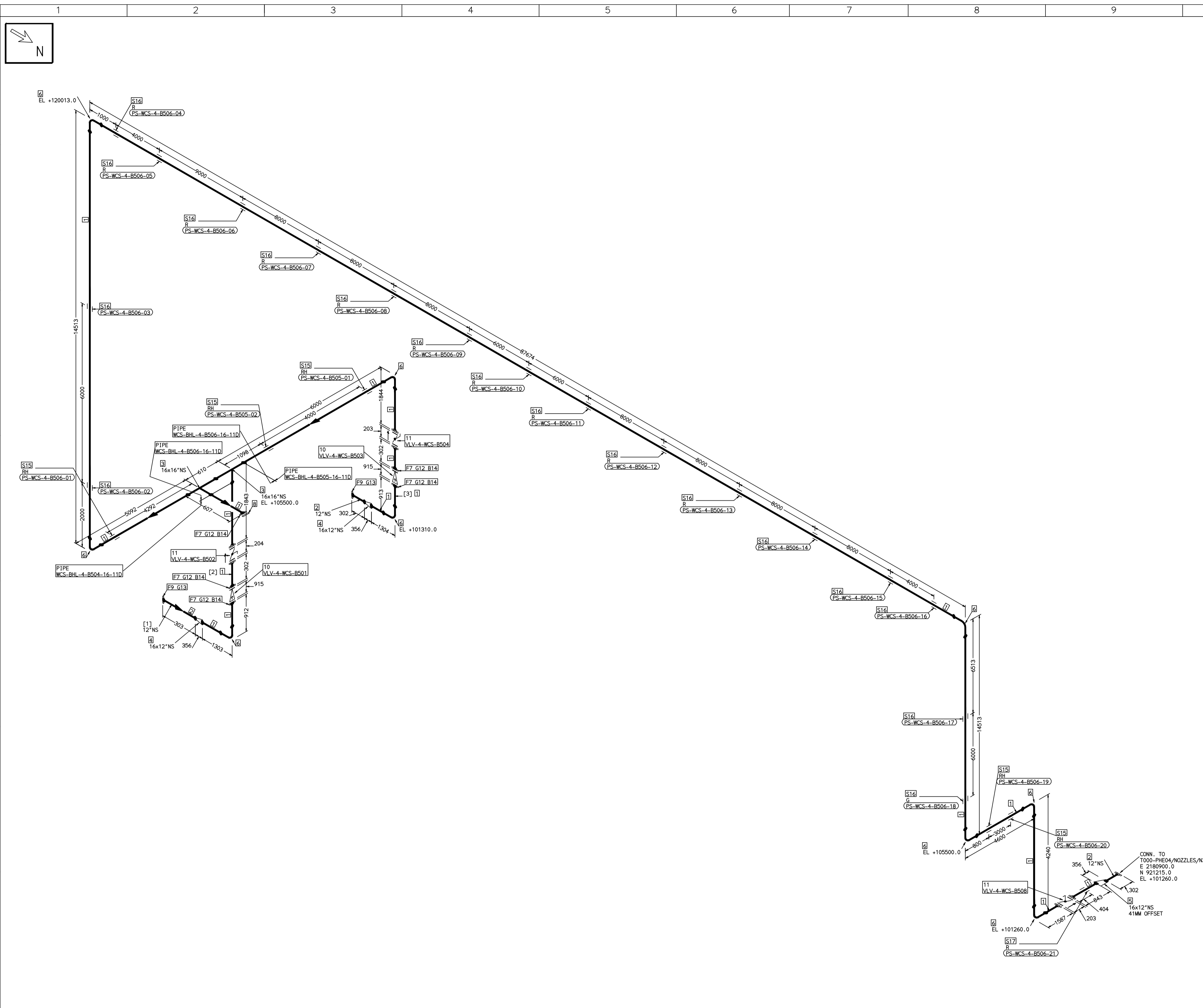


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COMPUTER FILE NAME:



FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE ERW/SAW IS-3589 PE 30	IS3589GRFE3	16	T6		136181M	59.25			
2	PIPE ERW/SAW IS-3589 PE 30	IS3589GRFE3	12	T6		M 900MM	47.02			
3	TEE STRT ASME B16.9 BW	A234GRWPB	16 x 16	S10		2	90.8	HY7242511429		
4	ROCR CONC ASME B16.9 BW	A234GRWPB	16 x 12	S10XS20		2	22.65	AA7242530636		
5	ROCR ECC ASME B16.9 BW	A234GRWPB	16 x 12	S10XS20		1	22.65			
6	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	16	S10		9	59.59	AA7242502420		
7	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	16		CL150	5	54	AA7246101179		
8	FLANGE BLIND ASME B16.5 CL150 RF	A105	16		CL150	1	82	HY7246166173		
9	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	12		CL150	2	29	AA7246101152		
10	SWING CHECK VALVE ASME B16.10 CL150 RF (B16.5)	A216GRWCB	16		CL150	2	1123.2	AA7541408174		
11	BFLV GO ANMA CS04 PN10 DFLGD (FF-C207D)	A216GRWCB	16		PN10	3	160			

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
12	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	16		CL150	5	2.1	HY7240362094		
13	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	12		CL150	2	1.41	HY7240362078		
14	140 STD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	1	M27X140	CL150	80	0.92	HY7142198648		
15	RIGID HANGER		16			5	0			
16	PIPE SUPPORT		16			17	0			
17	PIPE REST		16			1	0			

[1] [2] [3]

- NOTES:-**
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 - SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
 - PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM PERPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE	
	DRN.	PCC	-SD-	05-05-14
	CHKD.	VJK	-SD-	05-05-14
	APPRD.	GS	-SD-	05-05-14
DRAWING NO:		REV		
4-ACW-PUMP-DISCH-UPTO-PHE		1-381-01-06078		
SHT. No. 1		NO. OF SHTS. 1		

REFERENCE DRAWINGS:-

WCS-BHL-4-B504-16-11D	11D-RHP	14"
WCS-BHL-4-B506-16-11D	11D-RHP	14"
WCS-BHL-4-B505-16-11D	11D-RHP	14"

LINE PARAMETERS:-

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCS-BHL-4-B504-16-11D								11D-RHP	14"
WCS-BHL-4-B506-16-11D								11D-RHP	14"
WCS-BHL-4-B505-16-11D								11D-RHP	14"

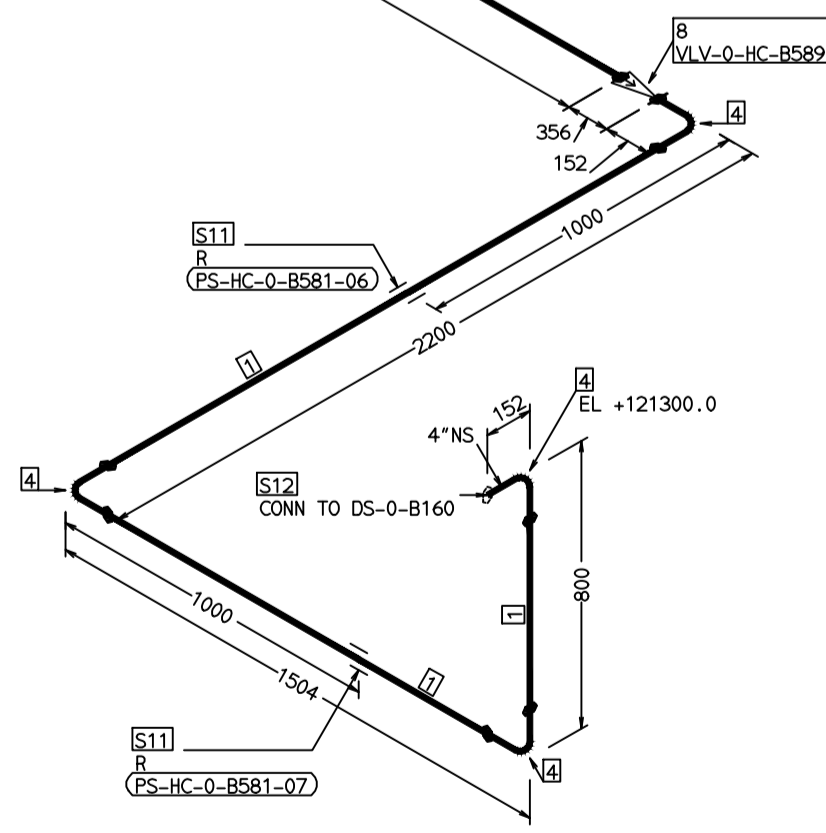
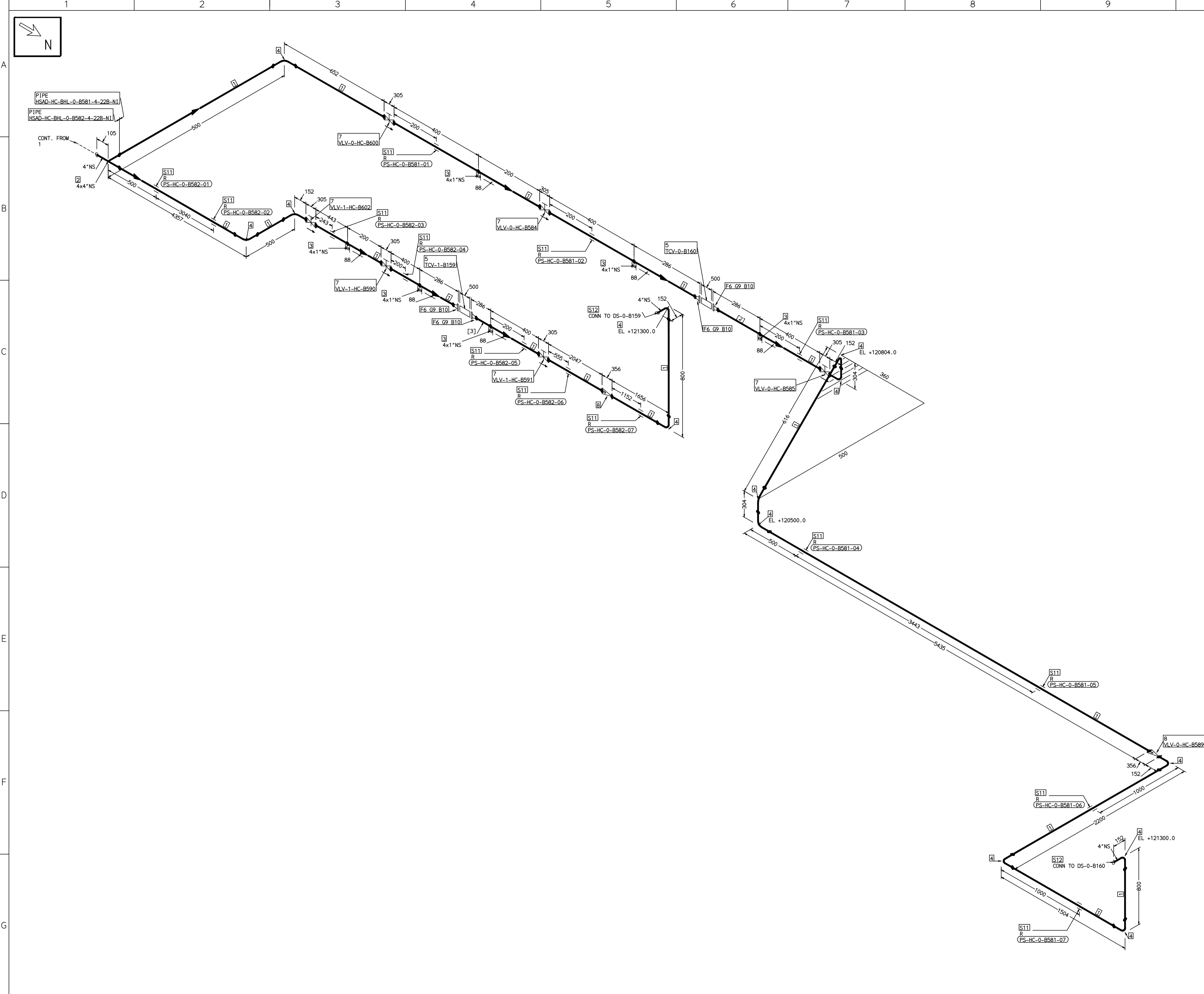
- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - ↘ DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - DIRECTION ANCHOR
 - RH - RIGID HANGER
 - SH - SPRING HANGER
 - BS - BOTTOM SPRING
 - VG - VERTICAL GUIDE

RECORD OF REVISIONS:-

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

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COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE SMLS ASME B36.10 PE	A312GRTP304	4	S105		21910MM	8.37		
2	TEE STRT ASME B16.9 BW	A403GRWP304	4 x 4	S105		1	3.5		
3	HALF COUPLING ASME B16.11 CL3000	A182GRF304	4 x 1	CL3000		6	0.34		
4	ELBOW LR 90 DEG ASME B16.9 BW	A403GRWP304	4	S105		13	2.23		
5	PIPING COMPONENT (USER DEFINED) CL300 RF (B16.5)	A403GRWP304	4	CL300		2	0		
6	FLANGE WELD NECK ASME B16.5 CL300 RF	A182GRF304	4	CL300		4	11		
7	GATE VALVE HO ASME B16.10 CL300 BW	A351GRCFB	4	CL300		6	88		
8	SWING CHECK VALVE ASME B16.10 CL300 BW	A351GRCFB	4	CL300		2	70.79		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
9	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL300 RF	SS304+PTFE	4	CL300		4	0.32		HY7240363074
10	120 STUD WITH 2 NUTS ASME B18.2	A193GRB8/A194GRB	3/4	M20X120		32	0.41		
11	PIPE REST		4			14	0		
12	GENERAL ATTACHMENT		4			2	0		

[2] [3]

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 - REINFORCEMENT PAD TO BE CUT FROM RESTRICTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

NAME	SIGN	DATE
DRN. PCC	-SD-	05-05-14
CHKD. VJK	-SD-	05-05-14
APPRD. GS	-SD-	05-05-14

SCALE: NTS

TITLE:	0-SPRAY-WATER-PPG-TO-BSS-DS	DRAWING NO:	1-381-01-05990	REV	OOP
		SHT. No. 3		NO. OF SHTS.	3

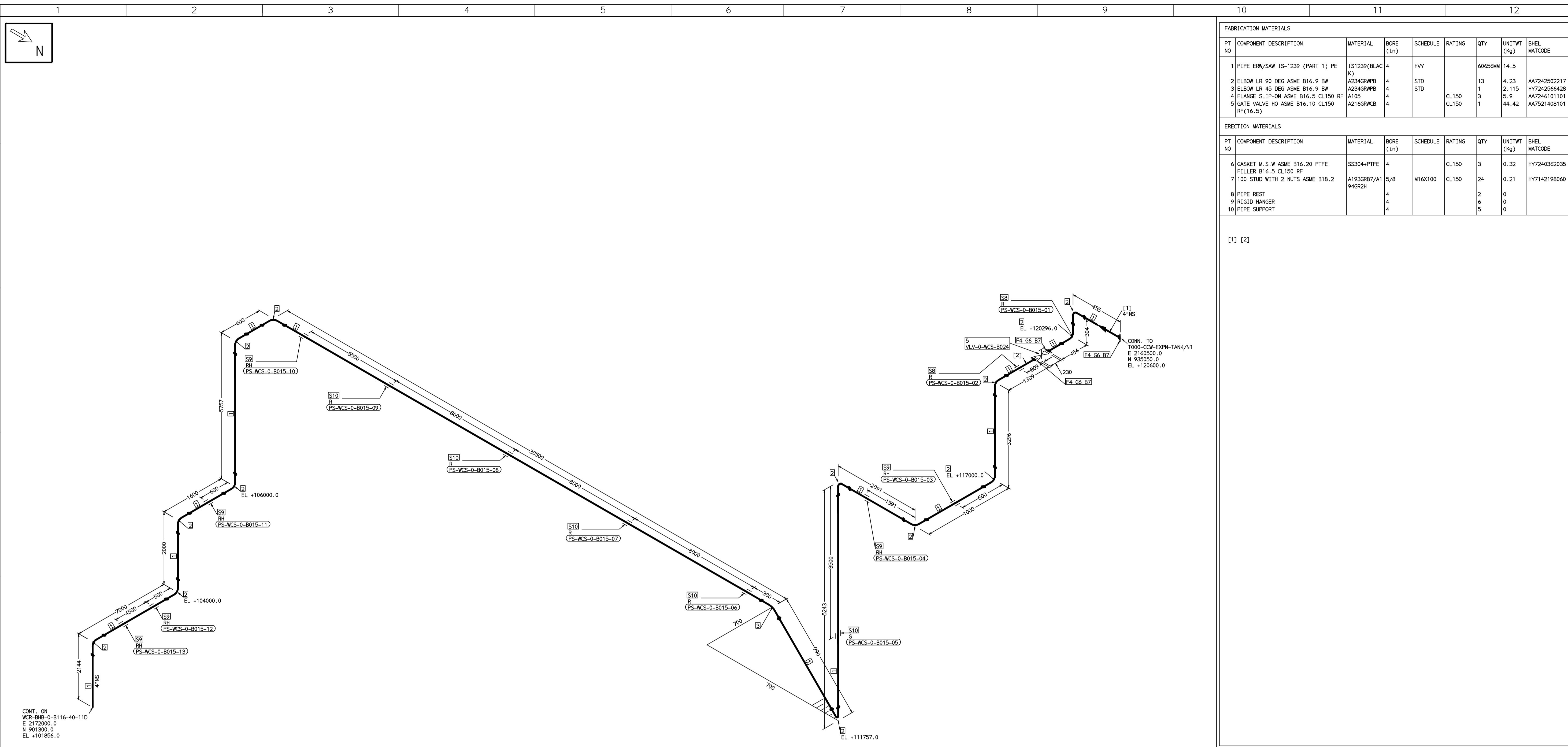
REFERENCE DRAWINGS:-	
1	
2	
3	
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7	

LINE PARAMETERS:-									
LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSAD-HC-BHL-0-B579-3-22B-NI	14.0	48.5	18.5	70				22B-RHP	3"
HSAD-HC-BHL-0-B580-3-22B-NI	14.0	48.5	18.5	70				22B-RHP	3"
HSAD-HC-BHL-0-B582-4-22B-NI	14.0	48.5	18.5	70				22B-RHP	4"
HSAD-HC-BHL-0-B581-4-22B-NI	14.0	48.5	18.5	70				22B-RHP	4"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - ↘ DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

RECORD OF REVISIONS:-					
OOP	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
05-05-14		PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

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CONT. ON
WCR-BHB-0-B116-40-11D
E 2172000.0
N 901300.0
EL +101856.0

FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-1239 (PART 1) PE K3	IS1239(BLAC)	4	HVY		60650MM	14.5		
2	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	4	STD		13	4.23	AA7242502217	
3	ELBOW LR 45 DEG ASME B16.9 BW	A234GRWPB	4	STD		1	2.115	HY7242566428	
4	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	4		CL150	3	5.9	AA7246101101	
5	GATE VALVE HO ASME B16.10 CL150 RF(16.5)	A216GRWCB	4		CL150	1	44.42	AA7521408101	

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
6	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	3	0.32	HY7240362035	
7	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A194GR2H	5/8	M16X100	CL150	24	0.21	HY7142198060	
8	PIPE REST		4			2	0		
9	RIGID HANGER		4			6	0		
10	PIPE SUPPORT		4			5	0		

[1] [2]

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 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCS-BHB-0-B015-4-11D								11D-RHP	

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

PIPE: WCS-BHB-0-B015-4-11D

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

NAME	SIGN	DATE
DRN. PCC	-SD-	05-05-14
CHKD. VJK	-SD-	05-05-14
APPRD. GS	-SD-	05-05-14

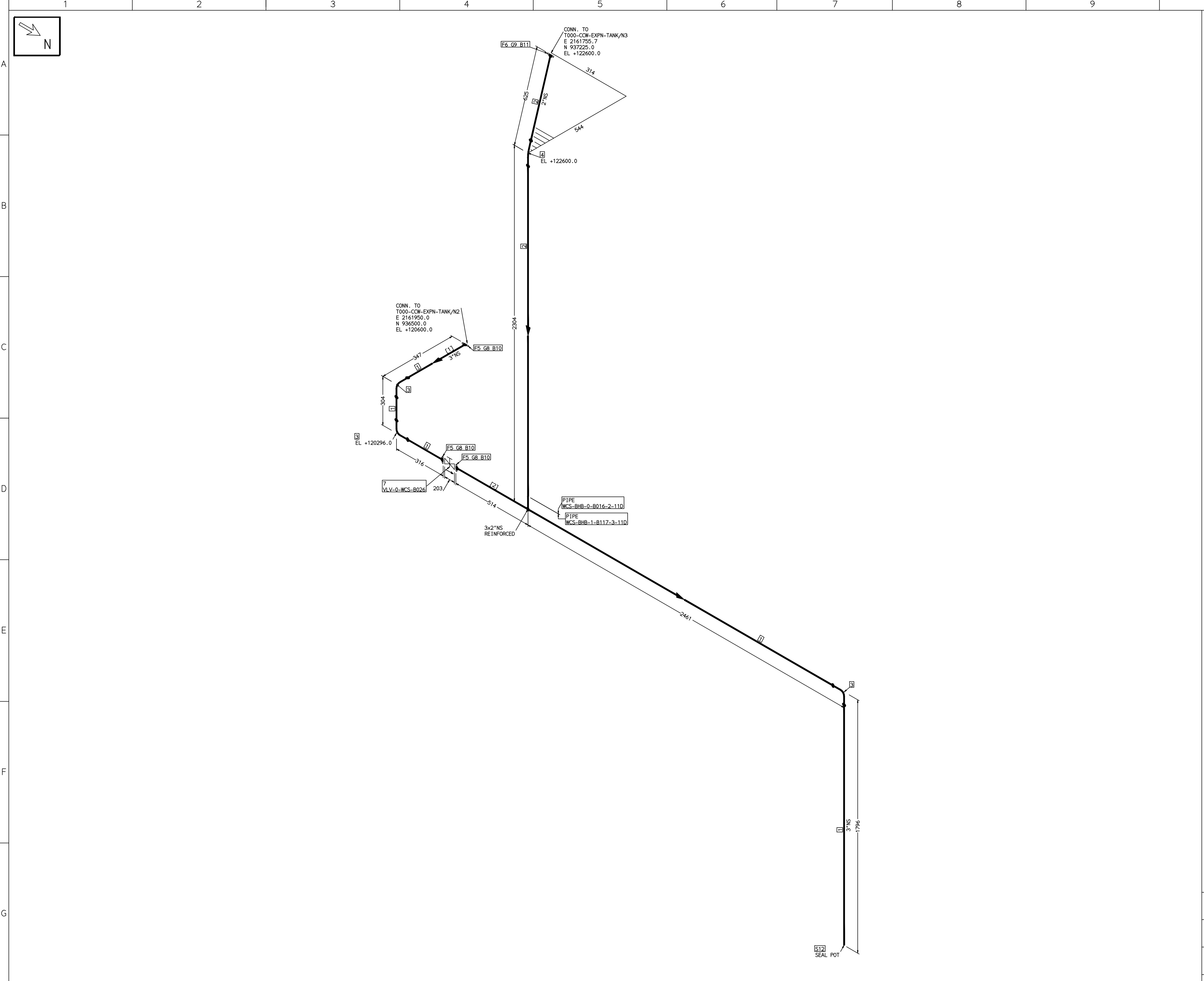
SCALE: NTS

TITLE:	0-CW-EXPN-TANK-TO-CW-HEADER	DRAWING NO:	1-381-01-05991	REV	OOP
SHT. No.	1	NO. OF SHTS.	1		

COMPUTER FILE NAME:

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COMPUTER FILE NAME:



FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE ERW/SAW IS-1239 (PART 1) PE K	IS1239(BLAC K)	3	HVY		5048MM	9.9	AA1011052601		
2	PIPE ERW/SAW IS-1239 (PART 1) PE K	IS1239(BLAC K)	2	HVY		2742MM	6.19	AA1011052580		
3	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	3	STD		3	2.3	AA7242502160		
4	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	2	STD		1	0.75	AA7242502110		
5	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	3		CL150	3	3.7	AA7246101080		
6	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	2		CL150	1	2.3	AA7246101063		
7	GATE VALVE HO ASME B16.10 CL150 RF(16.5)	A216GRWCB	3		CL150	1	29.94	AA7521408080		

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
8	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	3		CL150	3	0.19	HY7240362027		
9	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	2		CL150	1	0.11	HY7240362019		
10	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	12	0.21	HY7142198060		
11	90 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X90	CL150	4	0.2	HY7142198052		
12	GENERAL ATTACHMENT		3			1	0			

[1] [2]

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PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCS-BHB-1-B117-3-11D									11D-RHP
WCS-BHB-0-B016-2-11D									11D-RHP

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

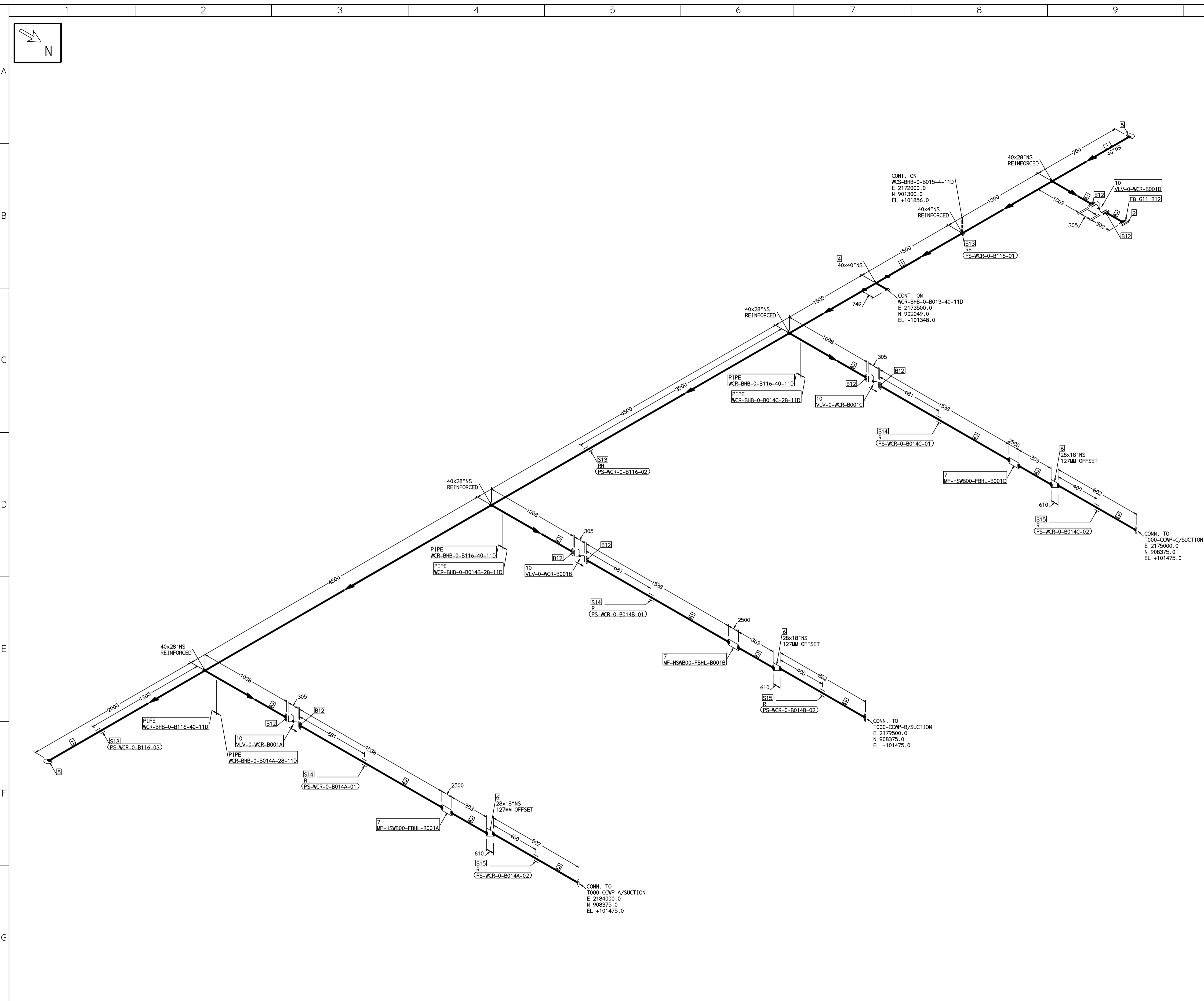
NAME	SIGN	DATE
DRN. PCC	-SD-	05-05-14
CHKD. VJK	-SD-	05-05-14
APPRD. GS	-SD-	05-05-14

SCALE: NTS

TITLE:	0-CW-EXPAN-TANK-OVERFLOW-DRAIN
DRAWING NO:	1-381-01-05992
REV	OOP
SHT. No. 1	NO. OF SHTS. 1

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COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 15-3589 PE 30	IS3589RFE3	40	T10		14202MM	248.09		
2	PIPE ERW/SAW 15-3589 PE 30	IS3589RFE3	28	T8		8603MM	138.7		
3	PIPE ERW/SAW 15-3589 PE 30	IS3589RFE3	18	T6		2400MM	66.73		
4	TEE STRT ASME B16.9 BW	A234GRWP	40 x 40	XS		1	894		
5	CAP ASME B16.9 BW	A234GRWP	40	STD		2	95		
6	RDCR ECC ASME B16.9 BW	A234GRWP	28 x 18	STDXS10		3	95		
7	PIPING COMPONENT (USER DEFINED) BW	A234GRWP	28			3	0		
8	FLANGE STEEL-RING ANMA C207-D FF	IS2062GRB	28		PN10	1	0		
9	FLANGE BLIND ANMA C207-D FF	IS2062GRB	28		PN10	1	0		
10	BFLY GO ANMA C504 PN10 DFLGD (FF-C207D)	A216GRWCB	28		PN10	4	490		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
11	GASKET NAB FLAT RING (FF-C207D)	PTFE	28		PN10	1	0		
12	120 STUD WITH 2 NUTS ASME B18.2 94GR2H	A193GRB7/A1	1.1/4	M33X140	PN10	1260	1.47		
13	PIPE REST		40			3	0		
14	PIPE REST		28			3	0		
15	PIPE REST		18			3	0		

[1]

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 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-		LINE PARAMETERS:-									
NO	DESCRIPTION	LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
		WCR-BHB-0-B116-40-11D								11D-RHP	40"
		WCR-BHB-0-B014C-28-11D								11D-RHP	28"
		WCR-BHB-0-B014B-28-11D								11D-RHP	28"
		WCR-BHB-0-B014A-28-11D								11D-RHP	28"

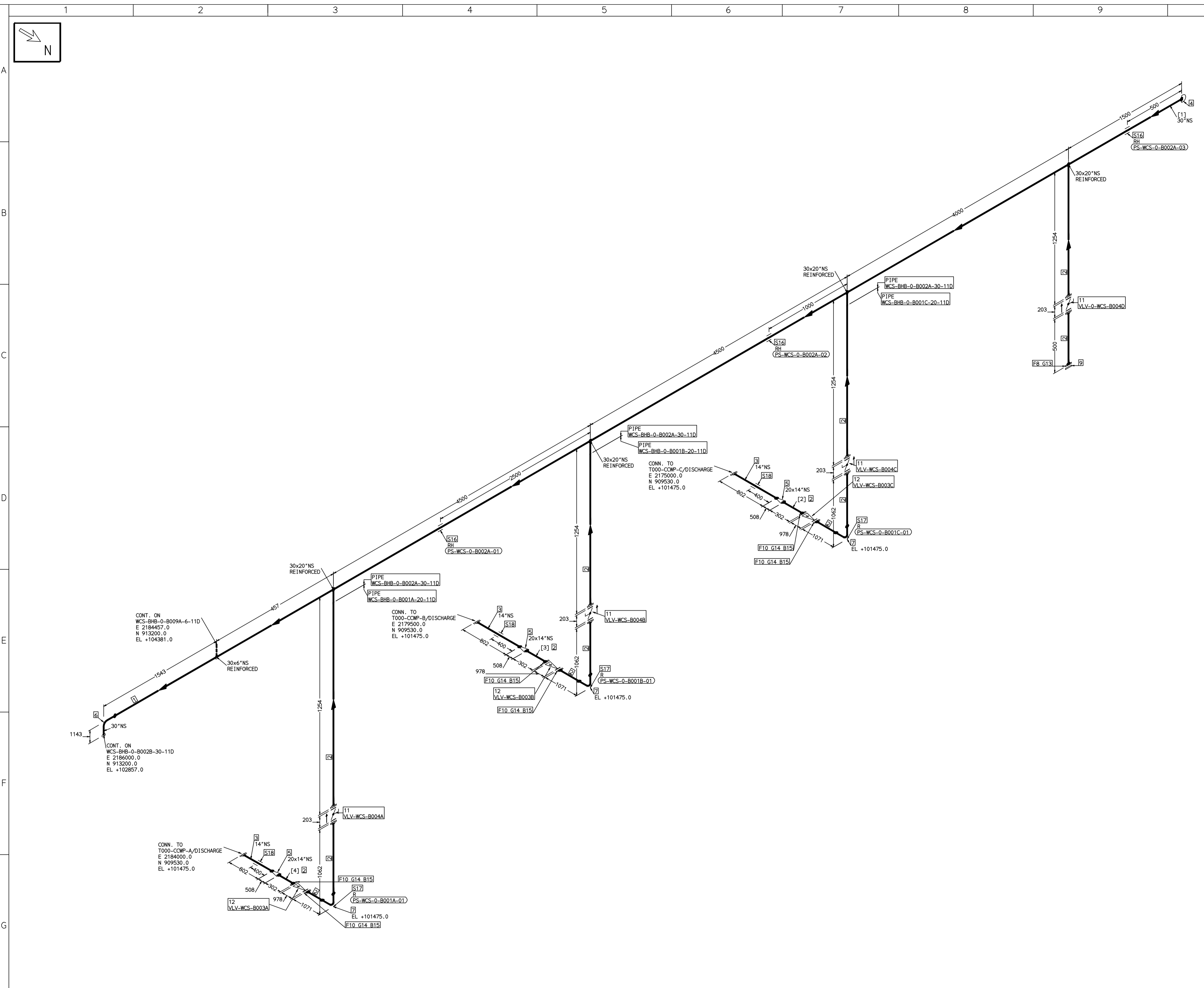
- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - ↘ DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - DIRECTION ANCHOR
 - RH - RIGID HANGER
 - SH - SPRING HANGER
 - BS - BOTTOM SPRING
 - VG - VERTICAL GUIDE

RECORD OF REVISIONS:-				
NO	DATE	DESCRIPTION	DRN BY	CHKD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING		NAME	SIGN	DATE
		DRN.	PCC	-SD-
		CHKD.	VJK	-SD-
		APPRD.	GS	-SD-
TITLE: 0-CCW-PUMP-SUCTION		DRAWING NO: 1-381-01-05993	REV OOP	DATE 05-05-14
SHT. No. 1		NO. OF SHTS. 1		

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COMPUTER FILE NAME:



FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3	30	T8			15357MM	148.76		
2	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3	20	T6			7101MM	74.28		
3	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3	14	T6			2400MM	51.73		
4	CAP ASME B16.9 BW	A234GRWPB	30	STD				1	62	
5	RODR CONC ASME B16.9 BW	A234GRWPB	20 x 14	S10XS10				3	50	
6	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	30	STD				1	315.83	
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	20	S10				3	93.53	HY7242502446
8	FLANGE STEEL-RING ANMA C207-D FF	IS2062GRB	20		PN10			1	0	
9	FLANGE BLIND ANMA C207-D FF	IS2062GRB	20		PN10			1	0	
10	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	20		CL150			6	75	AA7246101195
11	BFLV 60 ANMA C504 PN10 DFLGD (FF-C207D)	A216GRWCB	20		PN10			4	230	
12	SWING CHECK VALVE ASME B16.10 CL150 RF(B16.5)	A216GRWCB	20		CL150			3	1760.4	AA7541408190

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
13	GASKET NAB FULL FACE (FF-C207D)	PTFE	20		PN10			1	0	
14	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	20		CL150			6	2.87	HY7240362116
15	170 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A194GR2H	1.1, 1.8	M30X170	CL150			120	1.3	HY7142299037
16	RIGID HANGER		30					3	0	
17	PIPE REST		20					3	0	
18	PIPE REST		14					3	0	

[1] [2] [3] [4]

NOTES:-

- ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
- ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
- SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
- PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
- DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
- REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-	

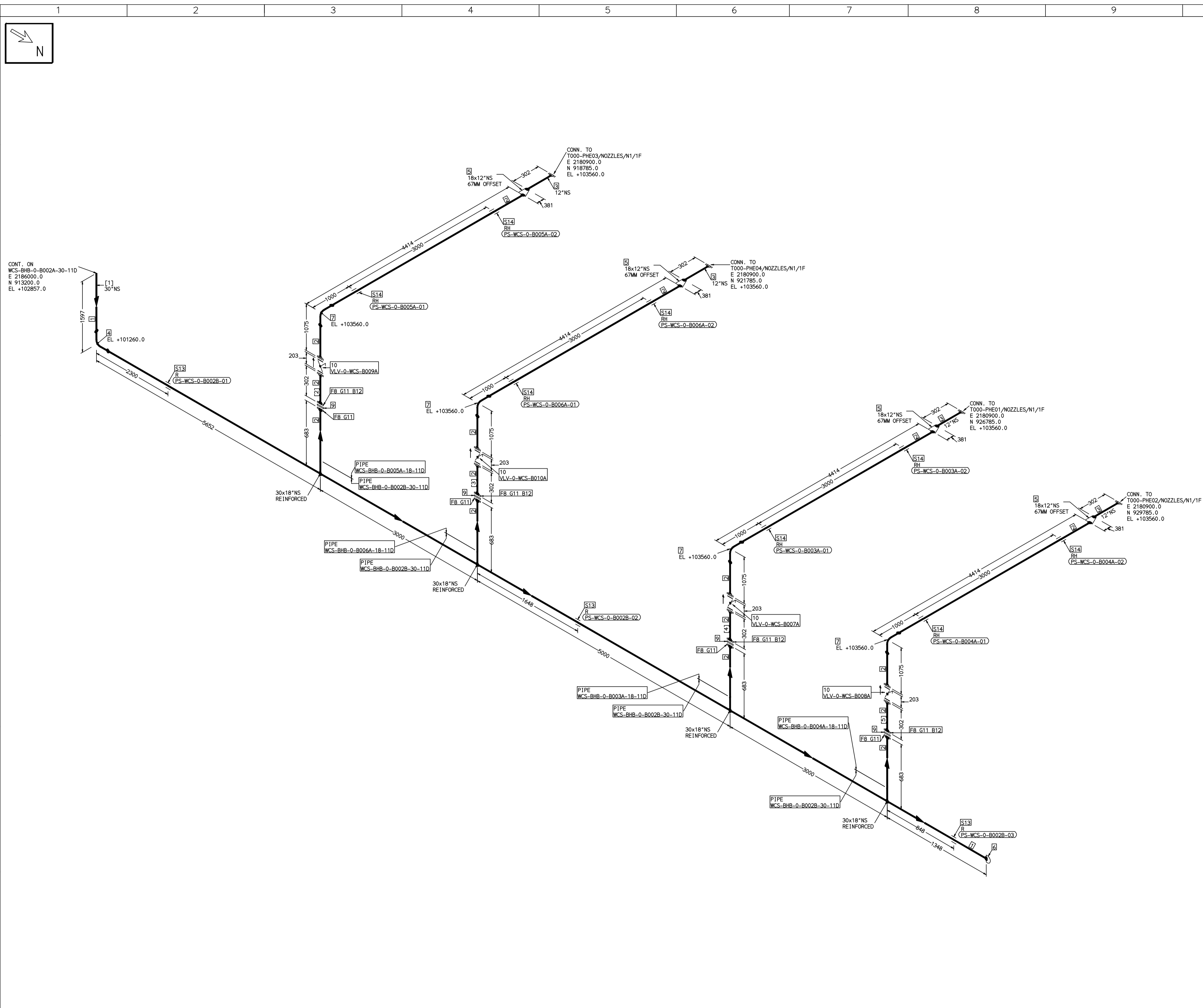
LINE PARAMETERS:-									
LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCS-BHB-0-B002A-30-11D								11D-RHP	30"
WCS-BHB-0-B001C-20-11D								11D-RHP	24"
WCS-BHB-0-B001B-20-11D								11D-RHP	24"
WCS-BHB-0-B001A-20-11D								11D-RHP	24"

LEGEND:-	
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL
A	- ANCHOR
R	- REST
RG	- REST + GUIDE
RL	- REST + LIMIT STOP
RGL	- RIGID HANGER
SH	- SPRING HANGER
BS	- BOTTOM SPRING
VG	- VERTICAL GUIDE

RECORD OF REVISIONS:-					
NO	DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE
DRN.	PCC	-SD-	05-05-14
CHKD.	VJK	-SD-	05-05-14
APPRD.	GS	-SD-	05-05-14
DRAWING NO: 1-381-01-05994			REV OOP
SHT. No. 1	NO. OF SHTS.		1

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FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-3589 PE 30	IS3589GRFE3	30	T8		17311MM	148.76		
2	PIPE ERW/SAW 1S-3589 PE 30	IS3589GRFE3	18	T6		19172MM	66.73		
3	PIPE ERW/SAW 1S-3589 PE 30	IS3589GRFE3	12	T6		1200MM	47.02		
4	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	30	STD		1	315.83		
5	RDCR ECC ASME B16.9 BW	A234GRWPB	18 x 12	S10XS20		4	26.42		
6	CAP ASME B16.9 BW	A234GRWPB	30	STD		1	62		
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	18	S10		4	75.54		HY7242502438
8	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	18		CL150	8	59		AA7246101187
9	SPACER & BLANK ASME B16.48 CL150 FF (B16.5)	A105	18		CL150	4	45.58		GT9757083143
10	BFLV GO ANNA C504 PN10 DFLGD (FF-C207D)	A216GRWC	18		PN10	4	190		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
11	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	18		CL150	8	2.31		HY7240362108
12	180 STUD WITH 2 NUTS ASME B18.2 94GR2H	A193GRB7/A194GR2H	1.1/8	M30X150	CL150	64	1.21		HY714229910
13	PIPE REST		30			3	0		
14	RIGID HANGER		18			8	0		

[1] [2] [3] [4] [5]

NOTES:-

- ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
- ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
- SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
- PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
- DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
- REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-	

LINE PARAMETERS:-									
LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCS-BHB-0-B002B-30-11D									11D-RHP "
WCS-BHB-0-B005A-18-11D									11D-RHP 18"
WCS-BHB-0-B006A-18-11D									11D-RHP 18"
WCS-BHB-0-B003A-18-11D									11D-RHP 18"
WCS-BHB-0-B004A-18-11D									11D-RHP 18"

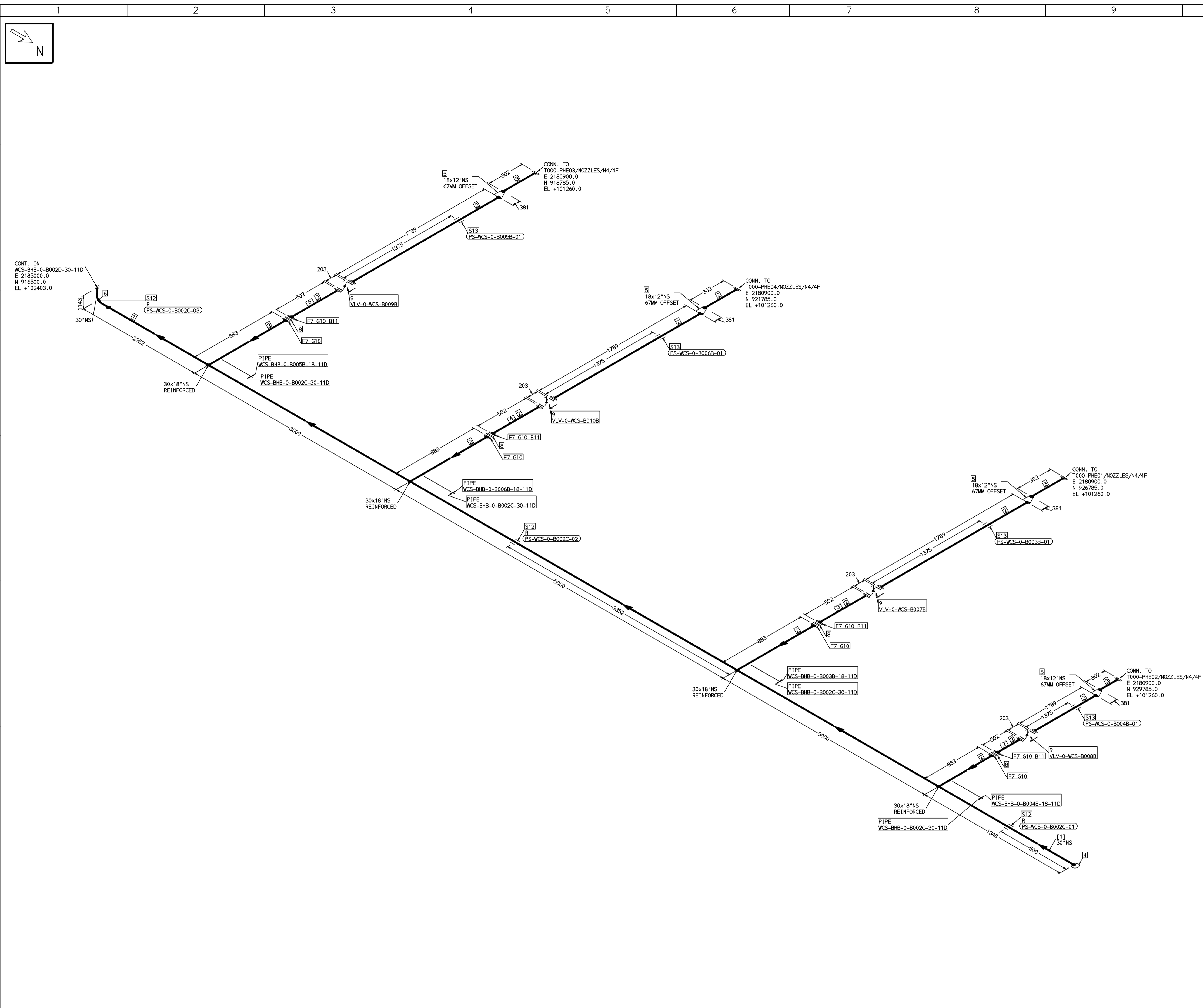
LEGEND:-	
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL
A	ANCHOR
R	REST
RG	REST + GUIDE
RL	REST + LIMIT STOP
RGL	DIRECTION ANCHOR
RH	RIGID HANGER
SH	SPRING HANGER
BS	BOTTOM SPRING
VG	VERTICAL GUIDE

RECORD OF REVISIONS:-					
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE
	DRN. PCC	-SD-	05-05-14
TITLE: 0-CCW-SUPPLY-TO-PHES	CHKD. VJK	-SD-	05-05-14
	APPRD. GS	-SD-	05-05-14
DRAWING NO: 1-381-01-05995		REV OOP	
SHT. No. 1	NO. OF SHTS. 1		

COMPUTER FILE NAME:

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



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-3589 PE 30	IS3589GRFE3	30	T8		13557MM	148.76		
2	PIPE ERW/SAW 1S-3589 PE 30	IS3589GRFE3	18	T6		11460MM	66.73		
3	PIPE ERW/SAW 1S-3589 PE 30	IS3589GRFE3	12	T6		1200MM	47.02		
4	CAP ASME B16.9 BW	A234GRWB	30	STD		1	62		
5	RODR ECC ASME B16.9 BW	A234GRWB	18 x 12	S10XS20		4	26.42		
6	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWB	30	STD		1	315.83		
7	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	18		CL150	8	59		AA7246101187
8	SPACER & BLANK ASME B16.48 CL150	A105	18		CL150	4	45.58		GT9757083143
9	RFLV GO ANNA CS04 PN10 DFLGD (FF-C207D)	A216GRWB	18		PN10	4	190		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
10	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	18		CL150	8	2.31		HY7240362108
11	180 STUD WITH 2 NUTS ASME B18.2 94GR2H	A193GRB7/A194GR2H	1.1/8	M30X150	CL150	64	1.21		HY7142299010
12	PIPE REST		30			3	0		
13	PIPE REST		18			4	0		

[1] [2] [3] [4] [5]

- NOTES:-**
- ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
 - ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
 - SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
 - PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESTRICTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCS-BHB-0-B002C-30-11D									30"
WCS-BHB-0-B004B-18-11D									18"
WCS-BHB-0-B003B-18-11D									18"
WCS-BHB-0-B006B-18-11D									18"
WCS-BHB-0-B005B-18-11D									18"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - RIGID HANGER
 - RH - RIGID HANGER
 - SH - SPRING HANGER
 - BS - BOTTOM SPRING
 - VG - VERTICAL GUIDE

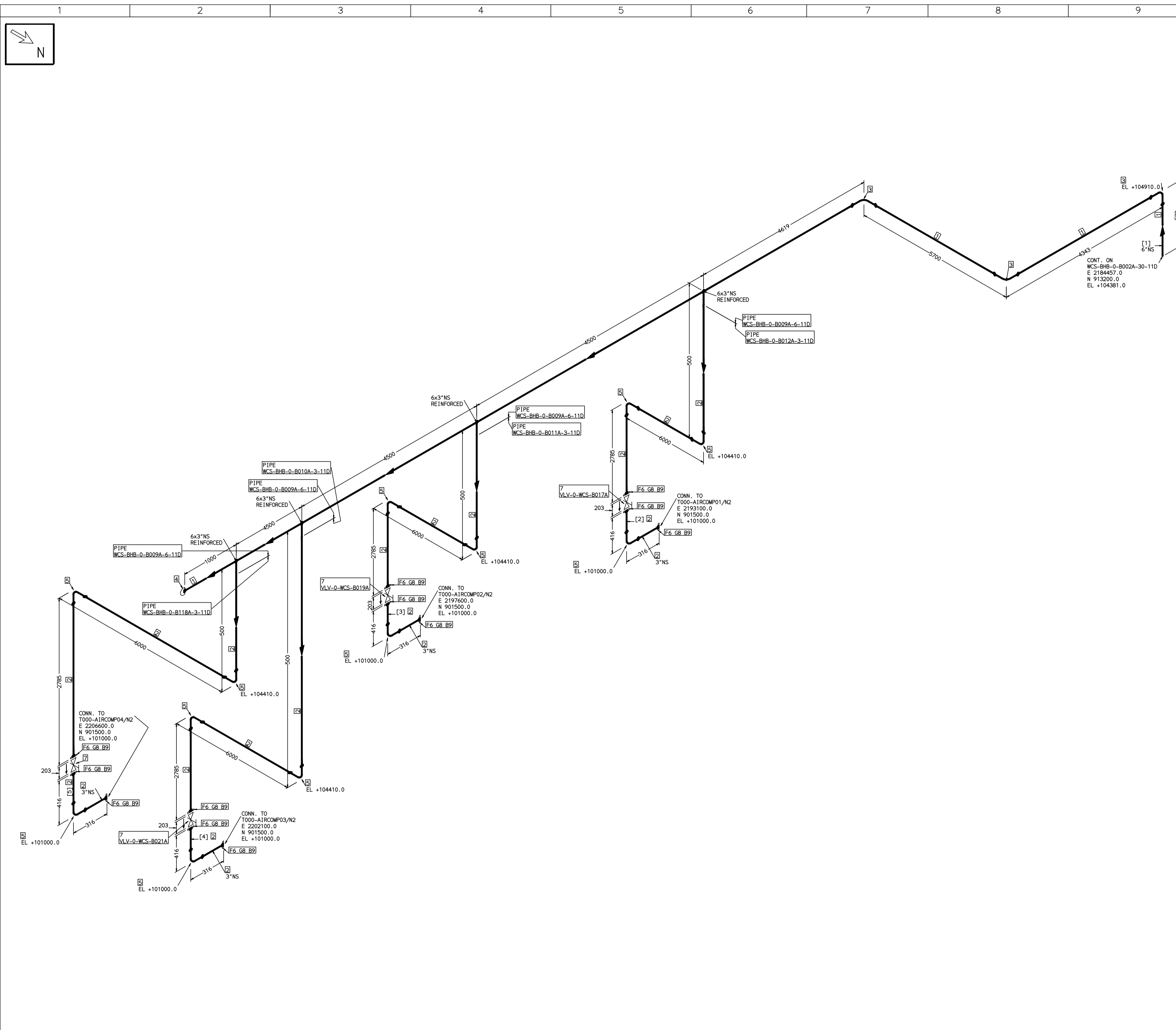
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

TITLE:		NAME	SIGN	DATE
0-CW-RETURN-FROM-PHES		BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING		
DRAWING NO:		DRN.	PCC	-SD-
1-381-01-05996		CHKD.	VJK	-SD-
SHT. No. 1		APPRD.	GS	-SD-
NO. OF SHTS. 1		SCALE: NTS		

COMPUTER FILE NAME:

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COMPUTER FILE NAME:



FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC K)	6	HVY		28317MM	21.3			
2	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC K)	3	HVY		37024MM	9.9	AA1011052601		
3	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	STD		3	11.01	AA7242502276		
4	CAP ASME B16.9 BW	A234GRWPB	6	STD		1	3.6	HY72425070565		
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	3	STD		12	2.3	AA7242502160		
6	FLANGE SLIP-ON ASME B16.5 CL150 RF A105	A216GRWCB	3		CL150	12	3.7	AA7246101080		
7	GATE VALVE HO ASME B16.10 CL150 RF(16.5)	A216GRWCB	3		CL150	4	29.94	AA7521408080		

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
8	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	3		CL150	12	0.19	HY7240362027		
9	100 STUD WITH 2 NUTS ASME B18.2 94GR2H	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	48	0.21	HY7142198060		

[1] [2] [3] [4] [5]

- NOTES:-**
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 - ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
 - SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
 - PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY	
CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCS-BHB-0-B009A-6-11D								11D-RHP	6"
WCS-BHB-0-B012A-3-11D								11D-RHP	3"
WCS-BHB-0-B011A-3-11D								11D-RHP	3"
WCS-BHB-0-B010A-3-11D								11D-RHP	3"
WCS-BHB-0-B118A-3-11D								11D-RHP	3"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - REST + LIMIT STOP
 - RH - RIGID HANGER
 - SH - SPRING HANGER
 - BS - BOTTOM SPRING
 - VG - VERTICAL GUIDE

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

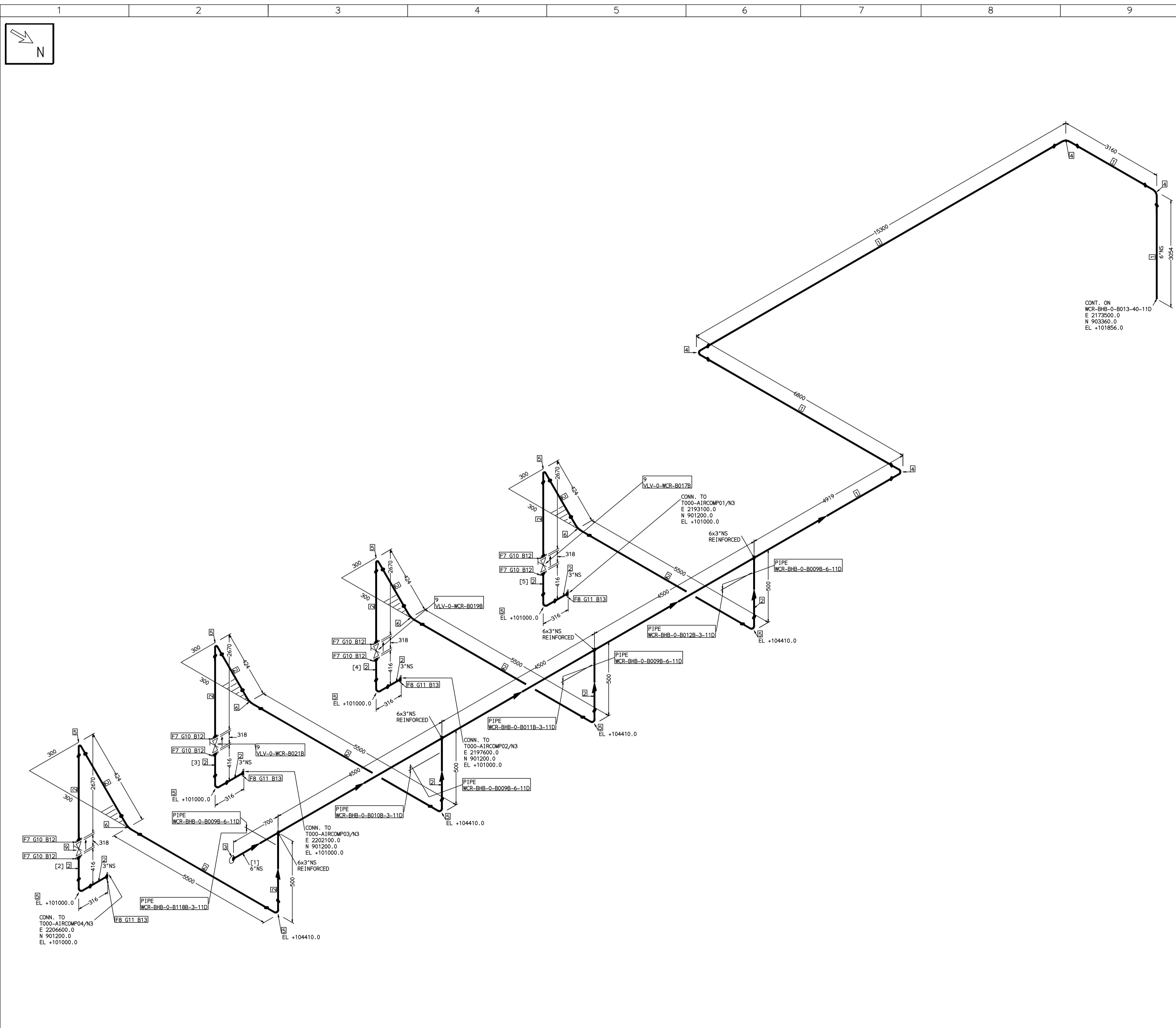
NAME	SIGN	DATE
DRN. PCC	-SD-	05-05-14
CHKD. VJK	-SD-	05-05-14
APPRD. GS	-SD-	05-05-14

SCALE: NTS

TITLE:	0-CW-SUPPLY-TO-IAPA-PCKG	DRAWING NO:	1-381-01-05997	REV	OOP
SHT. No. 1		NO. OF SHTS.		1	

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COMPUTER FILE NAME:



FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE ERW/SAW IS-1239 (PART 1) PE K	IS1239(BLAC K)	6	HVY		45601MM	21.3			
2	PIPE ERW/SAW IS-1239 (PART 1) PE K	IS1239(BLAC K)	3	HVY		35852MM	9.9	AA1011052601		
3	CAP ASME B16.9 BW	A234GRWPB	6	STD		1	3.6	HY7242570565		
4	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	STD		4	11.01	AA7242502276		
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	3	STD		12	2.3	AA7242502160		
6	ELBOW LR 45 DEG ASME B16.9 BW	A234GRWPB	3	STD		4	1.15	HY724256363		
7	FLANGE SLIP-ON ASME B16.5 CL300 RF	A105	3		CL300	8	5.9	AA7246106081		
8	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	3		CL150	4	3.7	AA7246101080		
9	GLOBE VALVE HO ASME B16.10 CL300 RF(16.5)	A216GRWCB	3		CL300	4	52.29	AA7501428085		

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
10	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL300 RF	SS304+PTFE	3		CL300	8	0.19	HY7240363066		
11	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL150 RF	SS304+PTFE	3		CL150	4	0.19	HY7240362027		
12	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GRZH	3/4	M20X120	CL300	64	0.41	HY7142198184		
13	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GRZH	5/8	M16X100	CL150	16	0.21	HY7142198060		

[1] [2] [3] [4] [5]

- NOTES:-**
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 - ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
 - SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
 - PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

CONSULTANT:		BECHTEL FREDERICK, MARYLAND, U.S.A	
PROJECT:		STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)	
CUSTOMER:		RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)	
RIL DRG NO. HAZIRA:		10090-HATX00-XXXX-XX-BHL-BXXX	

REFERENCE DRAWINGS:-

LINE PARAMETERS:-

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCR-BHB-0-B009B-6-11D								11D-RHP	6"
WCR-BHB-0-B118B-3-11D								11D-RHP	3"
WCR-BHB-0-B010B-3-11D								11D-RHP	3"
WCR-BHB-0-B011B-3-11D								11D-RHP	3"
WCR-BHB-0-B012B-3-11D								11D-RHP	3"

- LEGEND:-
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - DIRECTION ANCHOR
 - RH - RIGID HANGER
 - SH - SPRING HANGER
 - BS - BOTTOM SPRING
 - VG - VERTICAL GUIDE

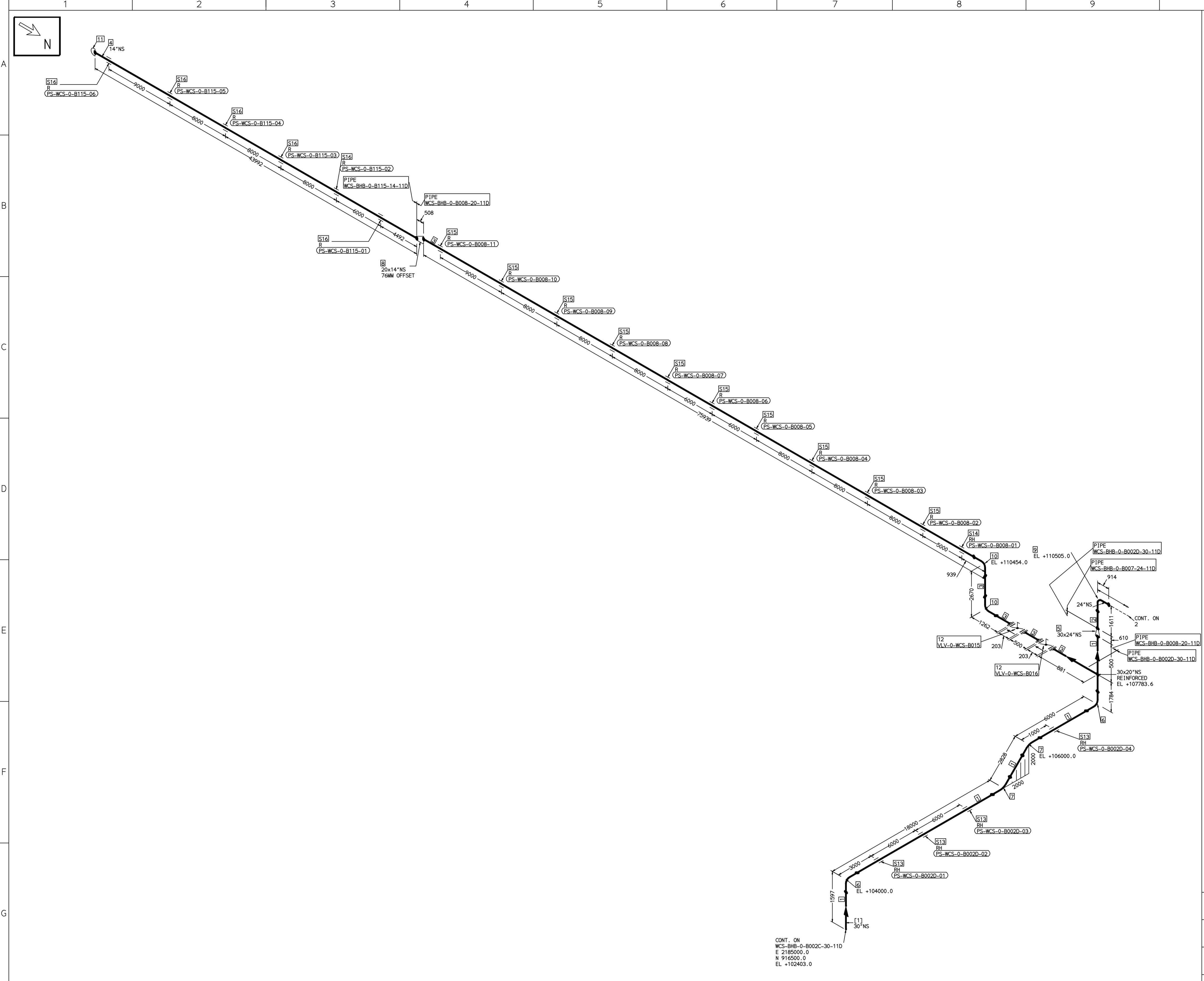
RECORD OF REVISIONS:-

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE	
	DRN.	PCC	-SD-	05-05-14
	CHKD.	VJK	-SD-	05-05-14
	APPRD.	GS	-SD-	05-05-14
DRAWING NO:		REV		
1-381-01-05998		OOP		
SHT. No. 1	NO. OF SHTS. 1			

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COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3	30	T8		24257MM	148.76		
2	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3	24	T8		697MM	118.77		
3	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3	20	T6		77920MM	74.28		
4	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3	14			43992MM	0		
5	RDCR CONC ASME B16.9 BW	A234GRWPB	30 x 24	STDSTD		1	100	HY7242682223	
6	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	30	STD		2	315.83		
7	ELBOW LR 45 DEG ASME B16.9 BW	A234GRWPB	30	STD		2	157.91		
8	RDCR ECC ASME B16.9 BW	A234GRWPB	20 x 14	S10XS10		1	50		
9	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	24	STD		1	201.49	HY7242502942	
10	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	20	S10		2	93.53	HY7242502446	
11	CAP ASME B16.9 BW	A234GRWPB	14	S10		1	15.5	HY7242570867	
12	BFLV GO ANMA C504 PN10 DFLGD (FF-C207D)	A216GRWCB	20		PN10	2	230		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
13	RIGID HANGER		30			4	0		
14	RIGID HANGER		20			1	0		
15	PIPE SUPPORT		20			10	0		
16	PIPE SUPPORT		14			6	0		

[1]

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 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCS-BHB-0-B002D-30-11D								11D-RHP	"
WCS-BHB-0-B008-20-11D								11D-RHP	20"
WCS-BHB-0-B115-14-11D								11D-RHP	14"
WCS-BHB-0-B007-24-11D								11D-RHP	24"
WCS-BHB-0-B073A-10-11D								11D-RHP	10"
WCS-BHB-0-B076-14-11D								11D-RHP	14"

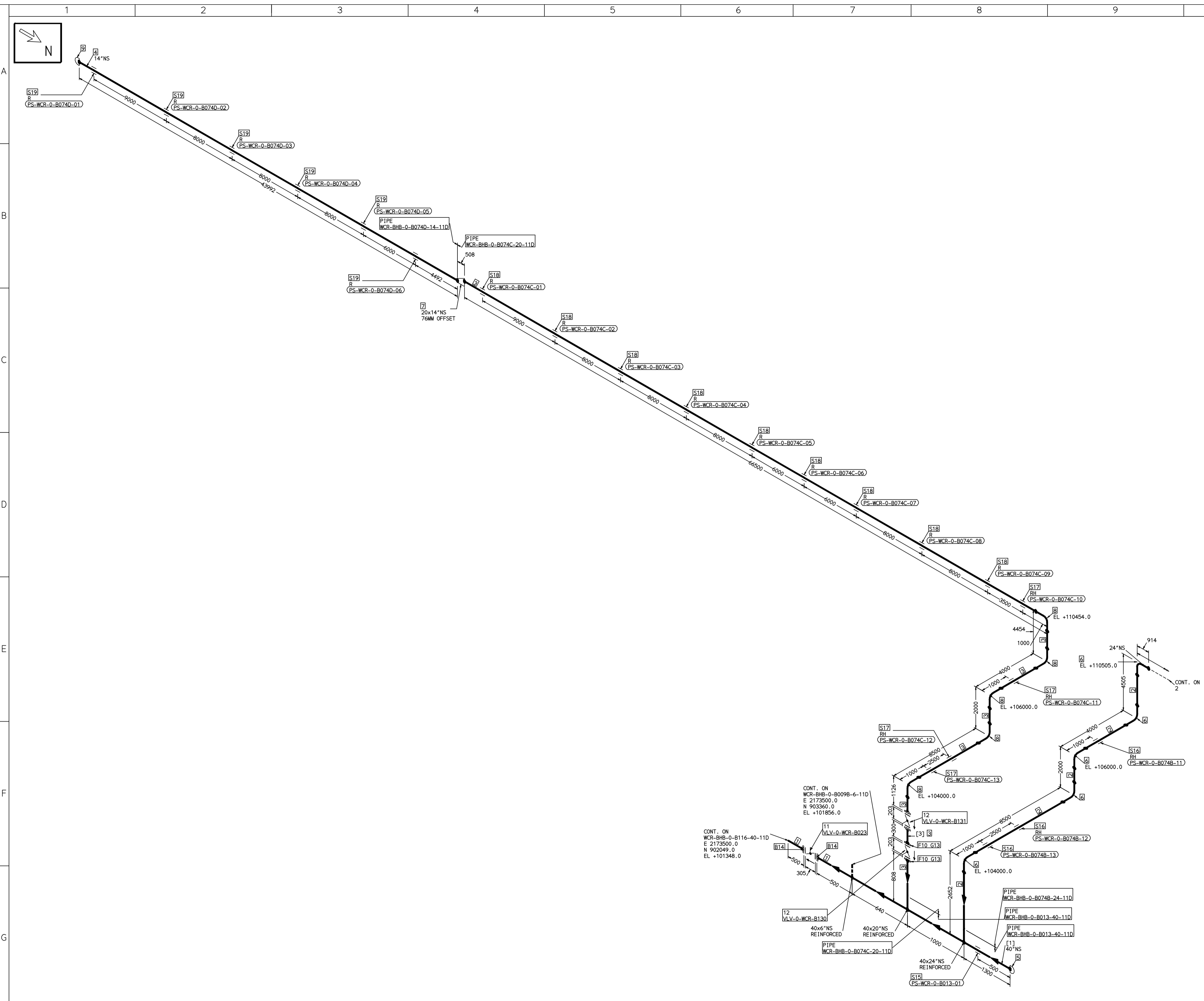
- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - REST + LIMIT STOP
 - RGL - DIRECTION ANCHOR
 - RH - RIGID HANGER
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REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING		NAME	SIGN	DATE
TITLE: 0-CW-SUPPLY-HEADER-PIPING		DRN.	PCC	-SD-
DRAWING NO: 1-381-01-05999		CHKD.	VJK	-SD-
SHT. No. 1		APPRD.	GS	-SD-
NO. OF SHTS. 2		SCALE: NTS		

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

COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-3589 PE 30	IS3589RFE3	40	T10		3940MM	248.09		
2	PIPE ERW/SAW 1S-3589 PE 30	IS3589RFE3	24	T8		13025MM	118.77		
3	PIPE ERW/SAW 1S-3589 PE 30	IS3589RFE3	20	T6		79628MM	74.28		
4	PIPE ERW/SAW 1S-3589 PE 14	IS3589RFE3	14	STD		43992MM	0		
5	CAP ASME B16.9 BW	A234GRWP	40	STD		1	95		
6	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWP	24	STD		5	201.49	HY7242502942	
7	ROCR ECC ASME B16.9 BW	A234GRWP	20 x 14	S10XS10		1	50		
8	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWP	20	S10		5	93.53	HY7242502446	
9	CAP ASME B16.9 BW	A234GRWP	14	S10		1	15.5	HY7242507867	
10	FLANGE STEEL-RING ANMA C207-D FF	IS2062GRB	20		PN10	2	0		
11	BFLV GO ANMA C504 PN10 DFLGD (FF-C207D)	A216GRWCB	40		PN10	1	1160		
12	BFLV GO ANMA C504 PN10 DFLGD (FF-C207D)	A216GRWCB	20		PN10	2	230		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
13	GASKET NAB FULL FACE (FF-C207D)	PTFE	20		PN10	2	0		
14	140 STUD WITH 2 NUTS ASME B18.2	A193SRB7/A194GRZH	1.1/2	M39X170	PN10	340	2.53		
15	PIPE REST		40			1	0		
16	RIGID HANGER		24			3	0		
17	RIGID HANGER		20			4	0		
18	PIPE SUPPORT		20			9	0		
19	PIPE SUPPORT		14			6	0		

[1] [3]

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 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESTRICTED RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

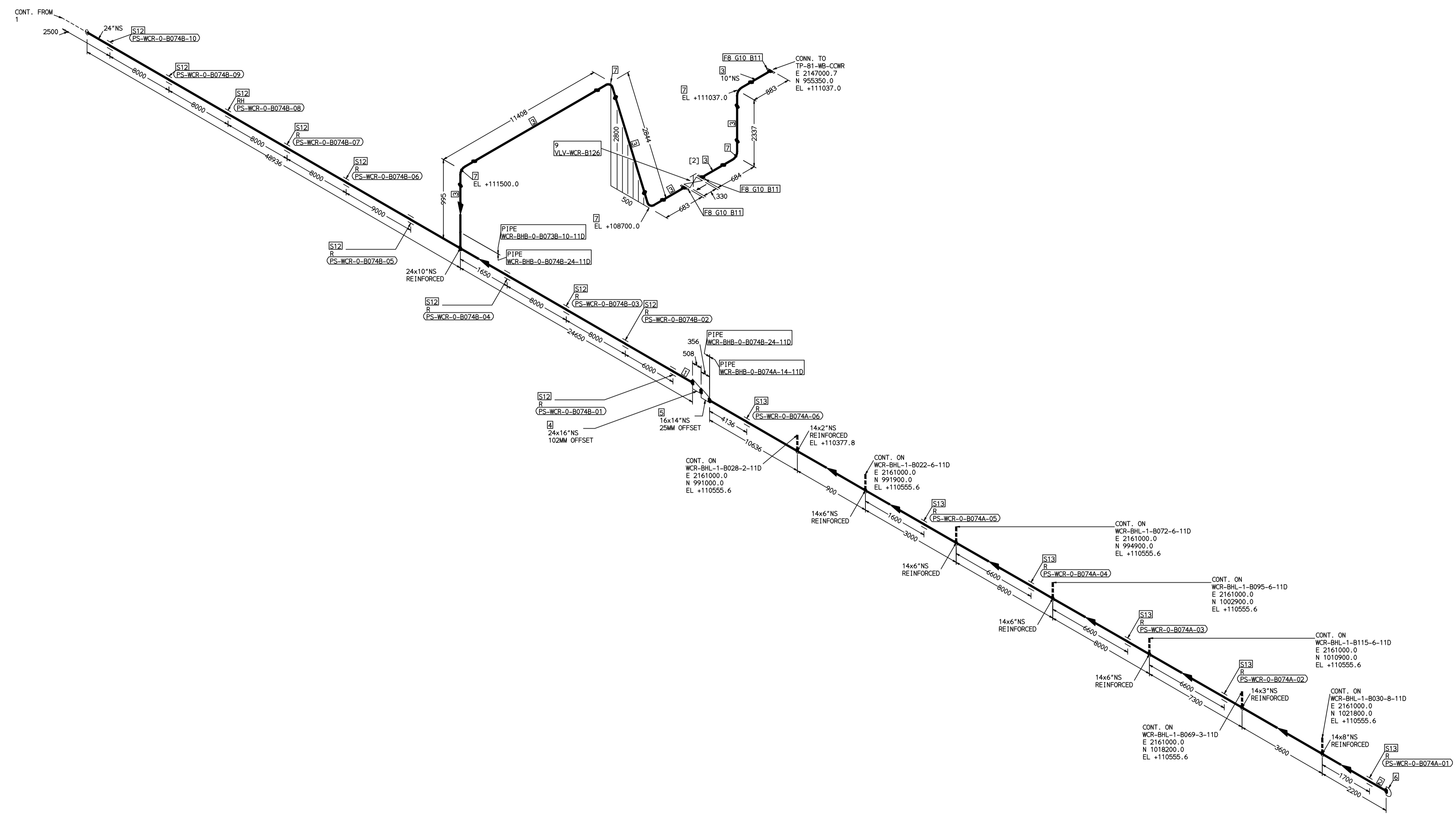
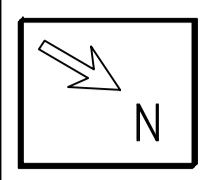
BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE
	DRN. PCC	-SD-	05-05-14
	CHKD. VUK	-SD-	05-05-14
	APPRD. GS	-SD-	05-05-14
DRAWING NO: 1-381-01-06000			REV OOP
SHT. No. 1	NO. OF SHTS. 2		

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCR-BHB-0-B013-40-11D								11D-RHP	"
WCR-BHB-0-B074B-24-11D								11D-RHP	24"
WCR-BHB-0-B073B-10-11D								11D-RHP	10"
WCR-BHB-0-B074A-14-11D								11D-RHP	14"
WCR-BHB-0-B074C-20-11D								11D-RHP	20"
WCR-BHB-0-B074D-14-11D								11D-RHP	"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
 R - REST
 RG - REST + GUIDE
 RL - REST + LIMIT STOP
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REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	GS

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FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE ERW/SAW 1S-3589 PE	IS3589RFE3	24	T8		7358MM	118.77			
2	PIPE ERW/SAW 1S-3589 PE	30	14			4363MM	0			
3	PIPE ERW/SAW 1S-3589 PE	IS3589RFE3	10	T6		15744MM	39.51			
4	RDR ECC ASME B16.9 BW	A234GRWPB	24 x 16	STDXS10		1	72			
5	RDR ECC ASME B16.9 BW	A234GRWPB	16 x 14	S10XS10		1	28			
6	CAP ASME B16.9 BW	A234GRWPB	14	S10		1	15.5		HY7242570867	
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	10	S20		5	26.6		AA7242502349	
8	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	10		CL150	3	19.5		AA7246101144	
9	GATE VALVE HD ASME B16.10 CL150 RF(16.5)	A216GRWB	10		CL150	1	203.91		AA7521408144	

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
10	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	10		CL150	3	1.14		HY7240362060	
11	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A194GR2H	7/8	M24X120	CL150	36	0.6		HY7142198460	
12	PIPE SUPPORT		24			10	0			
13	PIPE SUPPORT		14			6	0			

[2]

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 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
WCR-BHB-0-B013-40-11D								11D-RHP	"
WCR-BHB-0-B074B-24-11D								11D-RHP	24"
WCR-BHB-0-B073B-10-11D								11D-RHP	10"
WCR-BHB-0-B074A-14-11D								11D-RHP	14"
WCR-BHB-0-B074C-20-11D								11D-RHP	20"
WCR-BHB-0-B074D-14-11D								11D-RHP	"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - DIRECTION ANCHOR
 - RH - RIGID HANGER
 - SH - SPRING HANGER
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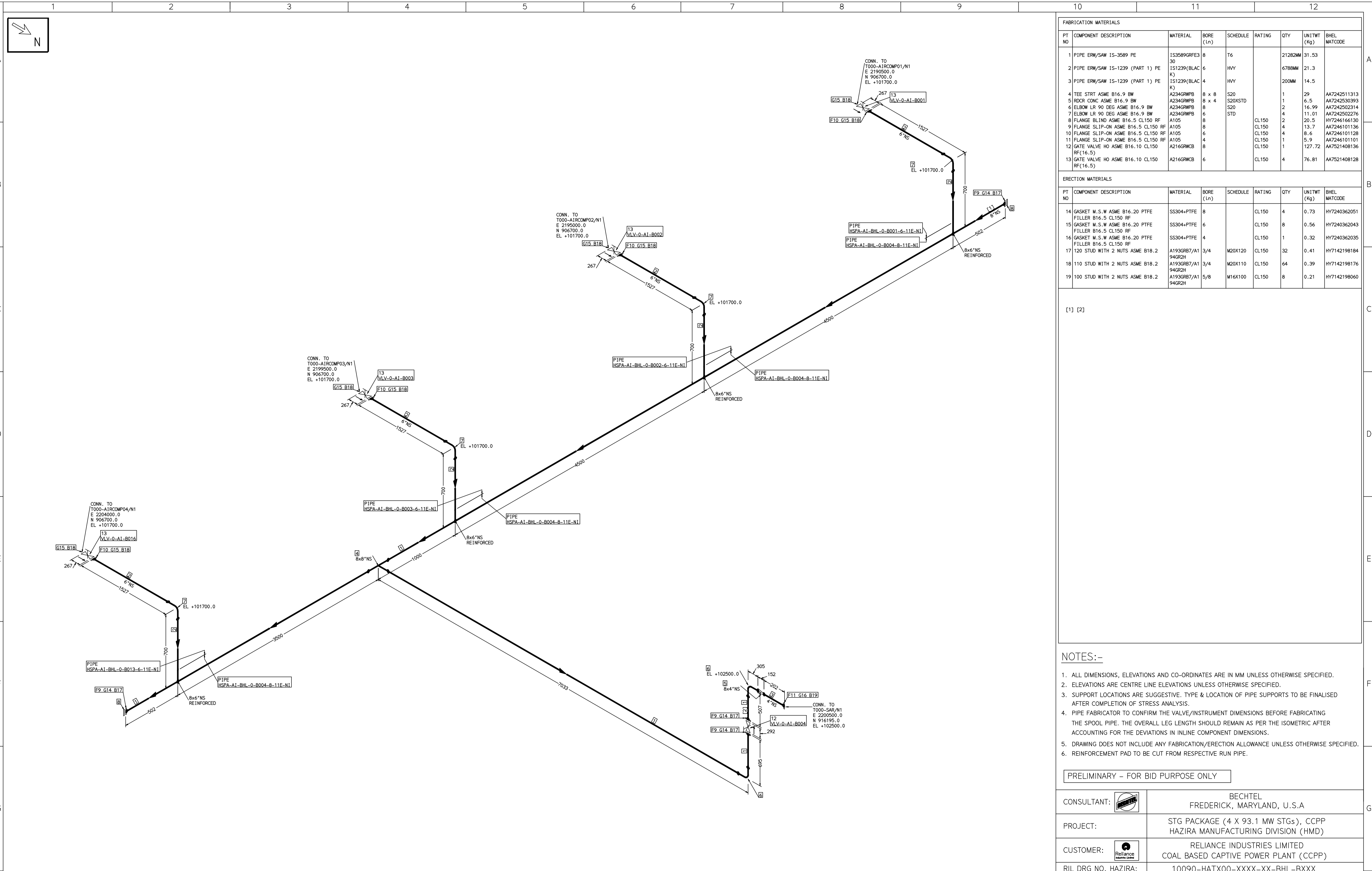
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE	
	DRN.	PCC	-SD-	05-05-14
	CHKD.	VJK	-SD-	05-05-14
	APPRD.	GS	-SD-	05-05-14
DRAWING NO:		REV		
1-381-01-06000		OOP		
SHT. No. 2	NO. OF SHTS. 2			

COMPUTER FILE NAME:

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COMPUTER FILE NAME:



ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
14	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	8		CL150	4	0.73	HY7240362051		
15	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	6		CL150	8	0.56	HY7240362043		
16	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	1	0.32	HY7240362035		
17	120 STUD WITH 2 NUTS ASME B18.2 94GR2H	A193GRB7/A1	3/4	M20X120	CL150	32	0.41	HY7142198184		
18	110 STUD WITH 2 NUTS ASME B18.2 94GR2H	A193GRB7/A1	3/4	M20X110	CL150	64	0.39	HY7142198176		
19	100 STUD WITH 2 NUTS ASME B18.2 94GR2H	A193GRB7/A1	5/8	M16X100	CL150	8	0.21	HY7142198060		

[1] [2]

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 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY	
CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-

1	2	3	4	5	6	7
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LINE PARAMETERS:-

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSPA-A1-BHL-0-B004-8-11E-NI								11E-RHP	"
HSPA-A1-BHL-0-B001-6-11E-NI								11E-RHP	"
HSPA-A1-BHL-0-B002-6-11E-NI								11E-RHP	"
HSPA-A1-BHL-0-B003-6-11E-NI								11E-RHP	"
HSPA-A1-BHL-0-B013-6-11E-NI								11E-RHP	"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - REST + LIMIT STOP
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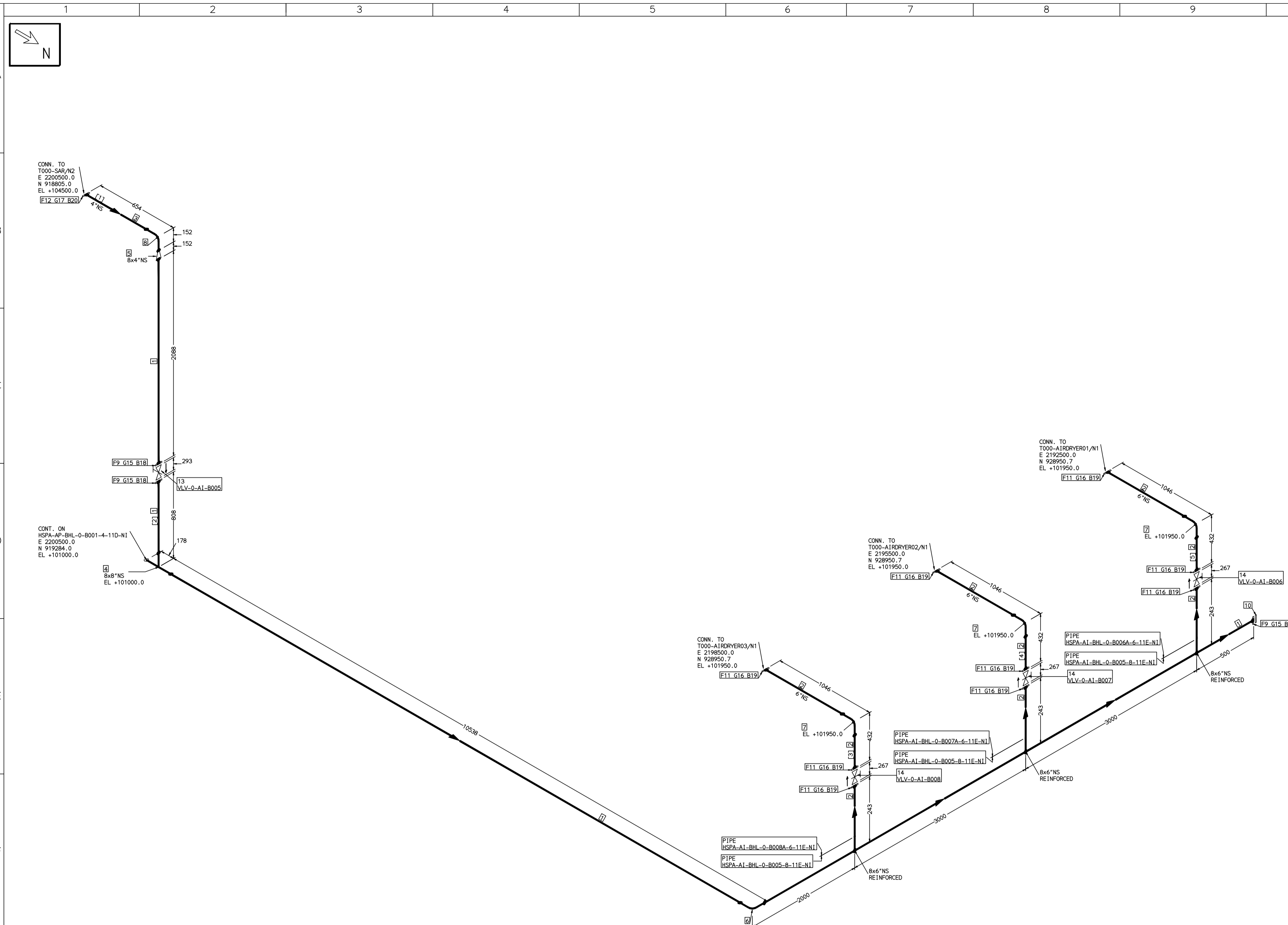
RECORD OF REVISIONS:-

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING		NAME	SIGN	DATE
		DRN.	PCC	-SD- 05-05-14
		CHKD.	VJK	-SD- 05-05-14
		APPRD.	GS	-SD- 05-05-14
TITLE: 0-IAPA-PPG-COMPR-TO-RECEIVER		DRAWING NO: 1-381-01-06001	REV OOP	
SHT. No. 1		NO. OF SHTS. 1		

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

COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW IS-3589 PE 30	IS3589RPF3	8	T6		20961MM	31.53		
2	PIPE ERW/SAW IS-1239 (PART 1) PE K	IS1239(BLAC K)	6	HVY		3556MM	21.3		
3	PIPE ERW/SAW IS-1239 (PART 1) PE K	IS1239(BLAC K)	4	HVY		500MM	14.5		
4	TEE STRT ASME B16.9 BW	A234GRWPB	8 x 8	S20			1	29	AA7242511313
5	RODR CONC ASME B16.9 BW	A234GRWPB	8 x 4	S20XSTD			1	6.5	AA7242530393
6	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	8 x 4	S20			1	16.99	AA7242502314
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	STD			3	11.01	AA7242502276
8	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	4	STD			1	4.23	AA7242502217
9	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	8		CL150		3	13.7	AA7246101136
10	FLANGE BLIND ASME B16.5 CL150 RF	A105	8		CL150		1	20.5	HY7246166130
11	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	6		CL150		1	8.6	AA7246101128
12	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	4		CL150		1	5.9	AA7246101101
13	GATE VALVE HO ASME B16.10 CL150 RF(16.5)	A216GRWCB	8		CL150		1	127.72	AA7521408136
14	GATE VALVE HO ASME B16.10 CL150 RF(16.5)	A216GRWCB	6		CL150		3	76.81	AA7521408128

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
15	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	8		CL150	3	0.73	HY7240362051	
16	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	6		CL150	9	0.56	HY7240362043	
17	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	1	0.32	HY7240362035	
18	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL150	24	0.41	HY7142198184	
19	110 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X110	CL150	72	0.39	HY7142198176	
20	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	8	0.21	HY7142198060	

[1] [2] [3] [4] [5]

NOTES:-

- ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
- ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
- SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
- PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
- DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
- REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-									

LINE PARAMETERS:-									
LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSPA-AI-BHL-0-B005-8-11E-NI								11E-RHP	
HSPA-AI-BHL-0-B008A-6-11E-NI								11E-RHP	
HSPA-AI-BHL-0-B007A-6-11E-NI								11E-RHP	
HSPA-AI-BHL-0-B006A-6-11E-NI								11E-RHP	

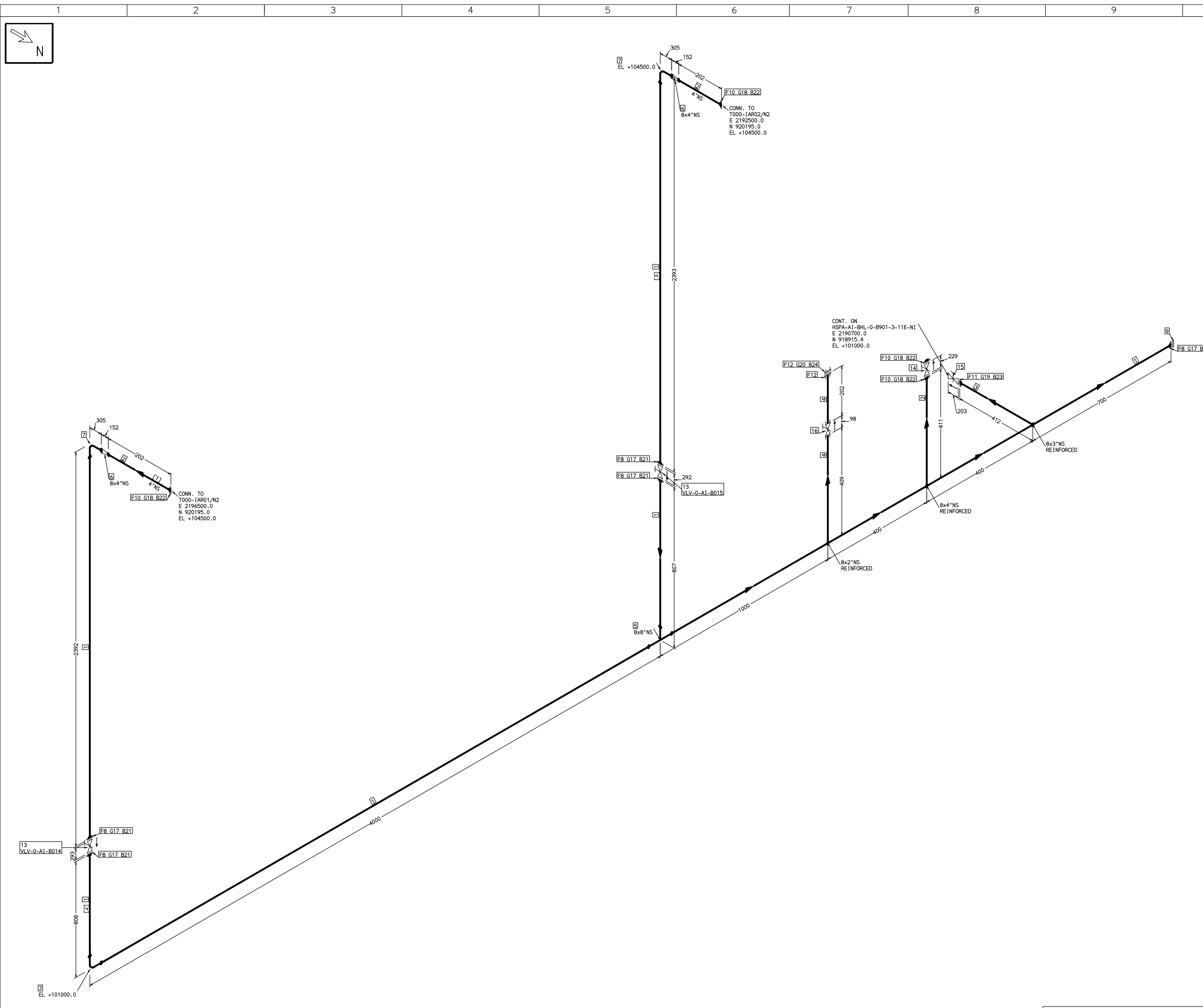
LEGEND:-									
—	SUPPORT LOCATION								
→	DIRECTION OF FLOW								
↘	DIRECTION OF SLOPE								
⊕	WELD SYMBOL								
A	ANCHOR								
R	REST								
RG	REST + GUIDE								
RL	REST + LIMIT STOP								
RGL	DIRECTION ANCHOR								
RH	RIGID HANGER								
SH	SPRING HANGER								
BS	BOTTOM SPRING								
VG	VERTICAL GUIDE								

RECORD OF REVISIONS:-									
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY				
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS				

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE
	DRN. PCC	-SD-	05-05-14
	CHKD. VJK	-SD-	05-05-14
	APPRD. GS	-SD-	05-05-14
DRAWING NO: 1-381-01-06002			REV OOP
SHT. No. 1	NO. OF SHTS. 1		

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COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-3589 PE	IS3589RPF3	8	T6			11134MM	31.53	
2	PIPE ERW/SAW 1S-1239 (PART 1) PE	IS1239(BLAC	4	HVY			716MM	14.5	
3	PIPE ERW/SAW 1S-1239 (PART 1) PE	IS1239(BLAC	3	HVY			310MM	9.9	AA1011052601
4	PIPE ERW/SAW 1S-1239 (PART 1) PE	IS1239(GALV	2	HVY			504MM	6.19	HY1011052741
5	TEE STRT ASME B16.9 BW	A234GRWPB	8 x 8	S20		1	29	AA7242511313	
6	ROCR CONC ASME B16.9 BW	A234GRWPB	8 x 4	S20XSTD		2	6.5	AA7242530393	
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	8	S20		3	16.99	AA7242502314	
8	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	8		CL150	5	13.7	AA7246101136	
9	FLANGE BLIND ASME B16.5 CL150 RF	A105	8		CL150	1	20.5	HY7246166130	
10	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	4		CL150	4	5.9	AA7246101101	
11	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	3		CL150	1	3.7	AA7246101080	
12	FLANGE SCREWED ASME B16.5 CL150 RF	A105(GALV)	2		CL150	2	0		
13	GATE VALVE HD ASME B16.10 CL150	A216GRWCB	8		CL150	2	127.72	AA7521408136	
14	GATE VALVE HD ASME B16.10 CL150	A216GRWCB	4		CL150	1	44.42	AA7521408101	
15	GATE VALVE HD ASME B16.10 CL150	A216GRWCB	3		CL150	1	29.94	AA7521408080	
16	GATE VALVE HD CL800 SCRD	A105	2		CL800	1	0	AA7521468945	

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
17	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	8		CL150	5	0.73	HY7240362051	
18	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	4	0.32	HY7240362035	
19	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	3		CL150	1	0.19	HY7240362027	
20	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	2		CL150	1	0.11	HY7240362019	
21	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL150	40	0.41	HY7142198184	
22	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	32	0.21	HY7142198060	
23	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	4	0.21	HY7142198060	
24	90 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X90	CL150	4	0.2	HY7142198052	

[1] [2] [3]

- NOTES:-**
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PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSPA-AI-BHL-0-B010-8-11E-NI								11E-RHP	

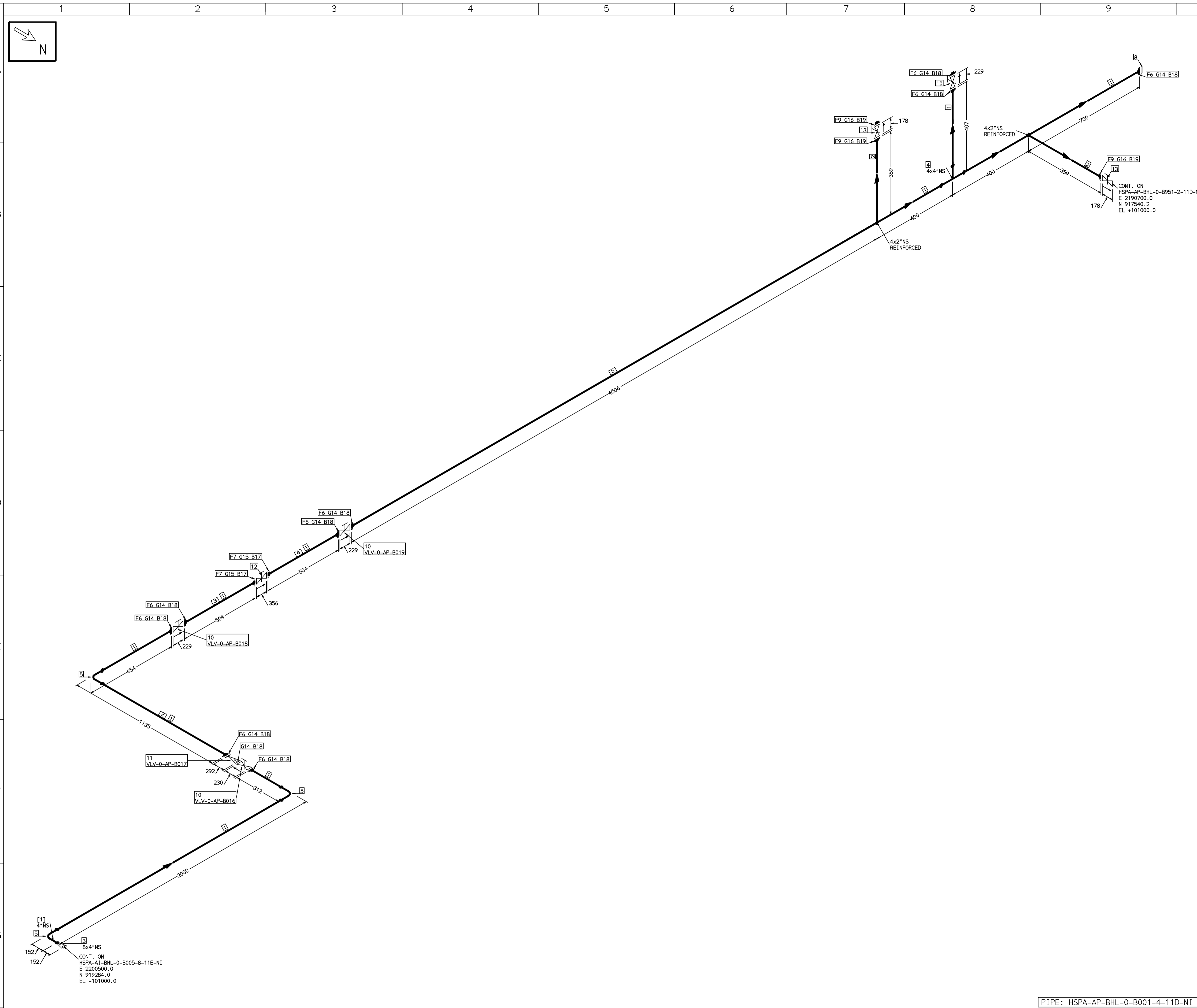
- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - DIRECTION ANCHOR
 - RH - RIGID HANGER
 - SH - SPRING HANGER
 - BS - BOTTOM SPRING
 - VG - VERTICAL GUIDE

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING		NAME	SIGN	DATE
DRN.	PCC	-SD-		05-05-14
CHKD.	VJK	-SD-		05-05-14
APPRD.	GS	-SD-		05-05-14
DRAWING NO: 1-381-01-06004		SCALE: NTS		REV OOP
SHT. No. 1				NO. OF SHTS. 1

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

COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC K)	4	HVY		10420MM	14.5		
2	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC K)	2	HVY		616MM	6.19	AA1011052580	
3	RDCR CONC ASME B16.9 BW	A234GRWPB	8 x 4	S20XSTD		1	6.5	AA7242530393	
4	TEE STRT ASME B16.9 BW	A234GRWPB	4 x 4	STD		1	5.3	AA7242511216	
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	4 x 4	STD		3	4.23	AA7242502217	
6	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	4		CL150	9	5.9	AA7246101101	
7	FLANGE SLIP-ON ASME B16.5 CL300 RF	A105	4		CL300	2	10	AA7246106103	
8	FLANGE BLIND ASME B16.5 CL150 RF	A105	4		CL150	1	7.7	HY7246166106	
9	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	2		CL150	3	2.3	AA7246101063	
10	GATE VALVE HO ASME B16.10 CL150 RF(16.5)	A216GRWCB	4		CL150	4	44.42	AA7521408101	
11	SWING CHECK VALVE ASME B16.10 CL150 RF(16.5)	A216GRWCB	4		CL150	1	56.76	AA7541408107	
12	REG GLOBE VALVE HO CL300 RF (B16.5)	A216GRWCB	4		CL300	1	86.36	AA7511428100	
13	GATE VALVE HO ASME B16.10 CL150 RF(16.5)	A216GRWCB	2		CL150	2	14.69	AA7521408063	

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
14	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	10	0.32	HY7240362035	
15	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL300 RF	SS304+PTFE	4		CL300	2	0.32	HY7240363074	
16	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	2		CL150	3	0.11	HY7240362019	
17	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL300	16	0.41	HY7142198184	
18	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	80	0.21	HY7142198060	
19	90 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X90	CL150	12	0.2	HY7142198052	

[1] [2] [3] [4] [5]

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PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-		LINE PARAMETERS:-								
LINE NUMBER		W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSPA-AP-BHL-0-B001-4-11D-NI									11D-RHP	"

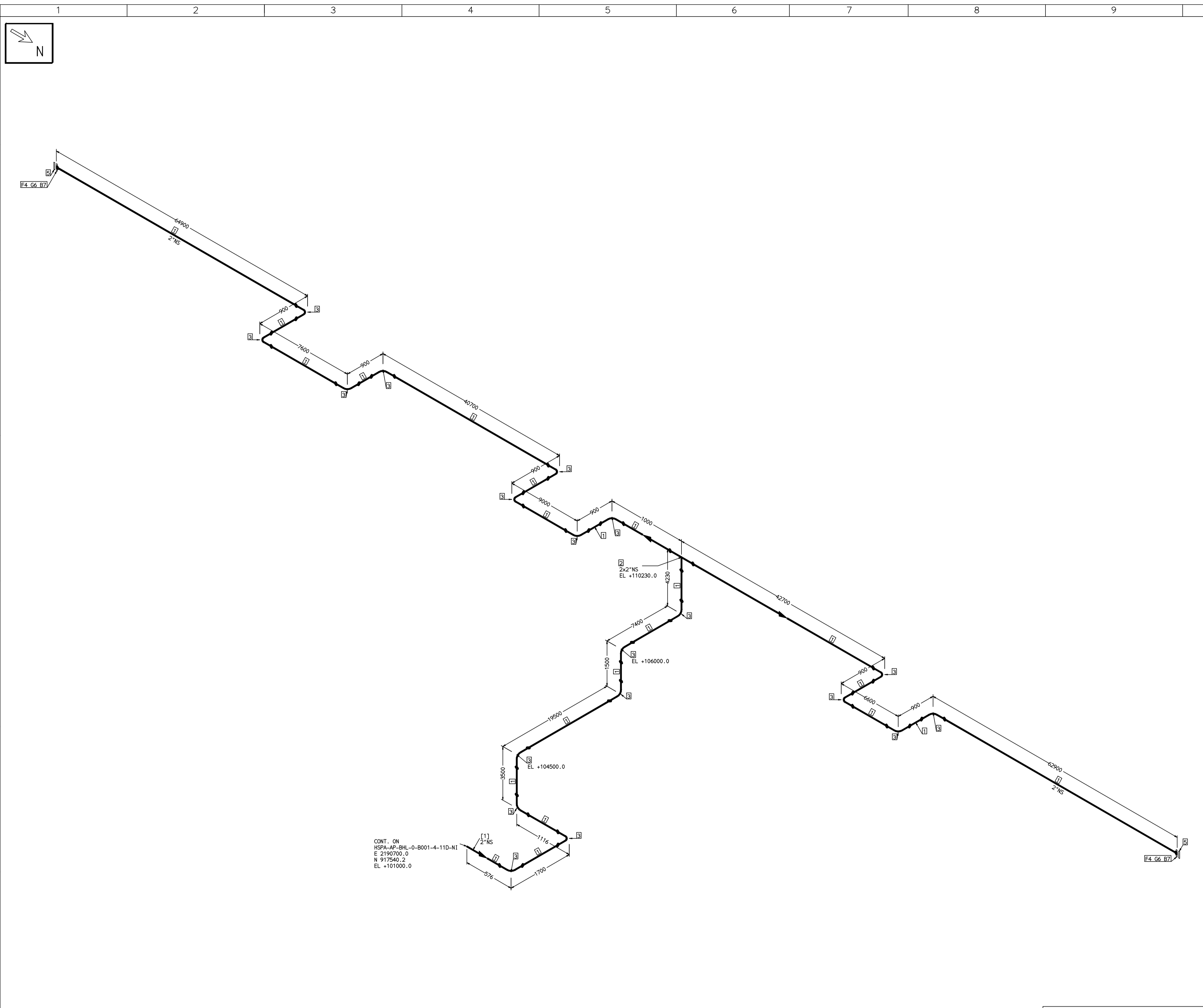
- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

RECORD OF REVISIONS:-					
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING		NAME SIGN DATE
TITLE: 0-PA-SUPPLY-FROM-IAPA-PACKG		DRN. PCC -SD- 05-05-14 CHKD. VJK -SD- 05-05-14 APPRD. GS -SD- 05-05-14 SCALE: NTS
DRAWING NO: 1-381-01-06005		REV OOP
SHT. No. 1		NO. OF SHTS. 1

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COMPUTER FILE NAME:



CONT. ON
HSPA-AP-BHL-0-B001-4-11D-N1
E 2190700.0
N 917540.2
EL +101000.0

FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-1239 (PART 1) PE K3	IS1239(BLAC)	2	HVY		277238M	6.19	AA1011052580	
2	TEE STRT ASME B16.9 BW	A234GRWPB	2 x 2	STD		M	1.3	AA7242511119	
3	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	2	STD		19	0.75	AA7242502110	
4	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	2		CL150	2	2.3	AA7246101063	
5	FLANGE BLIND ASME B16.5 CL150 RF	A105	2		CL150	2	2.3	HY7246166068	

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
6	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	2		CL150	2	0.11	HY7240362019	
7	90 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X90	CL150	8	0.2	HY7142198052	

[1]

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 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSPA-AP-BHL-0-B951-2-11D-N1								11D-RHP	

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

NAME	SIGN	DATE
DRN. PCC	-SD-	05-05-14
CHKD. VJK	-SD-	05-05-14
APPRD. GS	-SD-	05-05-14

SCALE: NTS

TITLE:	0-PA-SUPPLY-HEADER-PIPING	DRAWING NO:	1-381-01-06007	REV	OOP
SHT. No.	1	NO. OF SHTS.	1		

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



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE EFSW ASME B36.10 PE	A672GRB60	16	S10			10172MM	62.65	AA1049457145
2	PIPE SMLS ASME B36.10 PE	A106GRB	14	S40			1156MM	94.55	
3	PIPE SMLS ASME B36.10 PE	A106GRB	12	S20			1250MM	49.71	AA1049355725
4	TEE STRT ASME B16.9 BW	A234GRWPB	16 x 16	S10		2	90.8	0	HY7242511429
5	STRAINER BASKET TYPE CL300 RF(B16.5)	A234GRWPB	16 x 14		CL300	2	0	0	
6	RDCR CONC ASME B16.9 BW	A234GRWPB	16 x 12	S10XS20		2	22.65		AA7242530636
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	16	S10		2	59.59		AA7242502420
8	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	12	S20		2	37.61		AA7242502381
9	GATE VALVE GO CL150 BW	A216GRWCB	16		CL150	2	580		AA7521408756

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
10	200 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A194GR2H	1.1/4	M3X200	CL300	40	1.82		HY7142299215
11	PIPE REST					6	0		

[1]

- NOTES:-**
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 - SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
 - PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

BHARAT HEAVY ELECTRICALS LTD		PROJECT ENGINEERING & SYSTEMS DIVISION		R.C.PURAM, HYDERABAD-502032.		PE&SD LAYOUTS & PIPING ENGINEERING	
NAME	SIGN	DATE	DRN.	PCC	CHKD.	APPRD.	SCALE: NTS
		05-05-14					
		05-05-14					
		05-05-14					

TITLE:	1-CEP-SUCTION	DRAWING NO:	1-381-01-06008	REV	OOP
SHT. No.	1	NO. OF SHTS.	1		

REFERENCE DRAWINGS:-

1	2	3	4	5	6	7
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LINE PARAMETERS:-

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSAD-HC-BHL-1-B403-16-11G-NI	VAC	47.3	1.0	70				11G-RHP	16"
HSAD-HC-BHL-1-B405-16-11G-NI	VAC	47.3	1.0	70				11G-RHP	16"
HSAD-HC-BHL-1-B404-16-11G-NI	VAC	47.3	1.0	70				11G-RHP	16"

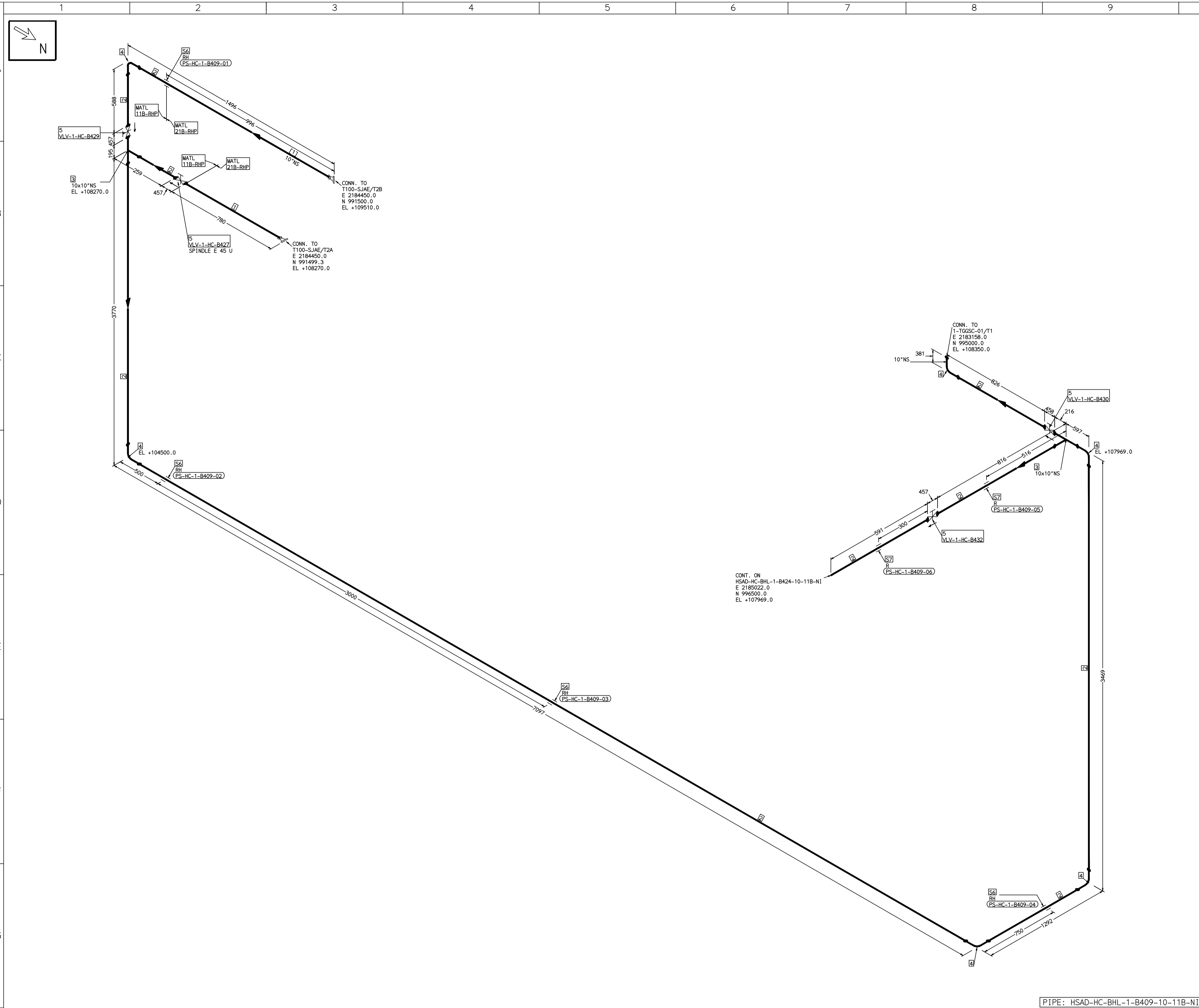
- LEGEND:-
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - ↘ DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

RECORD OF REVISIONS:-

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

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COMPUTER FILE NAME:



FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE SMLS ASME B36.10 PE	A106GRB	10	S40		1539MM	60.29	AA1049355687		
2	PIPE SMLS ASME B36.10 PE	A106GRB	10	S20		14750MM	41.76	AA1049355660		
3	TEE STRT ASME B16.9 BW	A234GRWPB	10 x 10	S20		2	34.7	AA7242511348		
4	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	10	S20		6	26.6	AA7242502349		
5	GATE VALVE HD ASME B16.10 CL150 BW	A216GRWCB	10	S20	CL150	4	225	AA7521408721		

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
6	RIGID HANGER		10			4	0			
7	PIPE REST		10			2	0			

[1]

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 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-	

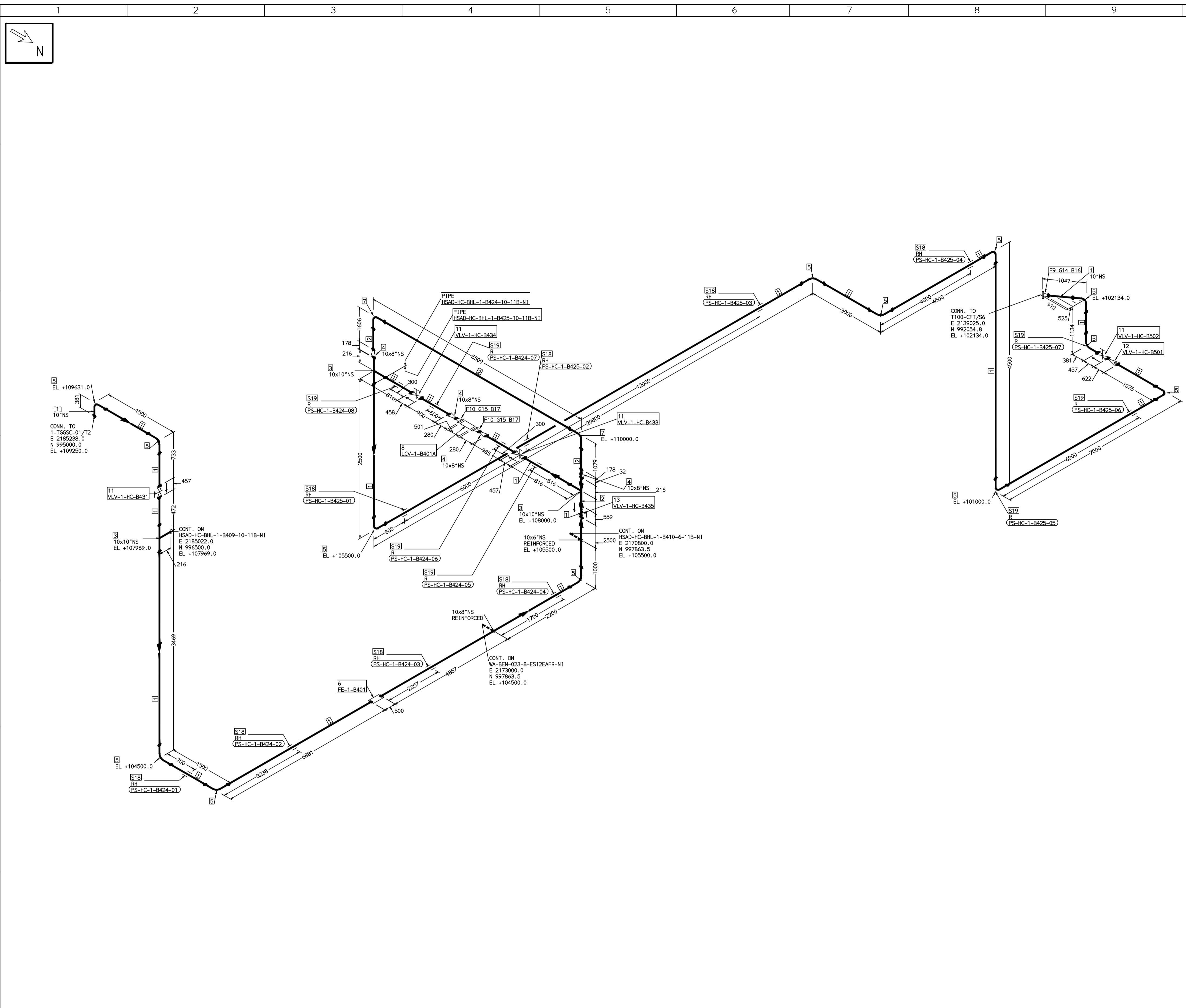
LINE PARAMETERS:-									
LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSAD-HC-BHL-1-B409-10-11B-NI	4.75	47.3	6.1	70				118-RHP	10"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
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RECORD OF REVISIONS:-					
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHEL		BHARAT HEAVY ELECTRICALS LTD		PROJECT ENGINEERING & SYSTEMS DIVISION	
R.C.PURAM, HYDERABAD-502032.		PE&SD		LAYOUTS & PIPING ENGINEERING	
TITLE:	1-CONDENSATE-PIPING-SJAE-GSC				
DRAWING NO:	1-381-01-06010		REV	OOP	
SHT. No. 1	NO. OF SHTS. 1		SCALE: NTS		

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FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE SMLS ASME B36.10 PE	A106GRB	10	S20		63643MM	41.76	AA1049355660		
2	PIPE SMLS ASME B36.10 PE	A106GRB	8	S20		6997MM	33.32	AA1049355663		
3	TEE STRT ASME B16.9 BW	A234GRWPB	10 x 10	S20		3	34.7	AA7242511348		
4	ROCR CONC ASME B16.9 BW	A234GRWPB	10 x 8	S20XS20		4	7.5	AA7242530482		
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	10	S20		13	26.6	AA7242502349		
6	PIPING COMPONENT (USER DEFINED) BW	A234GRWPB	10			1	0			
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	8	S20		2	16.99	AA7242502314		
8	PIPING COMPONENT (USER DEFINED) CL150 RF(B16.5)	A234GRWPB	8		CL150	1	0			
9	FLANGE WELD NECK ASME B16.5 CL150 RF	A105	10	S20	CL150	1	22.63	HY7246361677		
10	FLANGE WELD NECK ASME B16.5 CL150 RF	A105	8	S20	CL150	2	17.3	HY7246361219		
11	GATE VALVE HO ASME B16.10 CL150 BW	A216GRWCB	10		CL150	4	225	AA7521408721		
12	SWING CHECK VALVE ASME B16.10 CL150 BW	A216GRWCB	10		CL150	1	312.49	AA7541408727		
13	REG GLOBE VALVE HO ASME B16.10 CL300 BW	A216GRWCB	8		CL300	1	247.03	AA7511428711		

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
14	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	10		CL150	1	1.14	HY7240362060		
15	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	8		CL150	2	0.73	HY7240362051		
16	120 STUD WITH 2 NUTS ASME B18.2 94GRH	A193GRB7/A1 94GRH	7/8	M24X120	CL150	12	0.6	HY7142198460		
17	120 STUD WITH 2 NUTS ASME B18.2 94GRH	A193GRB7/A1 94GRH	3/4	M20X120	CL150	16	0.41	HY7142198184		
18	RIGID HANGER					8	0			
19	PIPE REST					7	0			

[1]

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PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-

1	
2	
3	
4	
5	
6	
7	

LINE PARAMETERS:-

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSAD-HC-BHL-1-B424-10-11B-NI	3.45	49.2	6.1	75				11B-RHP	10"
HSAD-HC-BHL-1-B425-10-11B-NI								11B-RHP	

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

RECORD OF REVISIONS:-

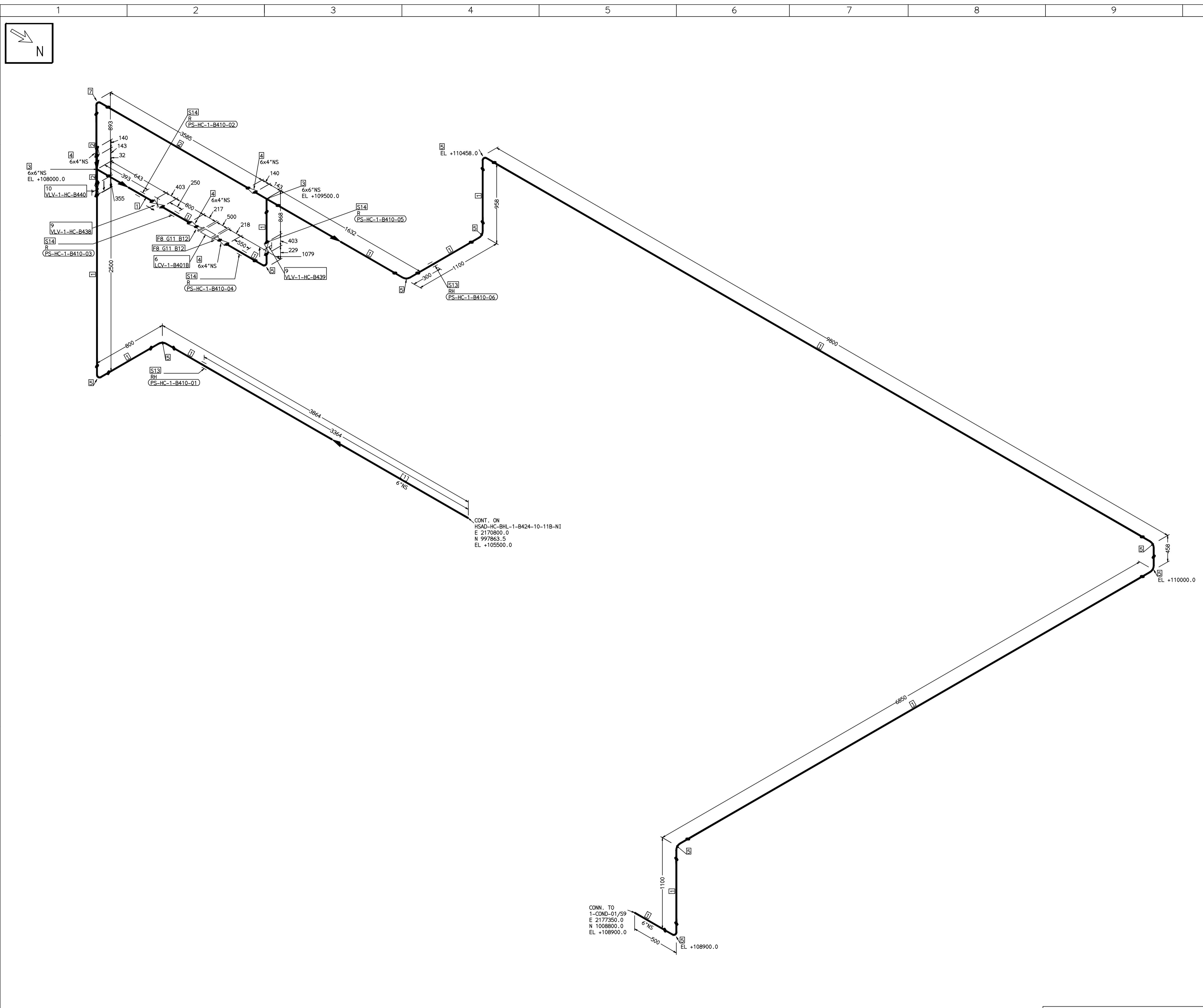
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE	
	DRN.	PCC	-SD-	05-05-14
	CHKD.	VJK	-SD-	05-05-14
	APPRD.	GS	-SD-	05-05-14
DRAWING NO:		REV		
1-381-01-06011		OOP		
SHT. No. 1	NO. OF SHTS. 1			

COMPUTER FILE NAME:

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COMPUTER FILE NAME:



FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE SMLS ASME B36.10 PE	A106GRB	6	S40		28029MM	28.26	AA104935512		
2	PIPE SMLS ASME B36.10 PE	A106GRB	4	S40		4206MM	16.08	AA1049355415		
3	TEE STRT ASME B16.9 BW	A234GRWPB	6 x 6	S40		2	11	AA7242511275		
4	RDCR CONC ASME B16.9 BW	A234GRWPB	6 x 4	S40S40		4	3.9	AA7242530350		
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	S40		10	11.01	AA7242502276		
6	PIPING COMPONENT (USER DEFINED) CL150 RF(B16.5)	A234GRWPB	4	S40	CL150	1	0			
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	4	S40		1	4.23	AA7242502217		
8	FLANGE WELD NECK ASME B16.5 CL150 RF	A105	4	S40	CL150	2	7.11	HY7246361103		
9	GATE VALVE HO ASME B16.10 CL150 BW	A216GRWCB	6		CL150	2	91.5	AA7521408705		
10	REG GLOBE VALVE HO ASME B16.10 CL300 BW	A216GRWCB	4		CL300	1	70.79	AA7511428681		

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
11	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	2	0.32	HY7240362035		
12	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A194GR2H	5/8	M16X100	CL150	16	0.21	HY7142198060		
13	RIGID HANGER		6			2	0			
14	PIPE REST		6			4	0			

[1]

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PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSAD-HC-BHL-1-B410-6-11B-NI	3.45	49.2	6.1	75				11B-RHP	3"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
 - A - ANCHOR
 - R - REST
 - RG - REST + GUIDE
 - RL - REST + LIMIT STOP
 - RGL - DIRECTION ANCHOR
 - RH - RIGID HANGER
 - SH - SPRING HANGER
 - BS - BOTTOM SPRING
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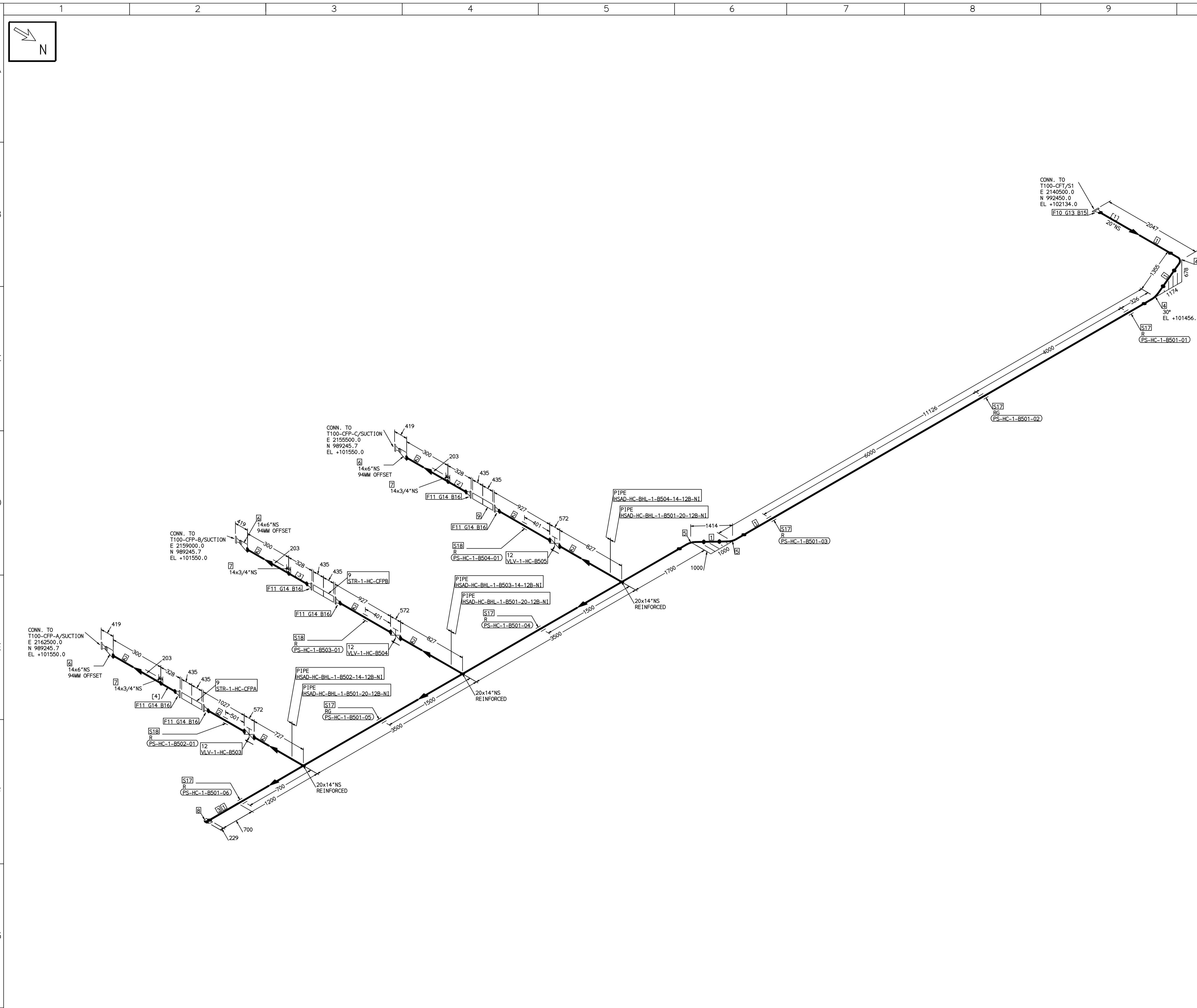
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

NAME	SIGN	DATE
DRN. PCC	-SD-	05-05-14
CHKD. VJK	-SD-	05-05-14
APPRD. GS	-SD-	05-05-14

SCALE: NTS

TITLE:	1-COND-MIN-RECIRCULATION	REV	OOP
DRAWING NO:	1-381-01-06012	SHT. No.	1
		NO. OF SHTS.	1

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FABRICATION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE SMLS ASME B36.10 PE	A312GRTP304	20	S10S		22493MM	68.65			
2	PIPE SMLS ASME B36.10 PE	A312GRTP304	14	S10S		5838MM	41.36			
3	PIPE SMLS ASME B36.10 PE	A312GRTP304	20	S10S		700MM	68.65			
4	ELBOW LR 90 DEG ASME B16.9 BW	A403GRWP304	20	S10S		2	81.79			
5	ELBOW LR 45 DEG ASME B16.9 BW	A403GRWP304	20	S10S		2	40.895			
6	RDCR ECC ASME B16.9 BW	A403GRWP304	14 x 6	S10SX10S		3	13.1			
7	HALF COUPLING ASME B16.11 CL3000	A182GRF304	14 x 3/4		CL3000	3	0.2			
8	CAP ASME B16.9 BW	A403GRWP304	20	S10S		1	27.5			
9	STRAINER Y-TYPE ASME B16.10 CL150	A403GRWP304	14		CL150	3	0			
10	FLANGE WELD NECK ASME B16.5 CL150	A182GRF304	20	S10S	CL150	1	80.76			
11	FLANGE WELD NECK ASME B16.5 CL150	A182GRF304	14	S10S	CL150	6	45.49			
12	GATE VALVE GO CL150 BW	A351GRCF8	14		CL150	3	492			

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
13	GASKET M.S.W ASME B16.20 PTFE	SS304+PTFE	20		CL150	1	2.87	HY7240362116		
14	GASKET M.S.W ASME B16.20 PTFE	SS304+PTFE	14		CL150	6	1.57	HY7240362086		
15	170 STUD WITH 2 NUTS ASME B18.2	A193GRB8/A1 94GRB	1.1, 1.8	M30X170	CL150	20	1.3			
16	140 STUD WITH 2 NUTS ASME B18.2	A193GRB8/A1 94GRB	1	M27X140	CL150	72	0.92			
17	PIPE REST		20			6	0			
18	PIPE REST		14			3	0			

[1] [2] [3] [4]

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 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

REFERENCE DRAWINGS:-

LINE PARAMETERS:-

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSAD-HC-BHL-1-B501-20-12B-NI	ATM	39.5	1.0	60				12B-RHP	20"
HSAD-HC-BHL-1-B504-14-12B-NI	ATM	39.5	1.0	60				12B-RHP	14"
HSAD-HC-BHL-1-B503-14-12B-NI	ATM	39.5	1.0	60				12B-RHP	14"
HSAD-HC-BHL-1-B502-14-12B-NI	ATM	39.5	1.0	60				12B-RHP	14"

- LEGEND:-**
- SUPPORT LOCATION
 - DIRECTION OF FLOW
 - DIRECTION OF SLOPE
 - WELD SYMBOL
- A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
RGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

RECORD OF REVISIONS:-

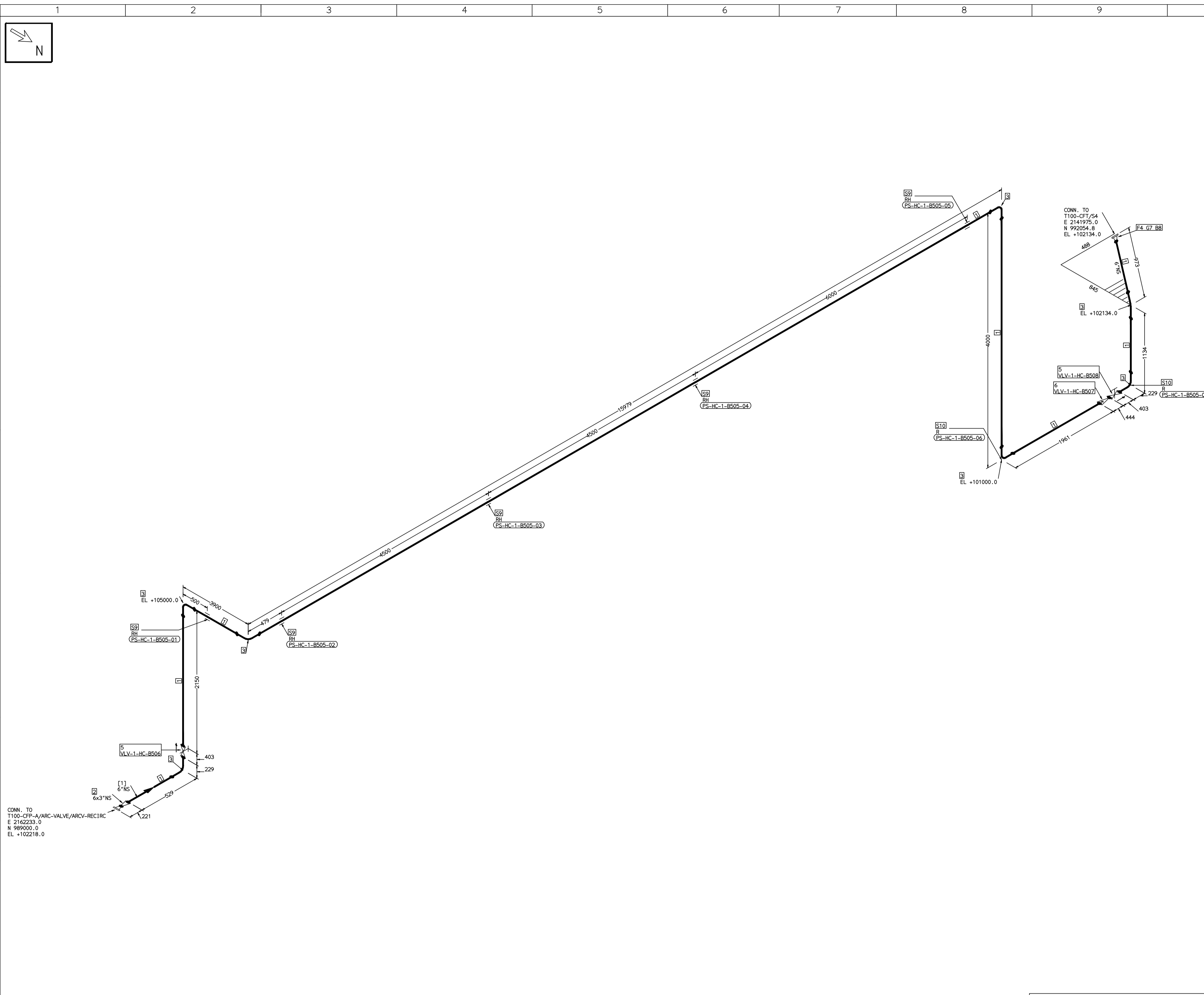
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING	NAME	SIGN	DATE	
	DRN.	PCC	-SD-	05-05-14
	CHKD.	VJK	-SD-	05-05-14
	APPRD.	GS	-SD-	05-05-14
DRAWING NO:		REV		
1-381-01-06013		OOP		
SHT. No. 1	NO. OF SHTS. 1			

COMPUTER FILE NAME:

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COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE SMLS ASME B36.10 PE	A312GRTP304	6	S105		27779MM	13.83		
2	RDCR CONC ASME B16.9 BW	A403GRWP304	6 x 3	S105XS105		1	3.9		
3	ELBOW LR 90 DEG ASME B16.9 BW	A403GRWP304	6	S105		7	5.44		
4	FLANGE WELD NECK ASME B16.5 CL300	A182GRF304	6	CL300		1	18.73		
5	GATE VALVE HO ASME B16.10 CL300 BW	A351GRCF8	6	CL300		2	150		
6	SWING CHECK VALVE ASME B16.10 CL300 BW	A351GRCF8	6	CL300		1	139.34		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
7	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL300 RF	SS304+PTFE	6	CL300		1	0.56	HY7240363082	
8	130 STD WITH 2 NUTS ASME B18.2	A193GRB8/A194GRB	3/4	M20X130		12	0.43		
9	RIGID HANGER		6			5	0		
10	PIPE REST		6			2	0		

[1]

- NOTES:-**
- ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
 - ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
 - SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
 - PIPE FABRICATOR TO CONFIRM THE VALVE/INSTRUMENT DIMENSIONS BEFORE FABRICATING THE SPOOL PIPE. THE OVERALL LEG LENGTH SHOULD REMAIN AS PER THE ISOMETRIC AFTER ACCOUNTING FOR THE DEVIATIONS IN INLINE COMPONENT DIMENSIONS.
 - DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

CONSULTANT:	BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATXR00-XXXX-XX-BHL-BXXX

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK S(mm)	INS MAT	PSPEC	BORE
HSAD-HC-BHL-1-B505-6-22B-NI	15.5	39.5	19.2	60				22B-RHP	6"

- LEGEND:-**
- ANCHOR
 - REST
 - REST + GUIDE
 - REST + LIMIT STOP
 - DIRECTION ANCHOR
 - RIGID HANGER
 - SPRING HANGER
 - BOTTOM SPRING
 - VERTICAL GUIDE

REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VJK	GS

NAME	SIGN	DATE
DRN. PCC	-SD-	05-05-14
CHKD. VJK	-SD-	05-05-14
APPRD. GS	-SD-	05-05-14

SCALE: NTS

TITLE:	1-CFP-A-RECIRCULATION	REV	OOP
DRAWING NO:	1-381-01-06014	SHT. No.	1
		NO. OF SHTS.	1