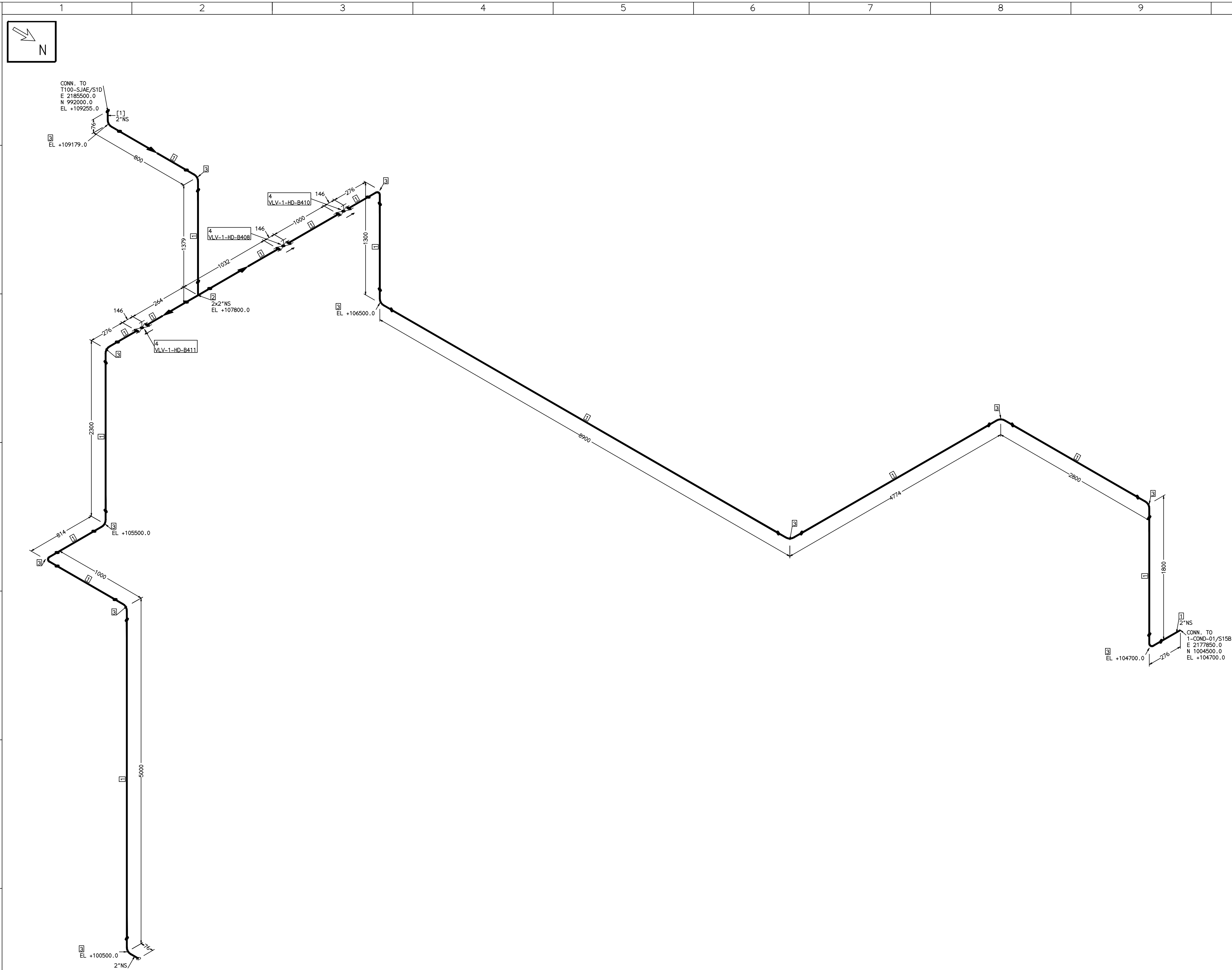


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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY DETRIMENTAL MANNER TO THE INTEREST OF THE COMPANY

COMPUTER FILE NAME:



FABRICATION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
1	PIPE SMLS ASME B36.10 PE	A106GRB	2	S40		31975MM	5.44	AA1049355270
2	TEE STRT ASME B16.9 BW	A234GRWPB	2 x 2	S40		1	1.3	AA7242511119
3	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	2	S40		13	0.75	AA7242502110
4	GLOBE VALVE HO CL800 SW	A105	2		CL800	3	11.4	AA7501468630

[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-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 \$(mm)	INS MAT	PSPEC	BORE
HSAD-HD-BHL-1-B420-2-11G-HC								11G-RHP	"

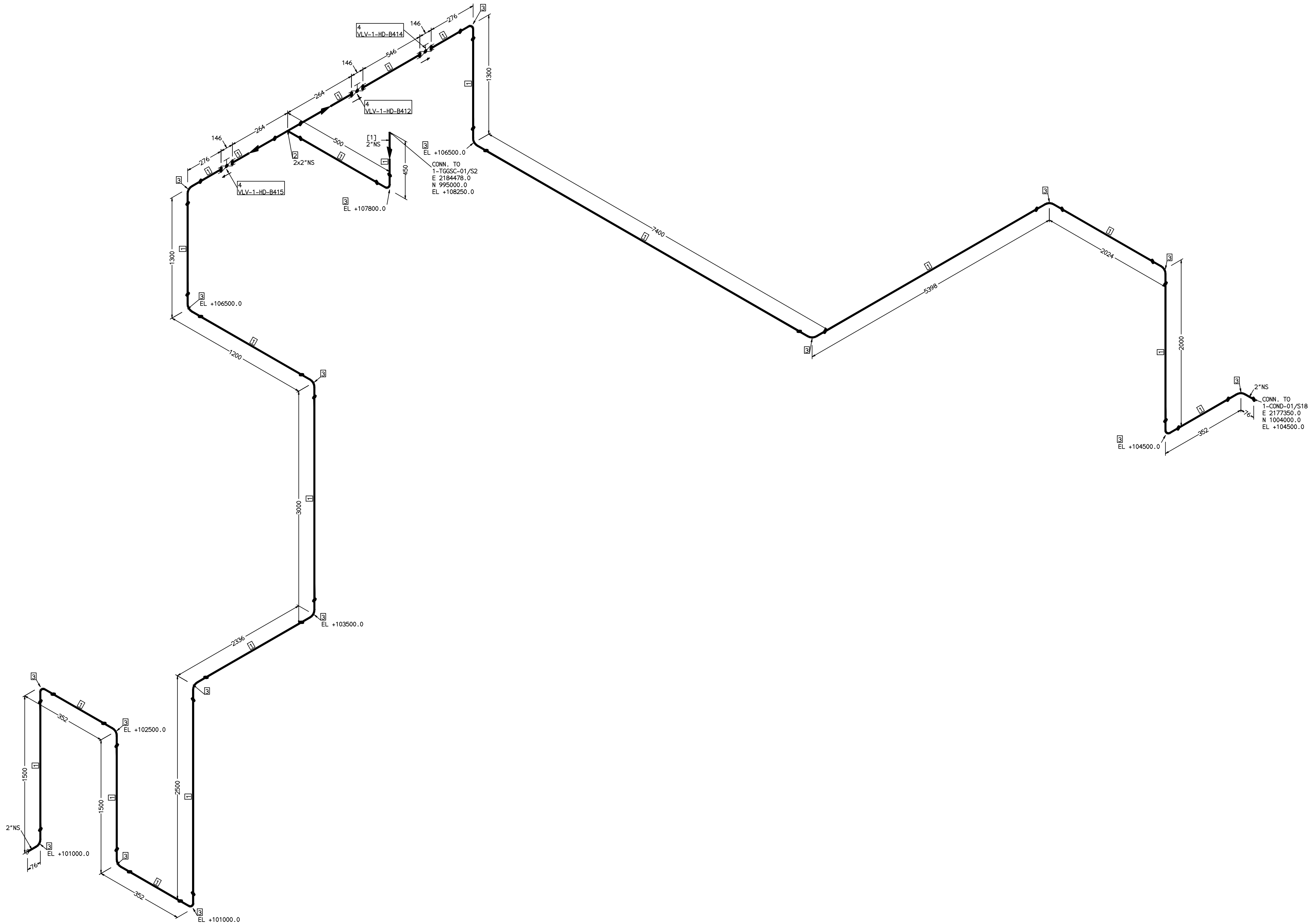
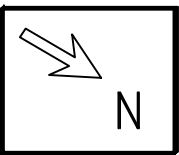
LEGEND:-	
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL
A	ANCHOR
R	REST
RG	REST + GUIDE
RL	REST + LIMIT STOP
RGL	DIRECTION ANCHOR
RH	RIGID HANGER
SH	SPRING HANGER
BS	BOTTOM SPRING
VG	VERTICAL GUIDE

RECORD OF REVISIONS:-					
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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.	VUK	-SD-	05-05-14
		APPRD.	GS	-SD-	05-05-14
TITLE: 1-SJAE-B-AFTER-COND-DRAIN-PPG		DRAWING NO: 1-381-01-06042			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 SMLS ASME B36.10 PE	A106GRB	2	S40		32314MM	5.44	AA1049355270
2	TEE STRT ASME B16.9 BW	A234GRWPB	2 x 2	S40		1	1.3	AA7242511119
3	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	2	S40		18	0.75	AA7242502110
4	GLOBE VALVE HO CL800 SW	A105	2		CL800	3	11.4	AA7501468630

[1]

NOTES:-

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3. SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
4. 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.
5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
6. 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 \$(mm)	INS MAT	PSPEC	BORE
HSAD-HD-BHL-1-B421-2-11G-HC								11G-RHP	"

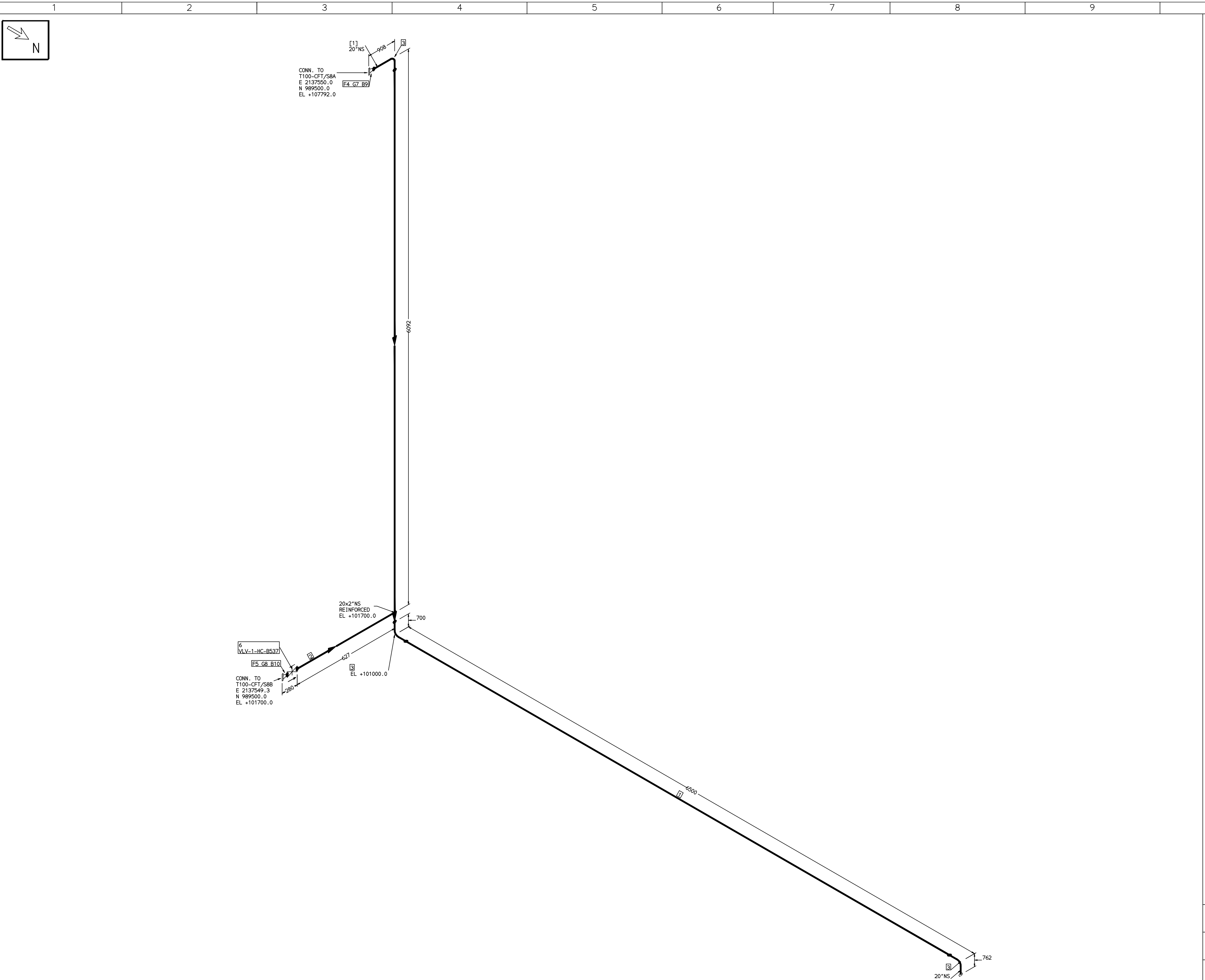
LEGEND:-	
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL
A	ANCHOR
R	REST
RG	REST + GUIDE
RL	REST + LIMIT STOP
RGL	DIRECTION ANCHOR
RH	RIGID HANGER
SH	SPRING HANGER
BS	BOTTOM SPRING
VG	VERTICAL GUIDE

RECORD OF REVISIONS:-					
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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
DRAWING NO:		1-381-01-06043	REV	OOP
SHT. No. 1		NO. OF SHTS. 1		

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COMPUTER FILE NAME:



FABRICATION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
1	PIPE EFSW ASME B36.10 PE	A672ORB60	20	S10		10306MM	78.56	AA1049457366
2	PIPE SWLS ASME B36.10 PE	A106GRB	2	S40		375MM	5.44	AA1049355270
3	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	20	S10		3	93.53	HY7242502446
4	FLANGE WELD NECK ASME B16.5 CL150	A105	20	S10	CL150	1	82.17	HY7246361723
5	FLANGE WELD NECK ASME B16.5 CL150 RF	A105	2	S40	CL150	1	2.54	HY7246361065
6	GATE VALVE HO ASME B16.10 CL150 BW	A216GRWCB	2		CL150	1	14.69	AA7521408640

ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
7	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	20		CL150	1	2.87	HY7240362116
8	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	2		CL150	1	0.11	HY7240362019
9	170 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	1.1/8	M30X170	CL150	20	1.3	HY7142299037
10	90 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X90	CL150	4	0.2	HY7142198052

[1]

- NOTES:-
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 - REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

PRELIMINARY - FOR BID PURPOSE ONLY

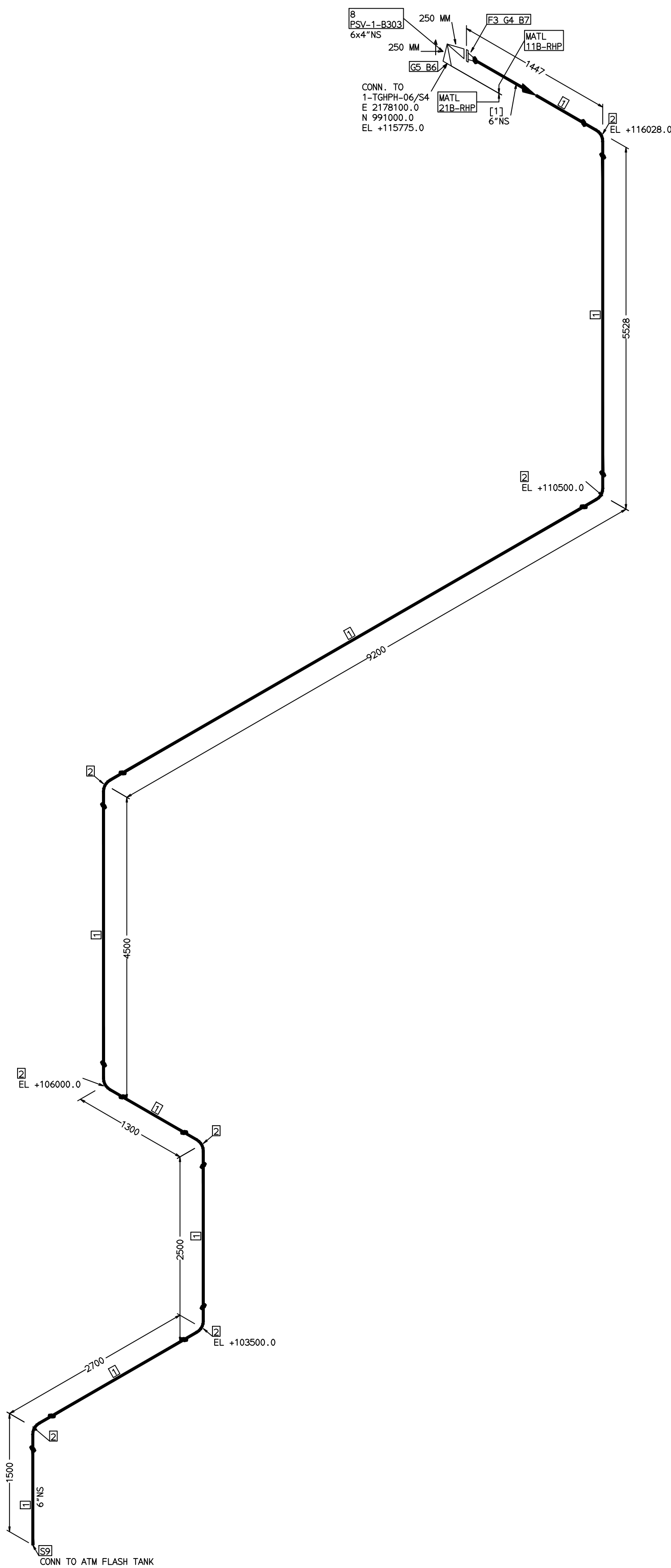
CONSULTANT:	 BECHTEL FREDERICK, MARYLAND, U.S.A
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)
CUSTOMER:	 RELIANCE INDUSTRIES LIMITED COAL BASED CAPTIVE POWER PLANT (CCPP)
RIL DRG NO. HAZIRA:	10090-HATX00-XXXX-XX-BHL-BXXX

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 \$(mm)	INS MAT	PSPEC	BORE
		HSAD-HC-BHL-1-B517-20-11B-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:-					
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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.	VUK	-SD-	05-05-14
		APPRD.	GS	-SD-	05-05-14
			SCALE: NTS		
TITLE: 1-CFT-OVERFLOW-DRAIN		DRAWING NO: 1-381-01-06044			REV OOP
		SHT. No. 1		NO. OF SHTS. 1	



[1]

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5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
6. 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

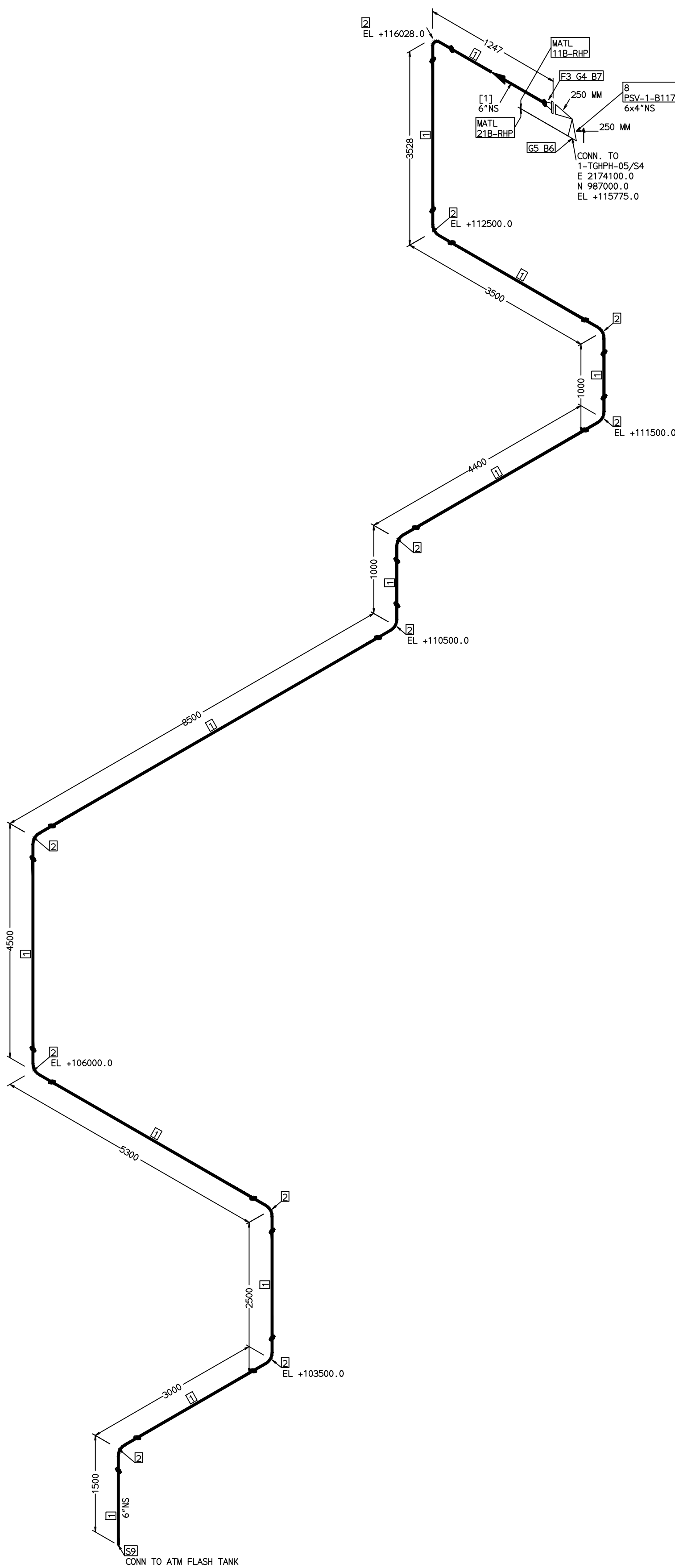
 BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING		NAME	SIGN	DATE
	DRN.	PCC	-SD-	05-05-14
	CHKD.	VUK	-SD-	05-05-14
	APPRD.	GS	-SD-	05-05-14
				SCALE: NTS
TITLE: 1-HPH6-SHELL-SIDE-PSV-OUTLET		DRAWING NO: 1-381-01-06045		REV 00P
		SHT. No. 1	NO. OF SHTS. 1	

[illegible]

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:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

COMPUTER FILE NAME: _____



ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
4	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	6		CL150	1	0.56	HY7240362043
5	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	A19304+GRAPH	4		CL300	1	0.32	HY7240365077
6	120 STD STUD WITH 2 NUTS ASME B18.2	A193GR87/A1 94G2QH	3/4	M20X120	CL150	8	0.41	HY7142198184
7	110 STD STUD WITH 2 NUTS ASME B18.2	A193GR87/A1 94G2QH	3/4	M20X110	CL150	8	0.39	HY7142198176
8	PSV FLGD (RF-RF)	A216GRWC6	6 x 4		C300RF X C150RF	1	0	
9	GENERAL ATTACHMENT					1	0	

[1]

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6. 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			NAME	SIGN	DATE
	PROJECT ENGINEERING & SYSTEMS DIVISION		DRN.	PCC	-SD-	05-05-14
	R.C.PURAM, HYDERABAD-502032.		CHKD.	VUK	-SD-	05-05-14
	LAYOUTS & PIPING ENGINEERING		APPRD.	GS	-SD-	05-05-14
					SCALE: NTS	
TITLE: 1-HPHS-SHELL-SIDE-PSV-OUTLET			DRAWING NO: 1-381-01-06046			REV OOP
			SHT. No. 1		NO. OF SHTS. 1	

[illegible]

LEGEND:-

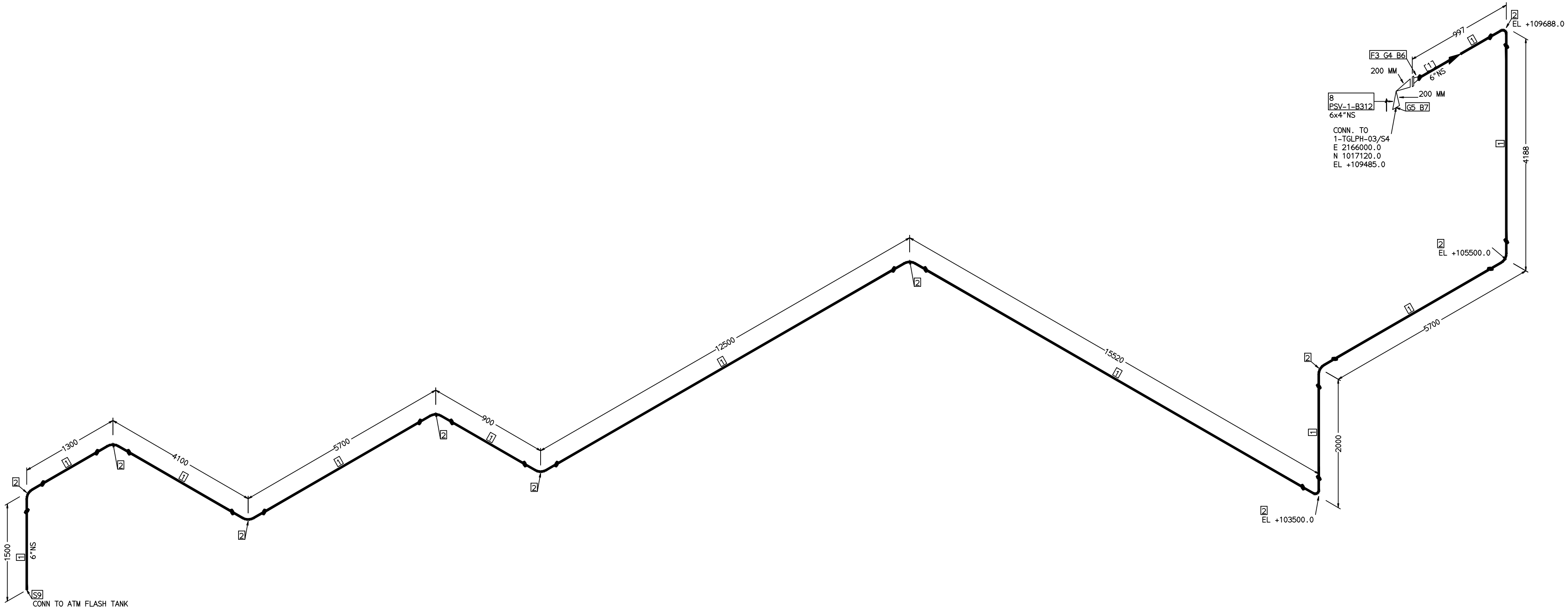
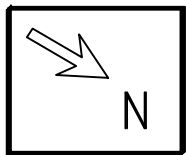
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL

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:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

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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		49736MM	28.26	AA1049355512
2	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	S40		10	11.01	AA7242502276
3	FLANGE WELD NECK ASME B16.5 CL150 RF	A105	6	S40	CL150	1	10.91	HY7246361120
ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
4	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	6		CL150	1	0.56	HY7240362043
5	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	1	0.32	HY7240362035
6	110 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X110	CL150	8	0.39	HY7142198176
7	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	8	0.21	HY7142198060
8	PSV FLGD (RF-RF)	A216GRWCB	6 x 4		C300RF X C150RF	1	0	
9	GENERAL ATTACHMENT		6			1	0	

[1]

NOTES:-

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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 \$(mm)	INS MAT	PSPEC	BORE
HSAF-SV-BHL-1-B315-6-11B-NI								11B-RHP	"

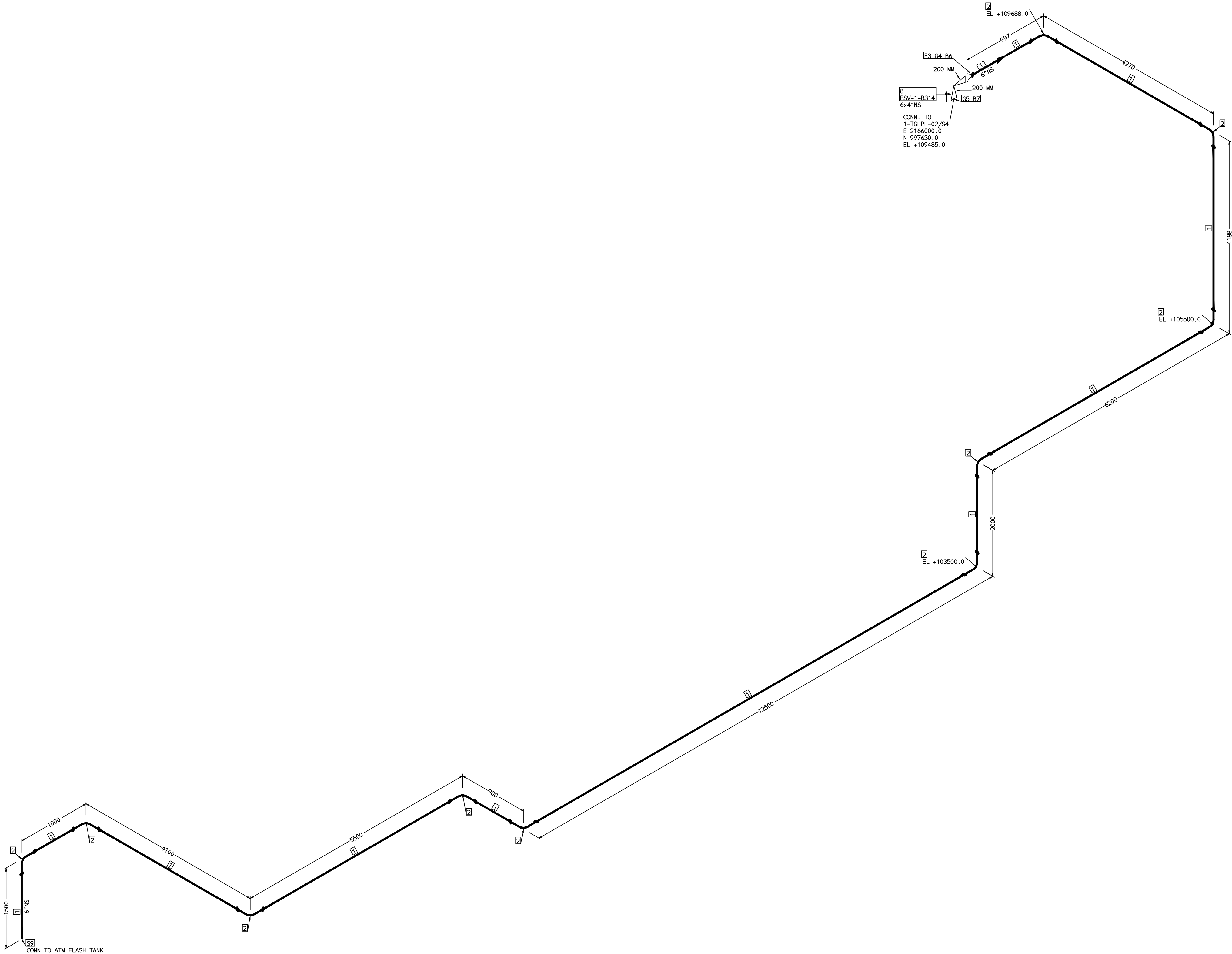
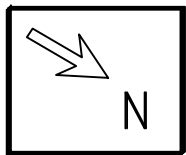
LEGEND:-				
	SUPPORT LOCATION			
	DIRECTION OF FLOW			
	DIRECTION OF SLOPE			
	WELD SYMBOL			
A	- ANCHOR			
R	- REST			
RG	- REST + GUIDE			
RL	- REST + LIMIT STOP			
RGL	- DIRECTION ANCHOR			
RH	- RIGID HANGER			
SH	- SPRING HANGER			
BS	- BOTTOM SPRING			
VG	- VERTICAL GUIDE			

RECORD OF REVISIONS:-					
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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.		VUK	-SD-	05-05-14
APPRD.		GS	-SD-	05-05-14
		SCALE: NTS		
TITLE: 1-LPH3-SHELL-SIDE-PSV-OUTLET		DRAWING NO: 1-381-01-06047		REV OOP
		SHT. No. 1	NO. OF SHTS. 1	

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COMPUTER FILE NAME:



FABRICATION MATERIALS							
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	BHEL MATCODE
1	PIPE SMLS ASME B36.10 PE	A106GRB	6	S40		38486MM	AA1049355512
2	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	S40		11.01	AA7242502276
3	FLANGE WELD NECK ASME B16.5 CL150 RF	A105	6	S40	CL150	10.91	HY7246361120
ERECTION MATERIALS							
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	BHEL MATCODE
4	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	6		CL150	1	HY7240362043
5	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	1	HY7240362035
6	110 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X110	CL150	8	HY7142198176
7	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	8	HY7142198060
8	PSV FLGD (RF-RF)	A216GRWCB	6 x 4		C300RF X C150RF	1	0
9	GENERAL ATTACHMENT		6			1	0

[1]

NOTES:-

1. ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
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3. SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
4. 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.
5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
6. 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 \$(mm)	INS MAT
		HSAP-SV-BHL-1-B319-6-11B-NI							11B-RHP

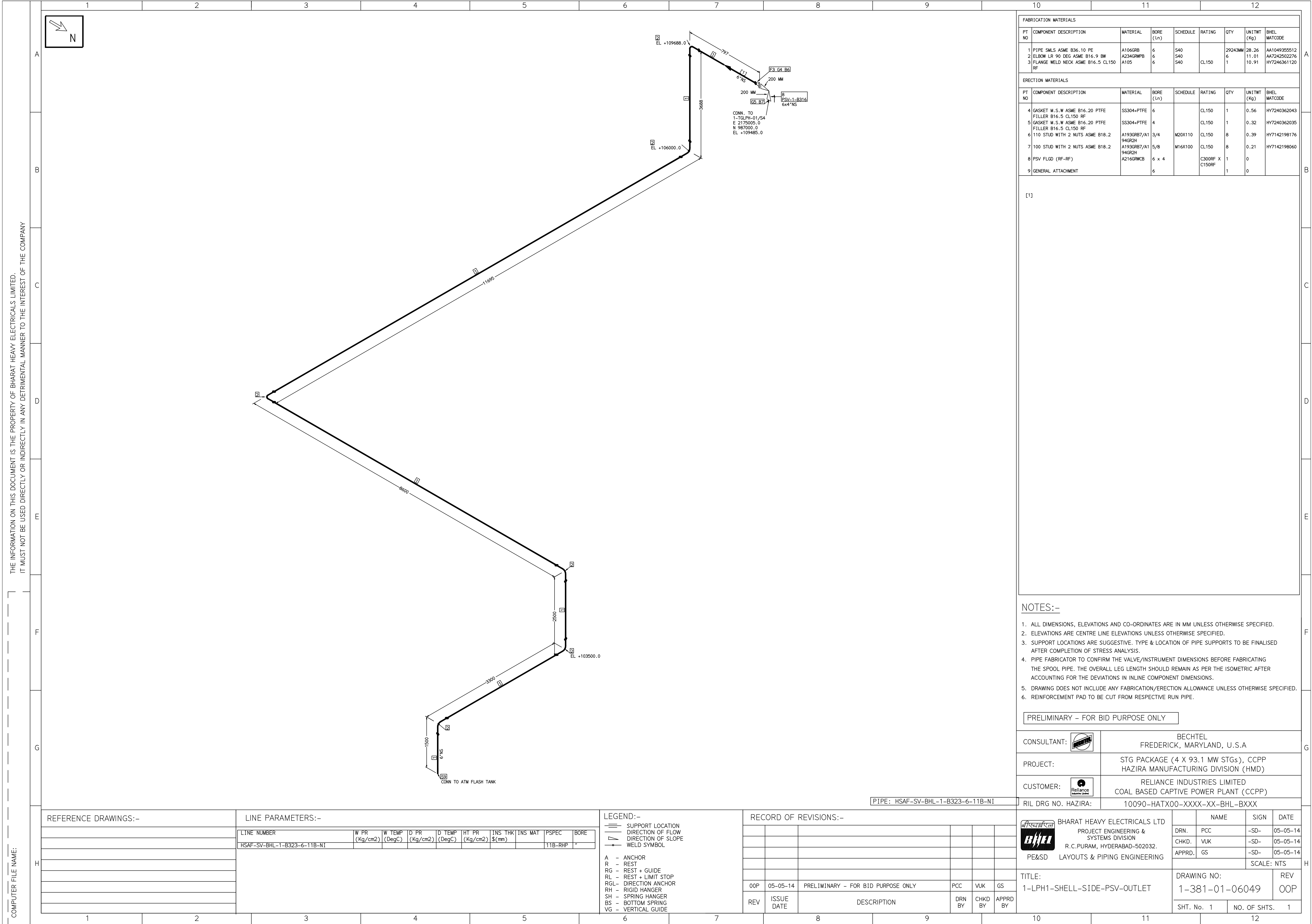
LEGEND:-	
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL
A	ANCHOR
R	REST
RG	REST + GUIDE
RL	REST + LIMIT STOP
RGL	DIRECTION ANCHOR
RH	RIGID HANGER
SH	SPRING HANGER
BS	BOTTOM SPRING
VG	VERTICAL GUIDE

RECORD OF REVISIONS:-			
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC VUK 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.	VUK	-SD-	05-05-14
		APPRD.	GS	-SD-	05-05-14
		SCALE: NTS			
TITLE: 1-LPH2-SHELL-SIDE-PSV-OUTLET		DRAWING NO: 1-381-01-06048			REV OOP
		SHT. No. 1		NO. OF SHTS. 1	

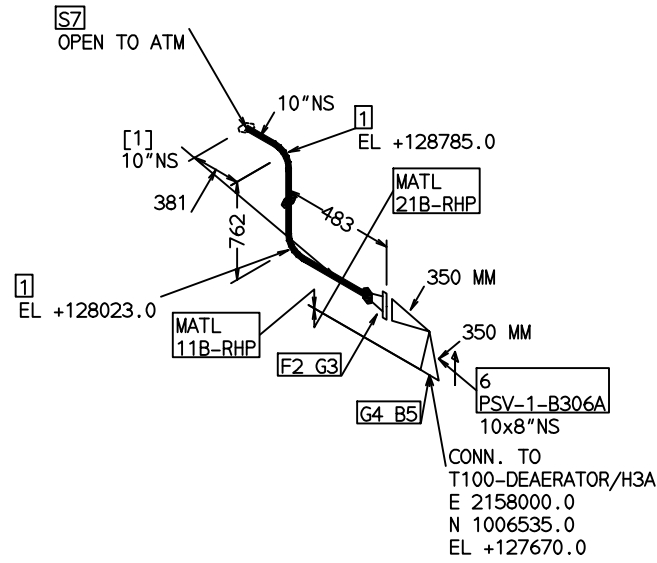
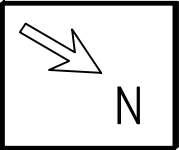
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COMPUTER FILE NAME:



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COMPUTER FILE NAME:



FABRICATION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
1	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	10	S20		2	26.6	AA7242502349
2	FLANGE WELD NECK ASME B16.5 CL150	A105	10	S20	CL150	1	22.63	HY7246361677
ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
3	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	10		CL150	1	1.14	HY7240362060
4	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	8		CL300	1	0.73	HY7240365093
5	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL300	8	0.41	HY7142198184
6	PSV FLGD (RF-RF)	A216GRWCB	10 x 8		C300RF X C150RF	1	0	
7	GENERAL ATTACHMENT		10			1	0	

[1]

NOTES:-

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5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
6. 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 \$(mm)	INS MAT	PSPEC	BORE	
	HSAF-SV-BHL-1-B310-6-11B-NI								11B-RHP	"	

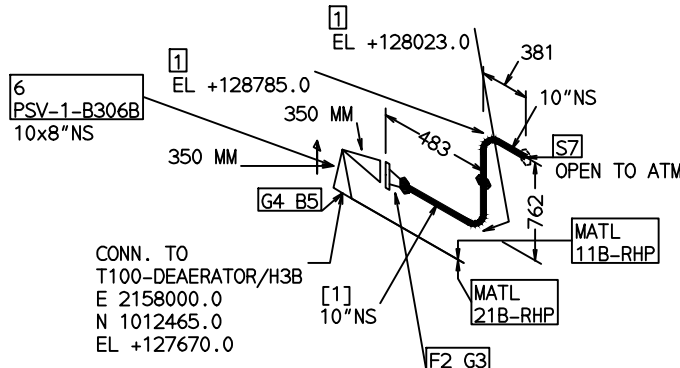
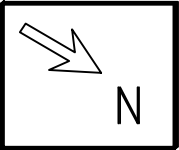
LEGEND:-		
	SUPPORT LOCATION	
	DIRECTION OF FLOW	
	DIRECTION OF SLOPE	
	WELD SYMBOL	
A	ANCHOR	
R	REST	
RG	REST + GUIDE	
RL	REST + LIMIT STOP	
RGL	DIRECTION ANCHOR	
RH	RIGID HANGER	
SH	SPRING HANGER	
BS	BOTTOM SPRING	
VG	VERTICAL GUIDE	

RECORD OF REVISIONS:-					
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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.	VUK	-SD-		05-05-14
APPRD.	GS	-SD-		05-05-14
SCALE: NTS				
TITLE: 1-DEAERATOR-PSV-1-OUTLET		DRAWING NO: 1-381-01-06050		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	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB A105	10 10	S20 S20	CL150	2 1	26.6 22.63	AA7242502349 HY7246361677
2	FLANGE WELD NECK ASME B16.5 CL150							

ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
3	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	10		CL150	1	1.14	HY7240362060
4	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	8		CL300	1	0.73	HY7240365093
5	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL300	8	0.41	HY7142198184
6	PSV FLGD (RF-RF)	A216GRWCB	10 x 8		C300RF X C150RF	1	0	
7	GENERAL ATTACHMENT		10			1	0	

[1]

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- REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

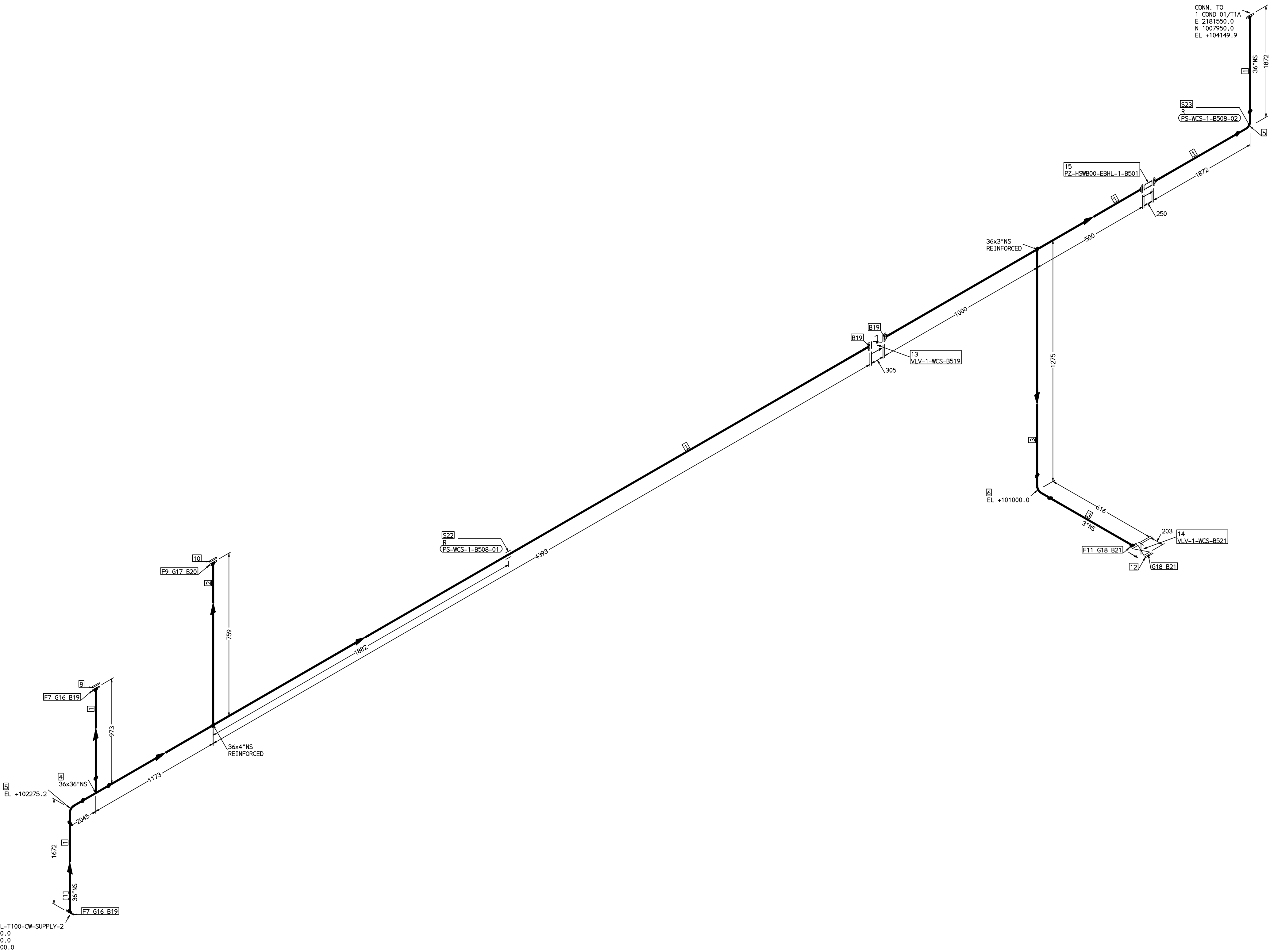
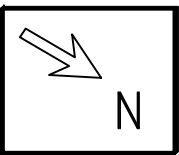
PRELIMINARY - FOR BID PURPOSE ONLY

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:-								LEGEND:-		RECORD OF REVISIONS:-				TITLE:			
		LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK \$(mm)	INS MAT	PSPEC	BORE	 SUPPORT LOCATION				DRAWING NO:		REV	
		HSAP-SV-BHL-1-B311-6-11B-NI										 DIRECTION OF FLOW				1-381-01-06051		OOP	
												 DIRECTION OF SLOPE				SHT. No. 1		NO. OF SHTS. 1	
												 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							

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COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW IS-3589 PE 30	IS3589GRFE3	36	T10		7993MM	222.94		
2	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC	4	HVY		303MM	14.5		
3	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC	3	HVY		1206MM	9.9	AA1011052601	
4	TEE STRT ASME B16.9 BW	A234GRWPB	36 x 36	XS		1	731		
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	36	XS		2	604.34		
6	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	3	STD		1	2.3	AA7242502160	
7	FLANGE STEEL-RING AWWA C207-D FF	IS2062GRB	36		PN10	2	0		
8	FLANGE BLIND AWWA C207-D FF	IS2062GRB	36		PN10	1	0		
9	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	4		CL150	1	5.9	AA7246101101	
10	FLANGE BLIND ASME B16.5 CL150 RF	A105	4		CL150	1	7.7	HY7246166106	
11	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	3		CL150	1	3.7	AA7246101080	
12	FLANGE BLIND ASME B16.5 CL150 RF	A105	3		CL150	1	4.1	HY7246166084	
13	BFLV GO AWWA C504 PN10 DFLGD (FF-C207D)	A216GRWCB	36		PN10	1	1200		
14	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 (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
15	RE JOINT PN10 FLGD AWWA (FF-C207D)		36			1	0		
16	GASKET NAB FLAT RING (FF-C207D)	PTFE	36		PN10	2	0		
17	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	1	0.32	HY7240362035	
18	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	3		CL150	2	0.19	HY7240362027	
19	140 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	1.1/2	M39X170	PN10	680	2.53		
20	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	8	0.21	HY7142198060	
21	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	8	0.21	HY7142198060	
22	PIPE SUPPORT		36			1	0		
23	PIPE REST		36			1	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

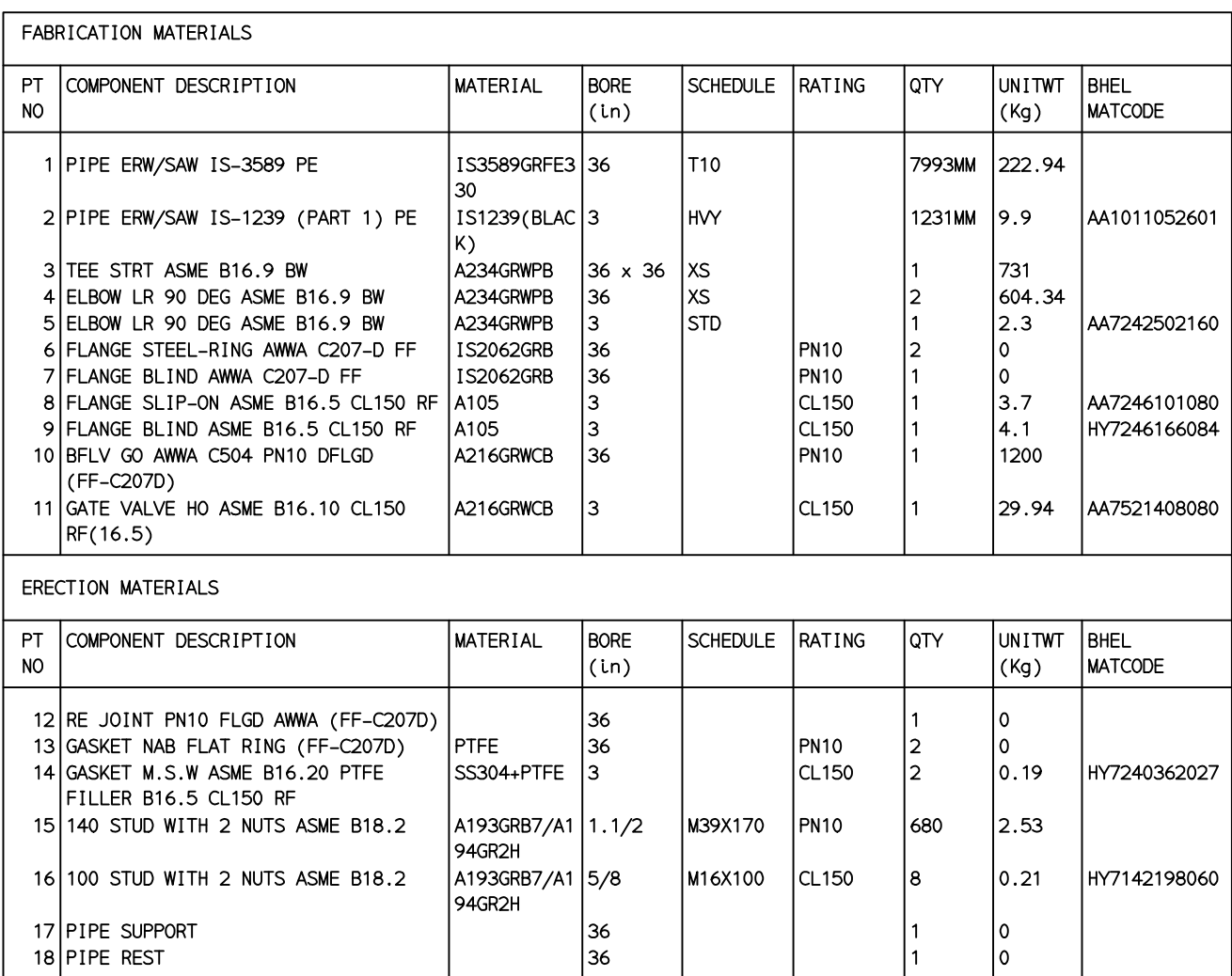
REFERENCE DRAWINGS:-	

LINE PARAMETERS:-									
LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK \$(mm)	INS MAT	PSPEC	BORE
WCS-BHL-1-B508-36-11D								11D-RHP	36"

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	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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.	VUK	-SD-		05-05-14
APPRD.	GS	-SD-		05-05-14
SCALE: NTS				
TITLE: 1-CW-INLET-1-TO-CONDENSER		DRAWING NO: 1-381-01-06052		REV OOP
SHT. No. 1		NO. OF SHTS. 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			
 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
				SCALE: NTS
TITLE:		DRAWING NO:		REV
1-CW-INLET-2-TO-CONDENSER		1-381-01-06053		00P
		SHT. No. 1	NO. OF SHTS. 1	

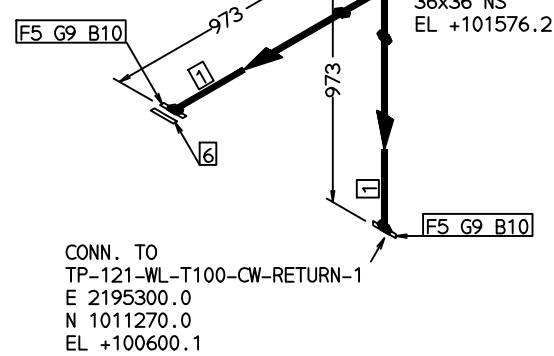
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LEGEND:-

	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:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VJK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY



ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (in)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BIMEL MATCODE
8	RE JOINT PN10 FLGD ANMA (FF-C207D)		36			1	0	
9	GASKET NAB FLAT RING (FF-C207D)	PTFE	36			2	0	
10	140 STUD WITH 2 NUTS ASME B16.2	A193GR87/A194GR2H	1-1/2	M39X170	PN10	680	2.53	
11	RIGID HANGER		36			3	0	

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CONSULTANT: 

PROJECT:	SIG PACKAGE (4 X 93.1 MW SIGs), 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

TITLE:
1-CW-OUTLET-1-FROM-CONDENSER

	REFERENCE DRAWINGS:-
H	

[illegible]

LEGEND:-

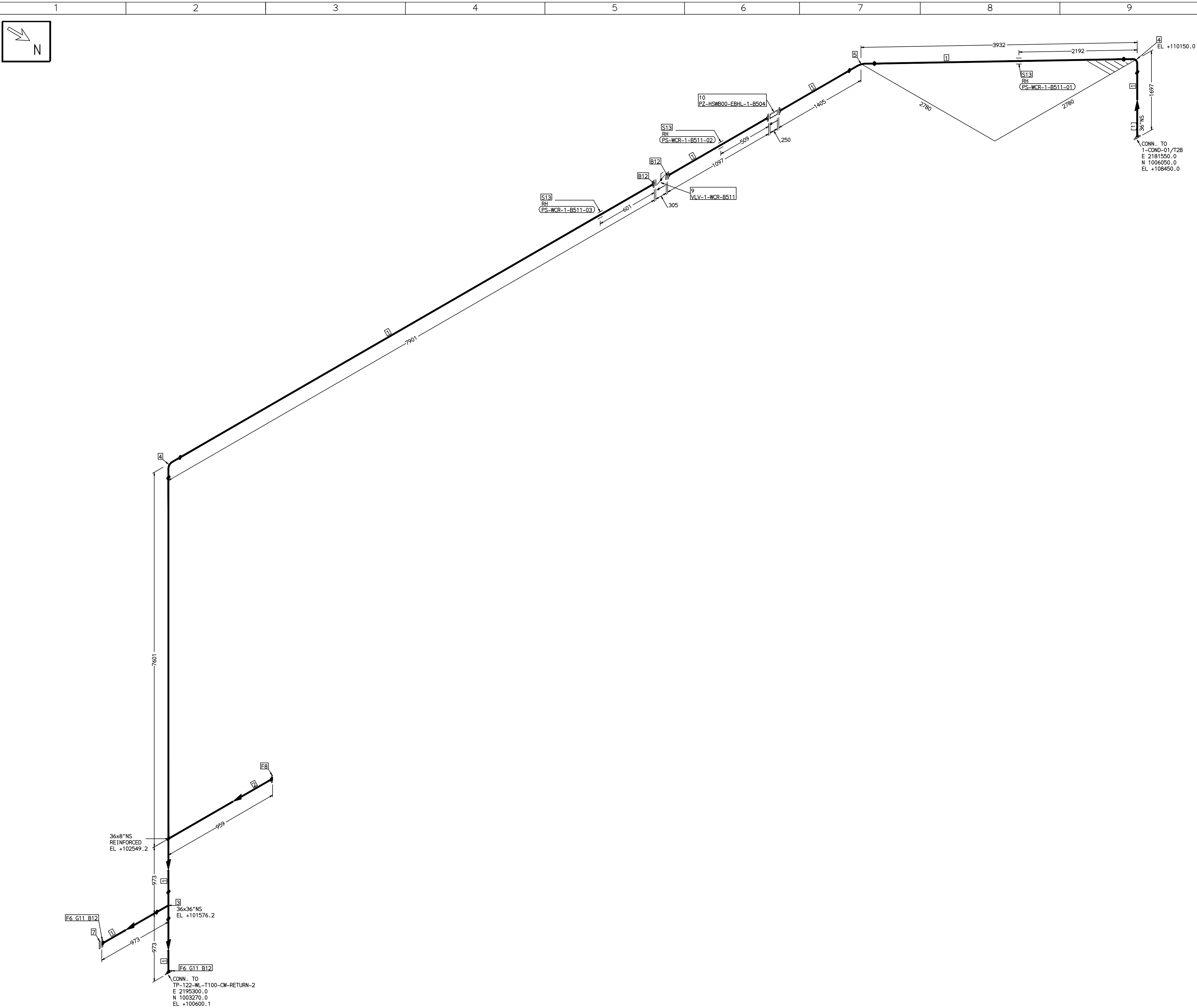
-  SUPPORT LOCATION
-  DIRECTION OF FLOW
-  DIRECTION OF SLOPE
-  WELD SYMBOL

A - ANCHOR
 R - REST
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 SH - SPRING HANGER
 BS - BOTTOM SPRING
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RECORD OF REVISIONS:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

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	IS3589GRFE3 30	36	T10		17915MM	222.94		
2	PIPE ERW/SAW IS-3589 PE	IS3589GRFE3 30	8	T6		513MM	31.53		
3	TEE STRT ASME B16.9 BW	A234GRWPB	36 x 36	XS		1	731		
4	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	36	XS		2	604.34		
5	ELBOW LR 45 DEG ASME B16.9 BW	A234GRWPB	36	XS		1	302.17		
6	FLANGE STEEL-RING ANMA C207-D FF	IS2062GRB	36		PN10	2	0		
7	FLANGE BLIND ANMA C207-D FF	IS2062GRB	36		PN10	1	0		
8	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	8		CL150	1	13.7	AA7246101136	
9	BFLV GO ANMA C504 PN10 DFLGD (FF-C207D)	A216GRWCB	36		PN10	1	1200		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
10	RE JOINT PN10 FLDG ANMA (FF-C207D)		36			1	0		
11	GASKET NAB FLAT RING (FF-C207D)	PTFE	36		PN10	2	0		
12	140 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	1.1/2	M39X170	PN10	680	2.53		
13	RIGID HANGER		36			3	0		

[1]

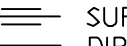
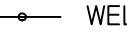
NOTES:-

- 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-HATX00-XXXX-XX-BHL-BXXX

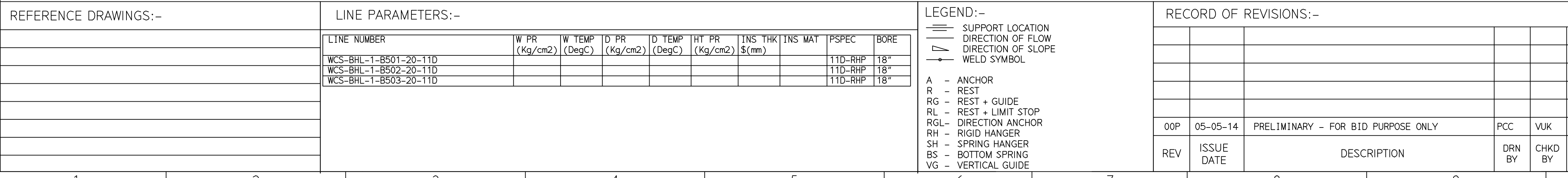
REFERENCE DRAWINGS:-		LINE PARAMETERS:-									
		LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK \$(mm)	INS MAT	PSPEC	BORE
		WCR-BHL-1-B511-36-11D								11D-RHP	36"

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								

RECORD OF REVISIONS:-									
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY				PCC	VUK	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.	VUK	-SD-	05-05-14
		APPRD.	GS	-SD-	05-05-14
		SCALE: NTS			
TITLE: 1-CW-OUTLET-2-FROM-CONDENSER		DRAWING NO: 1-381-01-06055			REV OOP
		SHT. No. 1		NO. OF SHTS. 1	

COMPUTER FILE NAME: _____



FABRICATION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
1	PIPE ERW/SAW IS-3589 PE	IS3589GRFE3 30	20	T6		22589MM	74.28	
2	PIPE ERW/SAW IS-3589 PE	IS3589GRFE3 30	14	T6		600MM	51.73	
3	TEE STRT ASME B16.9 BW	A234GRWPB	20 x 20	S10		1	120	HY7242511445
4	RODR ECC ASME B16.9 BW	A234GRWPB	20 x 14	S10XS10		2	50	
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	20	S10		4	93.53	HY72425024446
6	ELBOW LR 45 DEG ASME B16.9 BW	A234GRWPB	20	S10		4	46.765 0	HY7242566614
7	PIPING COMPONENT (USER DEFINED) CL150 RF(B16.5)	A234GRWPB	20		CL150	1		
8	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	20		CL150	3	75	AA7246101195
9	BFLV GO ANNA C504 PN10 DFLGD (FF-C2070)	A216GRWCB	20		PN10	3	330	
ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
10	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	20		CL150	3	2.87	HY72403621116
11	170 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	1.1/8	M30X170	CL150	60	1.3	HY7142299037
12	PIPE REST		20			4	0	

[1] [2]

NOTES:-

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2. ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.

3. SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.

4. 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.

5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.

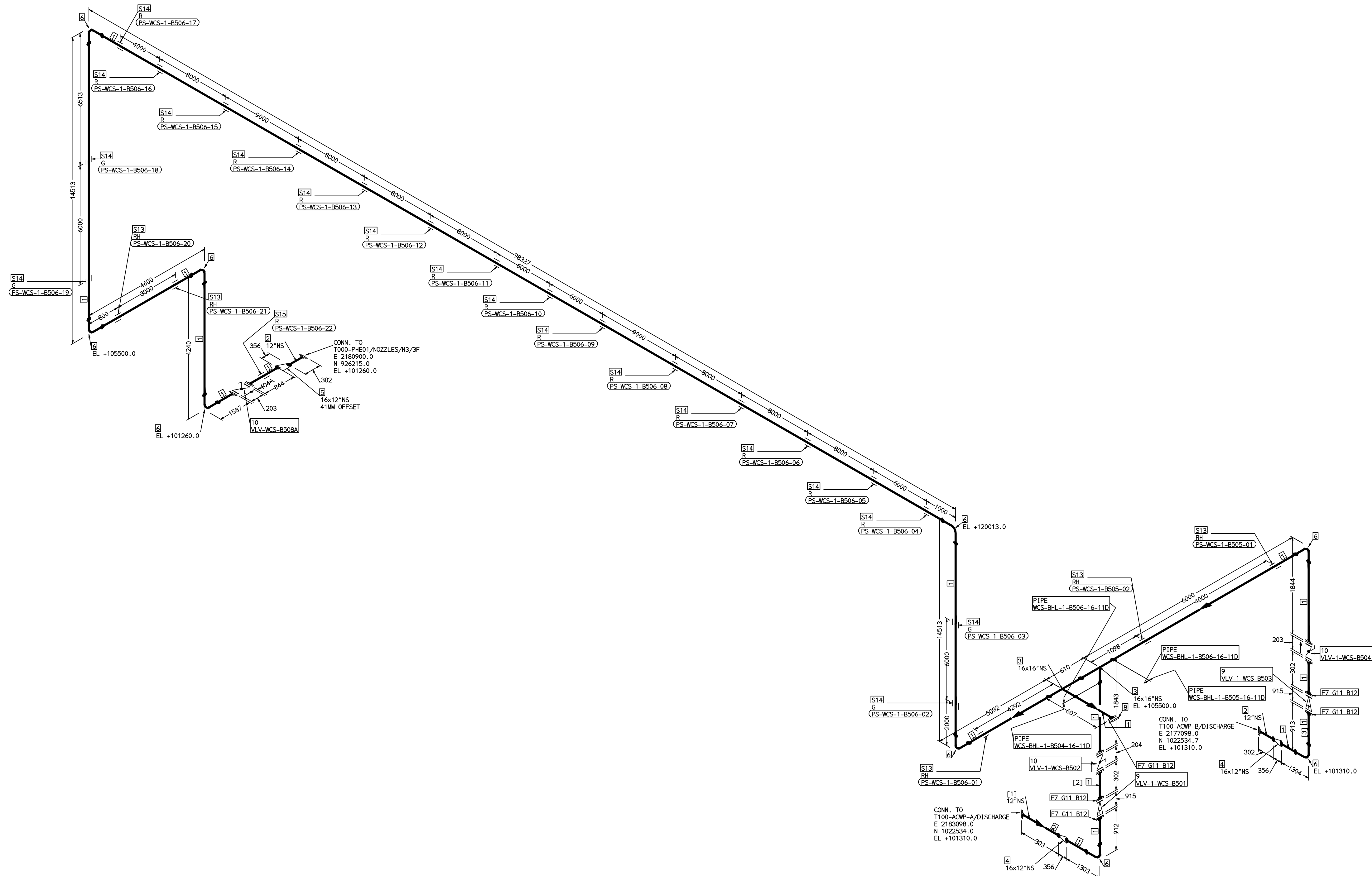
6. REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

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	-SD-	05-05-14
	CHKD.	VUK	-SD-	05-05-14
	APPRD.	GS	-SD-	05-05-14
				SCALE: NTS

TITLE: 1-ACW-PUMP-SUCTION	DRAWING NO: 1-381-01-06056	REV OOP
SHT. No. 1		NO. OF SHTS. 1



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6. 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		NAME	SIGN	DATE
	PROJECT ENGINEERING & SYSTEMS DIVISION		DRN.	PCC	-SD- 05-05-14
	R.C.PURAM, HYDERABAD-502032.		CHKD.	VUK	-SD- 05-05-14
	PE&SD LAYOUTS & PIPING ENGINEERING		APPRD.	GS	-SD- 05-05-14
				SCALE: NTS	
TITLE: 1-ACW-PUMP-DISCH-UPTO-PHE			DRAWING NO: 1-381-01-06057		REV OOP
			SHT. No. 1		NO. OF SHTS. 1

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LEGEND:-

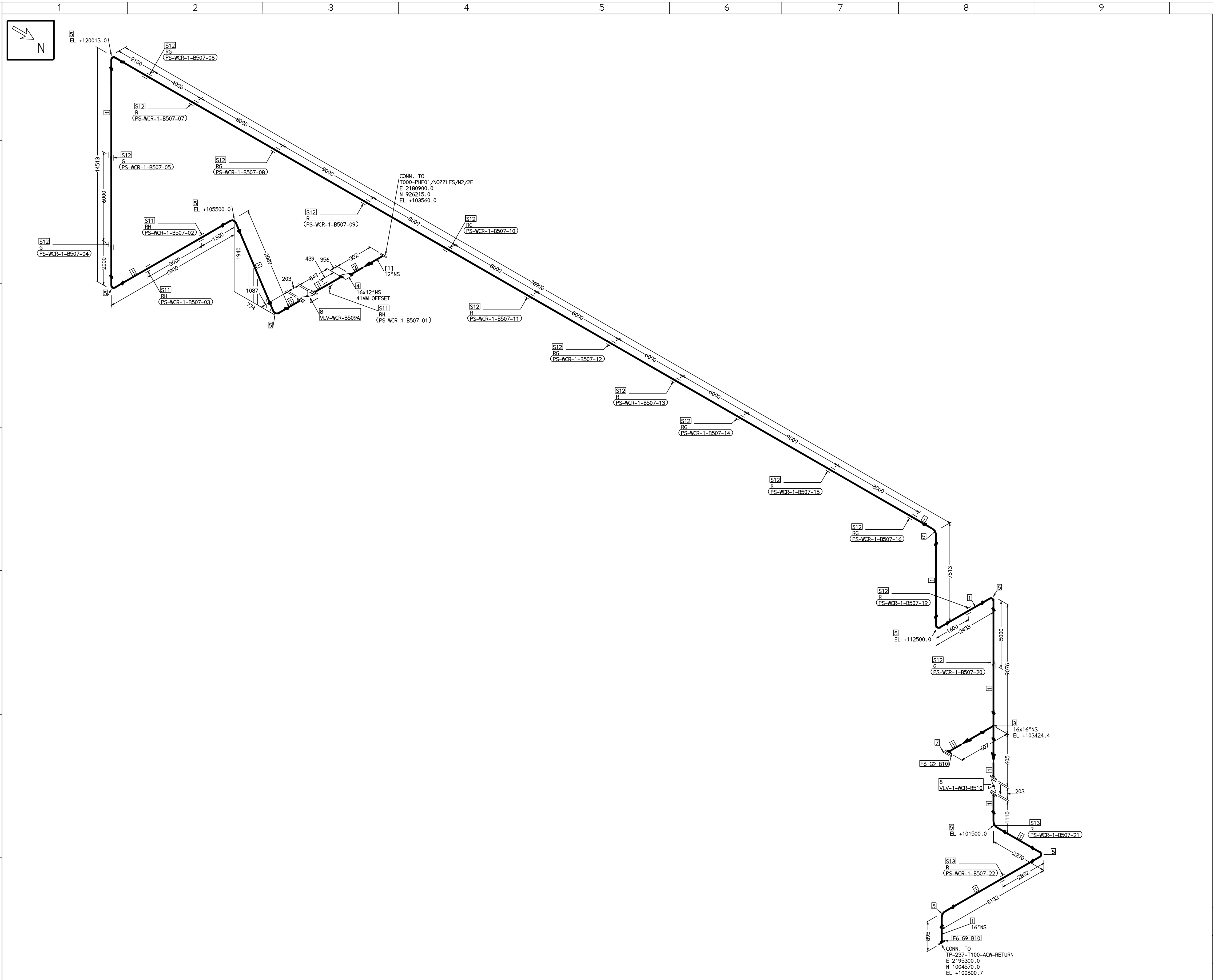
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL

A	-	ANCHOR
R	-	REST
RG	-	REST + GUIDE
RL	-	REST + LIMIT STOP
RG-L	-	DIRECTION ANCHOR
RH	-	RIGID HANGER
SH	-	SPRING HANGER
BS	-	BOTTOM SPRING
VG	-	VERTICAL GUIDE

RECORD OF REVISIONS:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

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COMPUTER FILE NAME:



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 (mm)	INS MAT	PSPEC	BORE
WCR-BHL-1-B507-16-11D								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:-			
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC VUK GS
REV	ISSUE DATE	DESCRIPTION	DRN BY CHKD BY APPRD BY

FABRICATION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
1	PIPE ERW/SAW IS-3589 PE	IS3589GRFE3 30	16	T6		120854M	59.25	
2	PIPE ERW/SAW IS-3589 PE	IS3589GRFE3 30	12	T6		M 300MM	47.02	
3	TEE STRT ASME B16.9 BW	A234GRWPB	16 x 16	S10		1	90.8	HY7242511429
4	ROCR ECC ASME B16.9 BW	A234GRWPB	16 x 12	S10XS20		1	22.65	AA7242502420
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	16	S10		10	59.59	AA7244101179
6	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	16		CL150	2	54	HY7246166173
7	FLANGE BLIND ASME B16.5 CL150 RF	A105	16		CL150	1	82	
8	BFLV GO ANNA CS04 PN10 DFLGD (FF-C207D)	A216GRWCB	16		PN10	2	160	

ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
9	GASKET M.S.W ASME B16.20 PTFE	SS304+PTFE	16		CL150	2	2.1	HY7240362094
10	140 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	1	M27X140	CL150	32	0.92	HY7142198648
11	RIGID HANGER		16			3	0	
12	PIPE SUPPORT		16			15	0	
13	PIPE REST		16			2	0	

[1]

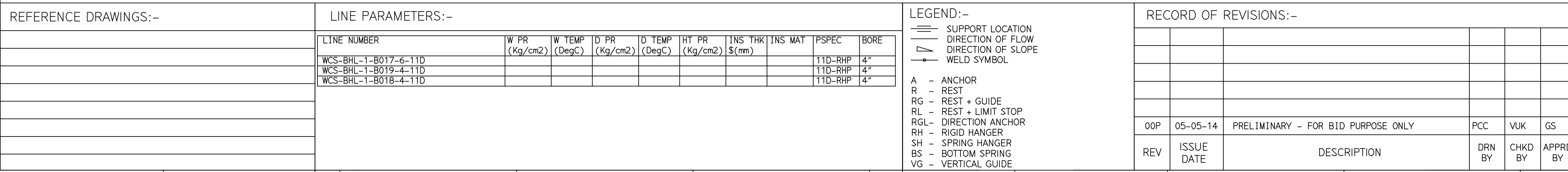
NOTES:-

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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

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
SCALE: NTS				
TITLE: 1-ACW-RETURN-FROM-PHE		DRAWING NO: 1-381-01-06058		REV OOP
SHT. No. 1		NO. OF SHTS. 1		



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	IS1239(BLAC K)	6	HVY		32051MM	21.3	
2	PIPE ERW/SAW IS-1239 (PART 1) PE	IS1239(BLAC K)	4	HVY		1894MM	14.5	
3	TEE STRT ASME B16.9 BW	A234GRWPB	6 x 6	STD		1	11	AA7242511275
4	RODR CONC ASME B16.9 BW	A234GRWPB	6 x 4	STD&STD		2	3.9	AA7242530350
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	STD		6	11.01	AA7242502276
6	ELBOW LR 45 DEG ASME B16.9 BW	A234GRWPB	6	STD		1	5.505	HY7242566568
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	4	STD		1	4.23	AA7242502217
8	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	4		CL150	4	5.9	AA7246101101
9	FLANGE WELD NECK ASME B16.5 CL300 RF	A105	4	S40	CL300	2	11.65	AA7246306102
10	GATE VALVE HD ASME B16.10 CL150 RF(16.5)	A216GRWCB	4		CL150	2	44.42	AA7521408101
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	4	0.32	HY7240362035
12	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	4		CL300	2	0.32	HY7240365077
13	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL300	16	0.41	HY7142198184
14	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	32	0.21	HY7142198060
15	RIGID HANGER		6			8	0	
16	PIPE REST		4			1	0	

[1] [2] [3]

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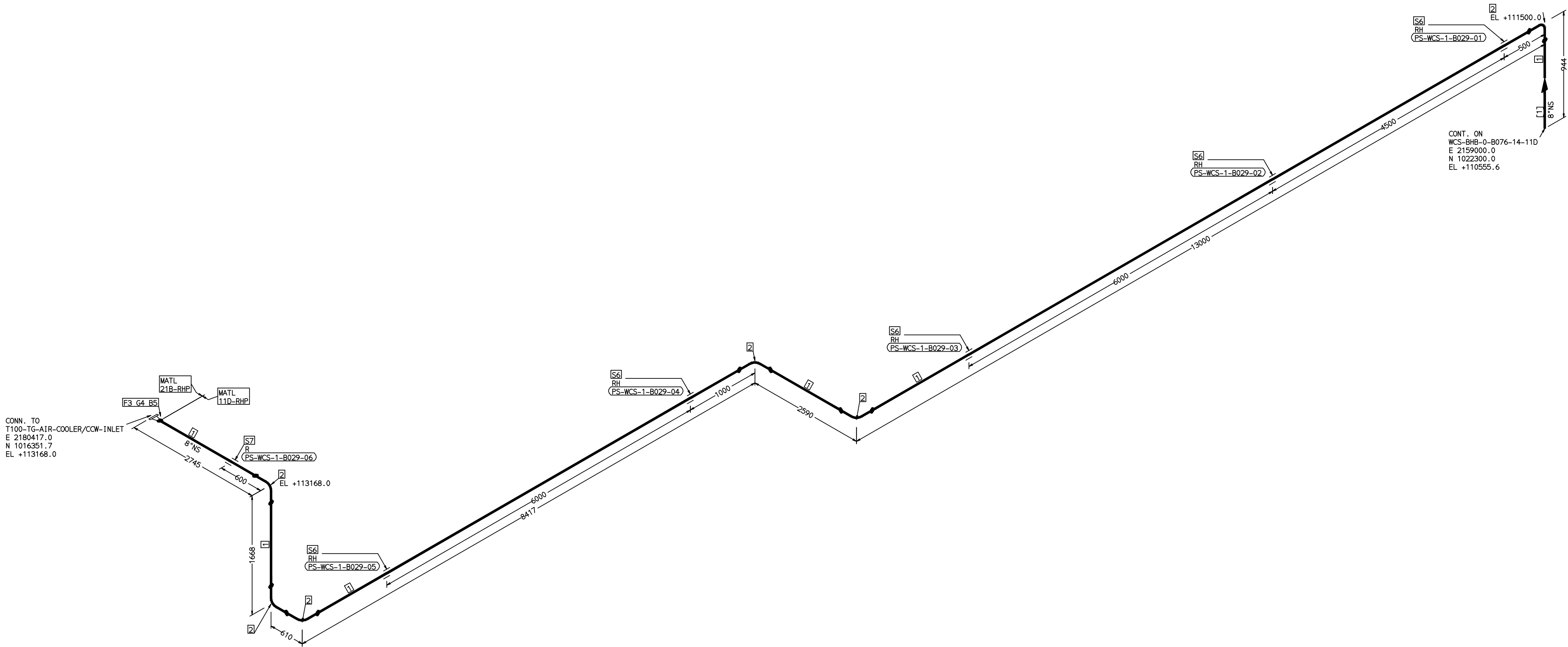
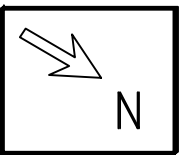
PRELIMINARY – FOR BID PURPOSE ONLY

CONSULTANT:	 BECHTEL FREDERICK, MARYLAND, U.S.A		
PROJECT:	STG PACKAGE (4 X 93.1 MW STGs), CCPP HAZIRA MANUFACTURING DIVISION (HMD)		
CUSTOMER:	 RELIANE 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
			SCALE: NTS	
TITLE:		DRAWING NO:		REV
1-CCW-SUPPLY-TO-OIL-COOLERS		1-381-01-06059		00P
		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	BHEL
						UNITWT (Kg)	MATCODE
1	PIPE ERW/SAW 1S-3589 PE	1S3589GRFE330	8	T6		26202MM	31.53
2	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	8	S20		6	16.99
3	FLANGE WELD NECK ASME B16.5 CL300	A105	8	S40	CL300	1	30.61
							AA7242502314
							HY7246306820

ERECTION MATERIALS							
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	BHEL
						UNITWT (Kg)	MATCODE
4	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	8		CL300	1	0.73
5	150 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A194GR2H	7/8	M24X150	CL300	12	0.69
6	RIGID HANGER		8			5	0
7	PIPE REST		8			1	0
							HY7240365093
							HY7142198494

[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			

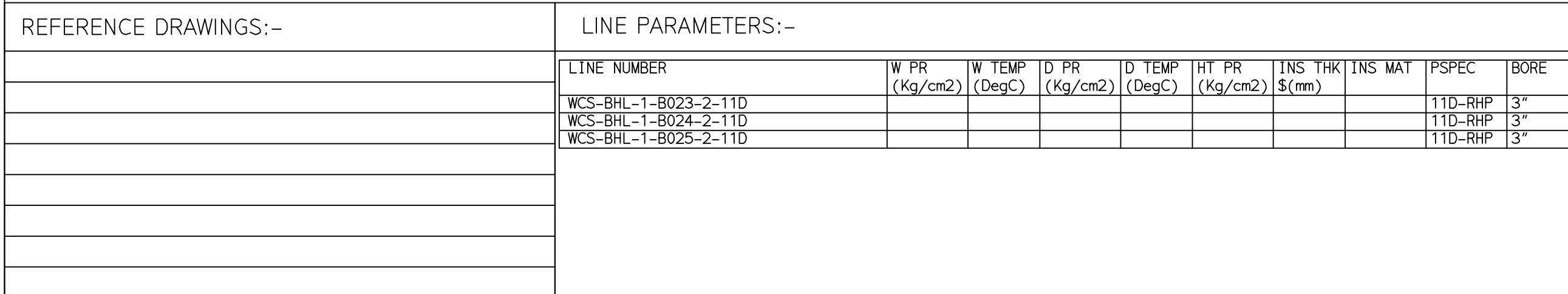
REFERENCE DRAWINGS:-	

LINE PARAMETERS:-									
LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK \$(mm)	INS MAT	PSPEC	BORE
WCS-BHL-1-B029-8-11D								11D-RHP	8"

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	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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.	VUK	-SD-		05-05-14
APPRD.	GS	-SD-		05-05-14
				SCALE: NTS
TITLE: 1-CCW-SUPPLY-PIPING-TGAC		DRAWING NO: 1-381-01-06060		REV OOP
		SHT. No. 1	NO. OF SHTS. 1	



LEGEND:-

	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL

A - ANCHOR
R - REST
RG - REST + GUIDE
RL - REST + LIMIT STOP
ANGL - DIRECTION ANCHOR
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

RECORD OF REVISIONS:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPRD BY

ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Lb)	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	4	0.11	HY7240362019
7	90 STUD WITH 2 NUTS ASME B18.2	A193GR87/A194GR2H	5/8	M16X90	CL150	16	0.2	HY7142198052
8	RIGID HANGER		2			10	0	
9	PIPE REST		2			2	0	

[1] [2] [3]

1. ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ELEVATIONS ARE THE SAME LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
3. SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
4. 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.
5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
6. REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

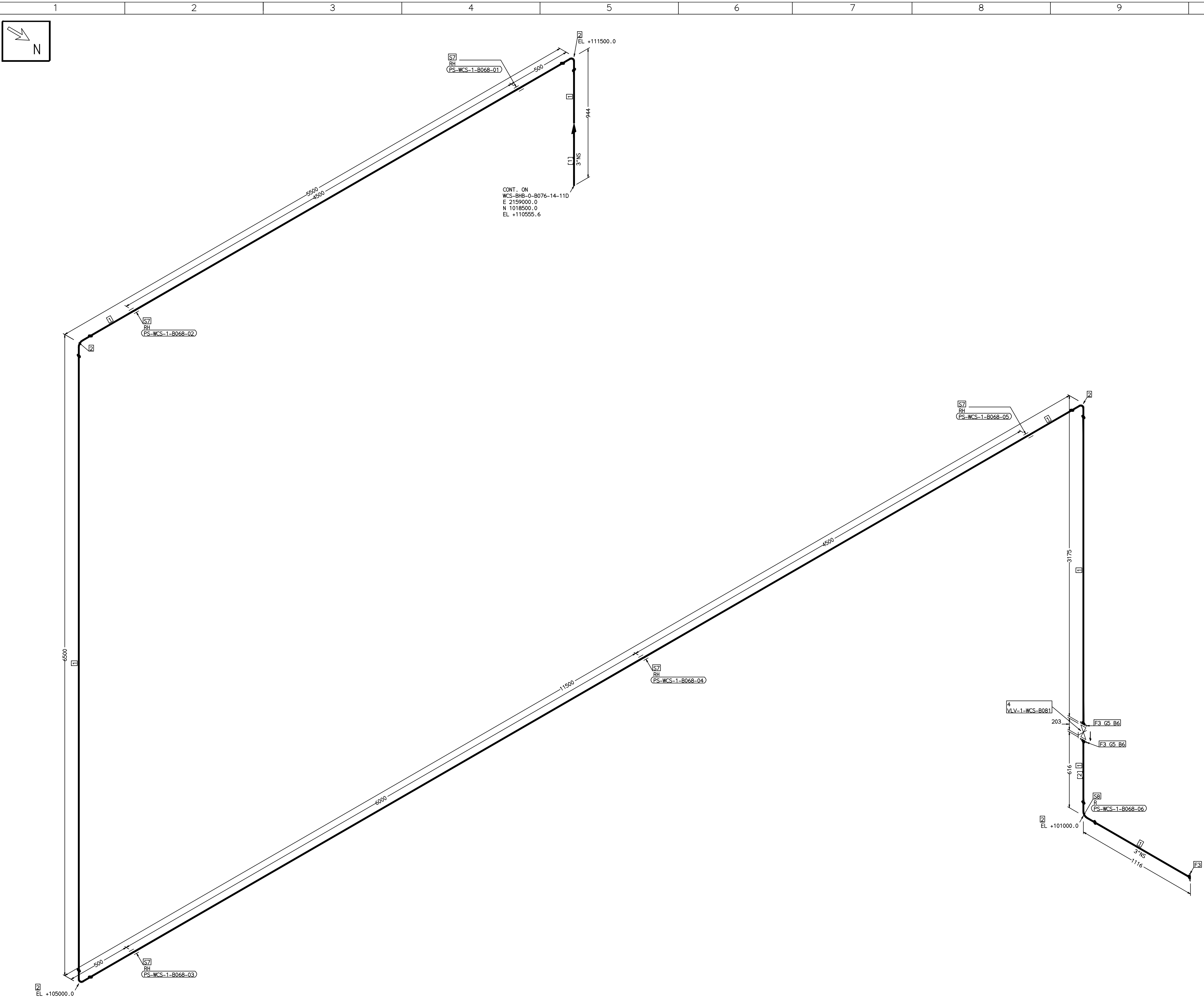
PRELIMINARY – FOR BID PURPOSE ONLY

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	-SD-	05-05-14
	CHKD.	VUK	-SD-	05-05-14
	APPRD.	GS	-SD-	05-05-14
				SCALE: NTS
TITLE: 1-CCW-SUPPLY-TO-HPSU-COOLERS		DRAWING NO: 1-381-01-06061		REV 00P
		SHT. No. 1	NO. OF SHTS. 1	

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COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-1239 (PART 1) PE	1S1239(BLAC K)	3	HVY		28205MM	9.9	AA1011052601	
2	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	3	STD		5	2.3	AA7242502160	
3	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	3		CL150	3	3.7	AA7246101080	
4	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 (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
5	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	3		CL150	2	0.19	HY7240362027	
6	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	8	0.21	HY7142198060	
7	RIGID HANGER		3			5	0		
8	PIPE REST		3			1	0		

[1] [2]

NOTES:-

1. ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
3. SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
4. 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.
5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
6. 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:-	

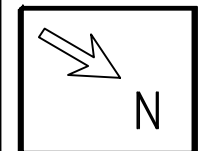
LINE PARAMETERS:-									
LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK \$(mm)	INS MAT	PSPEC	BORE
WCS-BHL-1-B068-3-11D								11D-RHP	"

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

RECORD OF REVISIONS:-					
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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.	VUK	-SD-	05-05-14
		APPRD.	GS	-SD-	05-05-14
				SCALE: NTS	
TITLE: 1-CW-SUPPLY-TO-SWAS-PANEL		DRAWING NO: 1-381-01-06062			REV OOP
SHT. No. 1			NO. OF SHTS. 1		

COMPUTER FILE NAME: _____



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

- PRELIMINARY – FOR BID PURPOSE ONLY

 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
				SCALE: NTS
TITLE: 1-CW-SUPPLY-PIPING-BFP-A		DRAWING NO: 1-381-01-06063		REV OOP
		SHT. No. 1	NO. OF SHTS. 1	

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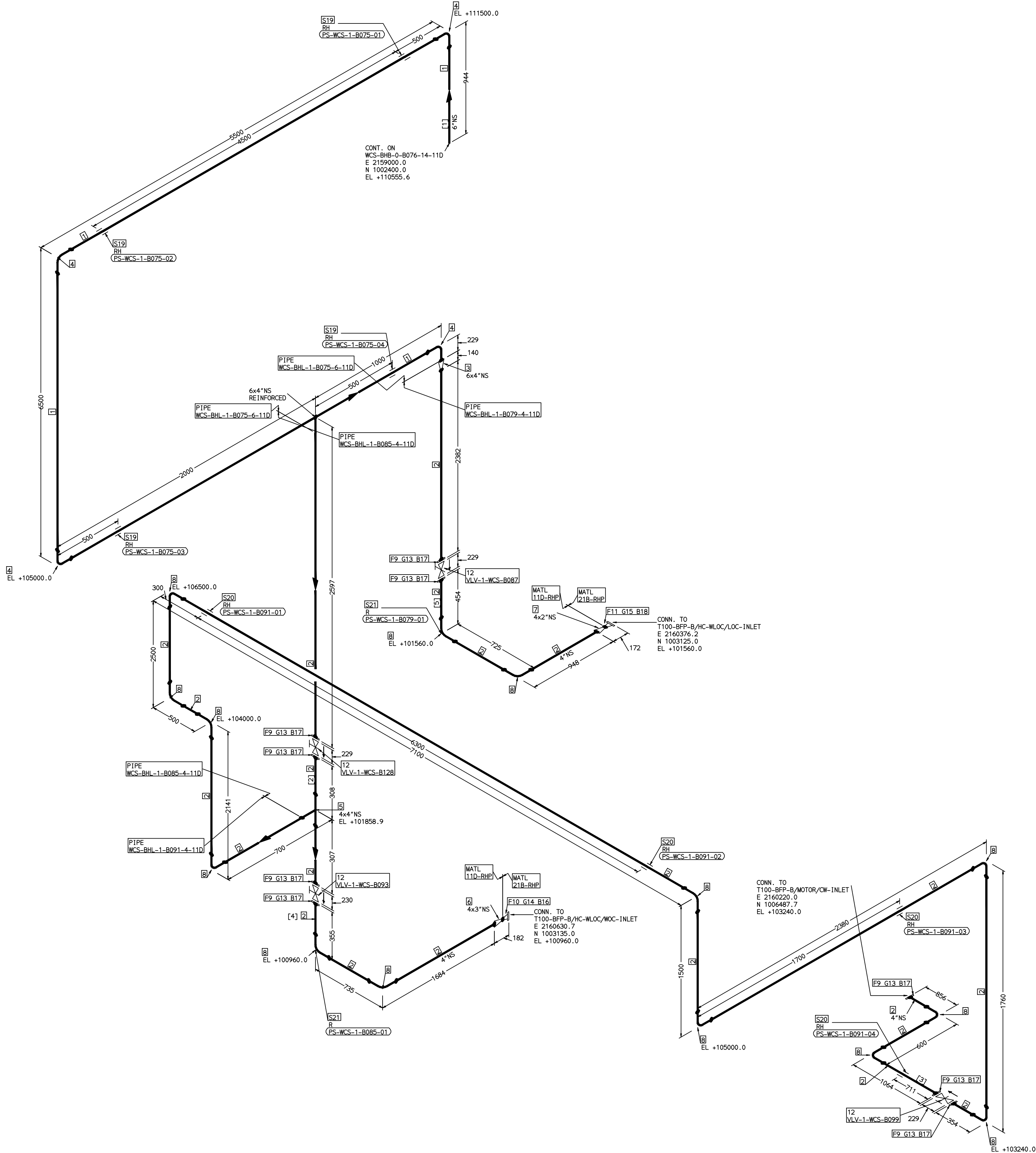
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL

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:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

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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 (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
1	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC K)	6	HVY		14341MM	21.3			
2	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC K)	4	HVY		27297MM	14.5			
3	RDCR CONC ASME B16.9 BW	A234GRWPB	6 x 4	STDSTD		1	3.9	AA7242530350		
4	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	STD		4	11.01	AA7242502276		
5	TEE STRT ASME B16.9 BW	A234GRWPB	4 x 4	STD		1	5.3	AA7242511216		
6	RDCR CONC ASME B16.9 BW	A234GRWPB	4 x 3	STDSTD		1	1.6	AA7242530261		
7	RDCR CONC ASME B16.9 BW	A234GRWPB	4 x 2	STDSTD		1	1.6	AA7242530210		
8	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	4	STD		14	4.23	AA7242502217		
9	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	4		CL150	9	5.9	AA7246101101		
10	FLANGE WELD NECK ASME B16.5 CL300 RF	A105	3	S40	CL300	1	7.15	AA7246306080		
11	FLANGE WELD NECK ASME B16.5 CL300 RF	A105	2	S40	CL300	1	3.5	AA7246306064		
12	GATE VALVE HO ASME B16.10 CL150 RF(16.5)	A216GRWCB	4		CL150	4	44.42	AA7521408101		

ERECTION MATERIALS										
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE		
13	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	9	0.32	HY7240362035		
14	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	3		CL300	1	0.19	HY7240365050		
15	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	2		CL300	1	0.11	HY7240365069		
16	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL300	8	0.41	HY7142198184		
17	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL150	72	0.21	HY7142198060		
18	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL300	8	0.21	HY7142198060		
19	RIGID HANGER		6			4	0			
20	RIGID HANGER		4			4	0			
21	PIPE REST		4			2	0			

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

NOTES:-

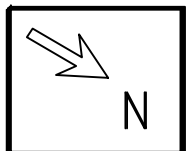
- ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
- ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
- SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
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- 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

 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

TITLE: 1-CW-SUPPLY-PIPING-BFP-B		DRAWING NO: 1-381-01-06064		REV OOP
SHT. No. 1		NO. OF SHTS. 1		



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

- PRELIMINARY – FOR BID PURPOSE ONLY

	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
					SCALE: NTS
TITLE: 1-CCW-SUPPLY-PIPING-BFP-C		DRAWING NO: 1-381-01-06065			REV OOP
		SHT. No. 1		NO. OF SHTS. 1	

LEGEND:-

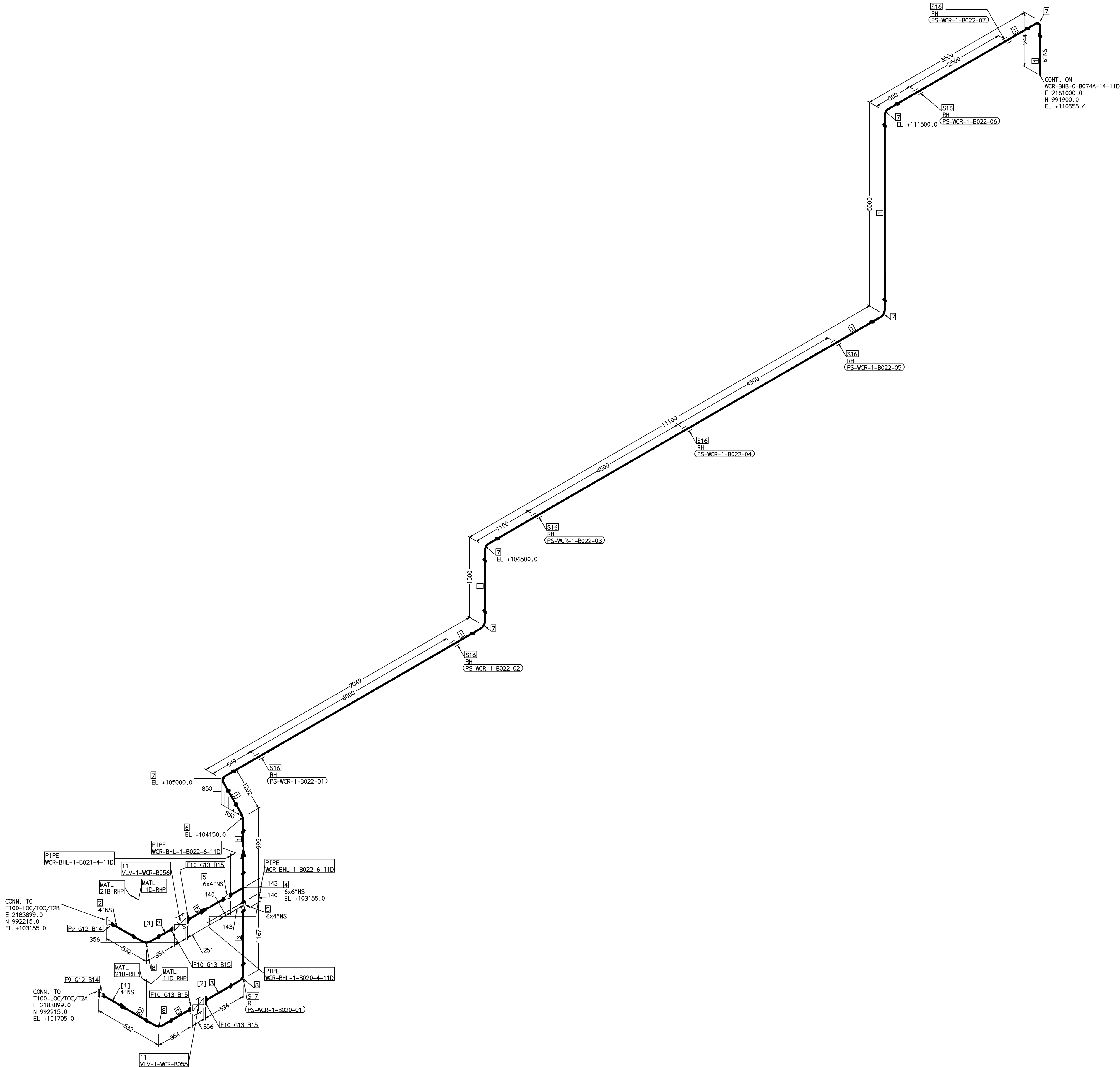
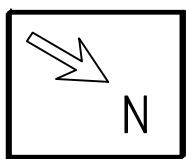
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL

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:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

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COMPUTER FILE NAME:



FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC K)	6	HVY		28209MM	21.3		
2	PIPE SMLS ASME B36.10 PE	A106GRB	4	S40		58MM	16.08	AA1049355415	
3	PIPE ERW/SAW IS-1239 (PART 1) PE K)	IS1239(BLAC K)	4	HVY		204MM	14.5		
4	TEE STRT ASME B16.9 BW	A234GRWPB	6 x 6	STD		1	11	AA7242511275	
5	REDUC CONC ASME B16.9 BW	A234GRWPB	6 x 4	STD&STD		2	3.9	AA7242530350	
6	ELBOW LR 45 DEG ASME B16.9 BW	A234GRWPB	6	STD		1	5.505	HY7242566568	
7	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	6	STD		6	11.01	AA7242502276	
8	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	4	STD		3	4.23	AA7242502217	
9	FLANGE WELD NECK ASME B16.5 CL300 RF	A105	4	S40	CL300	2	11.65	AA7246306102	
10	FLANGE SLIP-ON ASME B16.5 CL300 RF	A105	4		CL300	4	10	AA7246106103	
11	GLOBE VALVE HD ASME B16.10 CL300 RF(16.5)	A216GRWCB	4		CL300	2	86.36	AA7501428107	

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
12	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	4		CL300	2	0.32	HY7240365077	
13	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL300 RF	SS304+PTFE	4		CL300	4	0.32	HY7240363074	
14	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL300	16	0.41	HY7142198184	
15	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	3/4	M20X120	CL300	32	0.41	HY7142198184	
16	RIGID HANGER		6			7	0		
17	PIPE REST		4			1	0		

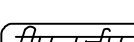
[1] [2] [3]

NOTES:-

- ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
- ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
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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

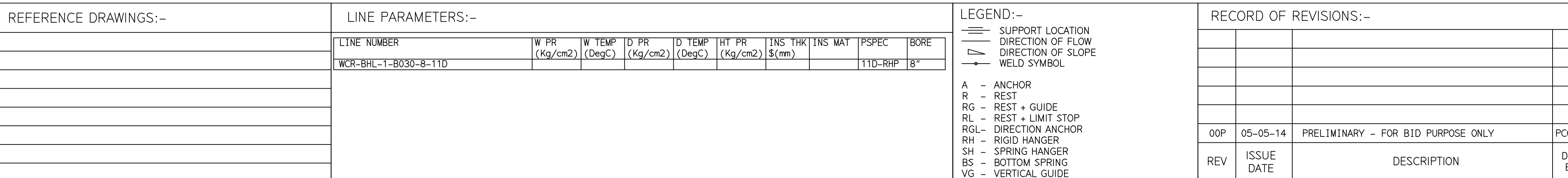
	BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R. C. PURAM, HYDERABAD-502032. PE&SD LAYOUTS & PIPING ENGINEERING		NAME	SIGN	DATE
		DRN.	PCC	-SD-	05-05-14
		CHKD.	VUK	-SD-	05-05-14
		APPRD.	GS	-SD-	05-05-14
				SCALE: NTS	

TITLE:	1-CW-RETURN-FROM-OIL-COOLERS	DRAWING NO:	1-381-01-06066	REV	OOP
		SHT. No. 1	NO. OF SHTS. 1		

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 \$(mm)	INS MAT PSPEC
		WCR-BHL-1-B020-4-110							11D-RHP 4"
		WCR-BHL-1-B022-6-110							11D-RHP 4"
		WCR-BHL-1-B021-4-110							11D-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 - REST + LIMIT STOP
RH - RIGID HANGER
SH - SPRING HANGER
BS - BOTTOM SPRING
VG - VERTICAL GUIDE

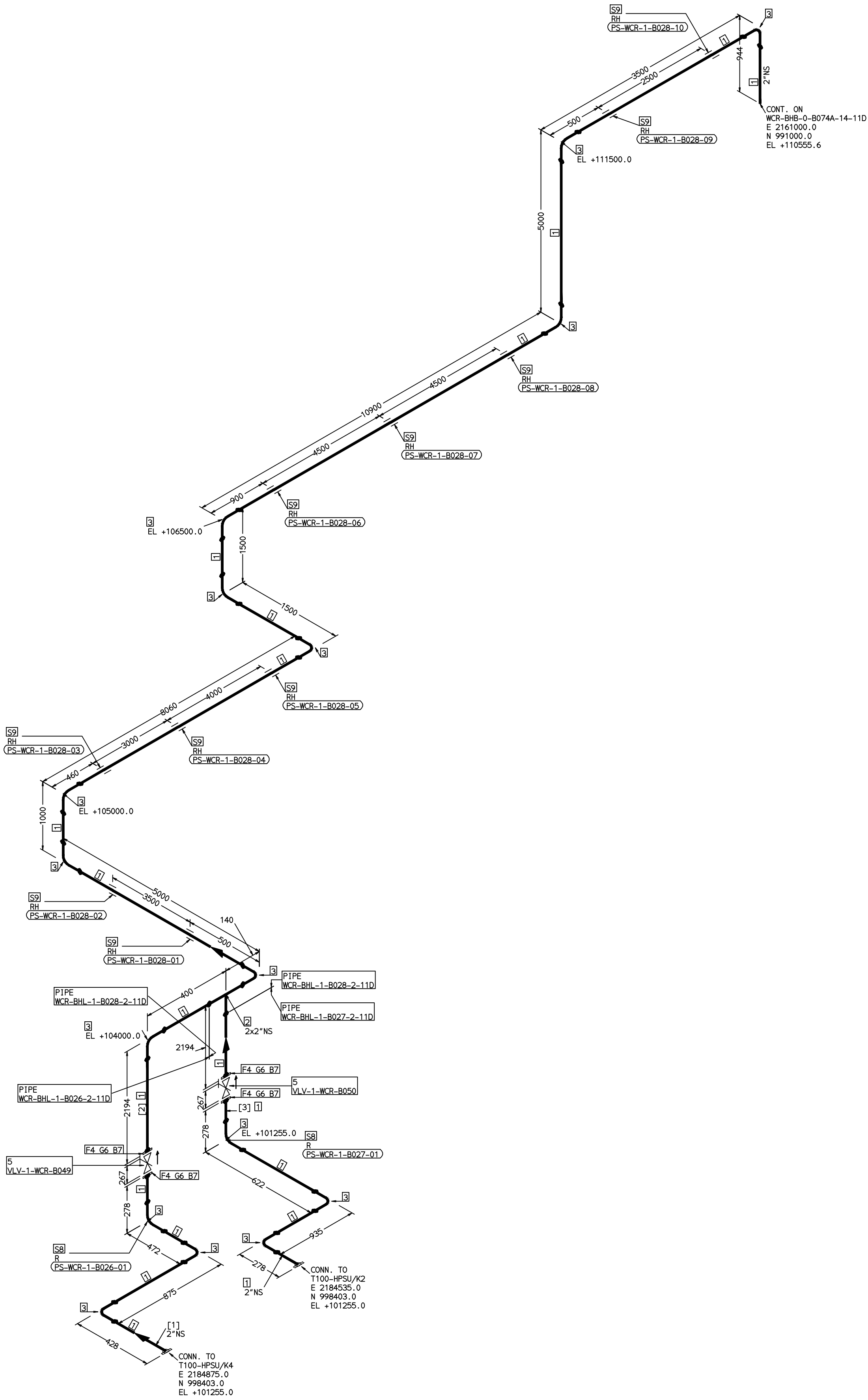
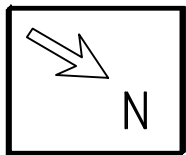
RECORD OF REVISIONS:-					
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY	APPRD BY



- | | | | | | |
|---|---|---|------|----------------|----------|
| 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 |
| | | | | SCALE: NTS | |
| TITLE: | | DRAWING NO: | | REV | |
| 1-CCW-RETURN-PIPING-TGAC | | 1-381-01-06067 | | OOP | |
| | | SHT. No. 1 | | NO. OF SHTS. 1 | |

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COMPUTER FILE NAME:



REFERENCE DRAWINGS:-

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK \$(mm)	INS MAT	PSPEC	BORE
WCR-BHL-1-B026-2-11D								11D-RHP	3"
WCR-BHL-1-B028-2-11D								11D-RHP	3"
WCR-BHL-1-B027-2-11D								11D-RHP	3"

LINE PARAMETERS:-

LINE NUMBER	W PR (Kg/cm2)	W TEMP (DegC)	D PR (Kg/cm2)	D TEMP (DegC)	HT PR (Kg/cm2)	INS THK \$(mm)	INS MAT	PSPEC	BORE
WCR-BHL-1-B026-2-11D								11D-RHP	3"
WCR-BHL-1-B028-2-11D								11D-RHP	3"
WCR-BHL-1-B027-2-11D								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	VUK	GS

FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW 1S-1239 (PART 1) PE K)	1S1239(BLAC K)	2	HVY		43862MM	6.19	AA1011052580	
2	TEE STRT ASME B16.9 BW	A234GRWPB	2 x 2	STD		1	1.3	AA7242511119	
3	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	2	STD		16	0.75	AA7242502110	
4	FLANGE SLIP-ON ASME B16.5 CL300 RF	A105	2		CL300	4	3.2	AA7246106065	
5	GLOBE VALVE HO ASME B16.10 CL300 RF(16.5)	A216GRWCB	2		CL300	2	27.11	AA7501428069	

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (In)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
6	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL300 RF	SS304+PTFE	2		CL300	4	0.11	HY7240363058	
7	100 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	5/8	M16X100	CL300	32	0.21	HY7142198060	
8	PIPE REST		2			2	0		
9	RIGID HANGER		2			10	0		

[1] [2] [3]

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.

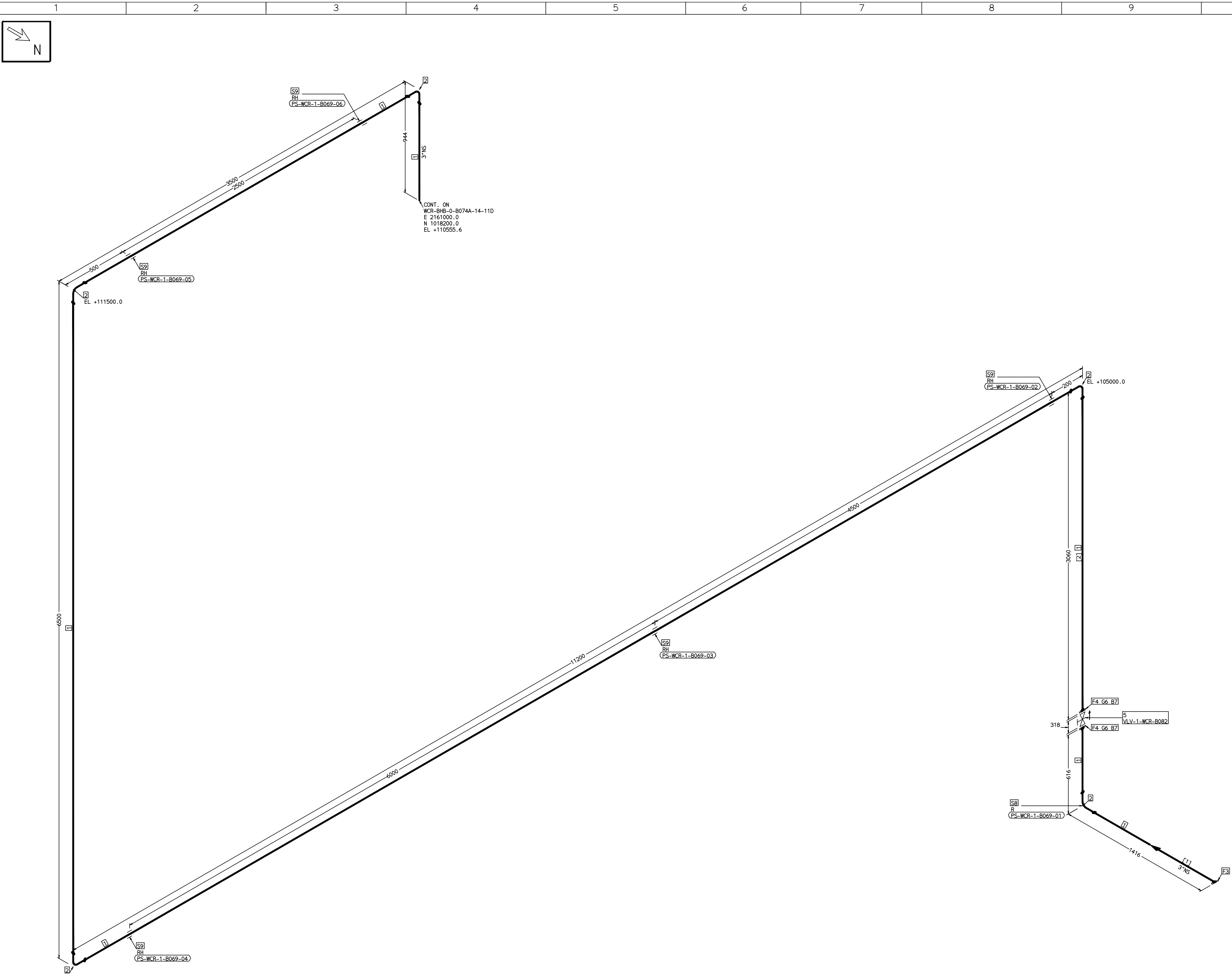
PRELIMINARY - FOR BID PURPOSE ONLY

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

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
SCALE: NTS			
TITLE: 1-CCW-RETURN-FROM-HPSU-COOLERS		DRAWING NO: 1-381-01-06068	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)	3	HVY		26090MM	9.9	AA1011052601	
2	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	3	STD		5	2.3	AA7242502160	
3	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	3		CL150	1	3.7	AA7246101080	
4	FLANGE SLIP-ON ASME B16.5 CL300 RF	A105	3		CL300	2	5.9	AA7246106081	
5	GLOBE VALVE HO ASME B16.10 CL300 RF(16.5)	A216GRWCB	3		CL300	1	52.29	AA7501428085	

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
6	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL300 RF	SS304+PTFE	3		CL300	2	0.19	HY7240363066	
7	120 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A194GR2H	3/4	M20X120	CL300	16	0.41	HY7142198184	
8	PIPE REST		3			1	0		
9	RIGID HANGER		3			5	0		

[1] [2]

NOTES:-

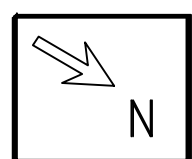
- ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
- ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
- SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
- PIPE FABRICATOR TO CONFIRM 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

 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:		REV	
1-381-01-06069		OOP	
SHT. No. 1		NO. OF SHTS. 1	

COMPUTER FILE NAME: _____



ERECTION MATERIALS								
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (in)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE
13	GASKET M.S.W ASME B16.20 PTF FILLER B16.5 CL300 RF	SS304+PTFE	4		CL300	6	0.32	HY7240363074
14	GASKET M.S.W ASME B16.20 PTFE FILLER B16.5 CL150 RF	SS304+PTFE	4		CL150	1	0.32	HY7240362035
15	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	3		CL300	1	0.19	HY7240365059
16	GASKET M.S.W ASME B16.20 GRAPHITE FILLER B16.5 CL300 RF	SS304+GRAPH	2		CL300	1	0.11	HY7240360600
17	120 STUD WITH 2 NUTS ASME B18.2	A193GB87/A1 94GR2H	3/4	M20X120	CL300	48	0.41	HY7142198184
18	120 STUD WITH 2 NUTS ASME B18.2	A193GB87/A1 94GR2H	3/4	M20X120	CL300	8	0.41	HY7142198184
19	100 STUD WITH 2 NUTS ASME B18.2	A193GB87/A1 94GR2H	5/8	M16X100	CL300	8	0.21	HY7142198060
20	100 STUD WITH 2 NUTS ASME B18.2	A193GB87/A1 94GR2H	5/8	M16X100	CL150	8	0.21	HY7142198060
21	RIGID HANGER		6			4	0	
22	PIPE REST		4			2	0	
23	RIGID HANGER		4			4	0	

NOTES:-

1. ALL DIMENSIONS, ELEVATIONS AND CO-ORDINATES ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ELEVATIONS ARE CENTRE LINE ELEVATIONS UNLESS OTHERWISE SPECIFIED.
3. SUPPORT LOCATIONS ARE SUGGESTIVE. TYPE & LOCATION OF PIPE SUPPORTS TO BE FINALISED AFTER COMPLETION OF STRESS ANALYSIS.
4. 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.
5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
6. REINFORCEMENT PAD TO BE CUT FROM RESPECTIVE RUN PIPE.

CONSULTANT: 

CUSTOMER:  Reliance Industries Limited

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

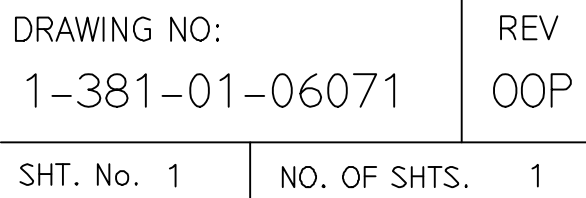
D	TITLE: 1-CW-RETURN-PIPING-BFP-A	DRAWING NO: 1-381-01-06070	REV 00P
		SHT. No. 1	NO. OF SHTS. 1

	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

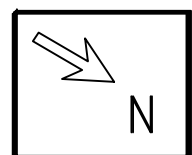
RECORD OF REVISIONS:-					
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY

COMPUTER FILE NAME: _____



 PE&SD	BHARAT HEAVY ELECTRICALS LTD	NAME		SIGN	DATE
	PROJECT ENGINEERING & SYSTEMS DIVISION	DRN.	PCC	-SD-	05-05-14
	R.C.PURAM, HYDERABAD-502032.	CHKD.	VUK	-SD-	05-05-14
	LAYOUTS & PIPING ENGINEERING	APPRD.	GS	-SD-	05-05-14
				SCALE: NTS	
TITLE: 1-CW-RETURN-PIPING-BFP-B		DRAWING NO: 1-381-01-06071			REV 00P
		SHT. NO. 1		NO. OF SHTS. 1	

COMPUTER FILE NAME: _____



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

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

	BHARAT HEAVY ELECTRICALS LTD			NAME	SIGN	DATE
	PROJECT ENGINEERING & SYSTEMS DIVISION		DRN.	PCC	-SD-	05-05-14
	R.C.PURAM, HYDERABAD-502032.		CHKD.	VUK	-SD-	05-05-14
	PE&SD LAYOUTS & PIPING ENGINEERING		APPRD.	GS	-SD-	05-05-14
					SCALE: NTS	
TITLE: 1-CCW-RETURN-PIPING-BFP-C			DRAWING NO: 1-381-01-06072			REV 00P
			SHT. No. 1		NO. OF SHTS. 1	

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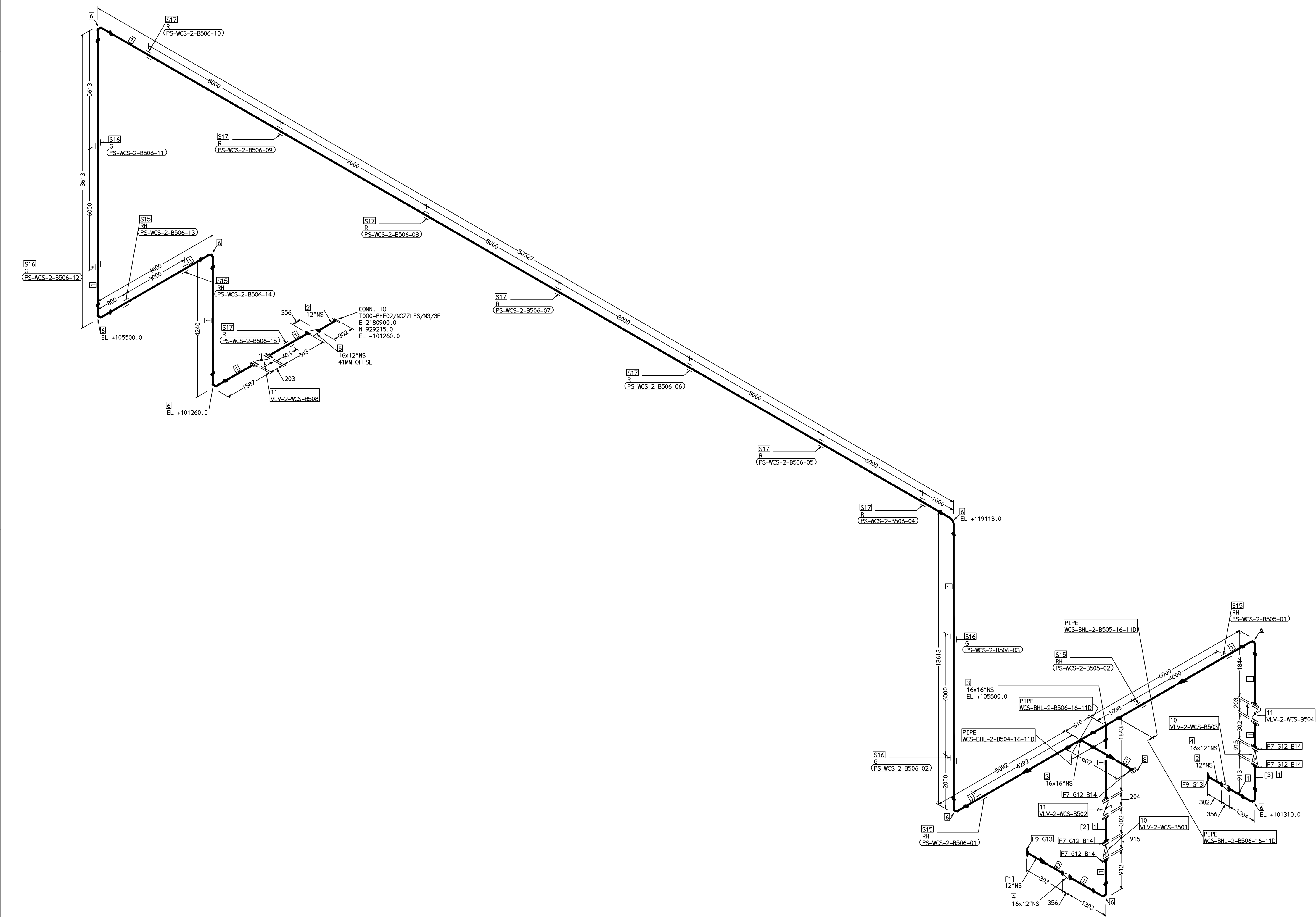
LEGEND:-

	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL

A	-	ANCHOR
R	-	REST
RG	-	REST + GUIDE
RL	-	REST + LIMIT STOP
RGL	-	REST + GUIDE ANCHOR
RH	-	RIGID HANGER
SH	-	SPRING HANGER
BS	-	BOTTOM SPRING
VG	-	VERTICAL GUIDE

RECORD OF REVISIONS:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

COMPUTER FILE NAME: _____



[1] [2] [3]

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5. DRAWING DOES NOT INCLUDE ANY FABRICATION/ERECTION ALLOWANCE UNLESS OTHERWISE SPECIFIED.
6. 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

 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
			SCALE: NTS	
TITLE:		DRAWING NO:		REV
2-ACW-PUMP-DISCH-UPTO-PHE		1-381-01-06073		00P
		SHT. No. 1	NO. OF SHTS. 1	

[illegible]

LEGEND:-

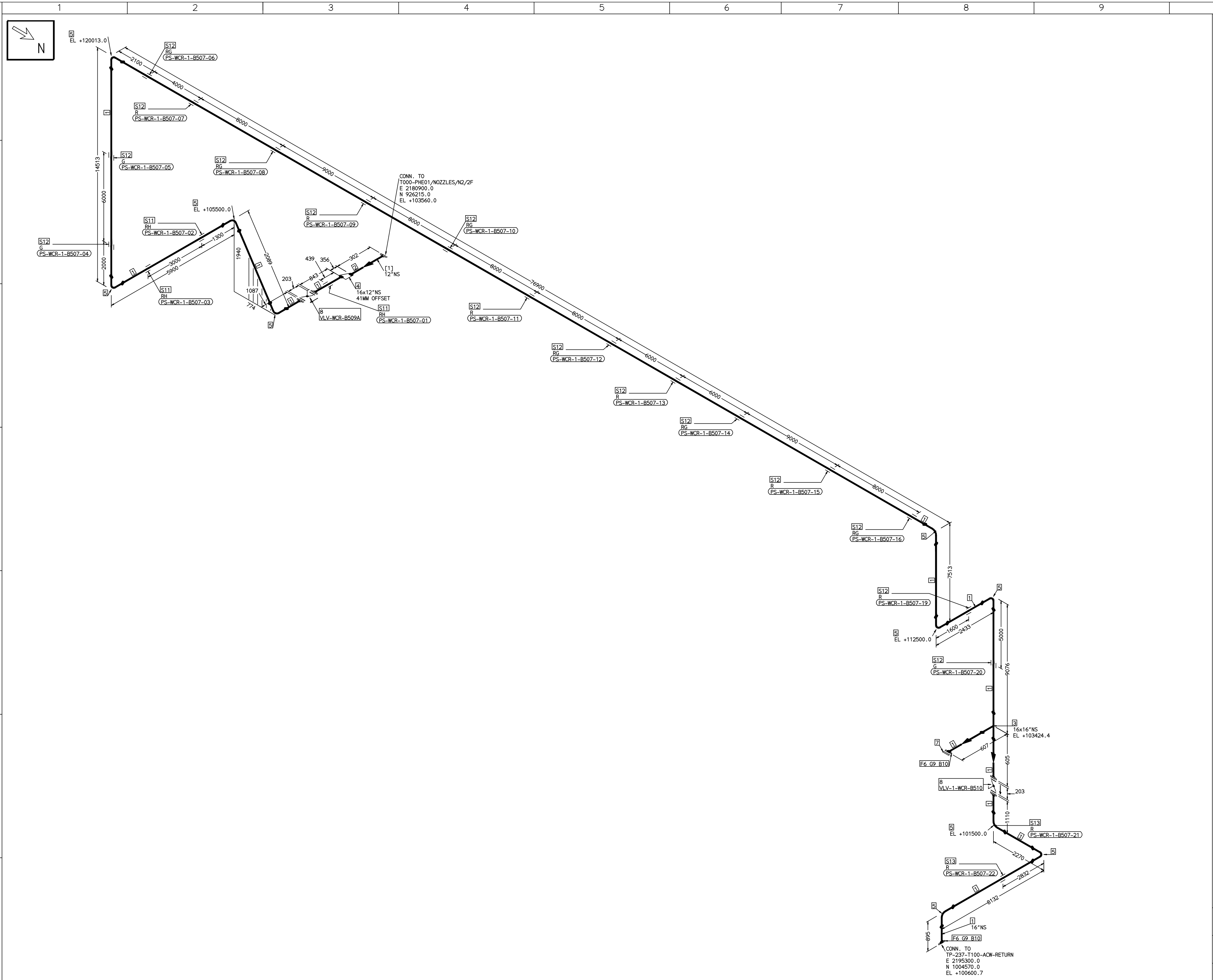
	SUPPORT LOCATION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	WELD SYMBOL

A	-	ANCHOR
R	-	REST
RG	-	REST + GUIDE
RL	-	REST + LIMIT STOP
RG-L	-	DIRECTION ANCHOR
RH	-	RIGID HANGER
SH	-	SPRING HANGER
BS	-	BOTTOM SPRING
VG	-	VERTICAL GUIDE

RECORD OF REVISIONS:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VUK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

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COMPUTER FILE NAME:



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 (mm)	INS MAT	PSPEC	BORE
WCR-BHL-1-B507-16-11D								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:-				
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK
REV	ISSUE DATE	DESCRIPTION	DRN BY	CHKD BY

FABRICATION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
1	PIPE ERW/SAW IS-3589 PE	IS3589GRFE3 30	16	T6		120854M	59.25		
2	PIPE ERW/SAW IS-3589 PE	IS3589GRFE3 30	12	T6		M 300MM	47.02		
3	TEE STRT ASME B16.9 BW	A234GRWPB	16 x 16	S10		1	90.8	HY7242511429	
4	ROCR ECC ASME B16.9 BW	A234GRWPB	16 x 12	S10XS20		1	22.65	AA7242502420	
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	16	S10		10	59.59	AA7244101179	
6	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	16		CL150	2	54	HY7246166173	
7	FLANGE BLIND ASME B16.5 CL150 RF	A105	16		CL150	1	82		
8	BFLV GO ANNA C504 PN10 DFLGD (FF-C207D)	A216GRWCB	16		PN10	2	160		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
9	GASKET M.S.W ASME B16.20 PTFE	SS304+PTFE	16		CL150	2	2.1	HY7240362094	
10	140 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	1	M27X140	CL150	32	0.92	HY7142198648	
11	RIGID HANGER		16			3	0		
12	PIPE SUPPORT		16			15	0		
13	PIPE REST		16			2	0		

[1]

NOTES:-

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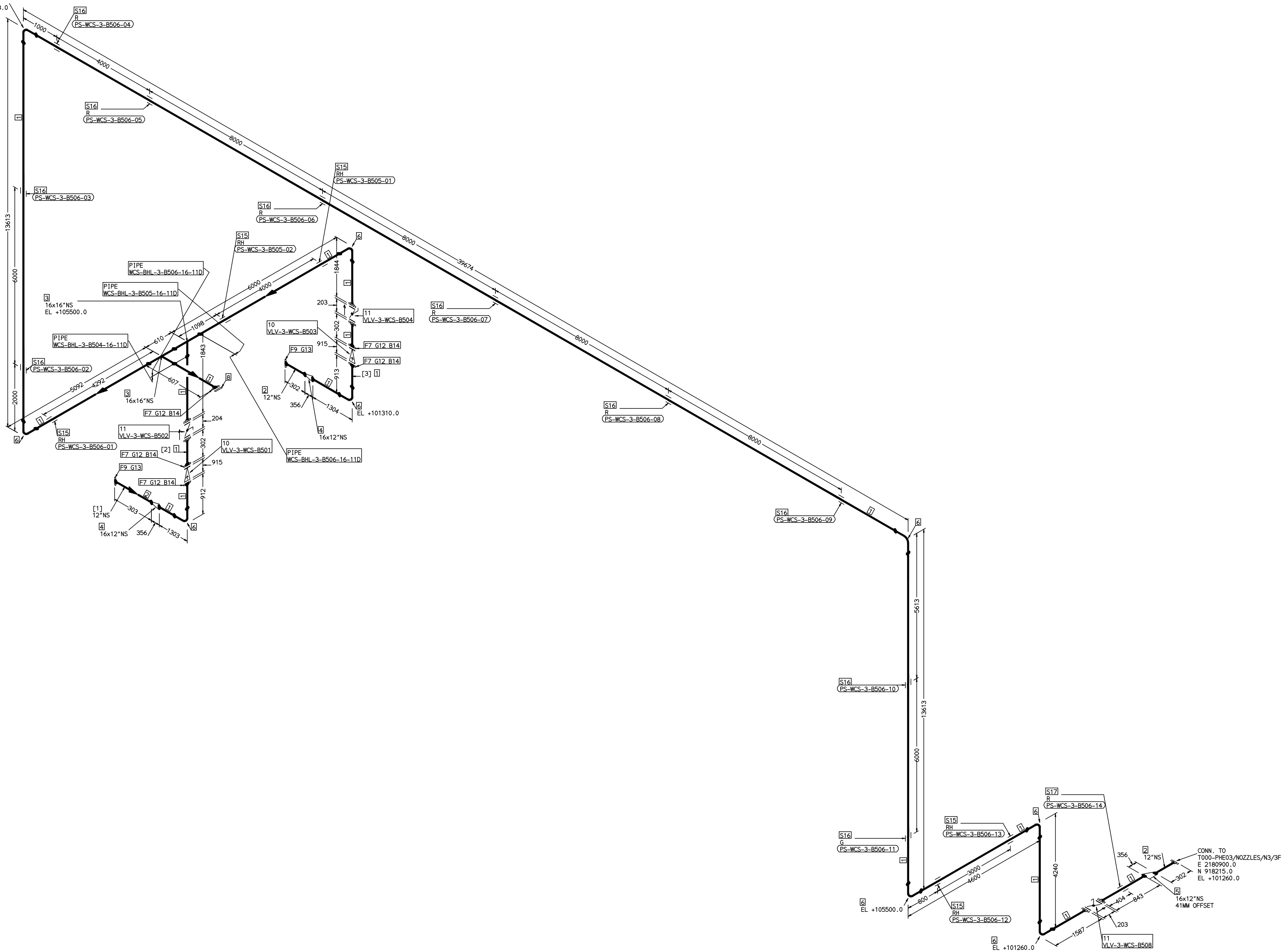
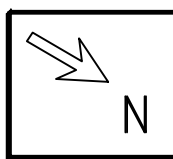
PRELIMINARY - FOR BID PURPOSE ONLY

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

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
SCALE: NTS				
TITLE: 2-ACW-RETURN-FROM-PHE		DRAWING NO: 1-381-01-06074		REV OOP
SHT. No. 1		NO. OF SHTS. 1		

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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	IS3589GRFE3 30	16	T6		86381MM	59.25		
2	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3 30	12	T6		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 ANWA 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 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	16	M27X140	CL150	80	0.92	HY7142198648	
15	RIGID HANGER		16			5	0		
16	PIPE SUPPORT		16			10	0		
17	PIPE REST		16			1	0		

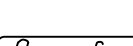
[1] [2] [3]

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

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

TITLE: 3-ACW-PUMP-DISCH-UPTO-PHE	DRAWING NO: 1-381-01-06075	REV OOP
SHT. No. 1	NO. OF SHTS. 1	

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 \$(mm)	INS MAT	PSPEC	BORE
WCS-BHL-3-B504-16-11D								11D-RHP	14"
WCS-BHL-3-B506-16-11D								11D-RHP	14"
WCS-BHL-3-B505-16-11D								11D-RHP	14"

LEGEND:-

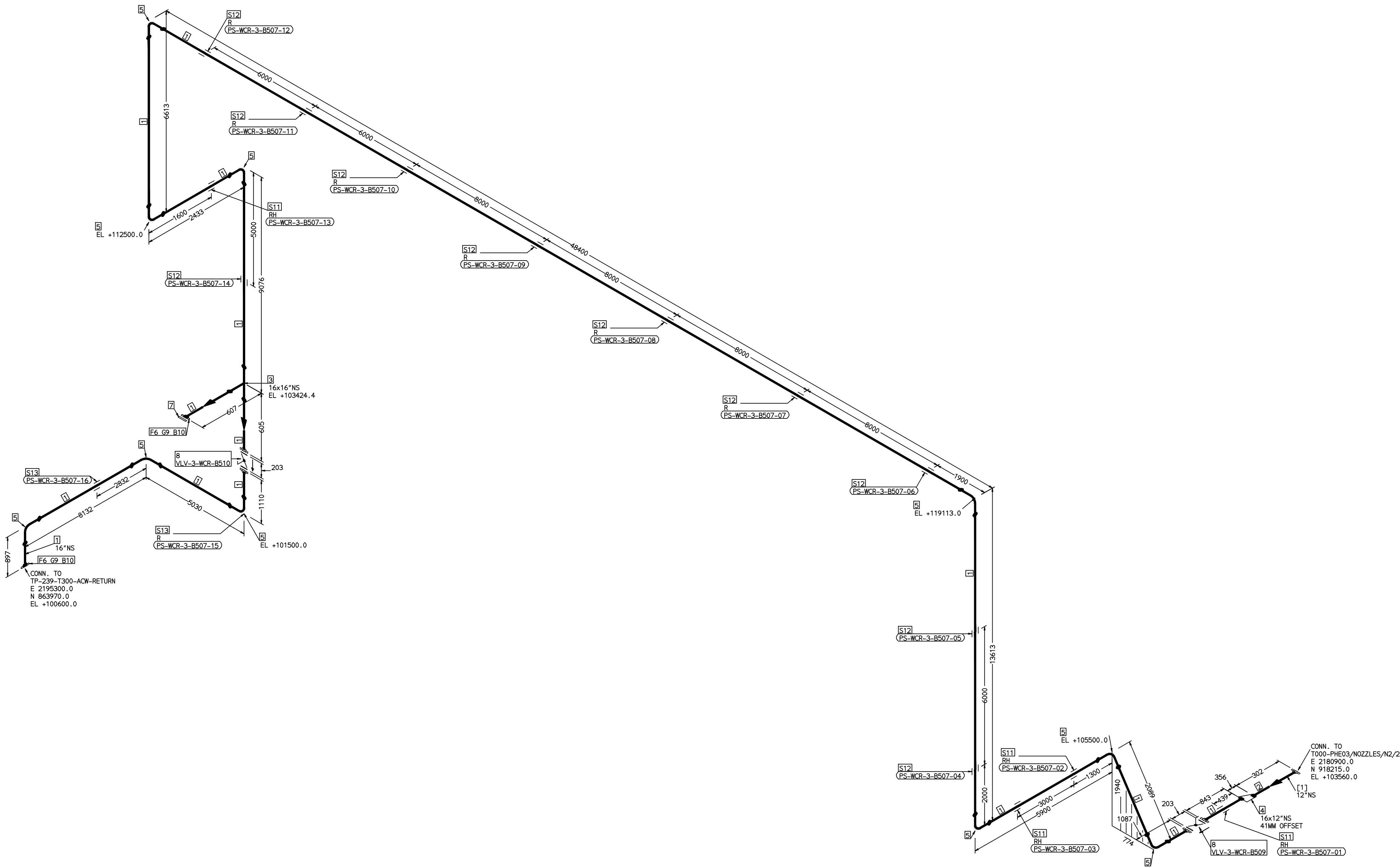
- SUPPORT LOCATION
- DIRECTION OF FLOW
- DIRECTION OF SLOPE
- WELD SYMBOL

- 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	VUK	GS

COMPUTER FILE NAME: _____



- PRELIMINARY – FOR BID PURPOSE ONLY

 PE&SD	BHARAT HEAVY ELECTRICALS LTD PROJECT ENGINEERING & SYSTEMS DIVISION R.C.PURAM, HYDERABAD-502032. LAYOUTS & PIPING ENGINEERING		NAME	SIGN	DATE
		DRN.	PCC	-SD-	05-05-14
		CHKD.	VUK	-SD-	05-05-14
		APPRD.	GS	-SD-	05-05-14
				SCALE: NTS	
TITLE: 3-ACW-RETURN-FROM-PHE		DRAWING NO:			REV
		1-381-01-06076			OOP
		SHT. No. 1		NO. OF SHTS. 1	

[illegible]

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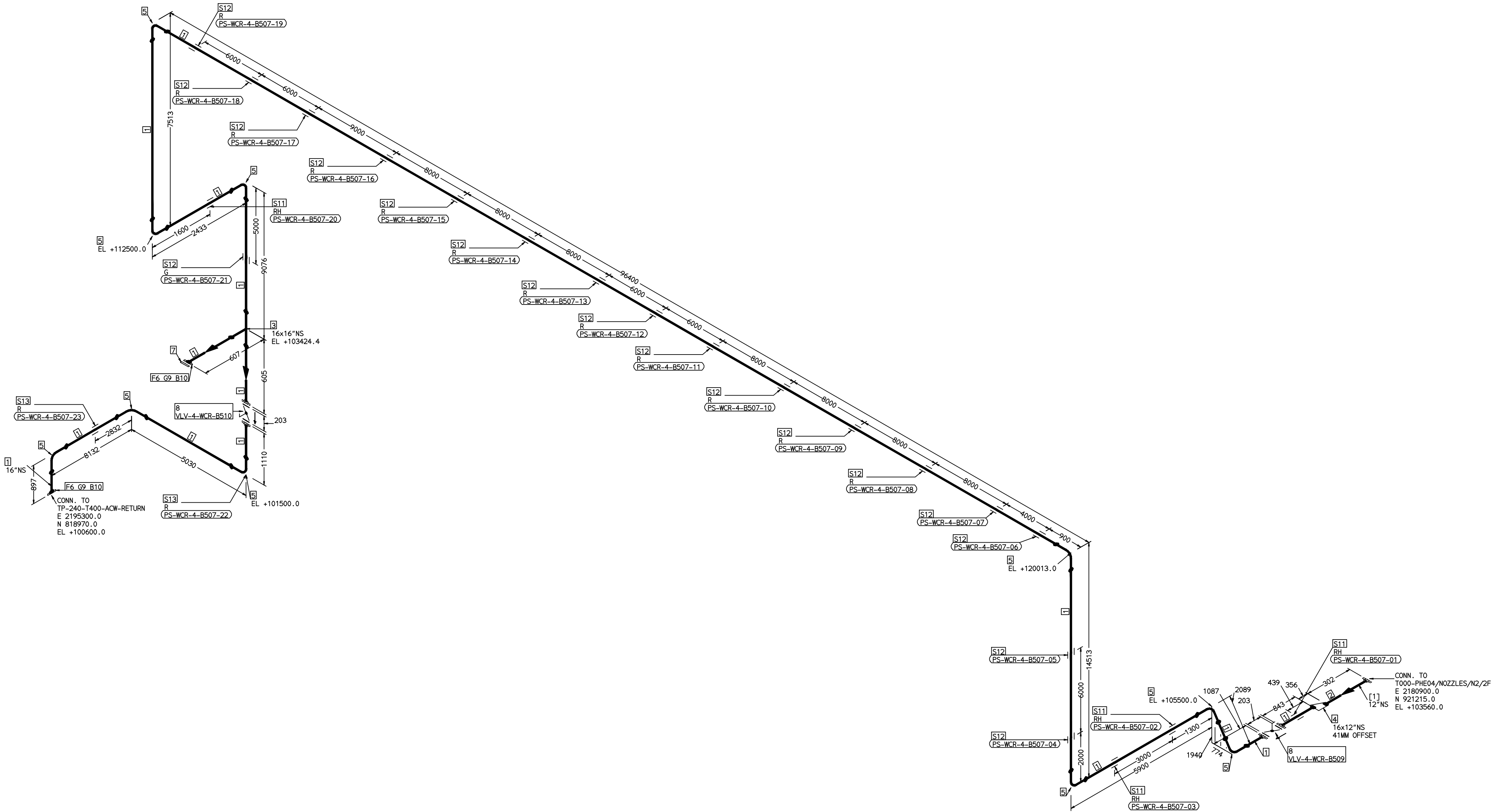
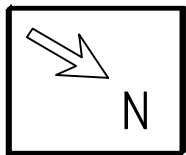
-  SUPPORT LOCATION
-  DIRECTION OF FLOW
-  DIRECTION OF SLOPE
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A - ANCHOR
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RECORD OF REVISIONS:-						
00P	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY		PCC	VJK	GS
REV	ISSUE DATE	DESCRIPTION		DRN BY	CHKD BY	APPR BY

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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	IS3589GRFE3 30	16	T6		143116M	59.25		
2	PIPE ERW/SAW 1S-3589 PE	IS3589GRFE3 30	12	T6		300MM	47.02		
3	TEE STRT ASME B16.9 BW	A234GRWPB	16 x 16	S10		1	90.8	HY7242511429	
4	ROCR ECC ASME B16.9 BW	A234GRWPB	16 x 12	S10XS20		1	22.65	AA7242502420	
5	ELBOW LR 90 DEG ASME B16.9 BW	A234GRWPB	16	S10		10	59.59	AA7244101179	
6	FLANGE SLIP-ON ASME B16.5 CL150 RF	A105	16		CL150	2	54	HY7246166173	
7	FLANGE BLIND ASME B16.5 CL150 RF	A105	16		CL150	1	82		
8	BFLV GO ANNA CS04 PN10 DFLGD (FF-C207D)	A216GRWCB	16		PN10	2	160		

ERECTION MATERIALS									
PT NO	COMPONENT DESCRIPTION	MATERIAL	BORE (Ln)	SCHEDULE	RATING	QTY	UNITWT (Kg)	BHEL MATCODE	
9	GASKET M.S.W ASME B16.20 PTFE	SS304+PTFE	16		CL150	2	2.1	HY7240362094	
10	140 STUD WITH 2 NUTS ASME B18.2	A193GRB7/A1 94GR2H	1	M27X140	CL150	32	0.92	HY7142198648	
11	RIGID HANGER		16			4	0		
12	PIPE SUPPORT		16			17	0		
13	PIPE REST		16			2	0		

[1]

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PRELIMINARY - FOR BID PURPOSE ONLY

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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 \$(mm)	INS MAT
		WCR-BHL-4-B507-16-11D							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
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RECORD OF REVISIONS:-					
OOP	05-05-14	PRELIMINARY - FOR BID PURPOSE ONLY	PCC	VUK	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.	VUK	-SD-	05-05-14
		APPRD.	GS	-SD-	05-05-14
					SCALE: NTS
TITLE: 4-ACW-RETURN-FROM-PHE		DRAWING NO: 1-381-01-06077			REV OOP
		SHT. No. 1		NO. OF SHTS. 1	