

**LEGEND**

WT	WAGON TIPLER		
AFD	APRON FEEDER		
DF	DRIBBLE FEEDER		
BCN	BELT CONVEYOR	CSU	COAL SAMPLING UNIT
CSU	COAL SAMPLING UNIT	SC	ECCENTRIC DISC SCREEN
CR	CRUSHER	FTR	FIXED TRAVELLING TRIPPER
CH	CRUSHER HOUSE	TTR	TRAVELLING TRIPPER
DH	DRIVE HOUSE	VFD	VIBRATING FEEDER
DE	DUST EXTRACTION SYSTEM	EL	ELEVATOR
DFDS	DRY FOG DUST SUPPRESSION SYSTEM	—	BELT CONVEYOR
FG	FLAP GATE	FD	FLOW DIVIDER
ICS	INLINE CONVEYOR SCALE	BVS	BUNKER VENTILATION SYSTEM
ILMS	INLINE MAGNETIC SEPARATOR	PH	PENT HOUSE
JNT	JUNCTION TOWER	—	PHASE-1
LI	BUNKER LEVEL INDICATOR	—	PHASE-2(FUTURE)
MD	METAL DETECTOR		
RBF	REVERSIBLE BELT FEEDER		
SCR	STACKER CUM RECLAIMER		
SP	SUMP PUMP		

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EQUIPMENT	NAME	QUANTITY	CAPACITY	EQUIPMENT	NAME	QUANTITY	CAPACITY
BCN 1A/B	CONVEYOR 1600MM WIDE	2	1800TPH	FG	FLAP GATE	LOT	
BCN 2A/B	CONVEYOR 1600MM WIDE	2	1800TPH	CR	CRUSHER	4	1000TPH
BCN 3A/B	CONVEYOR 1600MM WIDE	2	1800TPH	RBF	REVERSIBLE BELT FEEDER	4	1800TPH
BCN 4A/B	CONVEYOR 1600MM WIDE	2	1800TPH	SC	ECCENTRIC DISC SCREEN	2	1000TPH
BCN 5	CONVEYOR 1600MM WIDE	1	1800TPH	DE	DUST EXTRACTION SYSTEM	LOT	
BCN 6A/B	CONVEYOR 1200MM WIDE	2	1800TPH	DFDS	DUST FOG DUST SUPPRESSION SYSTEM	LOT	
BCN 7A/B	CONVEYOR 1200MM WIDE	2	1800TPH	EL	ELEVATOR	1	
BCN 8A/B	CONVEYOR 1200MM WIDE	2	1000TPH	MD	METAL DETECTOR	2	
BCN 9A/B	CONVEYOR 1200MM WIDE	2	1000TPH	ILMS	INLINE MAGNETIC SEPARATOR	2	
BCN 10A/B	CONVEYOR 1200MM WIDE	2	1000TPH	CSU	COAL SAMPLING UNIT	1	
				ICS	INLINE CONVEYOR SCALE	2	

EXHIBIT-10

REV.	DATE	ISSUED WITH DRAFT DPR	DRN.	STR.	MECH	ELEC.	INST.

**FICTNER**  
Consulting Engineers  
(India) Private Limited  
Chennai, Mumbai, Bangalore.

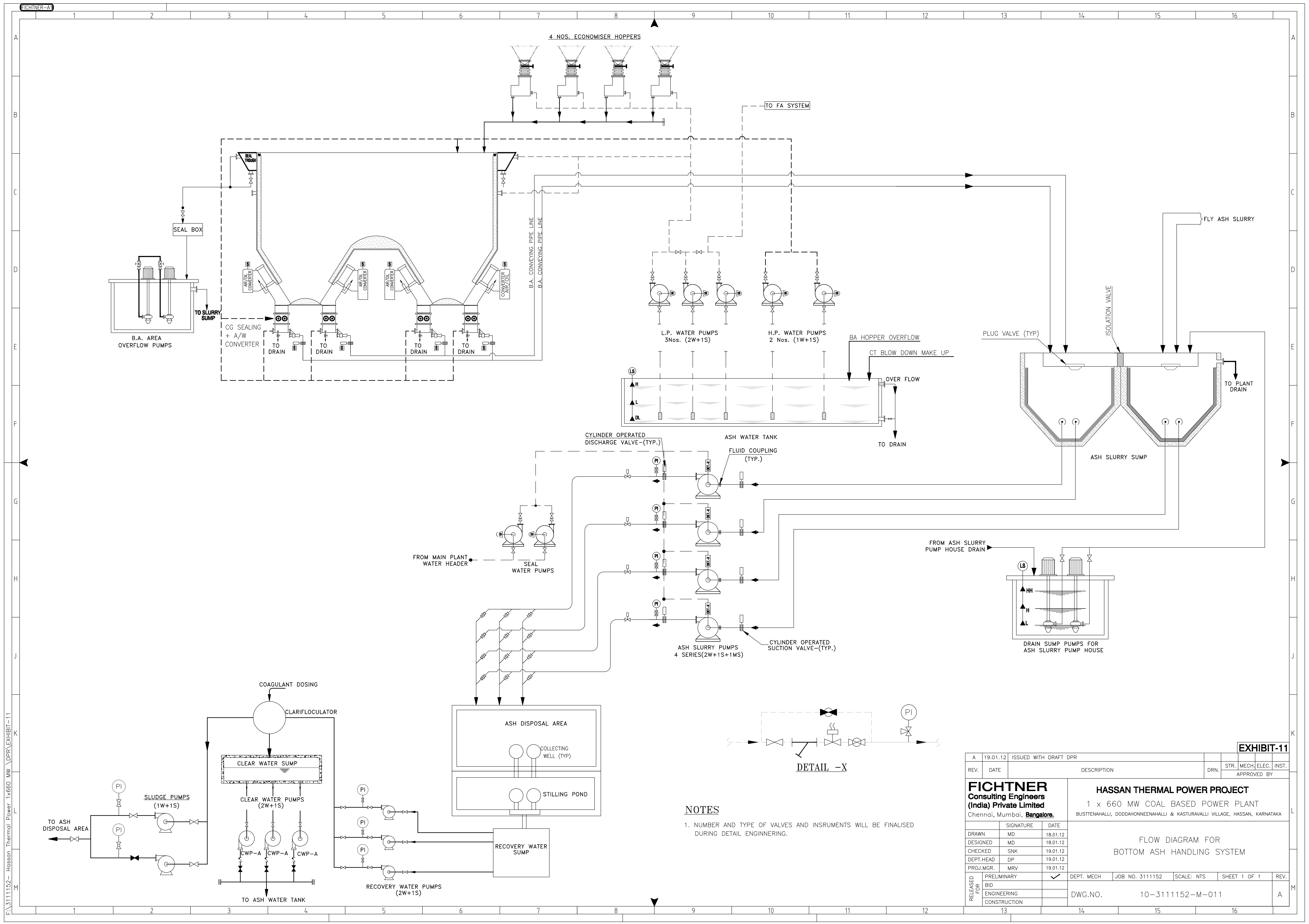
**HASSAN THERMAL POWER PROJECT**  
1 x 660 MW COAL BASED POWER PLANT  
BUSTENAHALLI, DODDAHONNEENAHALLI & KASTURAVALLI VILLAGE, HASSAN, KARNATAKA

FLOW DIAGRAM FOR  
COAL HANDLING SYSTEM

DRAWN	SIGNATURE	DATE	DEPT. MECH	JOB NO. 3111152	SCALE: NTS	SHEET 1 OF 1	REV.
DESIGNED	MD	18.01.12					
CHECKED	SNK	19.01.12					
DEPT. HEAD	DP	19.01.12					
PROJ. MGR.	MRV	19.01.12					

RELEASED FOR CONSTRUCTION

DWG. NO. 10-3111152-M-010



4 NOS. ECONOMISER HOPPERS

TO FA SYSTEM

SEAL BOX

B.A. AREA OVERFLOW PUMPS

B.A. AREA OVERFLOW PUMPS

TO SLURRY SUMP

CG SEALING + A/W CONVERTER

TO DRAIN

TO DRAIN

TO DRAIN

TO DRAIN

B.A. CONVEYING PIPE LINE

B.A. CONVEYING PIPE LINE

L.P. WATER PUMPS 3Nos. (2W+1S)

H.P. WATER PUMPS 2 Nos. (1W+1S)

BA HOPPER OVERFLOW

CT BLOW DOWN MAKE UP

OVER FLOW

TO DRAIN

CYLINDER OPERATED DISCHARGE VALVE-(TYP.)

ASH WATER TANK

FLUID COUPLING (TYP.)

FROM MAIN PLANT WATER HEADER

SEAL WATER PUMPS

FROM ASH SLURRY PUMP HOUSE DRAIN

DRAIN SUMP PUMPS FOR ASH SLURRY PUMP HOUSE

ASH SLURRY PUMPS 4 SERIES(2W+1S+1MS)

CYLINDER OPERATED SUCTION VALVE-(TYP.)

COAGULANT DOSING

CLARIFLOCULATOR

CLEAR WATER SUMP

SLUDGE PUMPS (1W+1S)

CLEAR WATER PUMPS (2W+1S)

CWP-A

CWP-A

CWP-A

RECOVERY WATER PUMPS (2W+1S)

ASH DISPOSAL AREA

COLLECTING WELL (TYP.)

STILLING POND

RECOVERY WATER SUMP

TO ASH WATER TANK

DETAIL -X

**NOTES**

1. NUMBER AND TYPE OF VALVES AND INSTRUMENTS WILL BE FINALISED DURING DETAIL ENGINEERING.

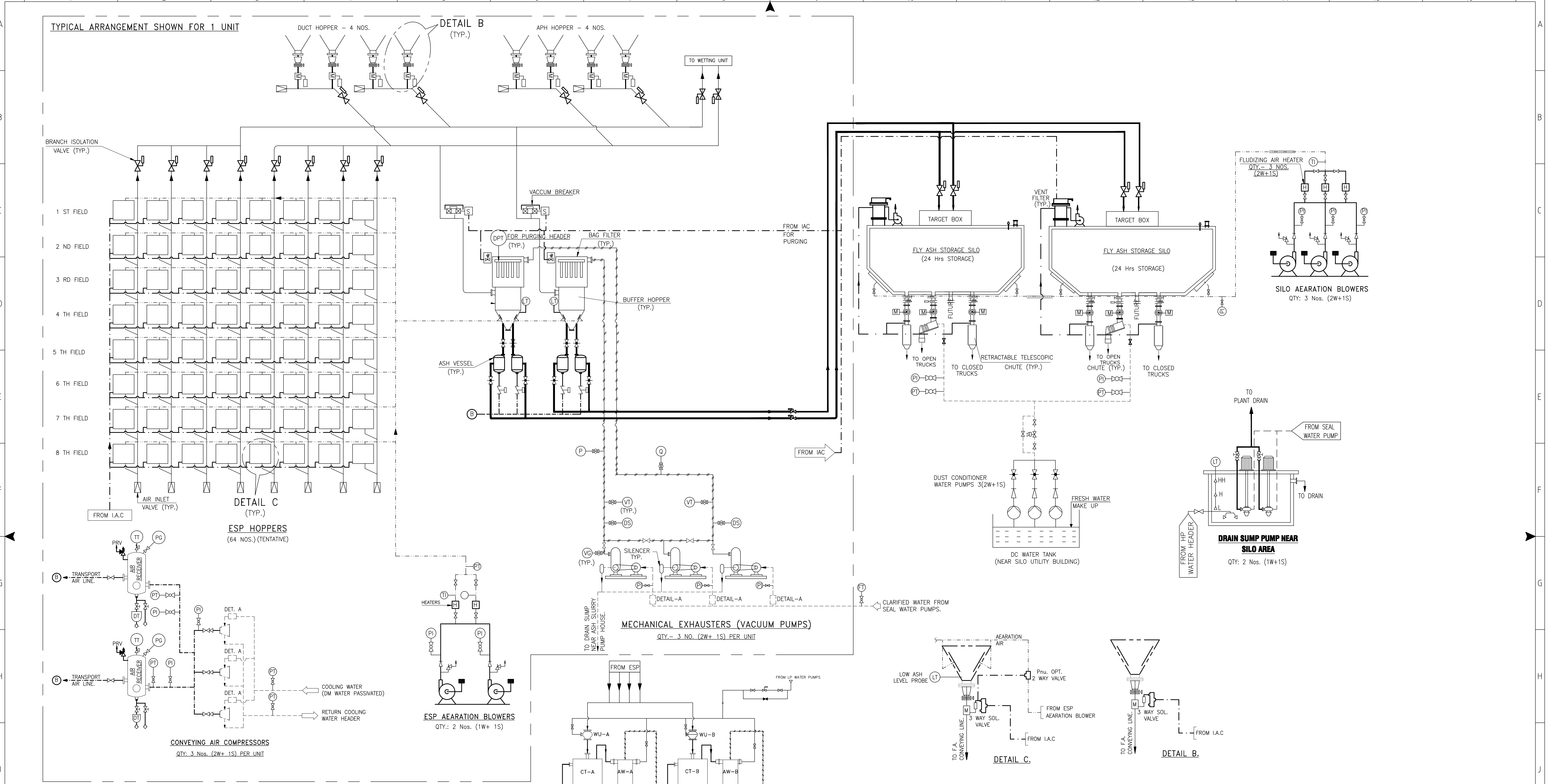
**EXHIBIT-11**

REV.	DATE	DESCRIPTION	DRN.	STR.	MECH	ELEC.	INST.	APPROVED BY
A	19.01.12	ISSUED WITH DRAFT DPR						

<b>FICTNER</b> Consulting Engineers (India) Private Limited Chennai, Mumbai, Bangalore.		<b>HASSAN THERMAL POWER PROJECT</b> 1 x 660 MW COAL BASED POWER PLANT BUSTTENAHALLI, DODDAHONNEENAHALLI & KASTURAVALLI VILLAGE, HASSAN, KARNATAKA	
FLOW DIAGRAM FOR BOTTOM ASH HANDLING SYSTEM			
RELEASED FOR:	PRELIMINARY	DEPT. MECH	JOB NO. 3111152
	BID		SCALE: NTS
	ENGINEERING		SHEET 1 OF 1
	CONSTRUCTION		REV. A
DWG.NO. 10-3111152-M-011			

F:\3111152 - Hassan Thermal Power 1x660 MW \DPR\EXHIBIT-11



**LEGEND**

SL. NO.	DESCRIPTION	SYMBOL
1	KNIFEGATE VALVE	[Symbol]
2	CHECK VALVE	[Symbol]
3	JETTING NOZZLE	[Symbol]
4	PLATE VALVE	[Symbol]
5	NEEDLE VALVE (THREE WAY)	[Symbol]
6	GLOBE VALVE	[Symbol]
7	GATE VALVE	[Symbol]
8	GATE VALVE NORMALY CLOSED	[Symbol]
9	MANUAL OPERATED B.F. VALVE	[Symbol]
10	PNEUMATIC OPTD. B.F. VALVE	[Symbol]
11	PNEUMATIC HEADER/ BRANCH HEADER ISOLATION VALVE	[Symbol]
12	MOTOR OPTD. KNIFE GATE VALVE	[Symbol]
13	PNEUMATIC FLOW CONTROL VALVE	[Symbol]
14	PRESSURE SAFETY VALVE	[Symbol]
15	ORIFICE PLATE	[Symbol]
16	DRAIN	[Symbol]

17	PROBE	[Symbol]
18	Y STRAINER	[Symbol]
19	STRAINER	[Symbol]
20	AIR INTAKE VALVE	[Symbol]
21	CYLINDER OPTD. MATERIAL HANDL'G VALVE	[Symbol]
22	AIR FILTER	[Symbol]
23	AIR HEATER	[Symbol]
24	AIR DRIER	[Symbol]
25	SOLENOID VALVE (2-WAY)	[Symbol]
26	SILENCER	[Symbol]
27	MANUAL OPERATED PLUG VALVE (NORMALY CLOSED)	[Symbol]
28	MANUAL OPERATED KNIFEGATE VALVE (NORMALY CLOSED)	[Symbol]
29	GLOBE VALVE (NORMALY CLOSED)	[Symbol]
30	REDUCER	[Symbol]
31	SILENCER CUM WATER SEPARATOR	[Symbol]
32	STRAINER	[Symbol]

**LINE CONVENTIONS**

SL. NO.	DESCRIPTION	SYMBOL
1	INSTRUMENT AIR LINE	IA
2	TRANSPORT AIR LINE	TA
3	FLUIDIZING AIR LINE (INSULATED)	FL
4	CLARIFIED / SEAL WATER LINE	SLW
5	BOTTOM ASH SEAL WATER PUMP DISCH. LINE	BASW
6	COOLING WATER LINE	CW
7	DRY ASH CONVEYING LINE (PRESSURE & VACUUM)	FA
8	ASH SLURRY LINE	SL
9	VACUUM LINE	VL

**INSTRUMENTS LEGEND**

SL. NO.	PARAMETERS	INDICATOR	TRANSMITTER	ELEMENT	METER
1	PRESSURE	PI	PT	-	-
2	VACUUM	VI	VT	-	-
3	TEMPERATURE	TI	TT	TE	-
4	FLOW	FI	FT	-	-
5	LEVEL (LIQUID)	LI	LT* (ULTRASONIC)	-	-
6	LEVEL (DRY ASH)	-	LT* (ULTRASONIC)	-	-
7	DUST SENSOR	-	-	DS	-

**EXHIBIT-12**

REV.	DATE	ISSUED WITH DRAFT DPR	DESCRIPTION	DRN.	STR.	MECH.	ELEC.	INST.	APPROVED BY
A	19.01.12	ISSUED WITH DRAFT DPR							

**FIGHTNER Consulting Engineers (India) Private Limited**  
Chennai, Mumbai, Bangalore.

**HASSAN THERMAL POWER PROJECT**  
1 x 660 MW COAL BASED POWER PLANT  
BUSTENAHALLI, DODDAHONNEENAHALLI & KASTURAWALI VILLAGE, HASSAN, KARNATAKA

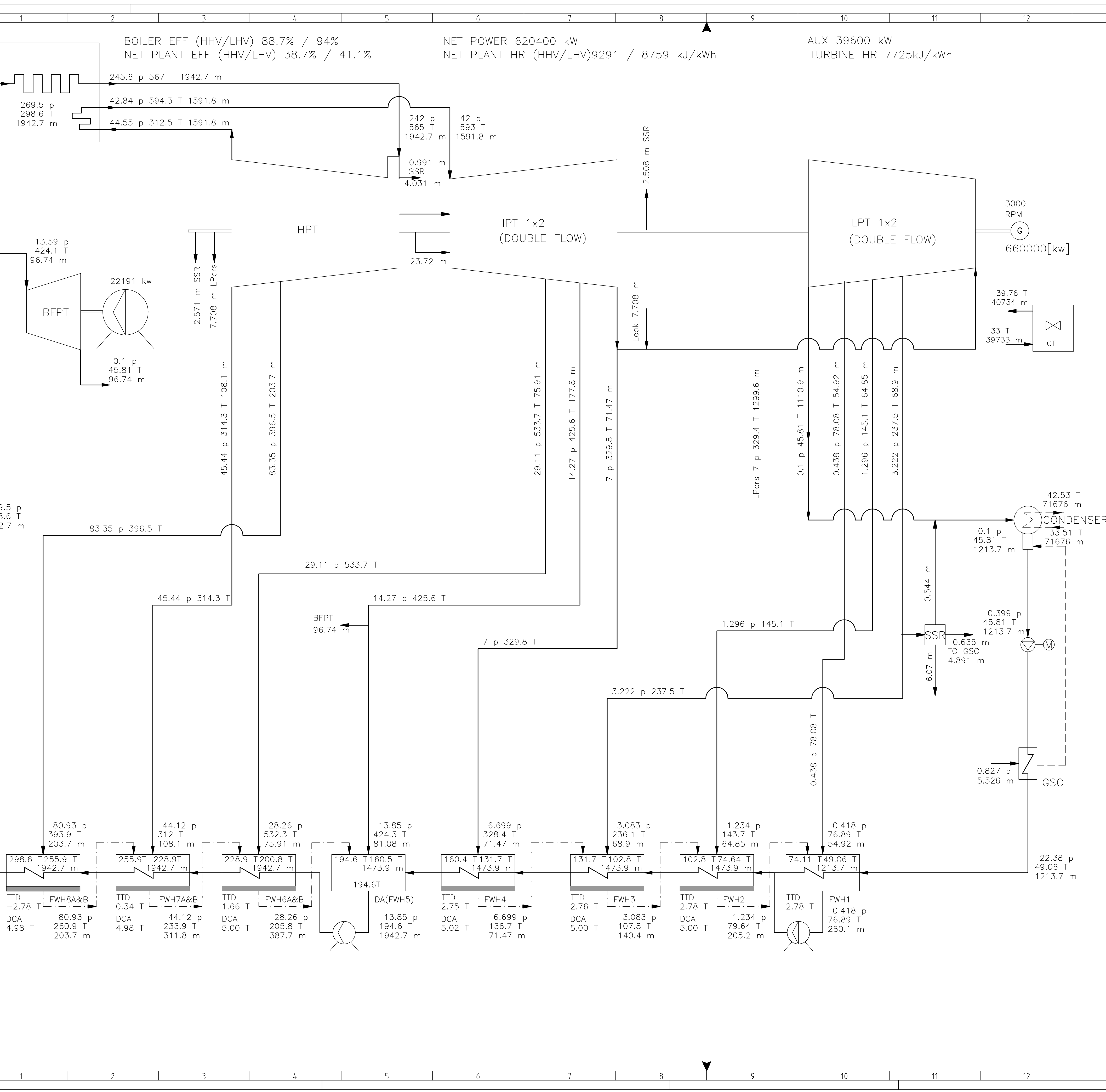
DRAWN	DESIGNED	CHECKED	DEPT. HEAD	PROJ. MGR.	SIGNATURE	DATE
MD	MD	MVB	DP	MRV		18.01.12
						18.01.12
						19.01.12
						19.01.12

FLOW DIAGRAM FOR FLY ASH HANDLING SYSTEM

RELEASED FOR	PRELIMINARY	BID	ENGINEERING	CONSTRUCTION	DEPT. MECH	JOB NO. 3111152	SCALE: NTS	SHEET 1 OF 1	REV.
	✓								A

DWG. NO. 10-3111152-M-012

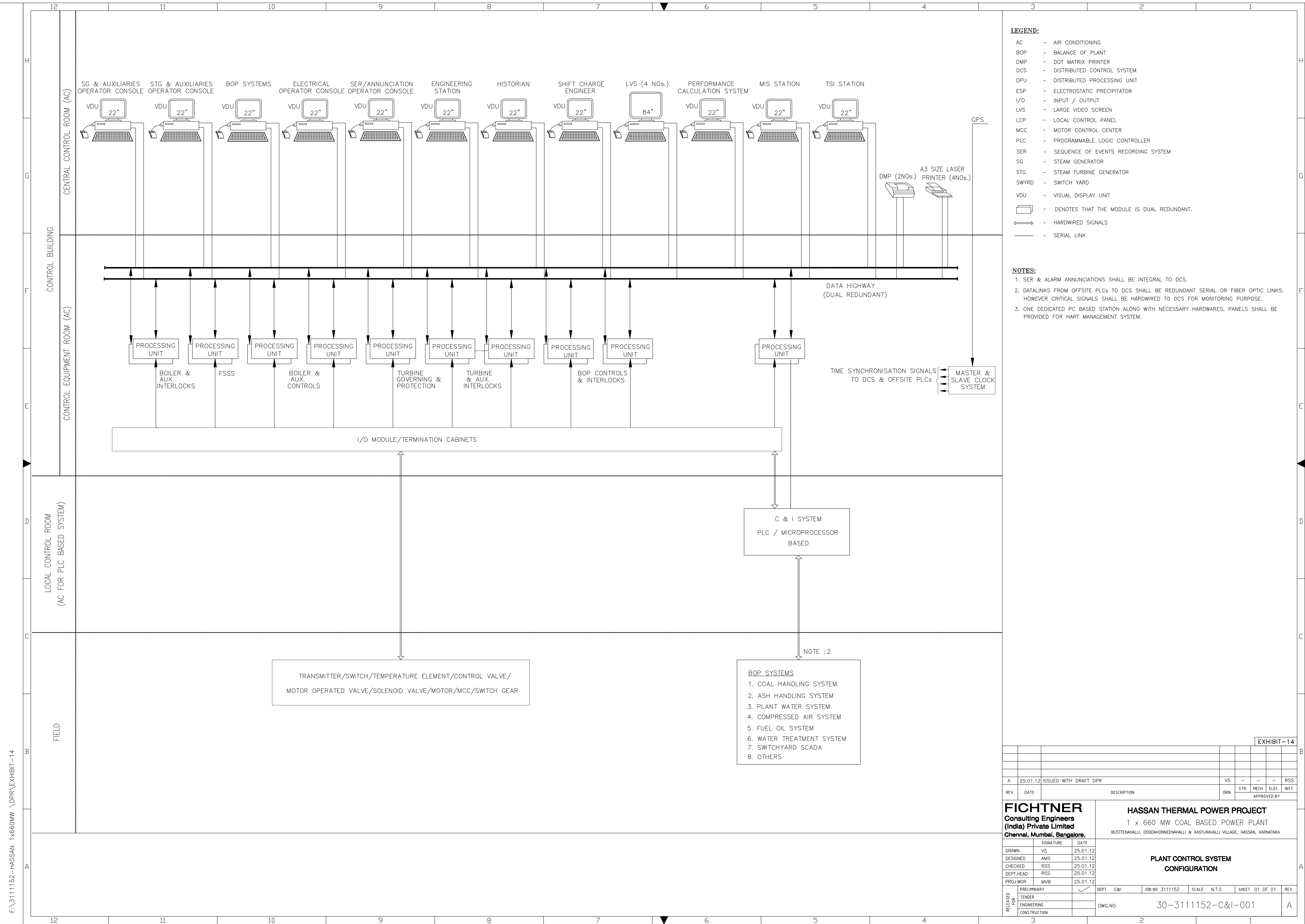
F:\3111152-HASSAN 1x660MW DPR\EXHIBIT-13



REV.	DATE	DESCRIPTION	DRN	STR	MECH	ELEC	INST.	APPROVED BY
A	27.01.12	ISSUED WITH DRAFT DPR		KGSR	MRV	DP	RSR	RS

<b>FICHTNER</b> Consulting Engineers (India) Private Limited Chennai, Mumbai, Bangalore.		<b>HASSAN THERMAL POWER PROJECT</b> 1 x 660 MW COAL BASED POWER PLANT BUSTENAHALLI, DODDHANONNEENAHALLI & KASTURAVALLI VILLAGE, HASSAN, KARNATAKA	
<b>HEAT BALANCE DIAGRAM</b>			
RELEASED FOR	SIGNATURE	DATE	REV.
TENDER		27.01.12	
ENGINEERING		27.01.12	
CONSTRUCTION		27.01.12	
DEPT. MECH.		JOB NO. 3111152	SCALE NTS
DWG. NO. 10-3111152-M-013		SHEET 1 OF 1	



- LEGEND:**
- AC - AIR CONDITIONING
  - BOP - BALANCE OF PLANT
  - DMP - DOT MATRIX PRINTER
  - DCS - DISTRIBUTED CONTROL SYSTEM
  - DPU - DISTRIBUTED PROCESSING UNIT
  - ESP - ELECTROSTATIC PRECIPITATOR
  - I/O - INPUT / OUTPUT
  - LVS - LARGE VIDEO SCREEN
  - LCP - LOCAL CONTROL PANEL
  - MCC - MOTOR CONTROL CENTER
  - PLC - PROGRAMMABLE LOGIC CONTROLLER
  - SER - SEQUENCE OF EVENTS RECORDING SYSTEM
  - SG - STEAM GENERATOR
  - STG - STEAM TURBINE GENERATOR
  - SWYRD - SWITCH YARD
  - VDU - VISUAL DISPLAY UNIT
- DENOTES THAT THE MODULE IS DUAL REDUNDANT.  
 - HARDWIRED SIGNALS  
 - SERIAL LINK

- NOTES:**
1. SER & ALARM ANNUNCIATIONS SHALL BE INTEGRAL TO DCS.
  2. DATALINKS FROM OFFSITE PLCs TO DCS SHALL BE REDUNDANT SERIAL OR FIBER OPTIC LINKS. HOWEVER CRITICAL SIGNALS SHALL BE HARDWIRED TO DCS FOR MONITORING PURPOSE.
  3. ONE DEDICATED PC BASED STATION ALONG WITH NECESSARY HARDWARES, PANELS SHALL BE PROVIDED FOR HART MANAGEMENT SYSTEM.

- NOTE : 2**
- BOP SYSTEMS**
1. COAL HANDLING SYSTEM
  2. ASH HANDLING SYSTEM
  3. PLANT WATER SYSTEM
  4. COMPRESSED AIR SYSTEM
  5. FUEL OIL SYSTEM
  6. WATER TREATMENT SYSTEM
  7. SWITCHYARD SCADA
  8. OTHERS

REV.	DATE	DESCRIPTION	DRN.	STR.	MECH.	ELEC.	INST.	RSS.
A	25.01.12	ISSUED WITH DRAFT DPR		VS	-	-	-	RSS

**APPROVED BY**

<b>FICHTNER</b> Consulting Engineers (India) Private Limited Chennai, Mumbai, Bangalore.	<b>HASSAN THERMAL POWER PROJECT</b> 1 x 660 MW COAL BASED POWER PLANT BUSTENAHALLI, DODDAHONNEAHALLI & KASTURAWALLI VILLAGE, HASSAN, KARNATAKA	
<b>PLANT CONTROL SYSTEM CONFIGURATION</b>		
DRAWN: VS DESIGNED: AMS CHECKED: RSS DEPT. HEAD: RSS PROJ. MGR: MVB	SIGNATURE: _____ DATE: 25.01.12	DEPT: C&I JOB NO: 3111152 SCALE: N.T.S. SHEET: 01 OF 01 REV: A
PRELIMINARY: <input checked="" type="checkbox"/> TENDER: <input type="checkbox"/> ENGINEERING: <input type="checkbox"/> CONSTRUCTION: <input type="checkbox"/>	DWG. NO. 30-3111152-C&I-001	

F:\3111152-HASSAN 1x660MW \DPR\EXHIBIT-14



**NOTES**  
 1. THE COMMERCIAL OPERATION IS BY 42th MONTH.  
 2. ONLY MAJOR ACTIVITIES AND THEIR RESTRAINTS ARE HIGHLIGHTED IN THIS SCHEDULE.

**LEGEND**

ba.	BID ANALYSIS
bfp.	BOILER FEED PUMP
blr strl.stl.	BOILER STRUCTURAL STEEL
br.	BID RECEIPT
bs.	BASIC STUDY
(c)	COMPLETE
ca.	TENDER ANALYSIS, PURCHASE RECOMMENDATION & CONTRACT AWARD
cep.	CONDENSATE EXTRACTION PUMP
commg.	COMMISSIONING
cond.	CONDENSER
e.t.&c.	ERECT, TEST & COMMISSION
engg.	DESIGN & ENGINEERING
erect.	ERECTION
fdns.	FOUNDATIONS
fw.	FEED WATER HEATERS
mfg. & dely.	MANUFACTURE AND DELIVERY OF EQUIPMENT TO SITE
mob.	MOBILISE
(p)	PART
sbo & svs.	STEAM BLOWOUT & SAFETY VALVE SETTING
swyd.	SWITCHYARD
synch.	SYNCHRONISATION
t&c.	TESTING AND COMMISSIONING
▼	MILESTONE START/COMPLETION
—/—/—	CRITICAL ACTIVITY

**EXHIBIT-15**

REV.	DATE	DESCRIPTION	DRN.	STR.	MECH.	ELEC.	INST.
A	19.01.12	ISSUED WITH DRAFT DPR					

<b>FICHTNER</b>		<b>HASSAN THERMAL POWER PROJECT</b>	
Consulting Engineers (India) Private Limited		1 x 660 MW COAL BASED POWER PLANT	
Chennai, Mumbai, Bangalore.		BUSTENAHALLI, DODDANOHNEENAHALLI & KASTURAVALLI VILLAGE, HASSAN, KARNATAKA	
DRAWN	SIGNATURE	DATE	
DESIGNED	HSCB	19.01.12	
CHECKED	MVB	19.01.12	
DEPT. HEAD	DP	19.01.12	
PROJ. MGR.	MRV	19.01.12	

**PROJECT NETWORK SCHEDULE**

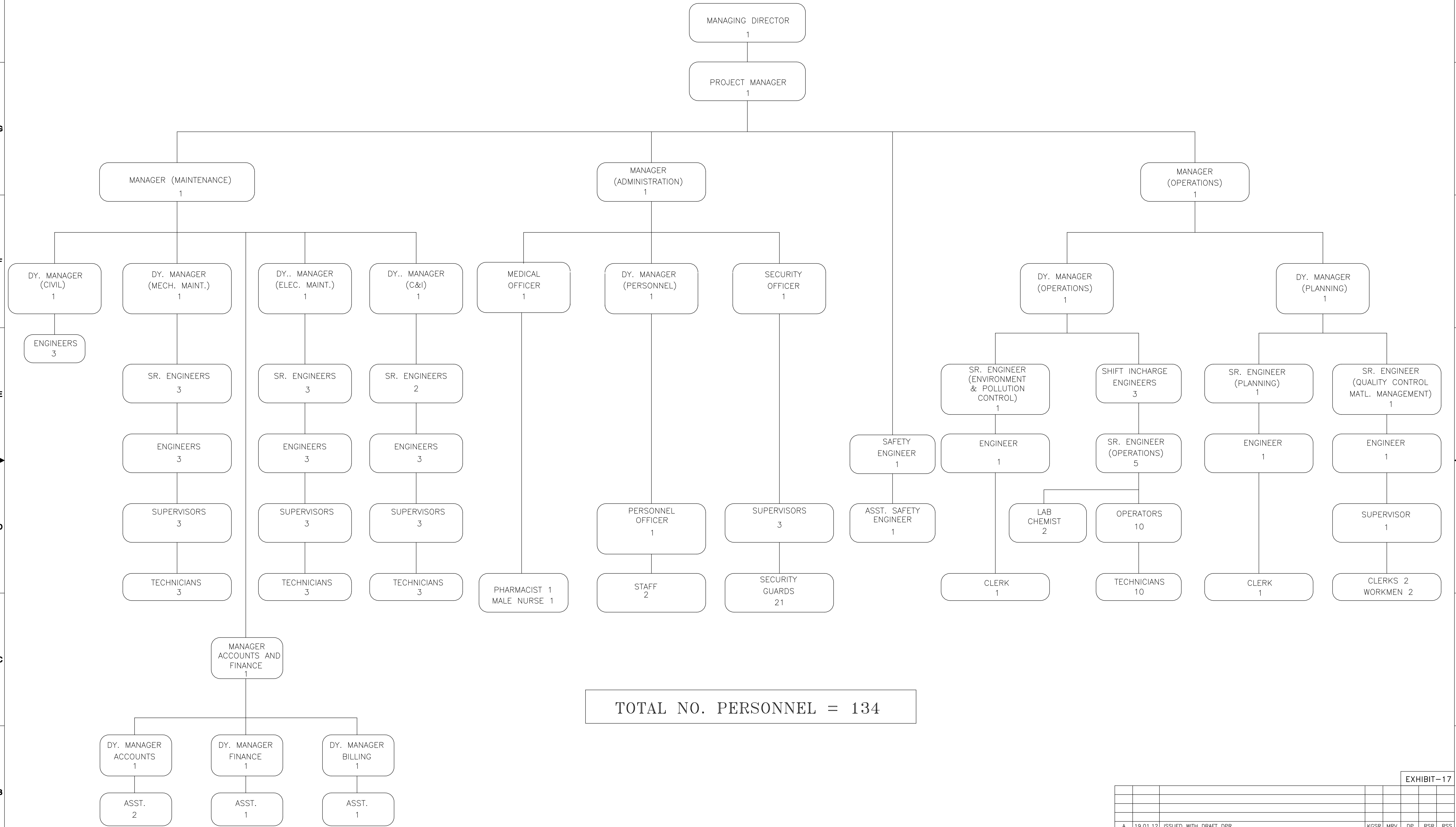
RELEASED TO:	PRELIMINARY	DEPT. MECH	JOB NO. 3111152	SCALE: NTS	SHEET 1 OF 1	REV.
	ENGINEERING					
	CONSTRUCTION					

DWG. NO. 10-3111152-M-015





ORGANISATION CHART FOR POWER PLANT OPERATION & MAINTENANCE



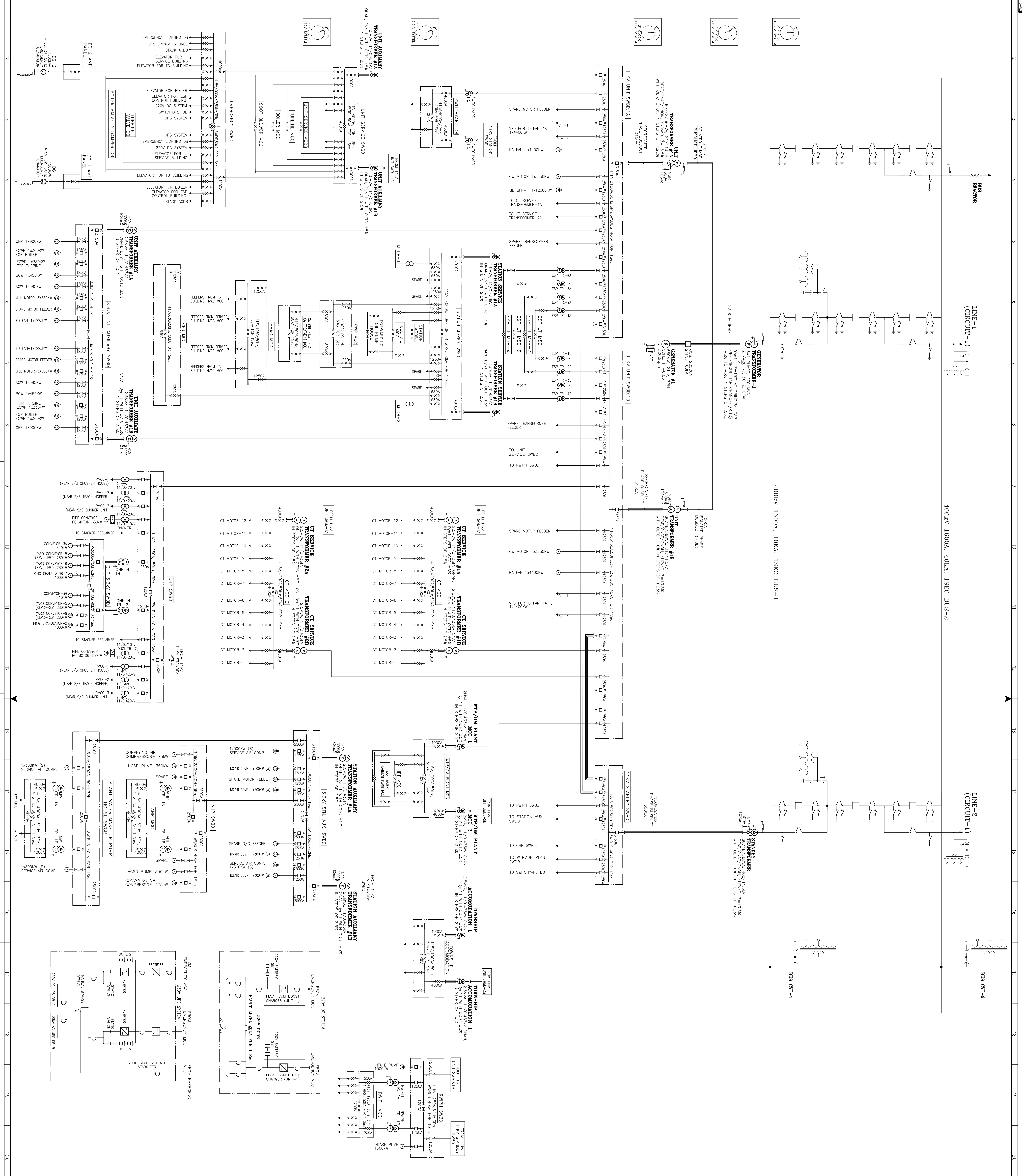
TOTAL NO. PERSONNEL = 134

F:\3111152- Hassan Thermal Power 1x660 Mw \DPR\EXHIBIT-17

EXHIBIT-17

REV.	DATE	DESCRIPTION	DRN.	STR.	MECH	ELEC.	INST.
A	19.01.12	ISSUED WITH DRAFT DPR		KGSR	MRV	DP	RSR
APPROVED BY							
<b>FICHTNER</b> Consulting Engineers (India) Private Limited Chennai, Mumbai, Bangalore.			<b>HASSAN THERMAL POWER PROJECT</b> 1 x 660 MW COAL BASED POWER PLANT BUSTENAHALLI, DODDAHONNEENAHALLI & KASTURAWALLI VILLAGE, HASSAN, KARNATAKA				
DRAWN	KGSR	19.01.12	ORGANISATION CHART FOR OPERATION & MAINTENANCE				
DESIGNED	PRK	19.01.12					
CHECKED	VM	19.01.12					
DEPT. HEAD	DP	19.01.12					
PROJ. MGR.	MRV	19.01.12					
RELEASED FOR	PRELIMINARY	✓	DEPT. MECH	JOB NO. 3111152	SCALE: NTS	SHEET 1 OF 1	REV.
	BID		DWG. NO. 10-3111152-M-017				A
	ENGINEERING						
	CONSTRUCTION						





Legend, Abbreviations, Notes, and Key Single Line Diagram. Includes symbols for bus, transformer, generator, and various electrical components. Notes describe system restoration procedures and emergency actions.