CLAUSE NO.	TENDER DRAWING LIST

1.00.00 APPLICABLE DRAWINGS

The drawings listed below and forming part of the specification (Refer Part-E) shall supplement the requirements specified herein. The scope and terminal points of the equipment to be furnished under this package shall be as identified in these drawings and read in conjunction with text of the specification:

(A) SCHEMES

Sl. No	Drawings Title	Drawings No.	Rev. No.	No. of Sheets
1)	Scheme of Absorber system	0011-109-POM-A-001	A	2
2)	Scheme of Limestone Milling system	0011-109-POM-A-002	A	1
3)	Scheme of Gypsum De-watering system	0011-109-POM-A-003	A	1
4)	P&ID Diagram for ECW System of FGD	0011-109-POM-A-004	A	1
5)	Process Flow Diagram for FGD Waste water treatment (FGD WWT) for ZLD	0011-109-POM-A-005	A	3

(B) CONTROL & INSTRUMENTATION

Sl. No.	Drawings Title	Drawings No.	No. of Sheets
1.	Standard configuration diagram for PLC	0000-151-POI-A-013	1
2.	G.A. of Junction Box	0000-999-POI-A-017	1
3.	Instrumentation cabling diagram grounding scheme for cabinets/panels/Power Supply	0000-999-POI-A-019A	2
4.	Scheme of 24V DC Power supply system	0000-999-POI-A-019B	1

Sl. No.	Drawings Title	Drawings No.	No. of Sheets
5.	Scheme for Uninterruptible Power Supply System	0000-999-POI-A-019C	1
6.	Instrumentation/control/power supply cabling diagram	0000-101/102-POI-A-021	3
7.	Instrument Source Connection details	0000-999-POI-A-035	14
8.	Typical GA of Local Instrument Enclosure, purging scheme, DP transmitter	0000-999-POI-A-036	1
9.	Interfacing of actuators	0000-999-POI-A-063	1
10.	Interfacing of field instruments/Electrical interface/PLC Interface	0000-999-POI-A-065	15

(C) ELECTRICAL

(1) Electrical single line diagram for FGD Package : Drg No. 0011-109-POE-J-001/B-E (Will be Furnished later)

Note : All the above drawings are indicative of Employer's requirements to enable the Bidder to make a suitable offer. All variations/alternations shall be clearly brought out in the technical deviation schedule with implications, if any. Such variations may be acceptable, after assessment of its implication and shall be subjected to the Employer's approval. However, the flexibility of operation and maintenance desired by the schemes and layouts shall be binding.

Electrical drawings (except Electrical single line diagram) are attached with respective Electrical Chapters in Part b, Section VI.

LEGEND :

	PUMP
	AIR COMPRESSOR
	NON RETURN VALVE
	MANUAL GATE VALVE(OPEN)
	MANUAL GATE VALVE(CLOSED)
	MOTORISED GATE VALVE(OPEN)
	MOTORISED GATE VALVE(CLOSED)
	MOTORISED GATE
	AGITATOR
	PNEUMATIC CONTROL VALVE
	PNEUMATIC OPERATED BI-PLANE DAMPER
	MOTOR OPERATED LOUVER DAMPER
	PNEUMATIC OPERATED LOUVER DAMPER
	PNEUMATIC OPERATED PINCH CONTROL VALVE
	KNIFE GATE/BUTTERFLY VALVE
	FAN
	HEATER
	PNEUMATIC GATE
	PNEUMATIC OPERATED
	MOTORIZED

	PROCESS WATER
	FILTRATE
	CRUSHED LIMESTONE
	GYPSUM SLURRY
	RECIRCULATION SLURRY
	AIR
	GAS
	VACUUM

ID FAN-A

ID FAN-B

FGD SCOPE

CHIMNEY-1

TYPICAL FOR ONE UNIT EXISTING CHIMNEY FOR FGD BY-PASS OPERATION

SEAL AIR SYSTEM

BOOSTER FAN-A

BOOSTER FAN-B

CEMS ANALYZERS

TYPICAL FOR ONE UNIT LOW HEIGHT CHIMNEY FOR FGD OPERATION

MIST ELIMINATORS

FROM MIST ELUMINATION WASH WATER PUMPS (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)

EMERGENCY WATER TANK

FROM PROCESS WATER PUMP (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)

NORMAL QUENCH SYSTEM

FROM FILTRATE WATER PUMP (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)

ABSORBER

SLURRY PIPING & PUMPS FLUSHING SYSTEM

SLURRY RECIRCULATION PUMPS

OXIDATION TANK

FROM LIMESTONE SLURRY PUMP (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-002)

TO GYPSUM DEWATERING SYSTEM (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)

GYPSUM BLEED PUMPS (2x100%)

TO ABSORBER

DRAINAGE

ABSORBER AREA SUMP

TYPICAL FOR EACH PUMP

TYPICAL FOR EACH BLOWER

FROM PROCESS WATER PUMP (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)

OXIDATION AIR BLOWER

TG	TEMPERATURE GAUGE
TE	TEMPERATURE ELEMENT
PI	PRESSURE INDICATOR
PT	PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DPI	DIFFERENTIAL PRESSURE INDICATOR
FT	FLOW TRANSMITTER
LT	LEVEL TRANSMITTER
AT	ANALYSER INSTRUMENT
VT	VIBRATION TRANSDUCER
DM	DENSITY MONITOR
PH	PH ANALYSER

NOTES

1. THE SCHEME SHALL BE FINALIZED DURING DETAILED ENGINEERING BASED ON SPECIFICATION AND SYSTEM REQUIREMENT.
2. ANY EQUIPMENT / VALVE / PIPE NOT SHOWN IN THE DRAWING BUT REQUIRED FOR COMPLETION OF THE SYSTEM SHALL BE INCLUDED IN THE SCOPE OF THE CONTRACTOR.
3. NUMBER OF AGITATORS / SLURRY SPRAY LEVELS/PUMPS SHALL BE AS PER THE CONTRACTOR'S PROVEN PRACTICE WITH REDUNDANCIES AS STIPULATED IN THE SPECIFICATION.
4. UTILITES LIKE COOLING WATER, SERVICE WATRE, INSTRUMENT AIR, SERVICE AIR, AUXILIARY STEAM SHALL BE PROVIDED TO THE CONTRACTOR AT EMPLOYER'S TERMINAL POINT AS ELABORATED IN SUB-SECTION:IV, PART-A, SECTION-VI OF THE SPECIFICATION. ALL PIPING/SYSTEM FROM THE TERMINAL POINT SHALL BE IN THE CONTRACTOR'S SCOPE.
5. ALL INSTRUMENTS SHALL BE PROVIDED WITH ISOLATION VALVES.
6. ALL INSTRUMENTS IN SLURRY LINES SHALL BE PROVIDED ISOLATION VALVES AND DIAPHRAGM.
7. ALL TEMPERTURE ELEMENTS (TEs) SHALL BE PROVIDED WITH TEMPERATURE TRANSMITERS.
8. ONLY ULTRASONIC/RADAR TYPE LEVEL TRANSMITTER SHALL BE PROVIDED FOR SLURRY TANK/SUMPS.
9. ALL MANUAL PUMP SUCTION VALVES SHALL BE PROVIDED WITH OPEN LIMIT SWITCHES.
10. ALL SLURRY TANKS SHALL BE PROVIDED WITH FIELD INDICATORS FOR LOCAL LEVEL INDICATION AND OTHER TANKS SHALL BE PROVIDED WITH LEVEL GAUGES FOR LOCAL LEVEL INDICATION.
11. PROPER DRAINAGE AND WATER WASHING ARRANGEMENT AS PER CONTRACTOR'S PROVEN PRACTICE SHALL BE PROVIDED.
12. PROVISION FOR FLUSHING OF SLURRY PIPING/VALVES/PUMPS & DRAIN SYSTEM ETC. SHALL BE PROVIDED.
13. FGD INLET, OUTLET AND BYPASS DAMPERS SHALL BE CONTROLLED FROM UNIT-BOP PART OF DDCMIS (EMPLOYER SCOPE).
14. **.## THE BIDDER AS PER ITS PROVEN PRACTICE CAN ALSO PROVIDE A COMMON 2X100% SEAL AIR SYSTEM TO MEET THE SEALING REQUIREMENTS.
15. CONTRACTOR SHALL ENSURE THE SIGNALS TO BE EXCHANGED WITH SG/BOP-DDCMIS (IN EMPLOYER'S SCOPE) FOR SAFE AND SATISFACTORY OPERATION OF FGD SYSTEM.
16. * AS PER THE BIDDER'S PROVEN PRACTICE, PNEUMATIC CAN BE PROVIDED.
17. TRIPLE REDUNDANT HARDWIRED POTENTIAL FREE CONTACTS SHALL BE PROVIDED BY BIDDER IN THE EMPLOYER'S CER-CONTROL EQUIPMENT ROOM FOR NORMAL/EMERGENCY OPERATION OF THE BYPASS DAMPER AND GATES. CABLE UPTO CR SHALL BE IN CONTRACTOR'S SCOPE.
18. SUPPLY, INSTALLATION AND COMMISSIONING OF INSTRUMENTS REQUIRED FOR FGD SYSTEM SHALL BE IN THE SCOPE OF CONTRACTOR. HOWEVER, MINIMUM INSTRUMENTS INDICATED ON THE DUCT (BEING SUPPLIED BY SG SUPPLIER) SHALL BE SUPPLIED, INSTALLED AND COMMISSIONED BY THE CONTRACTOR UNDER THIS PACKAGE.

FOR TENDER PURPOSE ONLY

NTPC LTD.
(A Government of India Enterprise)
ENGINEERING DIVISION

PROJECT: NTPC THERMAL POWER PROJECT

TITLE: SCHEME OF FGD-ABSORBER SYSTEM
SINGLE UNIT

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	APPD.	DATE
		Deepak	AJY	AJY M / HG E / AC C / AK C&I / ARCH	VG	15.06.11

CLEARED BY

SIZE	SCALE	DRG NO.	REV. NO.
A-1		0011-109-POM-A-001(a)	A

LEGEND :

	PUMP
	AIR COMPRESSOR
	NON RETURN VALVE
	MANUAL GATE VALVE(OPEN)
	MANUAL GATE VALVE(CLOSED)
	MOTORISED GATE VALVE(OPEN)
	MOTORISED GATE VALVE(CLOSED)
	MOTORISED GATE
	AGITATOR
	PNEUMATIC CONTROL VALVE
	PNEUMATIC OPERATED BI-PLANE DAMPER
	MOTOR OPERATED LOUVER DAMPER
	PNEUMATIC OPERATED LOUVER DAMPER
	PNEUMATIC OPERATED PINCH CONTROL VALVE
	KNIFE GATE/BUTTERFLY VALVE
	FAN/Blower
	HEATER
	PNEUMATIC GATE
	PNEUMATIC OPERATED
	MOTORIZED

	PROCESS WATER
	FILTRATE
	CRUSHED LIMESTONE
	GYPSUM SLURRY
	RECIRCULATION SLURRY
	AIR
	GAS
	VACUUM

ID FAN-A
ID FAN-B
FGD SCOPE
UNIT#1
UNIT#2
CHIMNEY
TYPICAL FOR TWO UNIT EXISTING CHIMNEY FOR FGD BY-PASS OPERATION
CEMS ANALYZERS
TYPICAL FOR LOW HEIGHT CHIMNEY FOR FGD OPERATION
SEAL AIR SYSTEM
BOOSTER FAN-A
BOOSTER FAN-B
MIST ELIMINATORS
FROM MIST ELUMINATION WASH WATER PUMPS (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)
EMERGENCY WATER TANK
FROM PROCESS WATER PUMP (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)
NORMAL QUENCH SYSTEM
FROM FILTRATE WATER PUMP (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)
ABSORBER
SLURRY PIPING & PUMPS FLUSHING SYSTEM
SLURRY RECIRCULATION PUMPS
FROM LIMESTONE SLURRY PUMP (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)
OXIDATION TANK
TO GYPSUM DEWATERING SYSTEM (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)
GYPSUM BLEED PUMPS (2x100%)
TO ABSORBER
DRAINAGE
ABSORBER AREA SUMP
TYPICAL FOR EACH PUMP
TYPICAL FOR EACH BLOWER
FROM PROCESS WATER PUMP (FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)
OXIDATION AIR BLOWER

TG	TEMPERATURE GAUGE
TE	TEMPERATURE ELEMENT
PI	PRESSURE INDICATOR
PT	PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
DPI	DIFFERENTIAL PRESSURE INDICATOR
FT	FLOW TRANSMITTER
LT	LEVEL TRANSMITTER
AT	ANALYSER INSTRUMENT
VT	VIBRATION TRANSDUCER
DM	DENSITY MONITOR
PH	PH ANALYSER

NOTES

1. THE SCHEME SHALL BE FINALIZED DURING DETAILED ENGINEERING BASED ON SPECIFICATION AND SYSTEM REQUIREMENT.
2. ANY EQUIPMENT / VALVE / PIPE NOT SHOWN IN THE DRAWING BUT REQUIRED FOR COMPLETION OF THE SYSTEM SHALL BE INCLUDED IN THE SCOPE OF THE CONTRACTOR.
3. NUMBER OF AGITATORS / SLURRY SPRAY LEVELS/PUMPS SHALL BE AS PER THE CONTRACTOR'S PROVEN PRACTICE WITH REDUNDANCIES AS STIPULATED IN THE SPECIFICATION.
4. UTILITES LIKE PROCESS WATER, SERVICE WATER, CLARIFIED WATER, INSTRUMENT AIR, SERVICE AIR, "AUXILIARY STEAM(as applicable)" SHALL BE PROVIDED TO THE CONTRACTOR AT EMPLOYER'S TERMINAL POINT AS ELABORATED IN PART-A, SECTION-VI OF THE TENDER SPECIFICATION. ALL PIPING/SYSTEM FROM THE TERMINAL POINT SHALL BE IN THE CONTRACTOR'S SCOPE.
5. ALL INSTRUMENTS SHALL BE PROVIDED WITH ISOLATION VALVES.
6. ALL INSTRUMENTS IN SLURRY LINES SHALL BE PROVIDED ISOLATION VALVES AND DIAPHRAGM.
7. ALL TEMPERTURE ELEMENTS (TEs) SHALL BE PROVIDED WITH TEMPERATURE TRANSMITERS.
8. ONLY ULTRASONIC/RADAR TYPE LEVEL TRANSMITTER SHALL BE PROVIDED FOR SLURRY TANK/SUMPS.
9. ALL MANUAL PUMP SUCTION VALVES SHALL BE PROVIDED WITH OPEN LIMIT SWITCHES.
10. ALL SLURRY TANKS SHALL BE PROVIDED WITH FIELD INDICATORS FOR LOCAL LEVEL INDICATION AND OTHER TANKS SHALL BE PROVIDED WITH LEVEL GAUGES FOR LOCAL LEVEL INDICATION.
11. PROPER DRAINAGE AND WATER WASHING ARRANGEMENT AS PER CONTRACTOR'S PROVEN PRACTICE SHALL BE PROVIDED.
12. PROVISION FOR FLUSHING OF SLURRY PIPING/VALVES/PUMPS & DRAIN SYSTEM ETC. SHALL BE PROVIDED.
13. FGD INLET, OUTLET AND BYPASS DAMPERS & BYPASS GATES SHALL BE CONTROLLED FROM UNIT-BOP PART OF DDCMIS (EMPLOYER SCOPE).
14. **,## THE BIDDER AS PER ITS PROVEN PRACTICE CAN ALSO PROVIDE A COMMON 2X100% SEAL AIR SYSTEM TO MEET THE SEALING REQUIREMENTS.
15. CONTRACTOR SHALL ENSURE THE SIGNALS TO BE EXCHANGED WITH SG/BOP-DDCMIS (IN EMPLOYER'S SCOPE) FOR SAFE AND SATISFACTORY OPERATION OF FGD SYSTEM.
16. * AS PER THE BIDDER'S PROVEN PRACTICE, PNEUMATIC CAN BE PROVIDED.
17. TRIPLE REDUNDANT HARDWIRED POTENTIAL FREE CONTACTS SHALL BE PROVIDED BY BIDDER IN THE EMPLOYER'S CER-CONTROL EQUIPMENT ROOM FOR NORMAL/EMERGENCY OPERATION OF THE BYPASS DAMPER AND GATES. CABLE UPTO CR SHALL BE IN CONTRACTOR'S SCOPE.
18. SUPPLY, INSTALLATION AND COMMISSIONING OF INSTRUMENTS REQUIRED FOR FGD SYSTEM SHALL BE IN THE SCOPE OF CONTRACTOR. HOWEVER, MINIMUM INSTRUMENTS INDICATED ON THE DUCT (BEING SUPPLIED BY SG SUPPLIER) SHALL BE SUPPLIED, INSTALLED AND COMMISSIONED BY THE CONTRACTOR UNDER THIS PACKAGE.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	CLEARED BY	APPD.	DATE
		Deepak	AJY	AJY M	HG E / AC C / AK C&I / ARCH	VG	15.06.11

NTPC LTD.
(A Government of India Enterprise)
ENGINEERING DIVISION

PROJECT: NTPC THERMAL POWER PROJECT

TITLE: SCHEME OF FGD-ABSORBER SYSTEM
(FOR TWO UNITS)

SIZE	SCALE	DRG NO.	REV. NO.
A-1		0011-109-POM-A-001	A

CRUSHED LIMESTONE FROM LIMESTONE HANDLING PLANT(BY BIDDER)

FROM FILTRATE WATER PUMPS
(FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)

FROM MILL-A

FROM MILL-B

LIMESTONE SILO - A ++

LIMESTONE SILO - B ++

LIMESTONE TO MILL-B

LIMESTONE MILLING SYSTEM

FEEDER-A

MILL HYDROCYCLONE - A

LIMESTONE BALL MILL - A along with LOS

GEAR BOX

MAIN MOTOR

AUXILIARY MOTOR

MILL SEPERATOR TANK

MILL CIRCUIT PUMP (2x100%)

LIMESTONE SLURRY STORAGE TANK

LIMESTONE SLURRY PUMP (nx100%)
n= nos. of units

TO ABSORBER
REFRE DRG. NO.
0011-109-POM-A-001

TYPICAL FOR ONE LIMESTONE SLURRY STORAGE TANK (1x100% stream)

SLURRY PIPING & PUMP FLUSHING SYSTEM

DRAINAGE

LIMESTONE GRINDING AREA SUMP

FROM PROCESS WATER PUMPS
(FOR CONTINUATION SEE DRG. NO. 0011-109-POM-A-003)

TYPICAL ARRANGEMENT ONE LIMESTONE MILL

NOTES

1. FOR NOTES AND LEGENDS SEE DRAWING NO. 0011-109-POM-A-001.
   LOS-LUBE OIL SYSTEM AS DETAILED IN TECHNICAL SPECIFICATION.
2. FACILITIES SHALL BE PROVIDED FOR UNLODING THE BUNKER THROUGH FEEDER.
   ++ EACH SILO SHALL BE PROVIDED WITH SS LINING IN CONICAL PORTION, LEVEL TRANSMITTERS, AIR CANOS, BAG FILTER SYSTEM, ETC. AS DETAILED IN PART-B, SECTION-IV OF TECHNICAL SPECIFICATIONS.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH	APPD.	DATE
		Deepak	AJY		CLEARED BY					VG	15.06.17

NTPC LTD.
(A Government of India Enterprise)
ENGINEERING DIVISION

PROJECT: NTPC THERMAL POWER PROJECT

TITLE: SCHEME OF FGD MILLING SYSTEM

SIZE	SCALE	DRG NO.	REV. NO.
A-1		0011-109-POM-A-002	A

FROM GYPSUM BLEED PUMPS
(REFER DRG. NO. 0011-109-POM-A-001)

PRIMARY HYDROCYCLONE FEED TANK

TO OTHER HYDROCYCLONE / BELT FILTERS

To Auxiliary Absorbent/Emergency Tank

PRIMARY HYDROCYCLONE

TO FILTRATE WATER TANK ALTERNETIVELY TO ABSORBER

SECONDARY HYDROCYCLONE FEED TANK

SECONDARY WASTE WATER HYDROCYCLONE X2

LIME FEEDING SYSTEM

PROCESS WATER LINE

LIME SOLUTION TANK

RECIRULATION CUM MIXING

WASTE WATER TANK

Waste water Treatment system

SEE NOTE-2

VACUUM BELT FILTERS

CLARIFIED WATER

CAKE WASH WATER TANK

TO GYPSUM HANDLING SYSTEM

AIR DISCHARGE

VACUUM PUMP SEAL

VACUUM PUMP

RECEIVER TANK

TYPICAL ARRANGEMENT FOR ONE VACUUM BELT FILTER

BOOSTER PUMPS (if required) (2x100%)

LEVEL CONTROL STATION FOR TANK

PROCESS WATER TANK-2

CW BLOWDOWN (REFER DRG. NO. 0011-109-POM-A-004)

Vacuum belt filter needs

Absorber process needs

To normal flue gas quenching system

To Limestone slurry Preparation system

Flushing system header & other process needs

PROCESS WATER PUMPS

WATER

PROCESS WATER TANK-1

To Mist Ellminator Washing System (REFER DRG. NO. 0011-109-POM-A-001)

Mist Ellminator Wash Water Pump

TYPICAL FOR One Stream

To Absorbent Tank

TO ABSORBENT SLURRY TANK PUMP (1x100%)

DRAINAGE

LIMESTONE GRINDING AREA SUMP

TO ABSORBERS
(REFER DRG. NO. 0011-109-POM-A-001)

FILTRATE TANK

FILTRATE WATER PUMPS (2x100%)

BELT & CLOTH WASH WATER PUMP

DRAINAGE

GYPSUM DEWATERING AREA SUMP

NOTES

1. FOR NOTES AND LEGEND SEE DRAWING NUMBER 0011-109-POM-A-001.
2. ARRANGEMENT FOR CAKE AND BELT/CLOTH WASHING SYSTEM INDICATED IS TYPICAL. CONTRACTOR MAY OFFER AN ALTERNATE SYSTEM AS PER HIS PROVEN PRACTICE.
3. FLUSHING SYSTEM FOR FILTRATE & WASTE WATER SYSTEM IF REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR.
4. LIME STORAGE AND FEEDING SYSTEM IS ALSO TO BE PROVIDED BY THE CONTRACTOR.
5. IN CASE OF ZLD SYSTEM IS SPECIFIED, THE WASTE WATER TREATMENT SYSTEM SHALL NOT BE APPLICABLE.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	APPD.	DATE
00	FOR TENDOR PURPOSE ONLY.	Deepak	AJY		VG	15.06.11

CLEARED BY: M | E | C | C&I | ARCH

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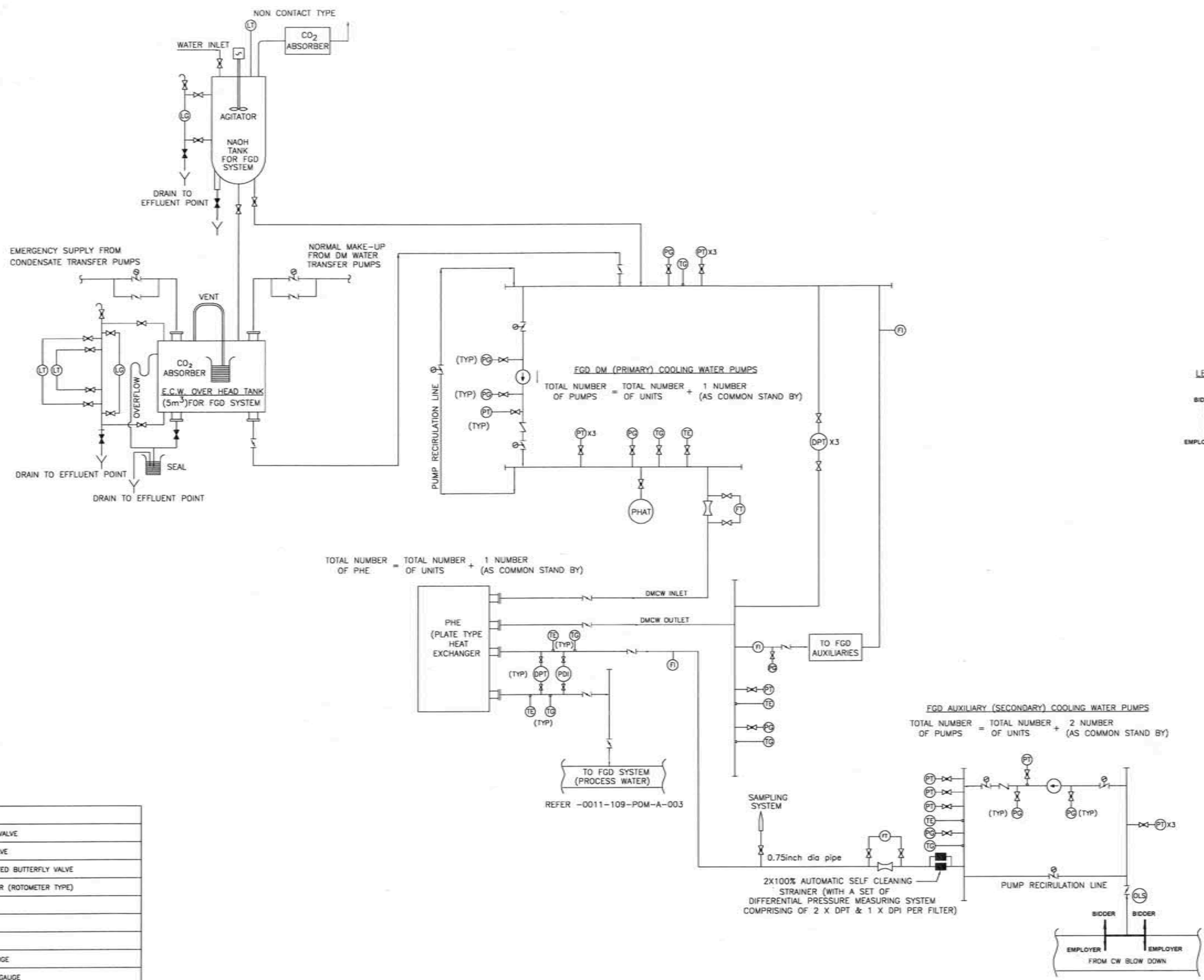
NTPC Limited
(A Government of India Enterprise)
ENGINEERING DIVISION

PROJECT: NTPC THERMAL POWER PROJECT

TITLE: SCHEME OF GYPSUM DEWATERING SYSTEM

SIZE	SCALE	DRG NO.	REV. NO.
A-1		0011-109-POM-A-003	A



LEGENDS :

BIDDER = FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE SCOPE

EMPLOYER = NTPC SCOPE

GENERAL NOTES :

1. SCHEME FOR ECW SYSTEM IS SHOWN FOR THE FGD
2. ALL DRAIN AND VENT. CONNECTIONS SHALL BE PROVIDED WITH VALVES AT REQUIRED POINTS/LOCATIONS AS PER LAYOUT.
3. pH OF PRIMARY CIRCUIT DM WATER SHALL BE MAINTAINED AROUND 9.5.
4. INSTRUMENTS ARE SHOWN ONLY FOR ONE SET OF PUMP, PHE (PLATE HEAT EXCHANGER) OR ONE HEADER AS THE CASE MAY BE FOR CLARITY AND ARE TYPICAL. THE SAME SHALL BE PROVIDED FOR ALL THE EQUIPMENTS AND HEADERS.
5. ROOT VALVE, ISOLATION VALVES, THREE WAY MANIFOLD ETC. REQUIRED FOR VARIOUS INSTRUMENTS SHALL BE PROVIDED BY BIDDER.
6. EACH HEAT EXCHANGER/COOLER OF VARIOUS AUXILIARIES SHALL BE PROVIDED WITH TEMPERATURE GAUGE AT INLET AND OUTLET BY THE RESPECTIVE BIDDER (COOLER SUPPLIER).FURTHER FLOW GLASS AT INLET SHALL ALSO BE PROVIDED BY COOLER SUPPLIER.
7. WINDING & BEARINGS TEMP MEASUREMENTS OF PUMPS AND MOTORS TO BE PROVIDED AS PER SPECIFICATION.
8. IN P&ID AT PUMP/PHES, SUCTION AND DISCHARGE MOTOR OPERATED BUTTERFLY VALVE HAS BEEN INDICATED. HOWEVER, BIDDER CAN ALTERNATIVELY PROVIDE MOTOR OPERATED GATE VALVE AT PUMP/PHES, SUCTION & DISCHARGE.
9. ALL THE INSTRUMENTS SHALL BE IN THE SCOPE OF THE BIDDER. MEASURING INSTRUMENTS INDICATED IN THE P&ID ARE MINMUM THAT ARE REQUIRED TO BE PROVIDED BY THE BIDDER. IN CASE ADDITIONAL INSTRUMENTS ARE REQUIRED AS PER THE STANDARD AND PROVEN PRACTICE OF BIDDER, THE SAME SHALL BE SUPPLIED WITH IN THIS CONTRACT.

LEGEND :

1.		GLOBE VALVE
2.		NON-RETURN VALVE
3.		BUTTERFLY VALVE
4.		MOTOR OPERATED BUTTERFLY VALVE
5.	FI	FLOW INDICATOR (ROTOMETER TYPE)
6.		FILTER
7.	S	STRAINER
8.		PUMP
9.	PG	PRESSURE GAUGE
10.	TG	TEMPERATURE GAUGE
11.	PDI	DIFFERENTIAL PR. GAUGE
12.	TE	TEMPERATURE ELEMENT
13.	PT	PRESSURE TRANSMITTER
14.	OLS	OPEN LIMIT SWITCH
15.	LT	LEVEL TRANSMITTER
16.	LG/LS	LEVEL GAUGE / LEVEL SWITCH
17.	DPT	DIFFERENTIAL PRESSURE TRANSMITER
18.	pH	pH SENSOR
19.	PHAT	pH ANALYSER TRANSMITTER
20.		FLOW ELEMENT (ORIFICE)
21.		CONTROL VALVE (PNEUMATIC ACTUATOR)
22.		NORMALLY CLOSED VALVE
23.	FT	FLOW TRANSMITTER

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	C	M	E	C&I	APPD	DATE
					CLEARED BY					

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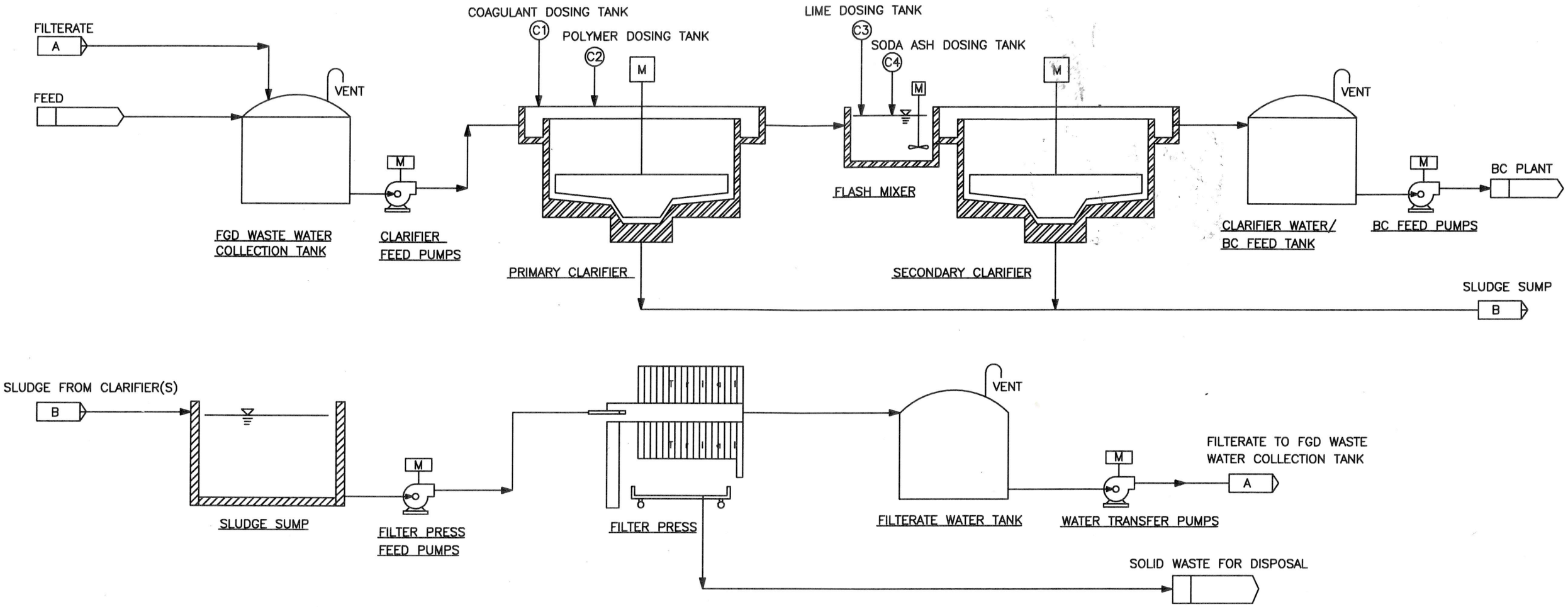
NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT
FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE

TITLE
P&ID DIAGRAM FOR ECW SYSTEM OF FGD

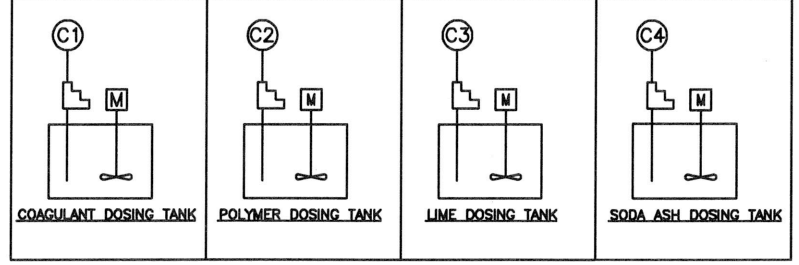
SIZE	SCALE	DRG.NO.	REV.
A2		0011-109-POM-A-004	A



COMMON NOTES FOR DRAWING.NO. 1,2 & 3

1. THE SCHEME SHOWN IS INDICATIVE ONLY. CONTRACTOR SHOULD FURNISH COMPLETE SCHEME & P&ID IN ALL RESPECTS DURING DETAILED ENGINEERING BASED ON TECHNICAL SPECIFICATION AND SYSTEM REQUIREMENTS INCLUDING ALL INSTRUMENTS, VALVES ETC. FOR SMOOTH, SAFE, EFFICIENT, TROUBLE FREE OPERATION OF PLANT.
2. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR SYSTEM DESIGN, SIZING OF THE COMPLETE FGD WWT PLANT.
3. CONTRACTOR SHALL NOTE THAT ANY ADDITIONAL EQUPIMENT/SYSTEM/SUB-SYSTEM AS REQUIRED SHALL ALSO BE PROVIDED.
4. THE INSTRUMENTS FOR WHICH TECHNICAL SPECIFICATION IS NOT ATTACHED, SHALL BE SUPPLIED AS PER STANDARD AND PROVEN PRACTICE OF THE CONTRACTOR. THE SAME SHALL BE ESTABLISHED BY THE CONTRACTOR DURING DETAILED ENGINEERING BY PROVIDING DETAILED EXPLANATION/CONCEPTS, IF REQUIRED BY THE EMPLOYER OF SUCH IMPLEMENTATION ALONG WITH STANDARD DOCUMENTATION.
5. TRANSMITTER FOR LEVEL MEASUREMENT SHALL BE ULTRASONIC/RADAR TYPE. UNLESS THE SAME ARE NOT SUITABLE FOR THE PROCESS REQUIREMENT. UNDER SUCH CIRCUMSTANCES, THE TYPE OF LEVEL TRANSMITTERS SHALL BE FINALIZED DURING DETAILED ENGINEERING.

CHEMICAL METERING STATIONS



REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	CLEARED BY C	M	E	C&I	APPD	DATE
				(PM)						7/8/17

एन टी पी सी लिमिटेड
NTPC Limited
(A GOVT. OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT
MUZAFFARPUR TPP ST-II (2 X 195 MW) KBUNL , BARH STPP ST-II (2 X 660MW) , FEROZE GANDHI UNCHAHAR TPP ST-IV (1 X 500 MW) , RIHAND STPP ST-II (2 X 500 MW) & ST-III (2 X 500 MW), VINDHYACHAL STPP ST-III (2 X 500 MW) & ST-IV (2 X 500 MW)

TITLE
PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT (FGD WWT) SYSTEM FOR ZLD

SIZE	SCALE	DRG.NO.	REV.
A3		0011-109-POM-A-005 (SHT.1 OF 3)	A

CAD FILE NAME : 0011-109-POM-A-005

AUX. STEAM (TO BE TAPPED POWER BLOCK)

AUX. STEAM
SHT.3
TO CRYSTALLIZER

DISTILLATE

CRYSTALLIZER CONDENSATE
SHT.3
FROM CRYSTALLIZER CONDENSATE PUMP

EVAPORATOR FEED HEAT EXCHANGER

VENT

EVAPORATOR DEAERATOR

(START-UP ONLY)

EVAPORATOR VAPOR COMPRESSOR

EVAPORATOR

MIST ELIMINATOR

CAUSTIC
SHT.3
FROM CAUSTIC PUMPS

ANTIFOAM
SHT.3
FROM HIGH CAPACITY ANTIFOAM PUMPS

ANTISCALANT

FORM STORAGE TANK

ANTISCALANT PUMPS

SEED RECYCLE CONE

SEED RECYCLE PUMP

TO CRYSTALLIZER FEED TANK
SHT.3

ACID

FORM STORAGE TANK

ACID PUMPS

VENT

ANTIFOAM
SHT.3
FROM ANTIFOAM PUMPS

SOFTENED FEED

EVAPORATOR DISTILLATE TANK

EVAPORATOR RECIRCULATION PUMP

START-UP

ANHYDROUS CALCIUM SULFATE
(START-UP ONLY)

EVAPORATOR FEED TANK

EVAPORATOR FEED PUMP

EVAPORATOR SEED TANK

EVAPORATOR DISTILLATE PUMP

EVAPORATOR SEED PUMP

REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	CLEARED BY C	M	E	C&I	APPD	DATE

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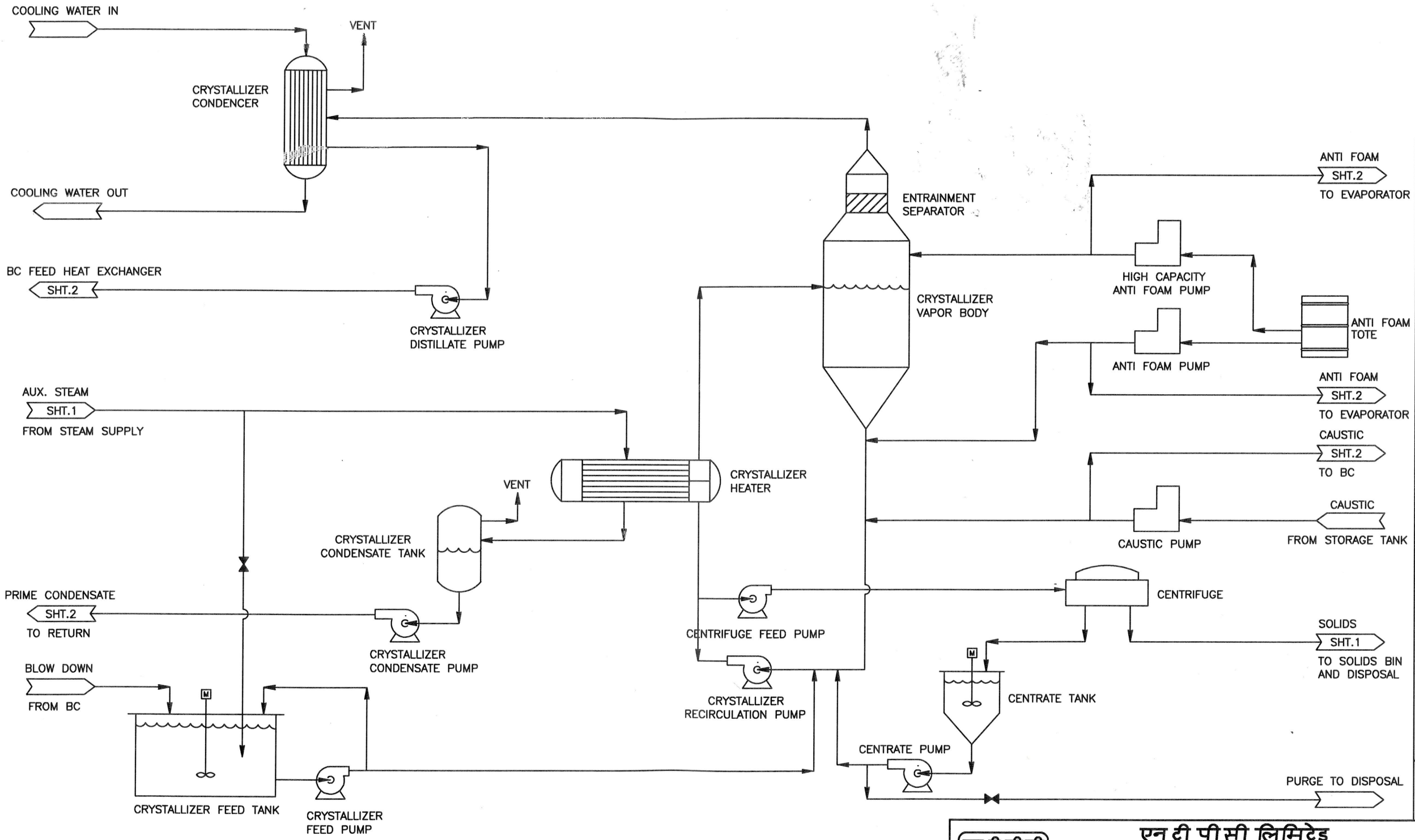
ENGINEERING DIVISION

PROJECT: MUZAFFARPUR TPP ST–II (2 X 195 MW) KBUNL , BARH STPP ST–II (2 X 660MW) , FEROZE GANDHI UNCHAHAR TPP ST–IV (1 X 500 MW) , RIHAND STPP ST–II (2 X 500 MW) & ST–III (2 X 500 MW), VINDHYACHAL STPP ST–III (2 X 500 MW) & ST–IV (2 X 500 MW)

TITLE: PROCESS FLOW DIAGRAM FOR FGD WASTE WATER TREATMENT (FGD WWT) SYSTEM FOR ZLD

SIZE	SCALE	DRG.NO.	REV.
A3		0011-109-POM-A-005 (SHT.2 OF 3)	A

CAD FILE NAME : 0011–109–POM–A–005



REV.	DESCRIPTION	DRAWN	DESIGN	CHKD.	C	M	E	C&I	APPD	DATE
			(PPM)							7/8/17

CLEARED BY

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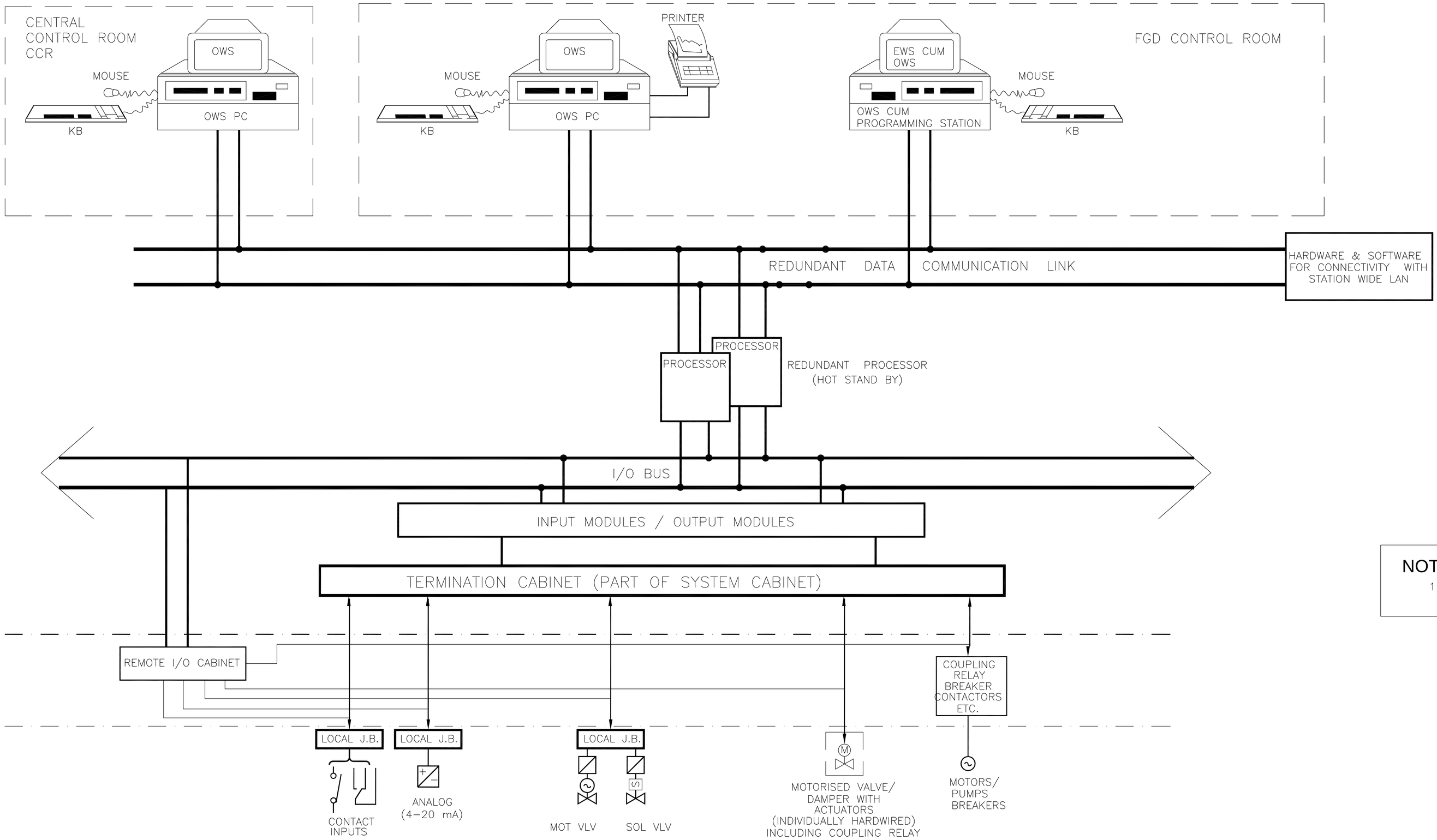
ENGINEERING DIVISION

PROJECT: MUZAFFARPUR TPP ST–II (2 X 195 MW) KBUNL , BARH STPP ST–II (2 X 660MW) , FEROZE GANDHI UNCHAHAR TPP ST–IV (1 X 500 MW) , RIHAND STPP ST–II (2 X 500 MW) & ST–III (2 X 500 MW), VINDHYACHAL STPP ST–III (2 X 500 MW) & ST–IV (2 X 500 MW)

TITLE: PROCESS FLOW DIAGRAM FOR CRYSTALLIZER SYSTEM

SIZE	SCALE	DRG.NO.	REV.
A3		0011-109-POM-A-005 (SHT.3 OF 3)	A

CAD FILE NAME : 0011–109–POM–A–005



NOTE:-

1. GI CONDUIT SHALL BE PROVIDED FOR IO BUS LEANING FGD CONTROL ROOM.

FOR TENDER PURPOSE ONLY

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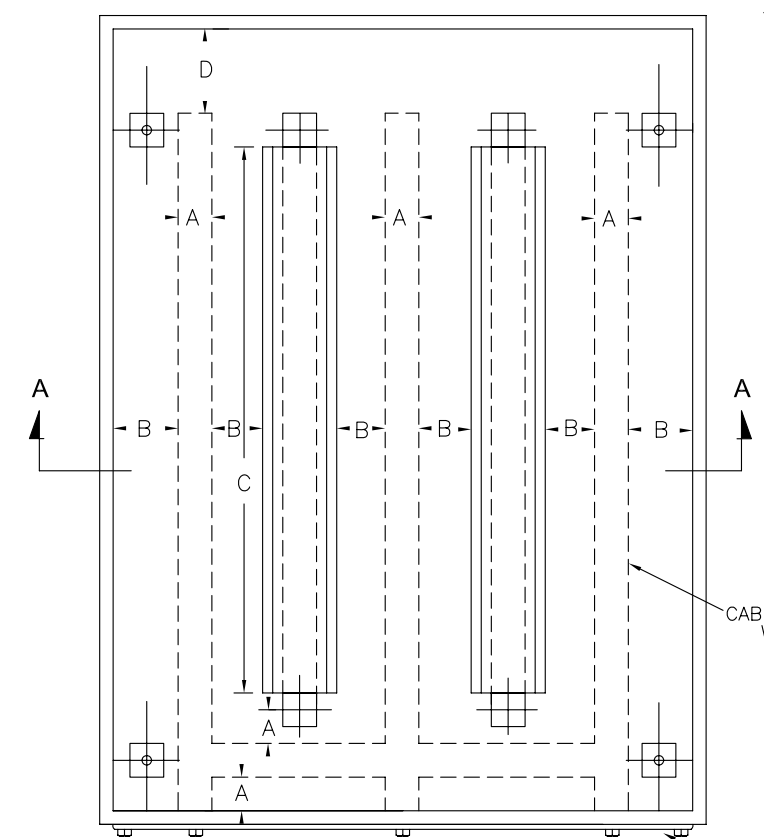
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
					CLEARED BY						

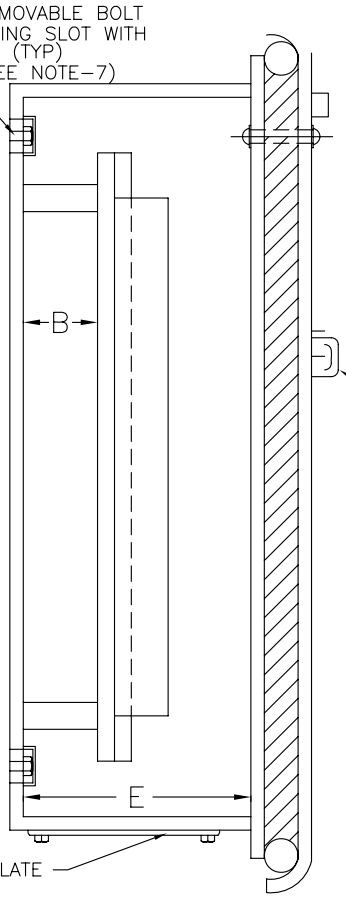
PROJECT:– TYPICAL THERMAL POWER PROJECT

TITLE:– STANDARD CONFIGURATION DIAGRAM FOR PLC BASED OFFSITE CONTROL SYSTEMS

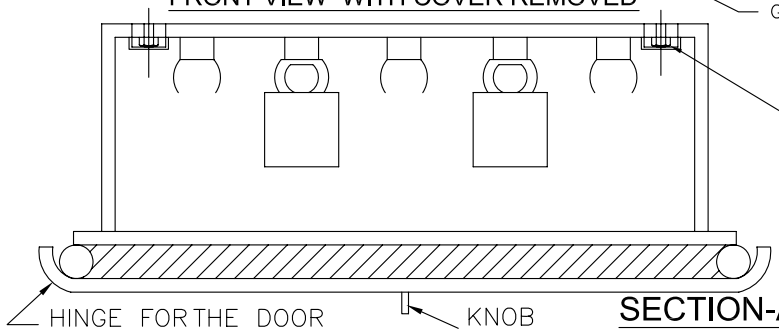
SIZE	SCALE	DRG. NO.	REV. NO.
A4	N.T.S.	0000-151-POI-A-013	A



FRONT VIEW WITH COVER REMOVED



SIDE ELEVATION



SECTION-AA

A – 75 mm
B – 25 mm
C – SEE NOTE–4
D – 100 mm
E – 150 mm

NOTES:–

1. JUNCTION BOXES SHALL HAVE GLAND PLATES AT THE BOTTOM OF THE BOX ONLY.
2. TUBULAR TYPE GASKETS WILL BE USED.
3. FRP JUNCTION BOXES, SHALL BE PROVIDED WITH POLYEUTHERENE COATING. ALSO REFER SUB SECTION INST CABLE, PART–B SECTION–VI FOR DETAILES.
4. DIMENSION OF 'C' SHALL BE BASED ON NO. OF TERMINAL BLOCKS.
5. THE EXACT TYPE & DIMENSION OF JUNCTION BOXES TO BE USED FOR A PARTICULAR APPLICATION SHALL BE AS DECIDED DURING DETAIL ENGG. STAGE AND SHALL BE SUBJECT TO EMPLOYER's APPROVAL WITHOUT ANY PRICE REPERCUSSION.
6. THE KNOB FOR ALL THE JUNCTION BOXES SHALL BE IDENTICAL.
7. ANY TYPE OF SEALED FIXING ARRANGEMENT AS PER MANUFACTURER's STANDARD CAN ALSO BE PROVIDED SUBJECT TO EMPLOYER's APPROVAL.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
D	GENERALLY REVISED		JM	KS							21.08.12
C	GENERALLY REVISED		JM	KS							04.08.06
B	GENERALLY REVISED	S.K.	A.R	PS							
A	FIRST ISSUE	S.K.	A.R	PS							04.05.05
					CLEARED BY						

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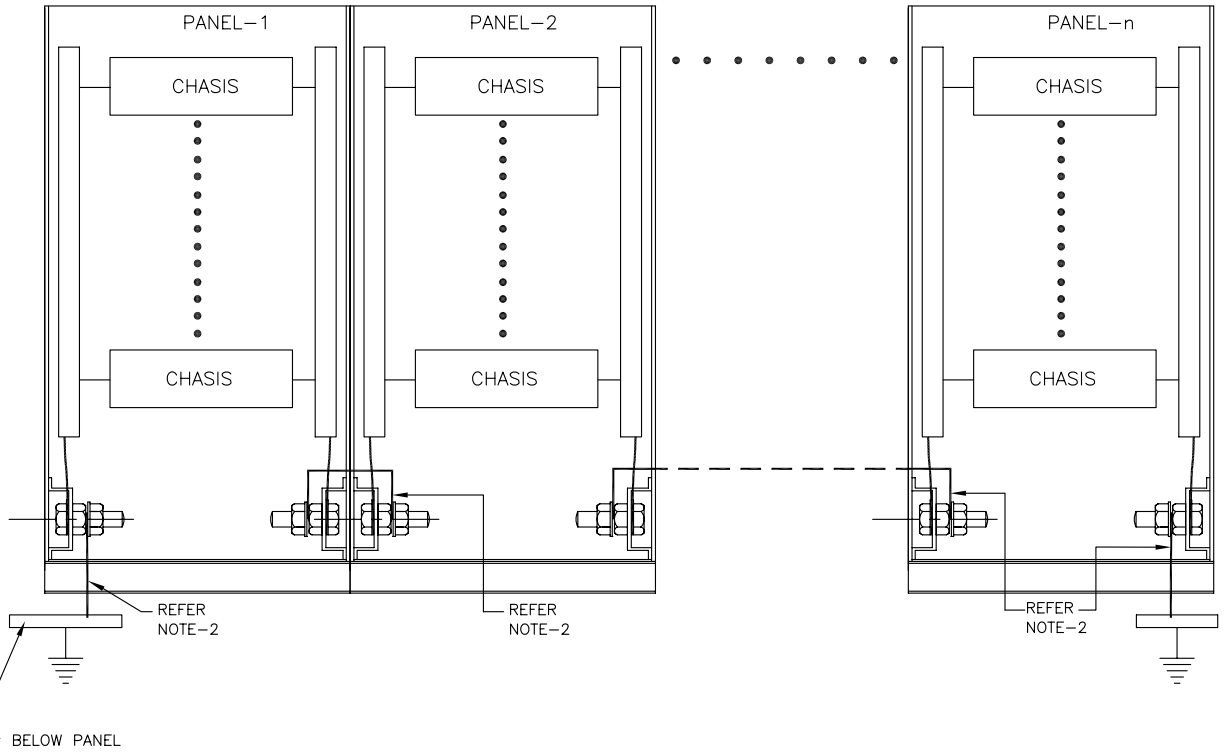
PROJECT: TYPICAL THERMAL POWER PLANT

TITLE: G.A. OF JUNCTION BOX

SIZE	SCALE	DRG. NO.	REV. NO.
A4	N.T.S.	0000-999-POI-A-017	D

GROUNDING FOR EACH ROW OF PANELS
(TYPICAL)



NOTES:–

1. SUPPLY, ERECTION, TERMINATION OF CABLES, FLATS ETC. REQUIRED FOR PROPER GROUNDING OF CONTRACTOR's CONTROL SYSTEM, SYSTEM CABINETS, POWER SUPPLY CABINETS ETC. ARE IN THE SCOPE OF CONTRACTOR.
2. CABLE IN CONTRACTOR'S SCOPE.
3. TO BE LOCATED IN DCDB.
4. EXACT LOCATION, ARRANGEMENTS OF FLATS ETC. SHALL BE AS FINALISED WITH CONTRACTOR. DURING DETAILED ENGINEERING.
5. CABINET BODY, CABINET BOTTOM PLATE, CABINET DOORS ARE TO BE CONNECTED TO PANEL EARTH FLAT COPPER CABLE BY CONTRACTOR.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
						CLEARED BY					

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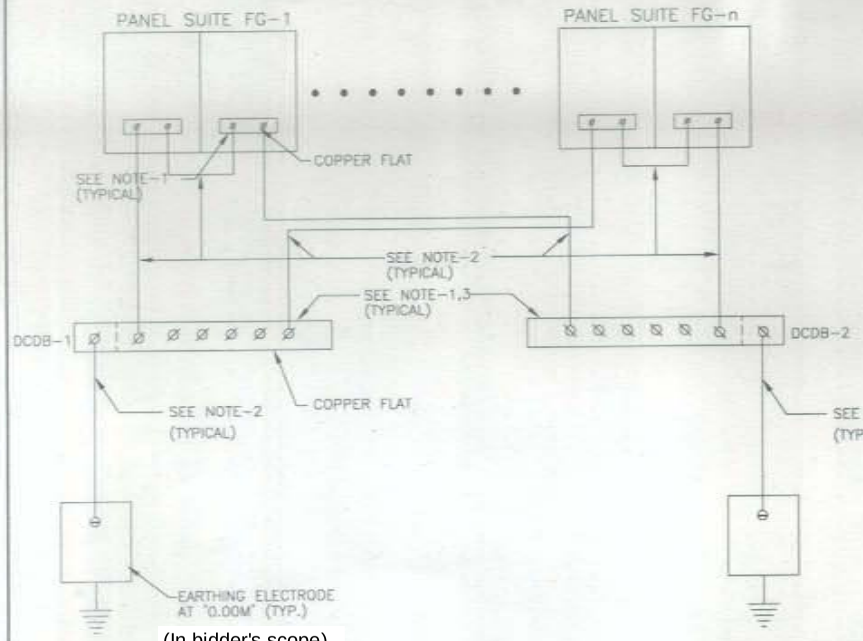
ENGINEERING DIVISION

PROJECT
TYPICAL THERMAL POWER PROJECT

TITLE
INSTRUMENTATION CABLING DIAGRAM
GROUNDING SCHEME FOR CABINETS / PANELS / POWER SUPPLY

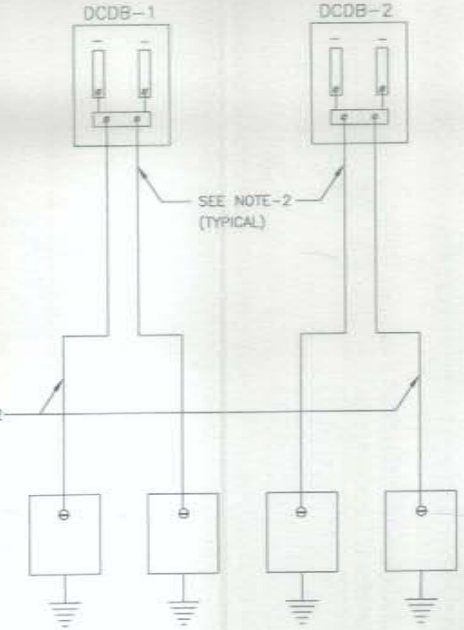
SIZE	SCALE	DRG. NO.	REV. NO.
A3	N.T.S.	0000-999-POI-A-019A SH–2 OF 2	A

SYSTEM/SHIELD GROUNDING (TYPICAL)

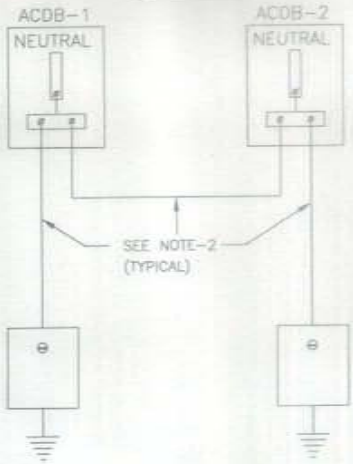


(In bidder's scope)

POWER GROUNDING (TYPICAL)



ACDB GROUNDING (TYPICAL)



NOTES:-

1. SUPPLY, ERECTION, TERMINATION OF CABLES, FLATS ETC. REQUIRED FOR PROPER GROUNDING OF CONTRACTOR's CONTROL SYSTEM, SYSTEM CABINETS, POWER SUPPLY CABINETS ETC. ARE IN THE SCOPE OF CONTRACTOR.
2. CABLE IN CONTRACTOR'S SCOPE.
3. TO BE LOCATED IN DCDB.
4. EXACT LOCATION, ARRANGEMENTS OF FLATS ETC. SHALL BE AS FINALISED WITH CONTRACTOR DURING DETAILED ENGINEERING.
5. CABINET BODY, CABINET BOTTOM PLATE, CABINET DOORS ARE TO BE CONNECTED TO PANEL EARTH FLAT COPPER CABLE BY CONTRACTOR.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										26.03.15

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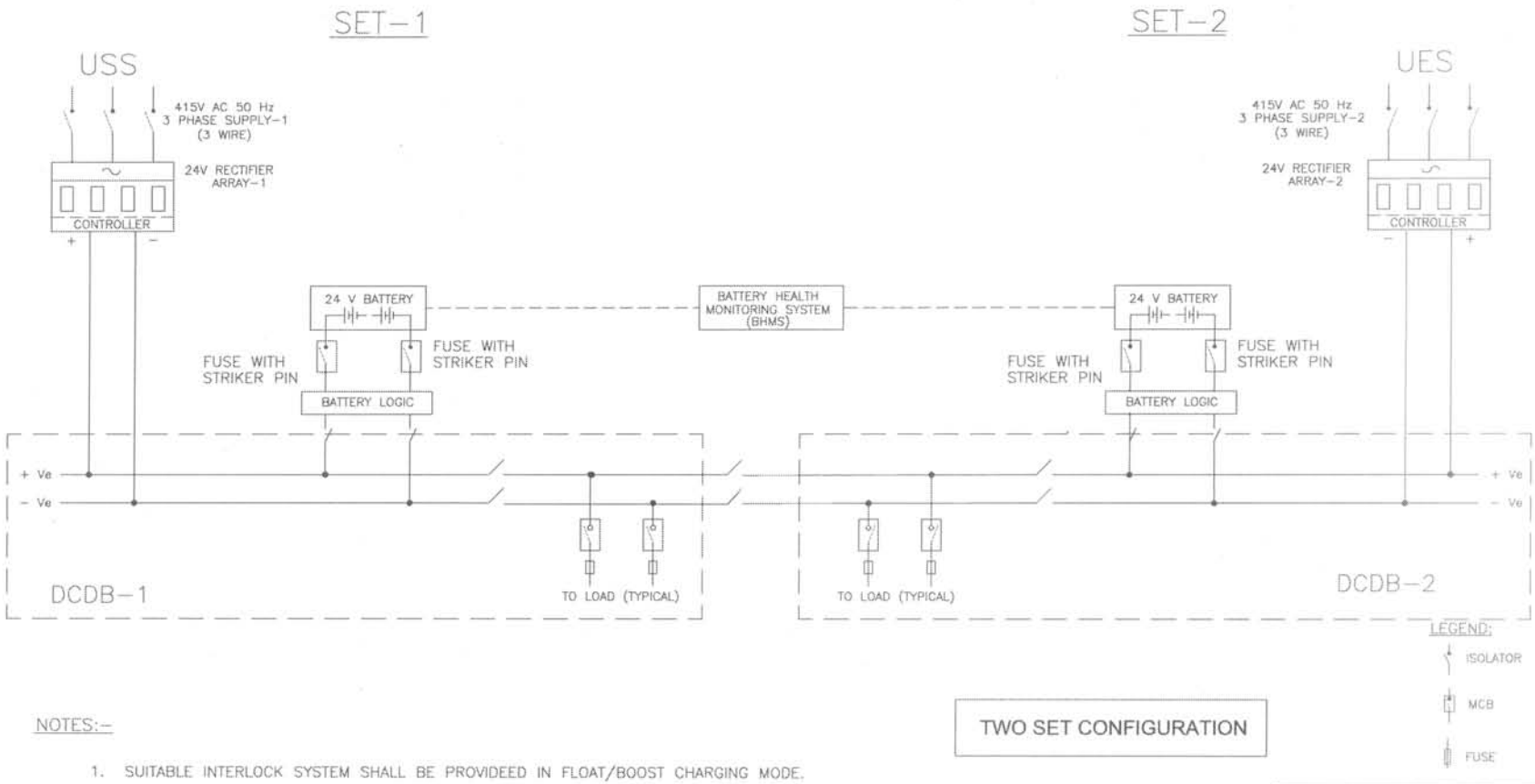
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INSTRUMENTATION CABLING DIAGRAM
GROUNDING SCHEME FOR CABINETS / PANELS / POWER SUPPLY

SIZE	SCALE	DRG. NO.	REV. NO.
A3	N.T.S.	0000-999-POI-A-019A	A

SH-1 OF 2



NOTES:–

1. SUITABLE INTERLOCK SYSTEM SHALL BE PROVIDEED IN FLOAT/BOOST CHARGING MODE.

TWO SET CONFIGURATION

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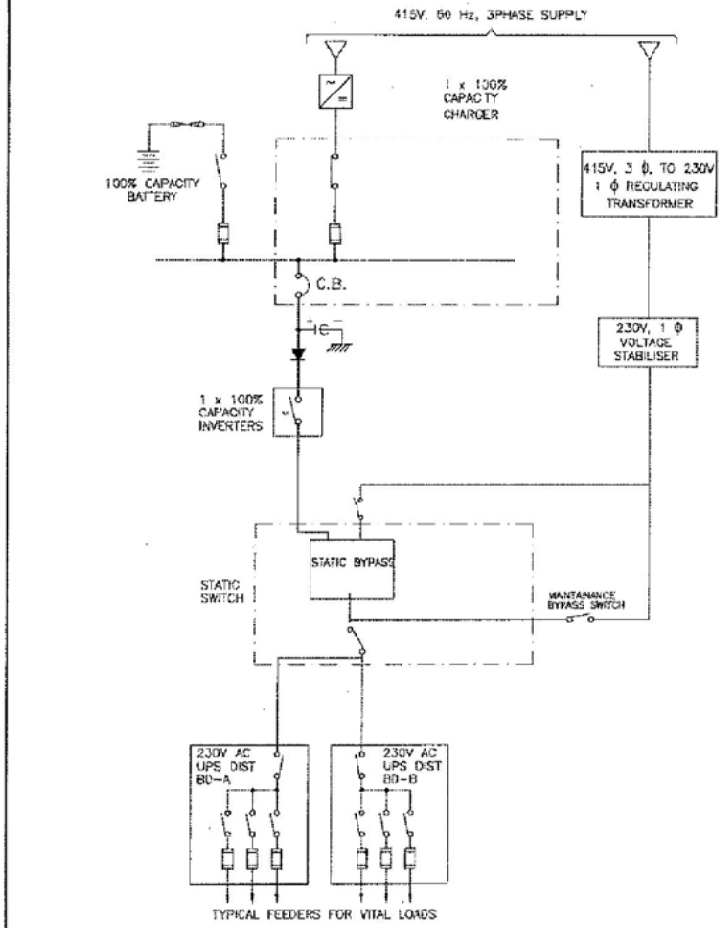
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: SCHEME FOR 24 V DC POWER SUPPLY SYSTEM

SIZE	SCALE	DRG. NO.	REV. NO.
A3	N.T.S.	0000-999-POI-A-019B	A



FOR TENDER PURPOSE ONLY

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ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT FOR STATION C& I

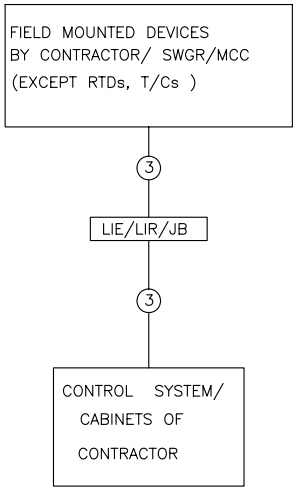
TITLE: SCHEME FOR UNINTERRUPTIBLE POWER SUPPLY SYSTEM -CONFIGURATION-B

REV.NO	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										22.10.12

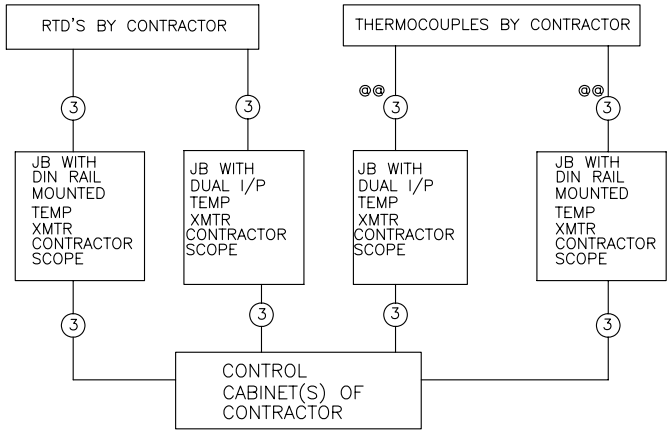
CLEARED BY

SIZE	SCALE	DRG. NO.	REV. NO.
A3	N.T.S.	0000-999-POI-A-019C (SH 2 of 2)	A

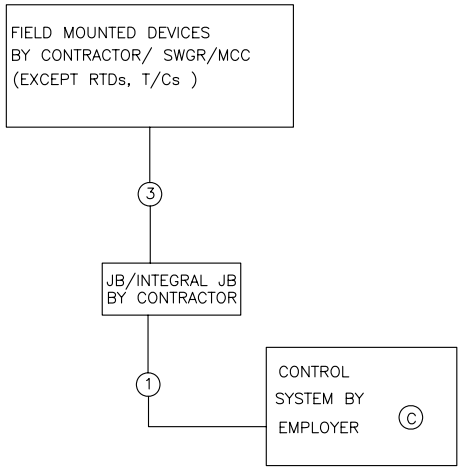
BOTH INSTRUMENTS/DEVICES AND CONTROLS IN CONTRACTOR SCOPE



CONTRACTOR'S RTD & THERMOCOUPLES AND TEMP TRANSMITTERS USED IN CONTRACTOR'S CONTROL SYSTEM



CONTRACTOR'S INSTRUMENTS/DEVICES USED IN EMPLOYER'S CONTROL SYSTEM



NOTES

- (C) -- EMPLOYER'S SCOPE
- * -- WHEREVER APPLICABLE
- 1– CABLES IN EMPLOYER'S SCOPE
- 3– CABLES IN CONTRACTOR'S SCOPE
- @@ – COMPENSATING CABLES
- ◄—(X)—► – SOFT LINKS
- 4– FOR SCOPE OF CABLE ALSO REFER CLAUSE NO. 4.00.00 SUBSECTION–III:C PART–A OF TECHNICAL SPECIFICATION.

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD.	DATE
B	FIRST ISSUE										21.08.12
					CLEARED BY						

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ENGINEERING DIVISION

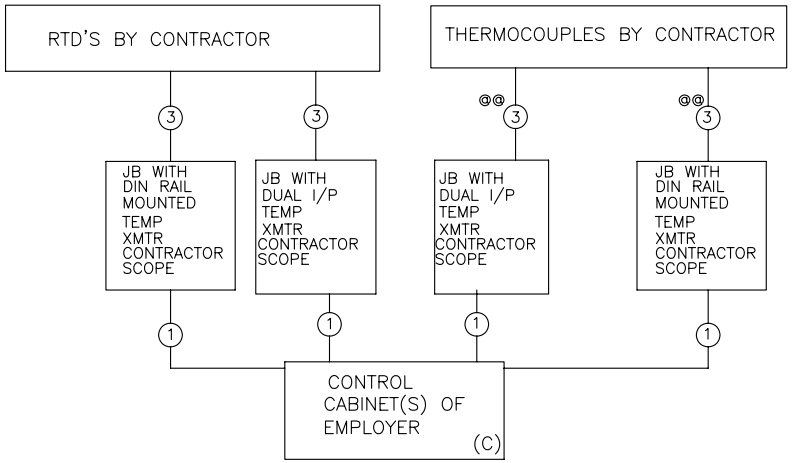
PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INSTRUMENTATION / CONTROL / POWER SUPPLY CABLING DIAGRAM

SIZE	SCALE	DRG. NO.	REV. NO.
A4	NTS	0000-101/102-POI-A-021 SH 1 OF 3	B

CAD FILE NAME :

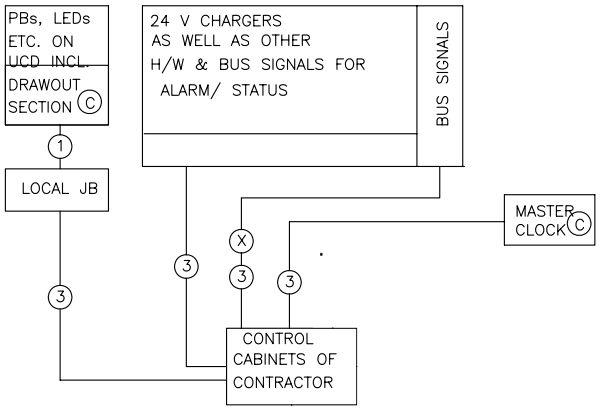
CONTRACTOR'S RTD & THERMOCOUPLES AND TEMP TRANSMITTERS USED IN EMPLOYER'S CONTROL SYSTEM



NOTES

(C) -- EMPLOYER'S SCOPE
* -- WHEREVER APPLICABLE
1– CABLES IN EMPLOYER'S SCOPE
3– CABLES IN CONTRACTOR'S SCOPE
@@ – COMPENSATING CABLES
(X) – SOFT LINKS
4– FOR SCOPE OF CABLE ALSO REFER CLAUSE NO. 4.00.00 SUBSECTION–III:C PARTA–A OF TECHNICAL SPECIFICATION.

CONTROL DESK MOUNTED DEVICES AND OTHER MISC SIGNALS INCLUDING ALARM/ STATUS SIGNALS ETC.



REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD.	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

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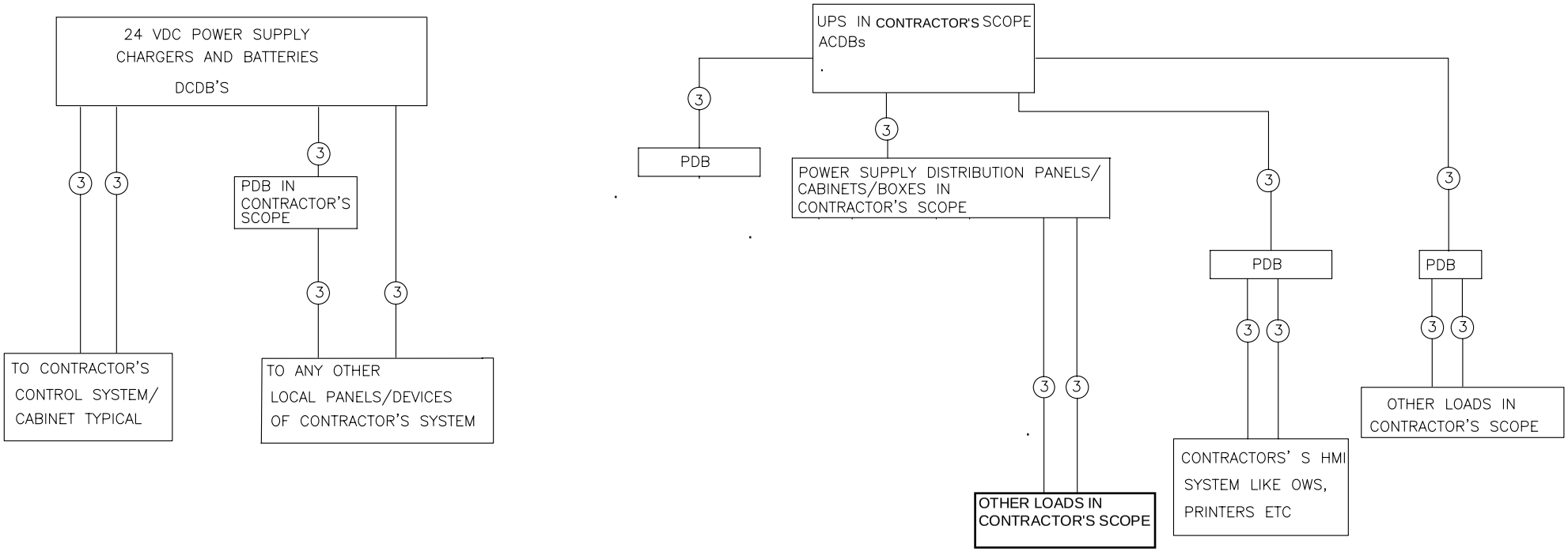
PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INSTRUMENTATION / CONTROL / POWER SUPPLY CABLING DIAGRAM

SIZE	SCALE	DRG. NO.	REV. NO.
A4	NTS	0000-101/102-POI-A-021 SH 2 OF 3	A

CAD FILE NAME :



NOTES :–

Ⓒ –– EMPLOYER'S SCOPE
* –– WHEREVER APPLICABLE
1– CABLES IN EMPLOYER'S SCOPE

2. DELETED

3– CABLES IN CONTRACTOR'S SCOPE
@@ – COMPENSATING CABLES
◄—Ⓧ—► – SOFT LINKS

4– FOR SCOPE OF CABLE ALSO REFER CLAUSE NO. 4.00.00 SUBSECTION–III:C PARTA–A OF TECHNICAL SPECIFICATION.

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD.	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

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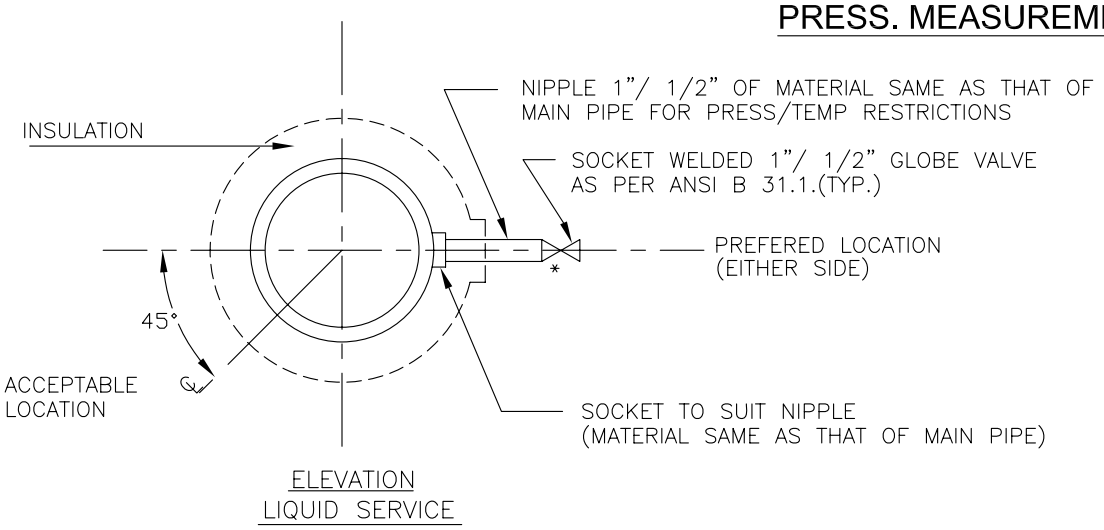
PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INSTRUMENTATION / CONTROL / POWER SUPPLY CABLING DIAGRAM

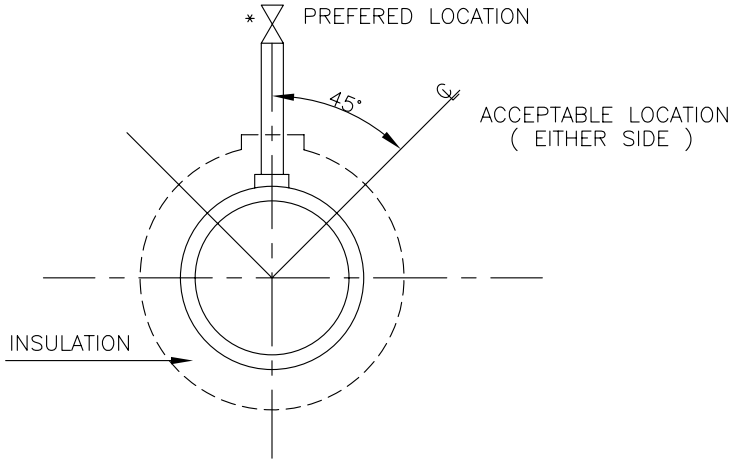
SIZE	SCALE	DRG. NO.	REV. NO.
A4	NTS	0000-101/102-POI-A-021 SH 3 OF 3	A

CAD FILE NAME :

PRESS. MEASUREMENT

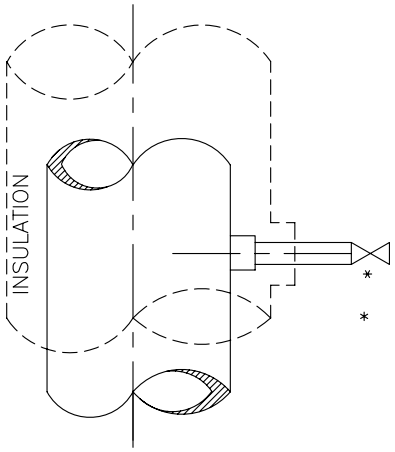


ELEVATION
LIQUID SERVICE



ELEVATION
STEAM SERVICE

PRESSURE CONNECTION ON HORIZONTAL PIPE



* USE DOUBLE ISOLATION VALVES FOR PRESSURE EQUAL TO OR EXCEEDING 40 Kg/Cm2.

ELEVATION
LIQUID OR STEAM SERVICE

PRESSURE CONNECTIONS ON VERTICAL PIPES

FOR TENDER PURPOSE ONLY

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ENGINEERING DIVISION

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	T.G. C&I	ARCH.	APPD.	DATE
A	FIRST ISSUE										21.08.12

CLEARED BY

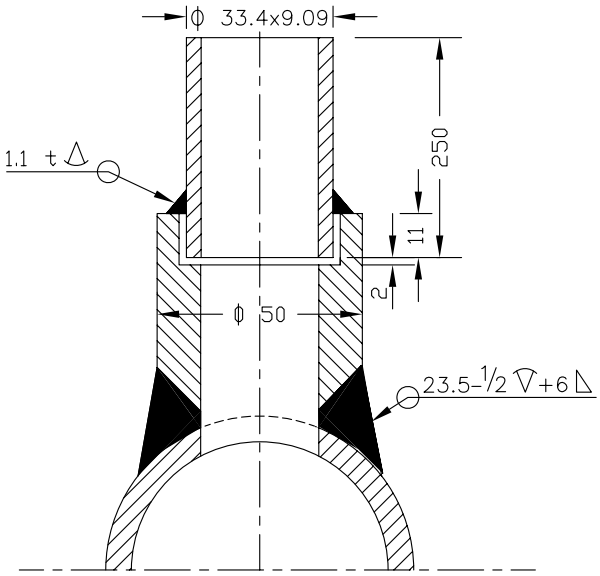
PROJECT: TYPICALTHERMAL POWER PROJECT

TITLE: INSTRUMENT SOURCE CONNECTION DETAILS

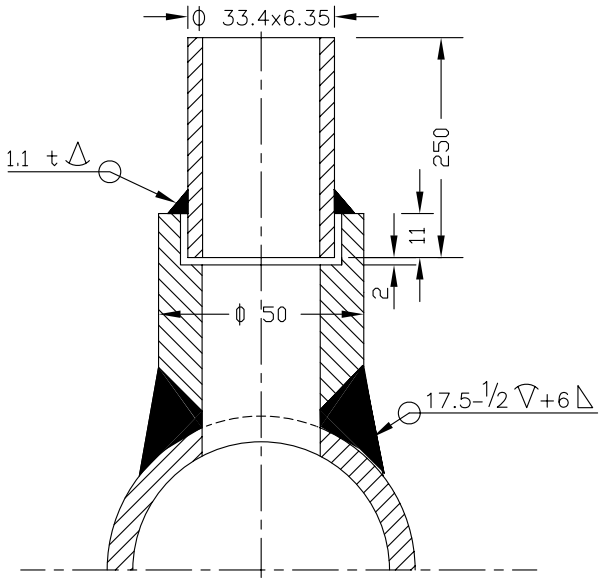
SIZE	SCALE	DRG. NO.	REV. NO.
A4	N.T.S.	0000-999-POI-A-035 Sh-1 Of 14	A

PRESSURE MEASUREMENT

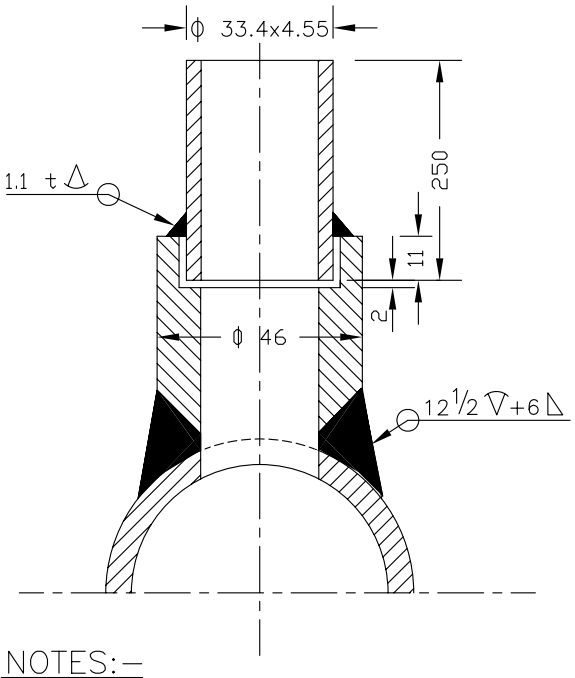
(SYSTEM PR.>40Kg/Sq Cm CL 9000)



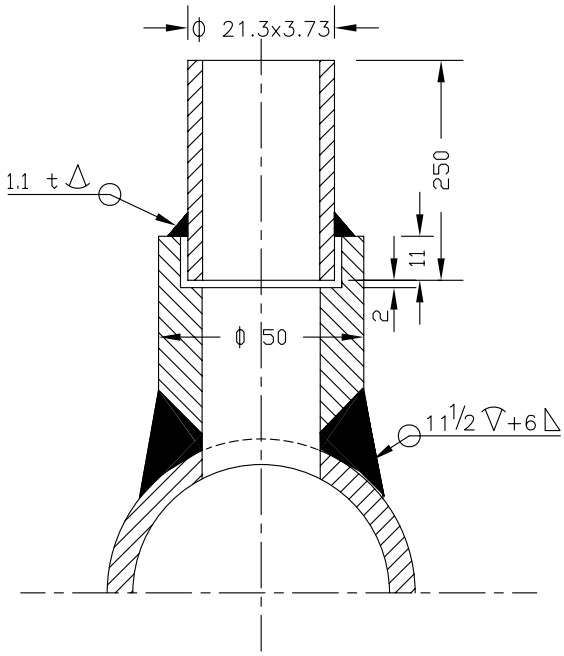
(SYSTEM PR.>40Kg/Sq Cm CL 6000)



(SYSTEM PR. <40Kg/Sq cm Nb 25 CL 3000)



(SYSTEM PR. <40Kg/Sq cm Nb 15 CL 3000)



NOTES:–

1. MATERIAL OF THE BOSS AND NIPPLE SHALL BE THE SAME AS THE PIPE INTO WHICH IT IS WELDED AND CONFIRM TO ANSI B 16.11.
2. THE LENGTH OF THE NIPPLE SHOULD BE 250mm.
3. THE OTHER END OF THE NIPPLE SHALL BE SOCKET WELDED WITH 1" GLOBE VALVE OF MATERIAL AS PER ANSI B 16.1.
4. TWO ISOLATED VALVES ARE TO BE USED FOR PRESSURE = >40 Kg/Cm2.
5. EDGE HOLE MUST BE CLEAN AND SQUARE OR ROUNDED SLIGHTLY (1/64" RADIUS) FREE FROM BURRS, WIRE EDGES OR OTHER IRREGULARITIES.
6. ORIENTATION OF TAP WILL BE VARY WITH TYPE OF PROCESS FLUID AND NATURE OF RUN OF THE PIPE.
7. ACTIVITIES TO BE COMPLETED AT THE SHOP, WELD THE COUPLING (OR BOSS) ON THE PIPE AND DRILL PRESSURE CONNECTION HOLE (SAME AS I D OF NIPPLE) IN THE PIPE IN ALLIGNMENT WITH HOLE IN THE COUPLING.
8. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.

FOR TENDER PURPOSE ONLY

REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	T.G. C&I	ARCH.	APPD.	DATE
A	FIRST ISSUE										21.08.12

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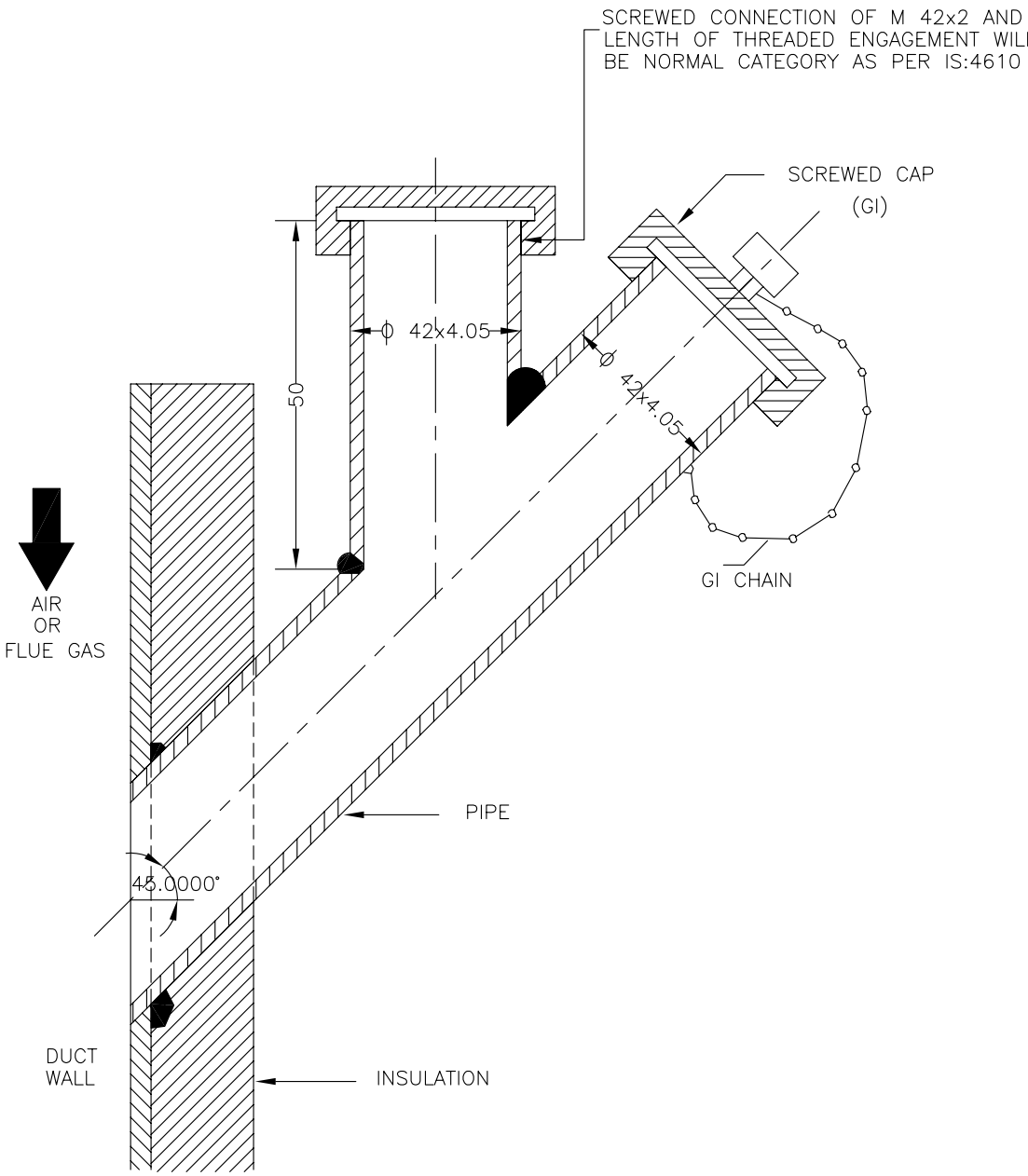
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICALTHERMAL POWER PROJECT

TITLE: INSTRUMENT SOURCE CONNECTION DETAILS

SIZE	SCALE	DRG. NO.	REV. NO.
A4	N.T.S.	0000-999-POI-A-035 Sh–2 Of 14	A

PRESS. MEASUREMENT



NOTES:–

1. THIS TYPE OF PRESSURE CONNECTON SHALL BE PROVIDED FOR PRESSURE MEASUREMENTS IN AIR AND FLUE GAS DUCT/FURNACE.
2. DIMENSIONS ARE INDICATIVE ONLY.

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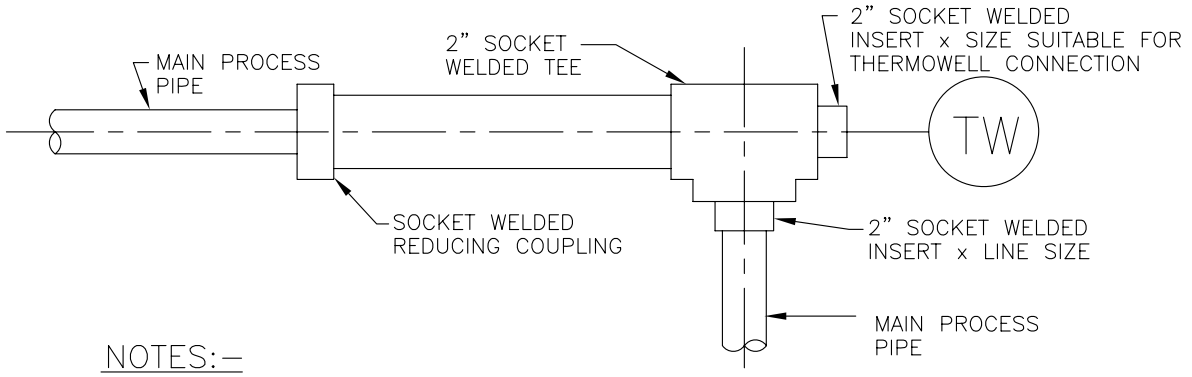
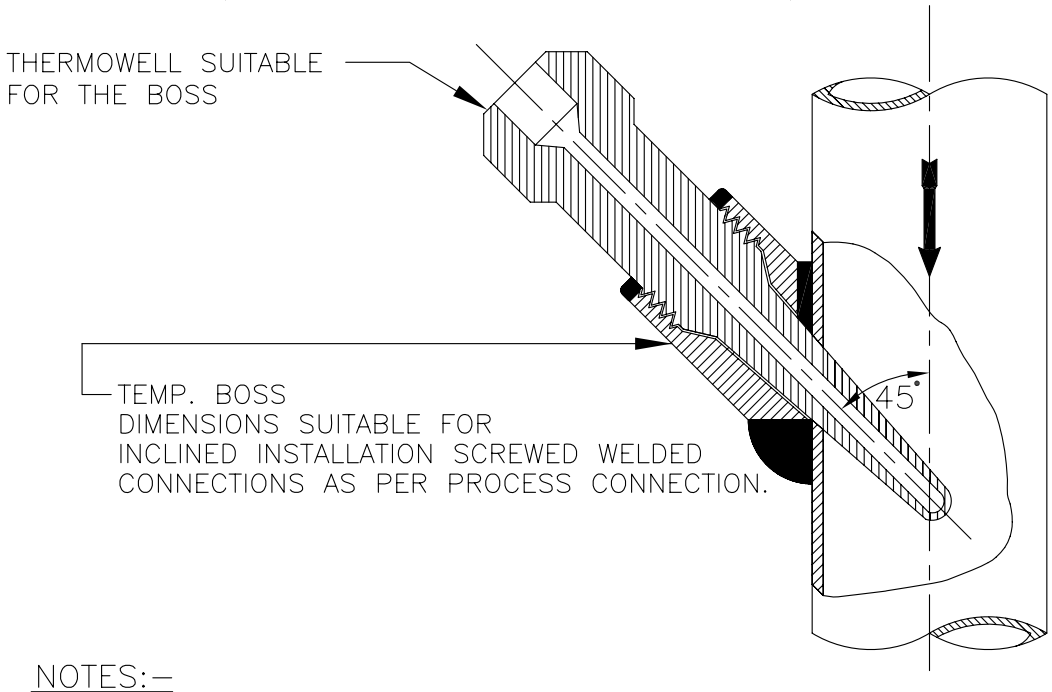


NOTES:–

1. THIS TYPE OF THERMOWELL INSTALLATION IS SUITABLE FOR THE PROCESS PIPE OF 2" NPS AND SMALLER.
2. FOR STEAM SERVICE THIS TYPE OF THERMOWELL INSTALLATION 90° BEND MAY BE USED ONLY IN VERTICAL PLANE.
3. THE LENGTH OF THE LARGER PIPE SECTION SHALL BE MINIMUM 150mm (IT MUST BE GREATER THAN THERMOWELL LENGTH).



NOTES:–

1. INCLINED INSTALLATION OF THERMOWELL SHALL BE APPLICABLE FOR 4" AND SMALLER LINE SIZE BUT LIMITED TO MIN. 3" LINE SIZE.
2. FOR 2" AND SMALLER LINE SIZE NECESSARY EXPANDER OF MIN. 3" SIZE OF MAIN PIPING SPECIFICATION SHALL BE USED.
3. THIS TYPE OF INSTALLATION IS APPLICABLE FOR HORIZONTAL AND VERTICAL PIPE SECTION.
4. FOR STEAM SERVICES EXPANDER SECTION MAY BE USED ONLY IN VERTICAL RUN.
5. THE EXPANDER SECTION SHALL BE OF ADEQUATE LENGTH (ATLEAST 3–4 TIMES DIA OF THE MAIN PROCESS PIPE AT BOTH SIDE OF THE INSTALLED THERMOWELL).

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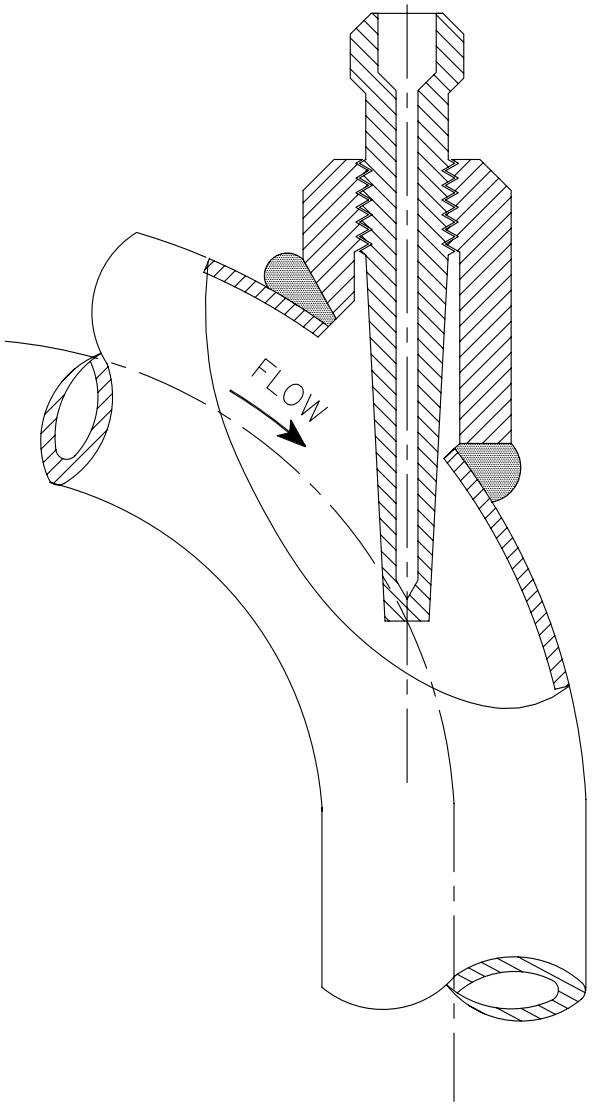
PROJECT	TYPICALTHERMAL POWER PROJECT (SG PACKAGE)
TITLE	INSTRUMENT SOURCE CONNECTION DETAILS

SIZE	SCALE	DRG. NO.	REV. NO.
A4	N.T.S.	0000-999/102-POI-A-035 Sh–4 Of 14	A



NOTES:–

1. FLOW INSTALLATION OF THERMOWELL SHALL BE APPLICABLE FOR 4" AND SMALLER LINE SIZE BUT LIMITED TO MINIMUM 3" LINE SIZE.

2. FOR 2" AND SMALLER LINE SIZE NECESSARY EXPANDER OF ELBOW FORM (AS SHOWN) OF MINIMUM 3" SIZE SHALL BE USED.

3. ELBOW EXPANDER SECTION IN HORIZONTAL PLANE MAY BE USED FOR LIQUID SERVICES. ONLY STEAM SERVICES EXPANDER SECTION MAY BE USED IN VERTICAL PLAN.

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TITLE: INSTRUMENT SOURCE CONNECTION DETAILS

SIZE	SCALE	DRG. NO.	REV. NO.
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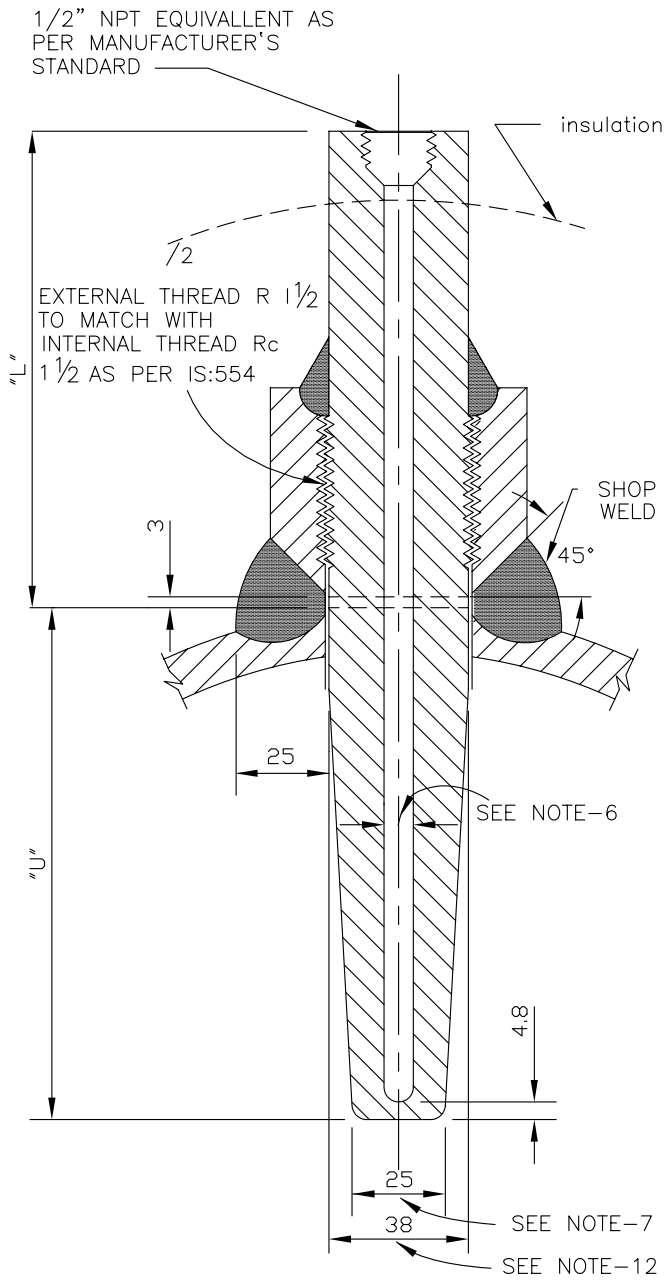
TEMP. MEASUREMENT



NOTES:-

1. THIS TYPE OF TEMPERATURE BOSS SHALL BE USED FOR THE PROCESS PRESS EQUAL/ABOVE 40 Kg/Cm2(g).
2. THE MATERIAL OF THE BOSS SHOULD BE SIMILAR TO THAT OF PIPING MATERIAL OF SPECIFICATION.
3. ALL WELD TO BE TESTED IN ACCORDANCE WITH APPLICABLE CODES BY MANUFACTURER.
4. MATERIAL OF THE THERMOWELL SHALL BE OF 316SS.
5. THERMOWELL SHALL BE DRILLED BARSTOCK TYPE.
6. INTERNAL BORE OF THE THERMOWELL SHOULD BE SELECTED BASED ON THE NORMAL SIZE OF THE SENSING ELEMENT AS PER ASME,PTC-19.3.
7. THE BOTTOM DIAMETER OF THE THERMOWELL TYPICALLY SHOWN HERE SHALL BE SUBJECT TO VARIATION BASED ON THE INTERNAL BORE OF THERMOWELL AND THICKNESS OF THERMOWELL MATERIAL TO WITHSTAND THE PROCESS PRESS.AND TEMP.,AS PER ASME,PTC-19.3.
8. THE TYPE OF TAPERED THERMOWELL SHALL BE USED FOR LIQUID VELO-CITIES UP TO 92M.P.S.(300F.T.P.S.).
9. THERMOWELL WITH THE INSULATION LAG EXTENSIONS SHALL BE USED WHEREVER APPLICABLE.
10. ACTIVITIES TO BE COMPLETED AT THE SHOP. WELD THE BOSS ON THE PIPE AND DRILL THE HOLE IN THE PIPE IN ALLIGNMENT WITH HOLE IN THE BOSS. PROVIDE INTERNAL THREAD AS PER IS:554 TO MATCH WITH THE THERMO-WELL EXTERNAL THREAD.
11. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
12. WIILL BE SUITABLE TO MATCH THE STUB DIMENSIONS AS PER RC 1½
13. THE "U" & "L" DIMENSIONS SHALL BE BE SELECTED BASED ON PARTICULAR APPLICATION AND THE SAME SHALL BE SUBJECT TO OWNER'S APPROVAL DURING DETAILED ENGINEERING.
14. ALL DIMENSIONS ARE INDICATIVE ONLY.

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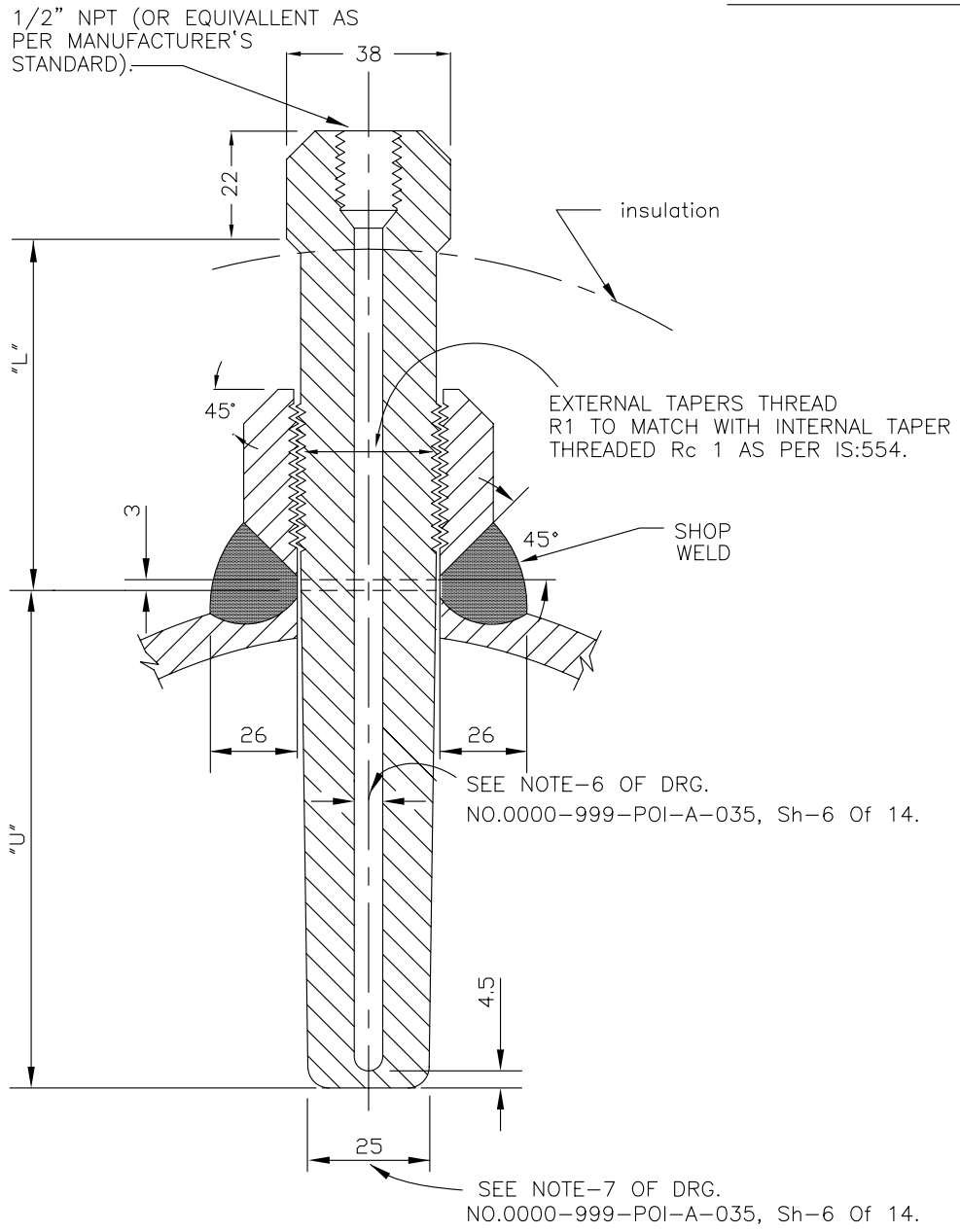
SIZE	SCALE	DRG. NO.	REV. NO.
A4	N.T.S.	0000-999-POI-A-035 Sh-6 Of 14	A

TEMP. MEASUREMENT



NOTES:-

1. THIS TYPE OF TEMPERATURE BOSS IS APPLICABLE FOR THE PROCESS PRESSURE/TEMPERATURE BELOW 40 Kg/Cm2(g)/400°C
2. FOR PRESSURE TIGHT JOINTS THE BOSS SHOULD HAVE INTERNAL TAPERED PIPE THREAD Rc 1 AS PER IS:554. THE LENGTH OF THREAD ENGAGEMENT SHOULD BE AS PER ABOVE STANDARD.
3. PIPES HAVING PROBABILITY OF PROLONGED VIBRATION SEAL WELDING MAY BE DONE ALL AROUND AFTER TIGHTENING THERMOWELL WITHIN THE BOSS.
4. SEE NOTES-2 TO 14 OF DRG. NO. 0000-999-POI-A-035, Sh-6 Of 14.

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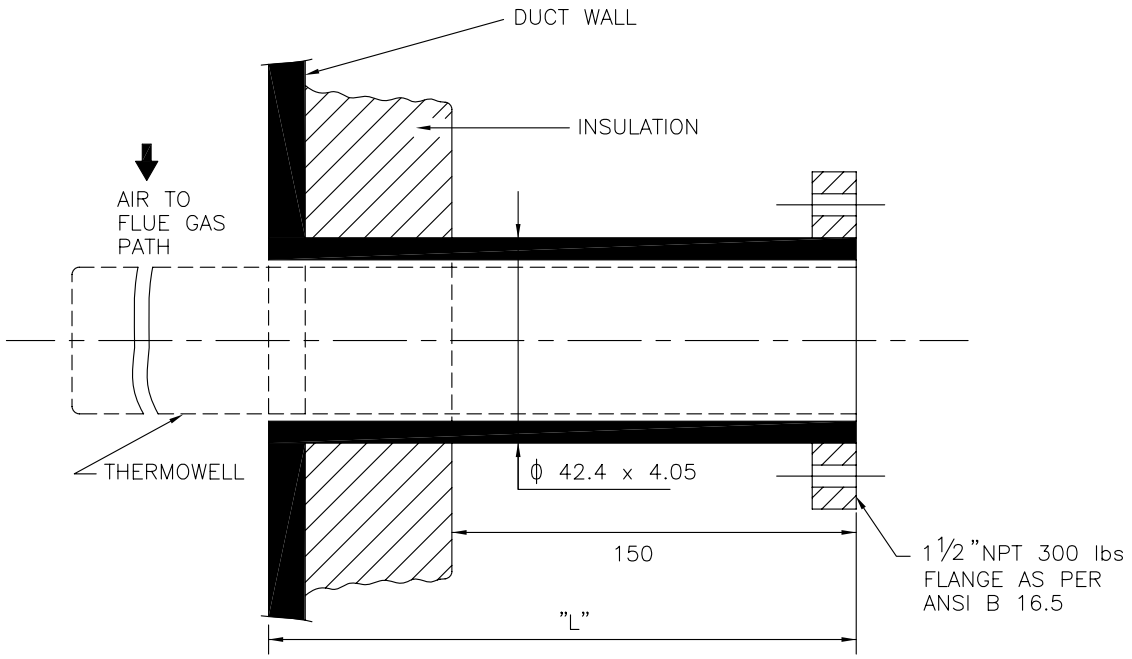

NOTES:–

1. THIS TYPE OF TEMPERATURE CONNECTIONS SHALL BE PROVIDED FOR TEMPERATURE MEASUREMENT IN AIR AND FLUE GAS DUCT.
2. MATERIAL OF THERMOWELL SHALL BE OF 316SS.
3. EXTERNAL CONNECTION SHALL BE OF SLIP ON FLANGED TYPE AND THERMOWELL DESIGN SHALL BE AS PER ASME.PTC–19.3 (REFER NOTES 9&10 OF DRG.NO. 0000–999–POI–A–035, Sh–6 Of 14).
4. BIDDER TO SUPPLY AND INSTALL THE COUNTER FLANGED AND THERMOWELL (ALONG WITH TEMP. ELEMENT).
5. ALL DIMENSIONS ARE INDICATIVE ONLY.

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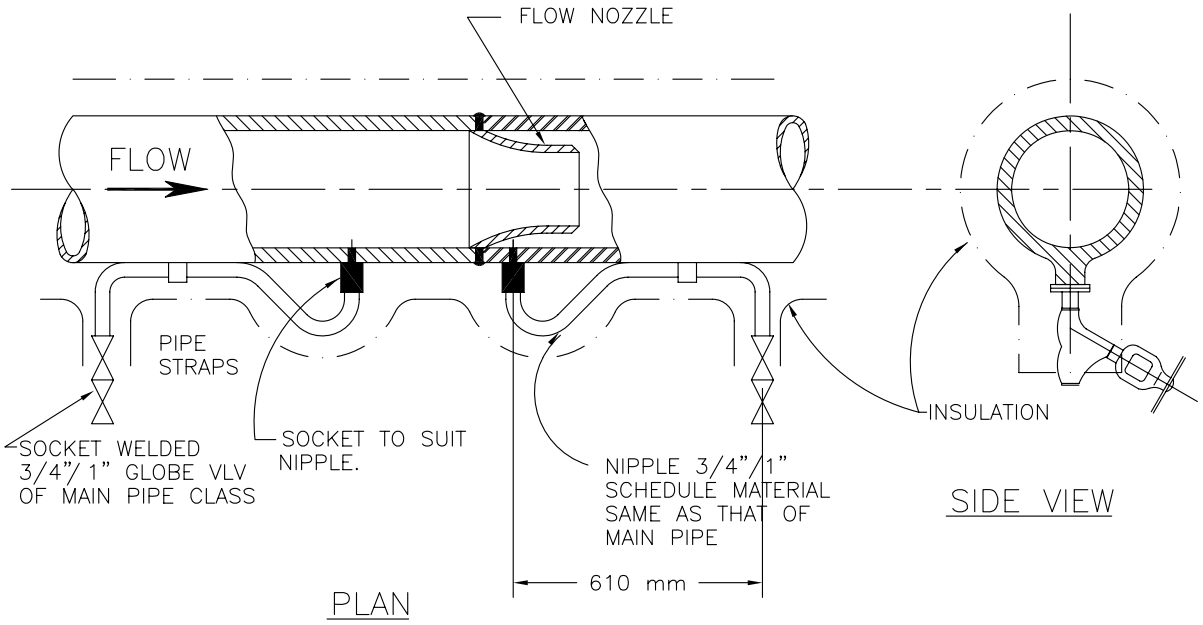

NOTES:–

1. THIS METHOD OF CONNECTING NIPPLES AND VALVES ON THE HORIZONTAL PIPE IS APPLICABLE FOR MEASUREMENT OF STEAM AT TEMP. ABOVE 455°C .
2. FOR STEAM SERVICE IN HORIZONTAL PIPE THE PRESSURE HOLES AND CONNECTING NIPPLES SHOULD BE IN THE HORIZONTAL PLANE OF THE PIPE CENTRE LINE.
3. THE ENTIRE LENGTH OF THESE NIPPLES AS WELL AS SHUT OFF VALVES SHOULD BE LAGGED IN WITH STEAM LINE AS SHOWN IN THE DRAWING.
4. FLOW ELEMENTS SHALL BE PROVIDED WITH 3 PAIRS OF TAPPING POINTS.

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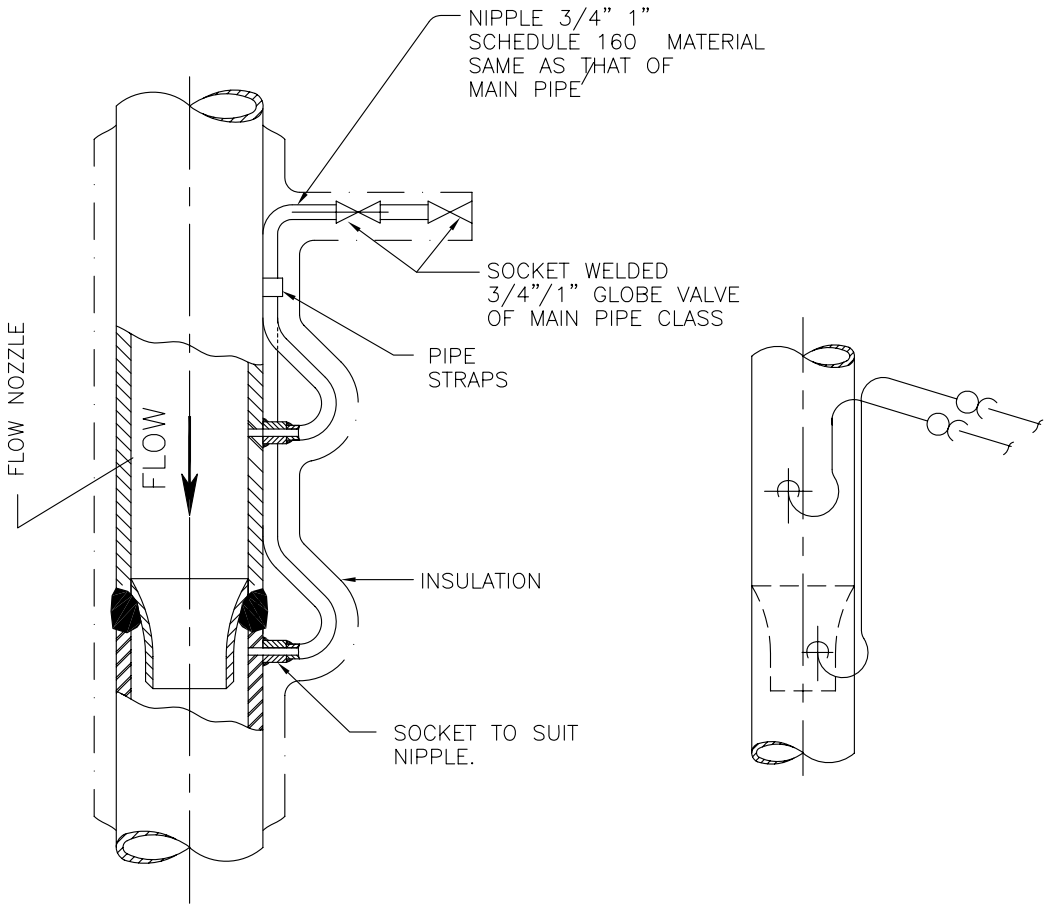

ELEVATION

NOTES:–

1. THIS METHOD OF CONNECTING NIPPLES AND VALVES ON THE VERTICAL STEAM PIPE IS APPLICABLE FOR MEASUREMENT OF STEAM AT TEMP. ABOVE 455°C
2. THE ENTIRE LENGTH OF THESE NIPPLES AS WELL AS SHUT OFF VALVES SHOULD BE LAGGED IN WITH STEAM LINE AS SHOWN IN THE DRAWING.
3. ON VERTICAL STEAM PIPE BOTH HIGH TEMPERATURE (SPECIAL VENTS) NIPPLES WILL BE LONG ENOUGH SO THAT HIGH AND LOW PRESSURE CONNECTION NIPPLES WILL BE AT SAME LEVEL.
4. UP STREAM AND DOWN STREAM PRESSURE CONNECTIONS MUST BE INSTALLED IN DIFFERENT PLANES PASSING THROUGH THE CENTRE OF THE PIPE.
5. FLOW ELEMENTS SHALL BE PROVIDED WITH 3 PAIRS OF TAPPING POINTS.

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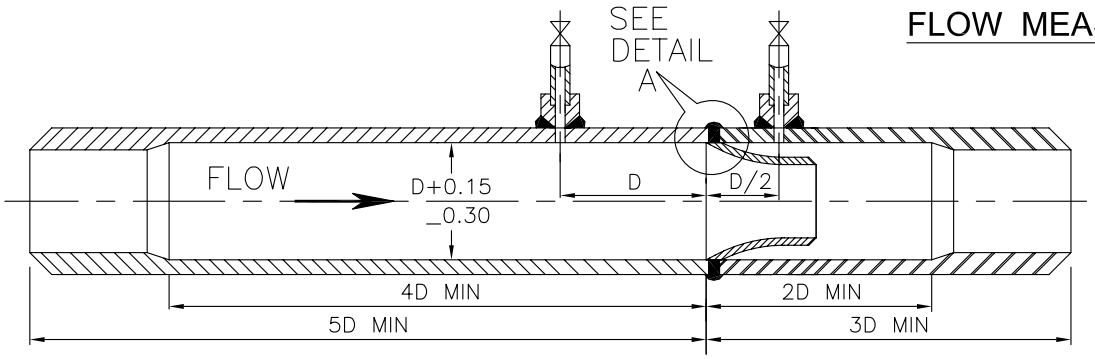
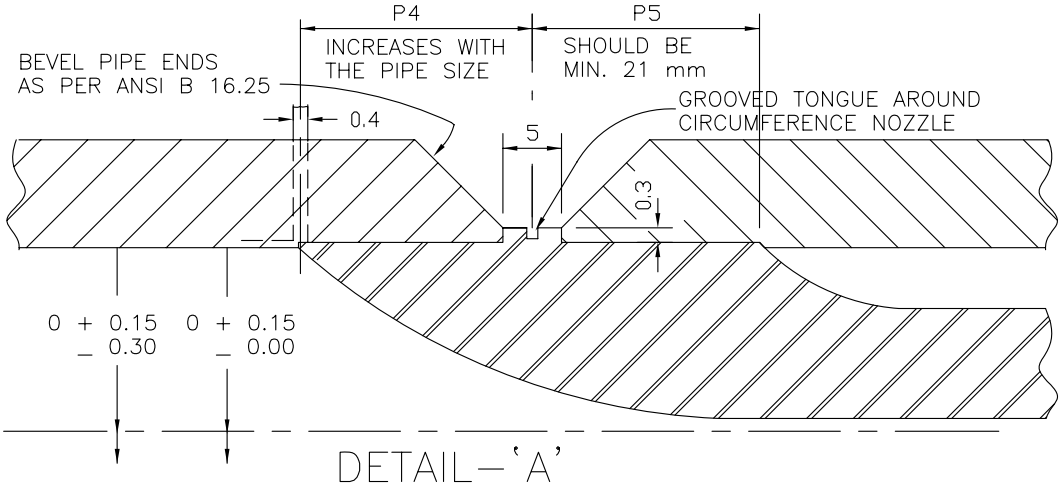
FLOW MEASUREMENT





DETAIL–'A'

NOTES:–

1. COMPLETE FLOW NOZZLE BRANCH ASSEMBLY ALONG WITH NIPPLES AND SOURCE ISOLATION VALVES SHALL BE SUPPLIED BY THE BIDDER. THE BIDDER ALSO TO INSTALL FLOW NOZZLE WITHIN THE MACHINED BRANCH, PRESSURE STUBS ON THE BRANCH PIPE (FOR ORIENTATION OF PRESSURE TAP REF. NOTE–3) ALONG WITH NIPPLE AND SOURCE ISOLATION VALVES.
2. THE MACHINING OF BRANCH PIPE SHOULD BE DONE AFTER PRESSURE CONNECTIONS HAVE BEEN WELDED TO PIPE AND ALSO EXTEND FOR ATLEAST 4D IN THE INLET SECTION, 2D IN THE OUTLET SECTION, MEASURED FROM THE INLET FACE OF FLOW NOZZLE. TOTAL BRANCH PIPE ASSEMBLY SHOULD BE ATLEAST A LENGTH OF 8D/5D IN THE INLET SECTION AND 3D IN THE OUTLET SECTION, MEASURED FROM THE INLET FACE OF THE FLOW NOZZLE AS SHOWN ABOVE.
3. ON HORIZONTAL PIPE RUN PRESSURE CONNECTIONS ARE TO BE LOCATED ON SIDES OF THE PIPE FOR LIQUID AND STEAM SERVICE AND ON THE TOP FOR DRY GAS SERVICE FOR PROCESS LIQUIDS, INSTALLATION OF PRESS. TAPS MAY BE ALLOWED WITHIN AN ANGLE OF 45° ELBOW HORIZONTAL FOR SPECIAL CASES BUT NO BOTTOM CONNECTIONS ARE ALLOWED.
4. THE LOCATION OF PRESSURE TAPS MUST BE WITHIN 1.5 mm(1/16") OF DISTANCE SPECIFIED AND NUMBER OF PAIRS OF PRESSURE TAPS TO BE PROVIDED WILL BE AS PER FLOW MEASUREMENT DATA SHEET.
5. PRESSURE TAPS SHOULD BE DRILLED RADIALLY WITH RESPECT TO PIPE AND THIS DRILLING SHOULD BE DONE AFTER ANY COUPLING FOR ATTACHING THE PRESSURE TUBING HAS BEEN WELDED TO THE PIPE. THE HOLE WHERE IT BREAKS THROUGH THE INNER SURFACE OF THE PIPE MUST BE FREE OF BURRS OR WIRE EDGE AND CORNER OF EDGE HOLE LEFT ROUNDED VERY SLIGHTLY (1/64" RADIOUS).
6. RECOMMENDED MAXIMUM DIAMETERS OF PRESSURE TAP HOLES IN THE BRANCH PIPES WILL BE AS PER EN ISO 5167:2003. THE DIAMETER FOR HOLE SHOULD REMAIN SAME FOR DISTANCE NOT LESS THAN 2.5 TIME OF DIA FROM THE INNER SURFACE OF THE PIPE.
7. FLOW NOZZLE SHALL BE CENTRED IN THE PIPE WITHIN 0.8 mm (1/32") OF THE PIPE AXIS. INSIDE DIAMETER MEASURED AT FOUR POINTS AT ANY CROSS SECTION SHALL NOT DIFFER BY MORE THAN 1%.
8. BRANCH PIPE SHALL BE AS PER MAIN PIPING MATERIAL SPECIFICATION. INTERNAL SURFACE OF BORED SECTIONS MUST BE SMOOTH AND STRAIGHT, FREE FROM SCALES, PITS, BURRS OR ANY IRREGULARTIES.
9. FLOW NOZZLE MATERIAL SHALL BE 316 SS AND THE DESIGN AS PER ASME.
10. MAXIMUM UPSTREAM AND DOWN STREAM STRAIGHT LENGTH REQUIRED FROM INLET FACE OF FLOW NOZZLE SHALL BE AS PER EN ISO 5167:2003.

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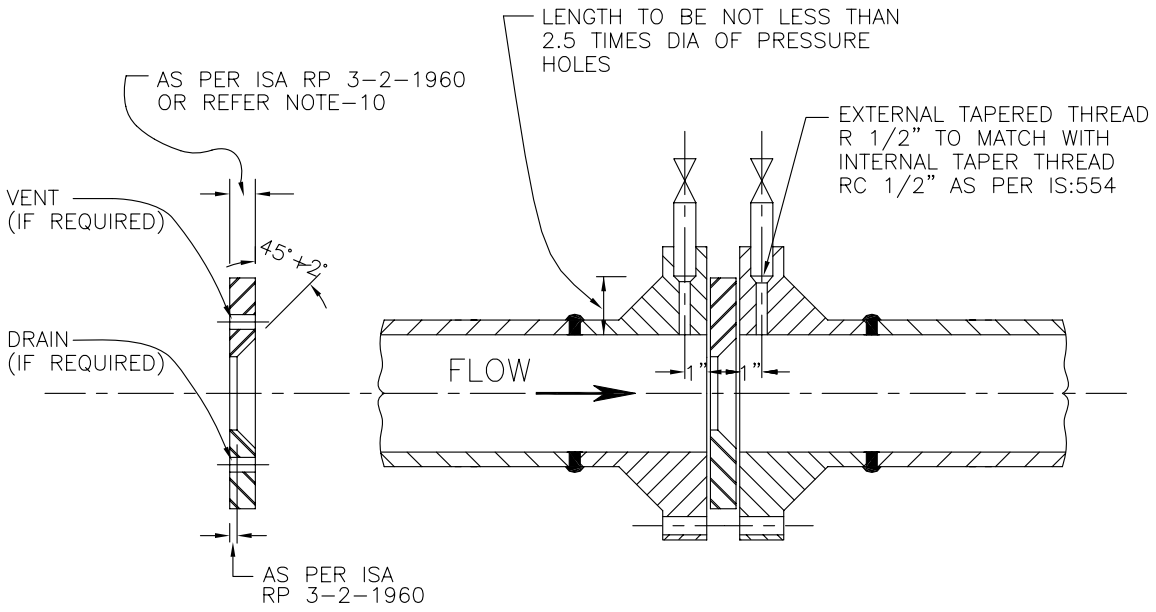
FLOW MEASUREMENT



NOTES:-

1. ORIFICE PLATE MOUNTED BETWEEN FLANGES WITH FLANGE TAPPING (AS SHOWN ABOVE) SHOULD BE LIMITED TO PIPE SIZES OF 2" OR LARGER.
2. ORIFICE PLATE SHALL BE MOUNTED BETWEEN PIPING FLANGES WITH THE SHARP EDGE FACING UPSTREAM SUCH THAT CENTRE OF THE CONCENTRIC ORIFICE SHOULD BE WITHIN 0.79 mm (1/32") OF THE AXIS OF THE PIPE.
3. TWO GASKETS SHALL BE INSERTED BETWEEN THE PLATE AND THE FLANGES AND INSIDE DIAMETER OF THE GASKETS SHOULD BE ATLEAST 1.5 mm (1/16") GREATER THAN THE INSIDE DIAMETER OF THE PIPE SO THAT THEY DO NOT PROTRUDE INTO THE PIPE.
4. PIPING FLANGES SHALL BE ANSI WELD NECK, RAISED FACE TYPE. THE FLANGE IS TO BE ALIGNED WITH THE FACE PERPENDICULAR TO THE FLOW AXIS.
5. BIDDER TO SUPPLY ORIFICE PLATE SPECIAL TYPE (HAVING PRESS. CONNECTIONS) OF FLANGES ALONG WITH GASKETS, NIPPLES AND SOURCE VALVES.
6. ON HORIZONTAL PIPE RUN PRESSURE CONNECTIONS ARE TO BE TAKEN FROM SIDES FOR LIQUID AND STEAM SERVICE AND FROM TOP FOR DRY GAS SERVICE. FOR PROCESS LIQUIDS INSTALLATION OF PRESSURE TAPS MAY BE ALLOWED WITHIN AN ANGLE OF 45° ELBOW THE HORIZONTAL IN SPECIAL CASES BUT NO BOTTOM CONNECTIONS ARE ALLOWED.
7. THE LOCATION OF PRESSURE TAPS MUST BE WITHIN 1.5 mm (1/16") OF THE DISTANCE SPECIFIED.
8. MAXIMUM DIAMETER OF PRESS. CONNECTION HOLES SHALL BE AS PER RECOMMENDATIONS OF ASME PTC 19.5. THE DIAMETER OF THE HOLE SHOULD REMAIN THE SAME FOR A DISTANCE NOT LESS THAN 2.5 TIMES OF THE DIAMETER BEFORE EXPANDING INTO THE PRESSURE PIPE.
9. THERE MUST BE NO BURRS WIRE EDGES OR OTHER IRREGULARTIES ALONG THE EDGE OF THE HOLE AND IT MUST BE SQUARE AND ROUNDED SLIGHTLY (1/64" RADIUS).
10. ORIFICE PLATE SHOULD BE FLAT WITHIN 0.02 mm (0.001") AND THE SURFACE ROUGHNESS SHOULD NOT EXCEED 20 MICRO INCH. THE THICKNESS OF THE ORIFICE PLATE SHOULD BE AS PER EN ISO 5167:2003.
11. FOR HORIZONTAL PIPE RUN DRAIN HOLES IN ORIFICE PLATES ARE AT THE BOTTOM (APPROX. TANGENT TO INSIDE DIA OF PIPE) FOR STEAM OR GAS SERVICE. VENT HOLES SHOULD BE LOCATED ON UPPER SIDE FOR INCOMPRESSIBLE FLUID.
12. ORIFICE PLATE SHOULD BE OF 316 SS (ASTM A167-54 GRADE-II).
13. RECOMMENDED MINIMUM LENGTHS OF STRAIGHT PIPE PRECEDING AND FOLLOWING ORIFICES SHALL BE AS PER EN ISO 5167:2003.
14. THREE PAIRS OF PRESSURE TAPS SHALL BE PROVIDED WITH NIPPLES OF REQUIRED LENGTH AND SOURCE VALVES AND THE UN-USED TAPS ARE PLUGGED.
15. THE INTERNAL TAPERED CONNECTION WITHIN THE FLANGE FOR PRESSURE TAPS SHOULD BE RC 1/2" AND THE NIPPLE SHOULD ALSO OF EXTERNAL THREADED R 1/2" AS PER IS:554. THE LENGTH OF THREADED ENGAGEMENT SHALL BE AS PER ABOVE STANDARD.

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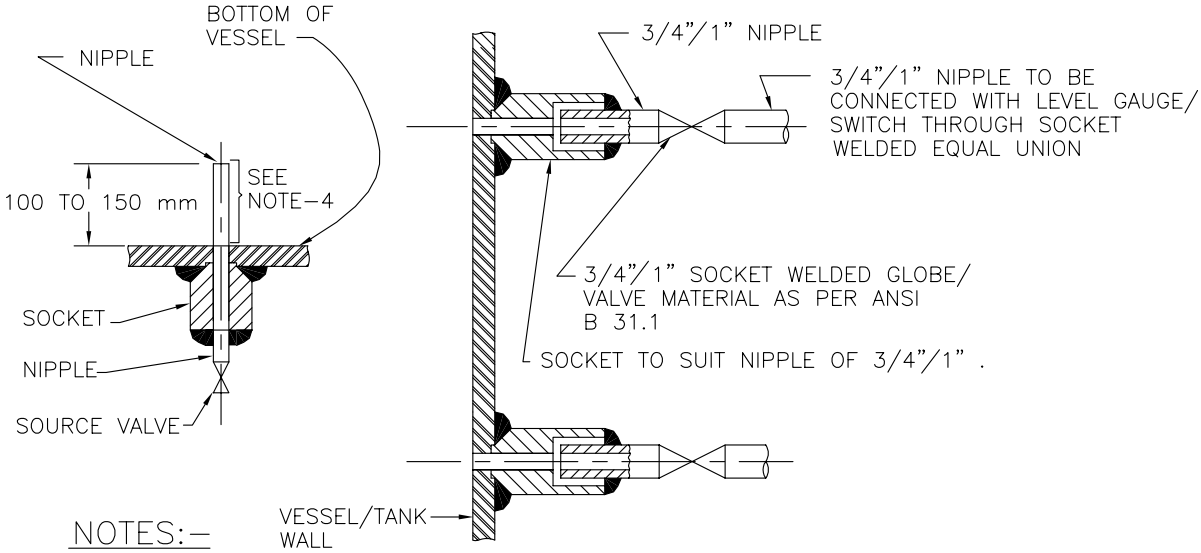
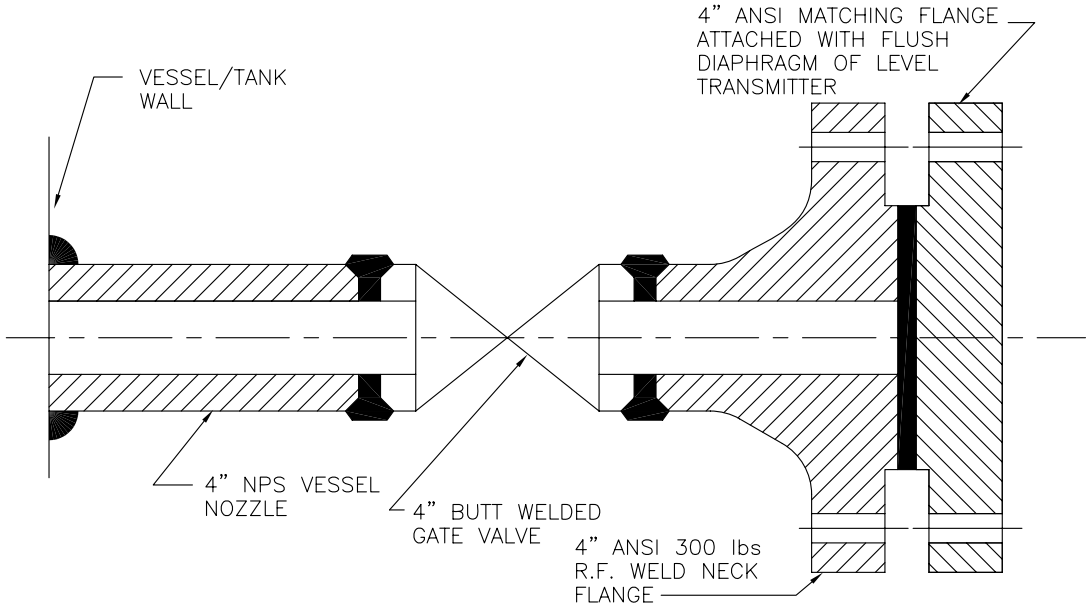
LEVEL MEASUREMENT



NOTES:–

1. THIS TYPE OF PROCESS CONNECTION SHALL BE USED FOR LEVEL GAUGE AND EXTERNAL CAGE TYPE FLOAT OR DISPLACER OPERATED LEVEL SWITCH.
2. FOR GAUGES 3/4" NIPPLE ALONG WITH 3/4" SW SOURCE VALVE AND FOR SWITCHES 1" NIPPLE ALONG WITH 1" SW SOURCE VALVE SHALL BE PROVIDED AS PROCESS CONNECTION.
3. SOURCE CONNECTION ON VESSEL SHOULD NOT BE LOCATED AT PLACES SUBJECTED TO INTERFACE AND TURBULENCE FROM INLETS AND OUTLETS.
4. IF LOWER CONNECTION IS TAKEN FROM BOTTOM OF THE VESSEL THEN THE NIPPLE MUST BE 100 mm TO 150 mm ABOVE THE BOTTOM OF THE VESSEL.



NOTES:–

1. THIS TYPE OF PROCESS CONNECTION SHALL BE PROVIDED FOR TANK LEVEL MEASUREMENT OF VISCOUS OR CORROSIVE LIQUID USING FLUSH DIAPHRAGM/WAFER TYPE LEVEL TRANSMITTER.
2. WELDING OF MATCHING FLANGE TO GATE VALVE SHALL BE DONE BY BIDDER.

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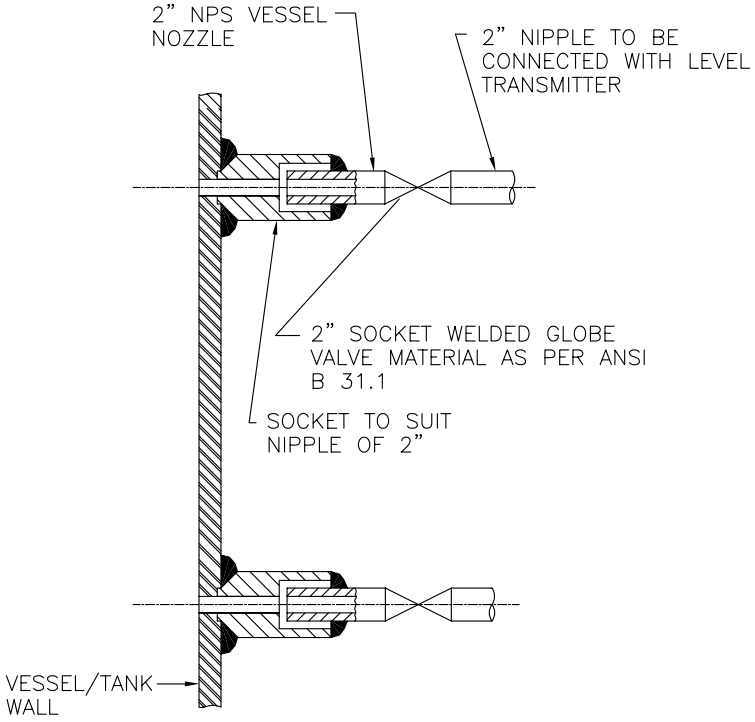
A4	N.T.S.	0000-999-POI-A-035 Sh–13 Of 14	A



NOTES:–

1. THIS TYPE OF PROCESS CONNECTION SHALL BE USED FOR DISPLACER TYPE LEVEL TRANSMITTER.
2. SOURCE CONNECTION ON VESSEL SHOULD NOT BE LOCATED AT PLACES SUBJECTED TO INTERFACE AND TURBULENCE FROM INLETS AND OUTLETS.
3. IF LOWER CONNECTION IS TAKEN FROM BOTTOM OF THE VESSEL THEN THE NIPPLE MUST BE 100 mm TO 150 mm ABOVE THE BOTTOM OF THE VESSEL.

FOR TENDER PURPOSE ONLY

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N T P C LIMITED
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ENGINEERING DIVISION

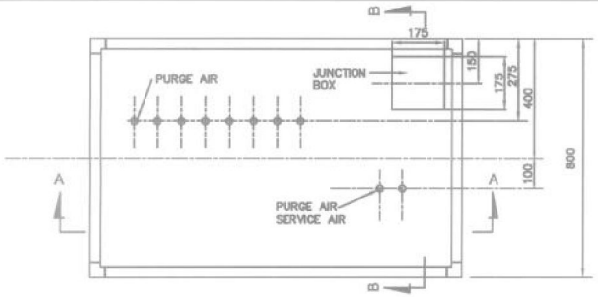
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	T.G. C&I	ARCH.	APPD.	DATE
A	FIRST ISSUE										21.08.12

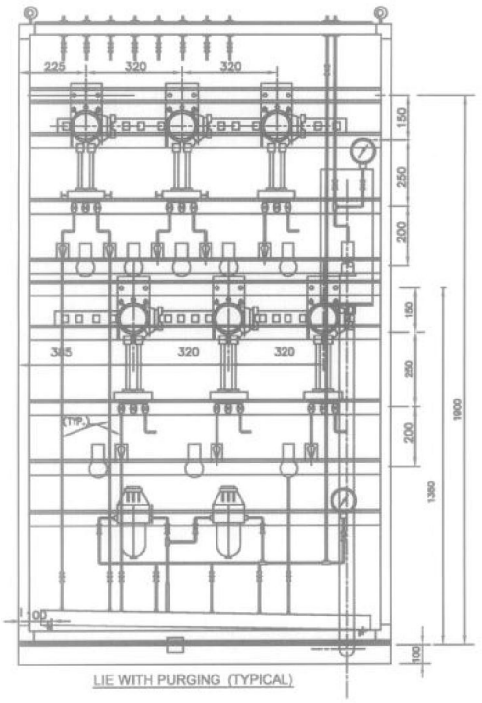
CLEARED BY

PROJECT: TYPICALTHERMAL POWER PROJECT

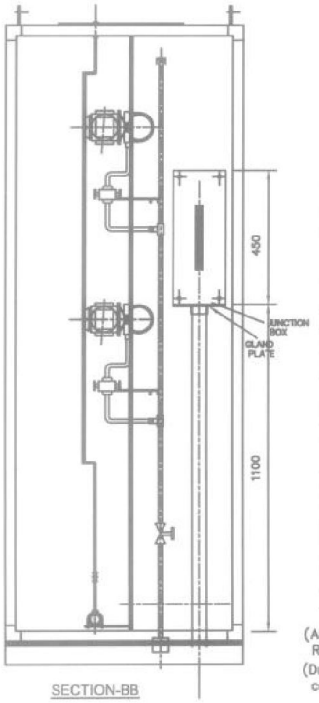
TITLE: INSTRUMENT SOURCE CONNECTION DETAILS

SIZE	SCALE	DRG. NO.	REV. NO.
A4	N.T.S.	0000-999-POI-A-035 Sh–14 Of 14	A





LIE WITH PURGING (TYPICAL)



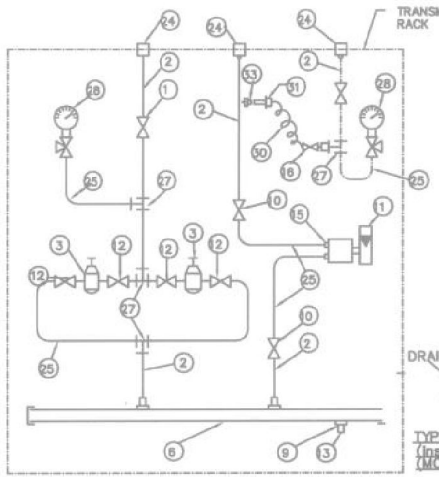
SECTION-BB

LIST OF MATERIALS

ITEM NO.	DESCRIPTION
1.	ISOLATION VALVE(gate/globe). SS.
2.	SEAMLESS SS PIPE.
3.	AIR FILTER REGULATOR.
6.	INST. AIR HEADER SS.
10.	COMP. NEEDLE VALVE SS.
11.	AIR PURGE SET.
12.	COMP VALVE SS.
13.	PLUG SS.
15.	TUBE SS CONNECTOR.
16.	TUBE COMP. EQUAL TEE UNION.
24.	BULKHEAD–SS SUITABLE FOR GI PIPE CONNECTION
25.	SEAMLESS TUBE SS.
27.	BRANCH TEE SS.
28.	PR. GAUGE.
30.	NYLON FLEX. HOSE BRAIDED WITH SS WIRE.
31.	HOSE BARBED CONN. SS.
33.	QUICK DISCONNECT SS (PURGE AIR CONNECTION TO INSTRUMENT SOURCE END).

LIST OF MATERIALS

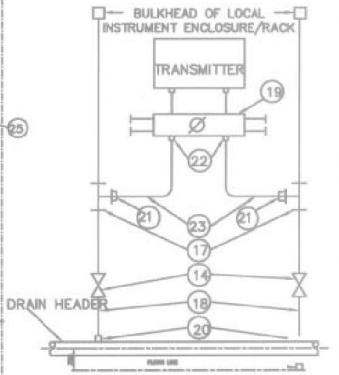
ITEM NO.	DESCRIPTION
14.	SW GLOBE VALVE.
17.	SW EQUAL TEE
18.	S.S. NIPPLE
19.	5 VALVE MANIFOLD
20.	SW HALF COUPLET CS
21.	PIPE x TUBE UNION
22.	SUITABLE ADAPTER
23.	SS TUBE



TYPICAL PURGE AIR CONNECTION INSIDE THE INST. ENCLOSURE

(APPLICABLE FOR MILL, AIR & FLUE GAS SERVICE INSTRUMENTS REQUIRING PURGE AIR)

(Drain Header of each LIE/LIR shall be connected to nearest plant drain)



TYPICAL ARRANGEMENT OF DP TRANSMITTER (Inside LIE/LIR) (MOUNTED BELOW INSTRUMENT SOURCE POINT)

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REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										02.09.11

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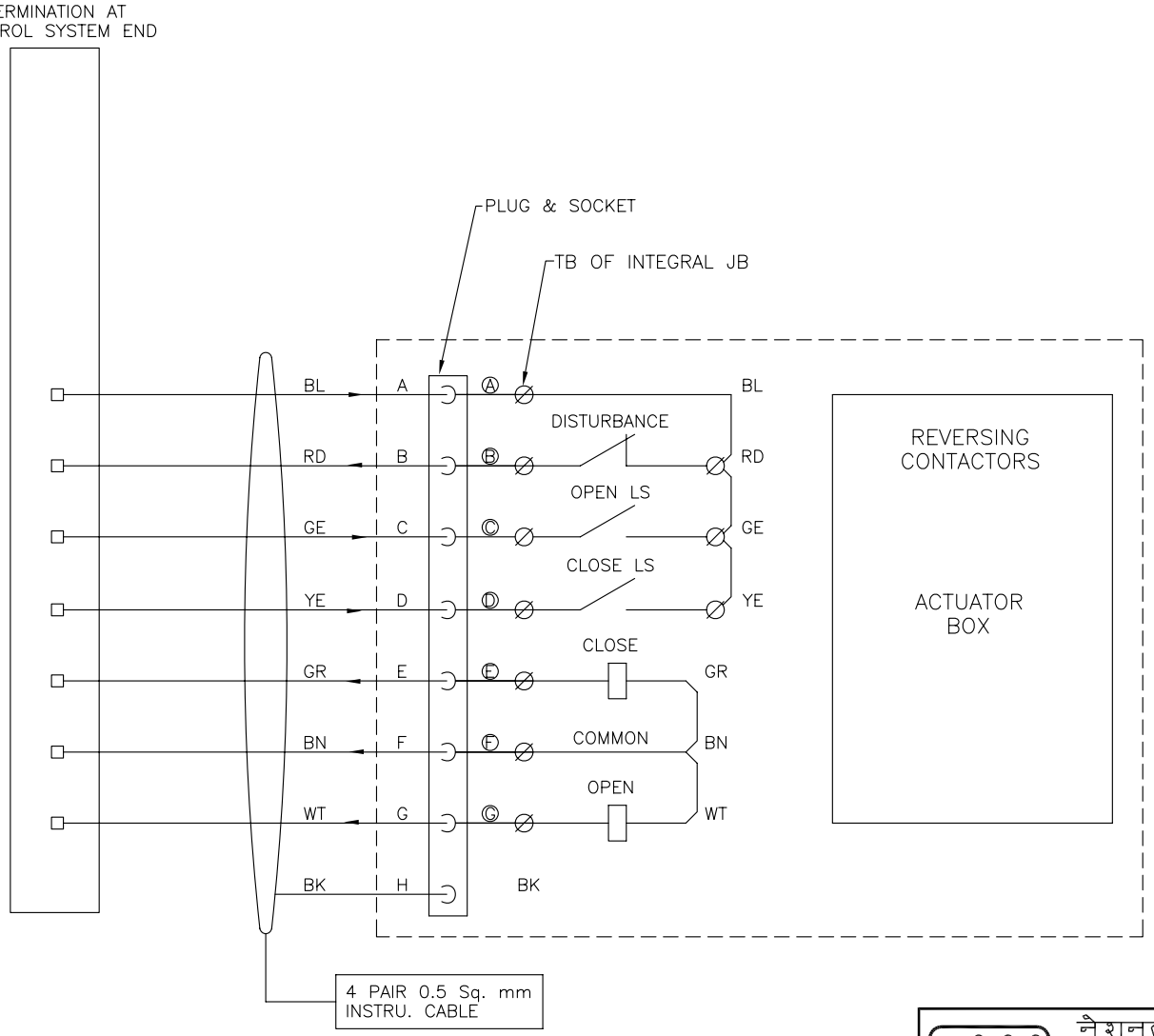
NTPC LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT (TURNKEY EPC PACKAGE)

TITLE: TYPICAL GA OF LOCAL INSTRUMENT ENCLOSURE, PURGING SCHEME, DP TRANSMITTER

SIZE	SCALE	DRG. NO.	REV. NO.
A2	N.T.S.	0000-999-POI-A-036	A



FOR TENDER PURPOSE ONLY

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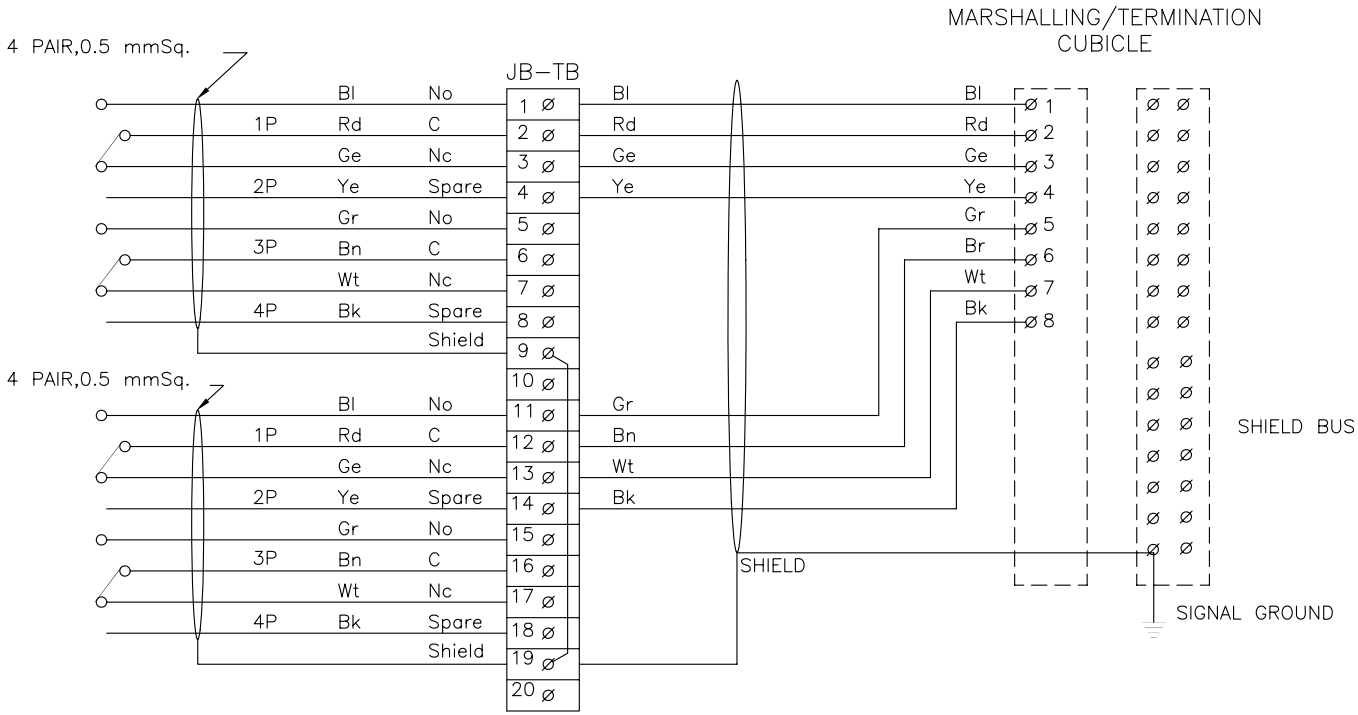
नैशनल थर्मल पावर कारपोरेशन लिमिटेड
National Thermal Power Corporation Ltd.
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF ACTUATORS

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
D	FIRST ISSUE										21.08.12
					CLEARED BY						

SIZE	SCALE	DRG. NO.	REV. NO.
A3	N.T.S.	0000-999-POI-A-063	D



FOR TENDER PURPOSE ONLY

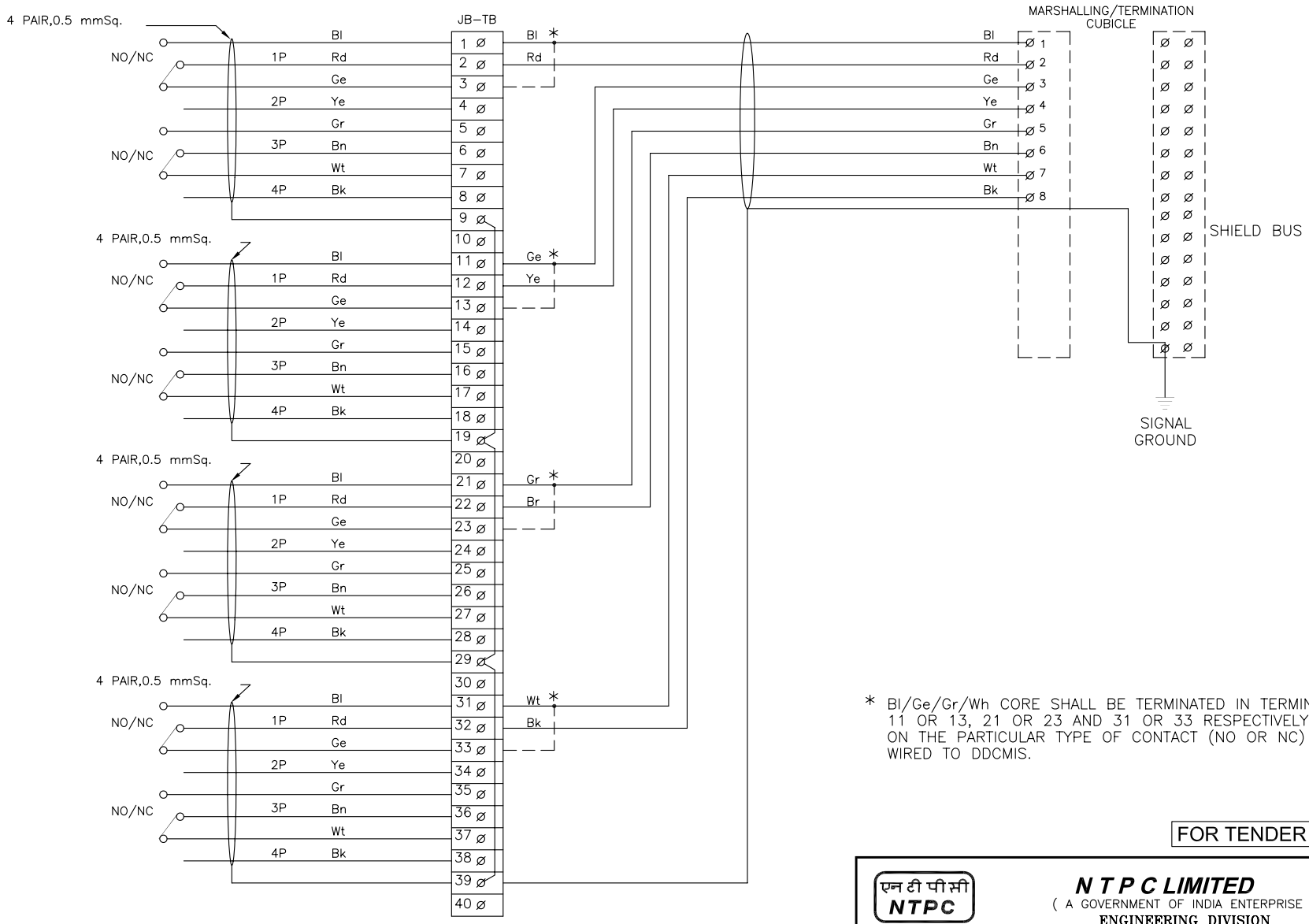
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS/ SWGR SWITCH (COC) TERMINATION DETAILS

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 01 OF 15	A



* Bl/Ge/Gr/Wh CORE SHALL BE TERMINATED IN TERMINAL 1 OR 3, 11 OR 13, 21 OR 23 AND 31 OR 33 RESPECTIVELY DEPENDING ON THE PARTICULAR TYPE OF CONTACT (NO OR NC) IS TO BE WIRED TO DDCMIS.

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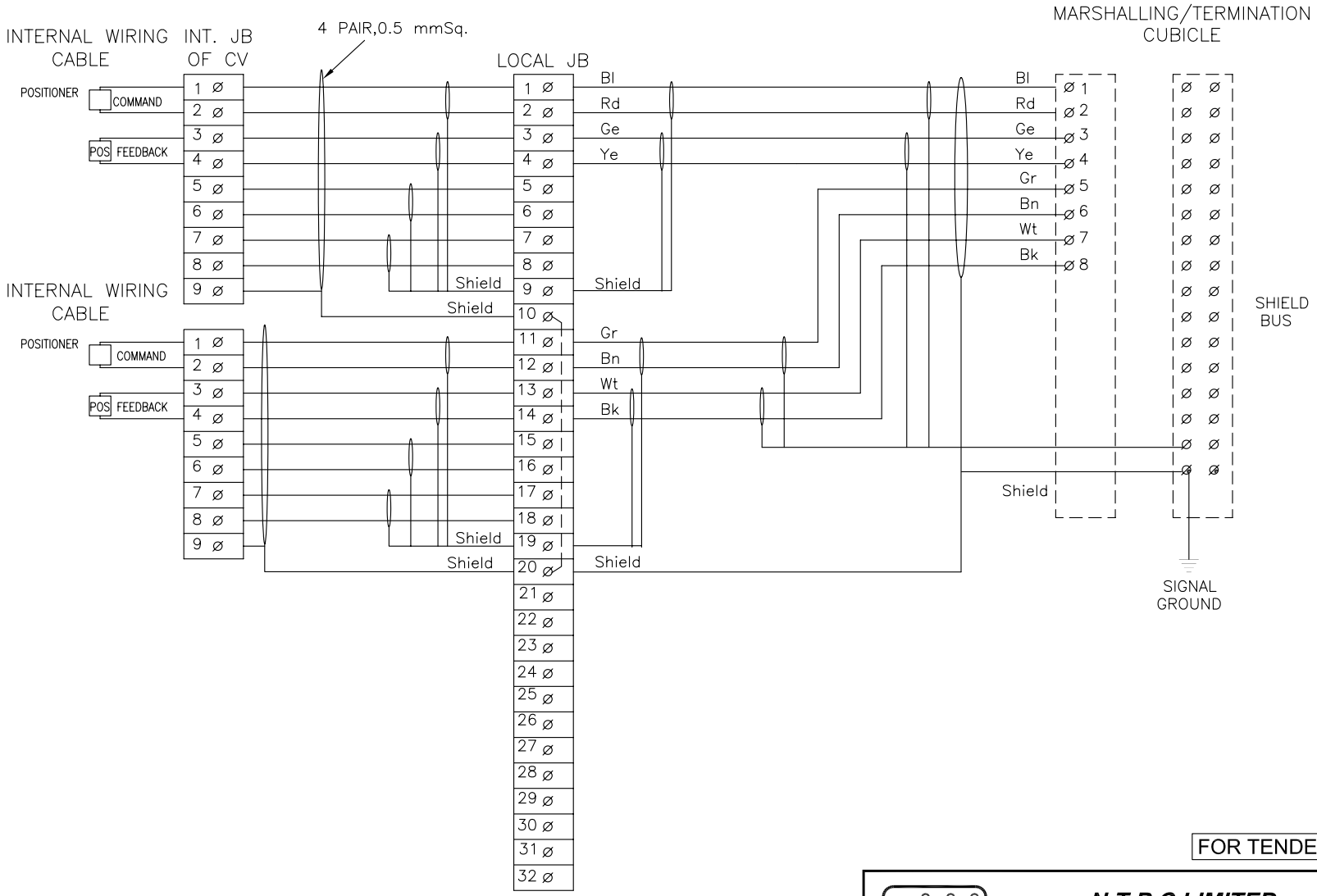
ENGINEERING DIVISION

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
SWITCH TERMINATION DETAILS
NO/NC

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 02 OF 15	A



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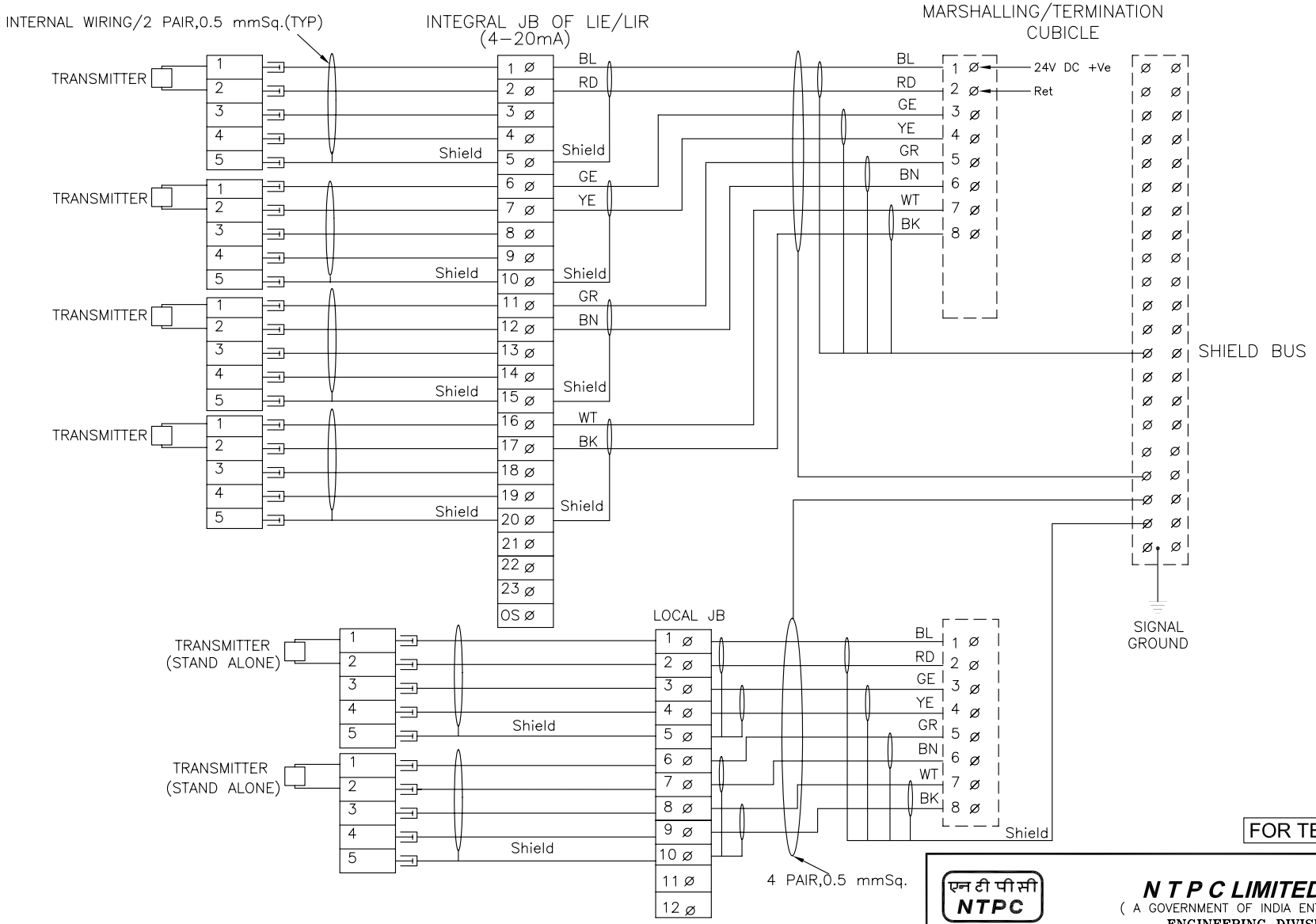
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS CONTROL VALVE

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 03 OF 15	A



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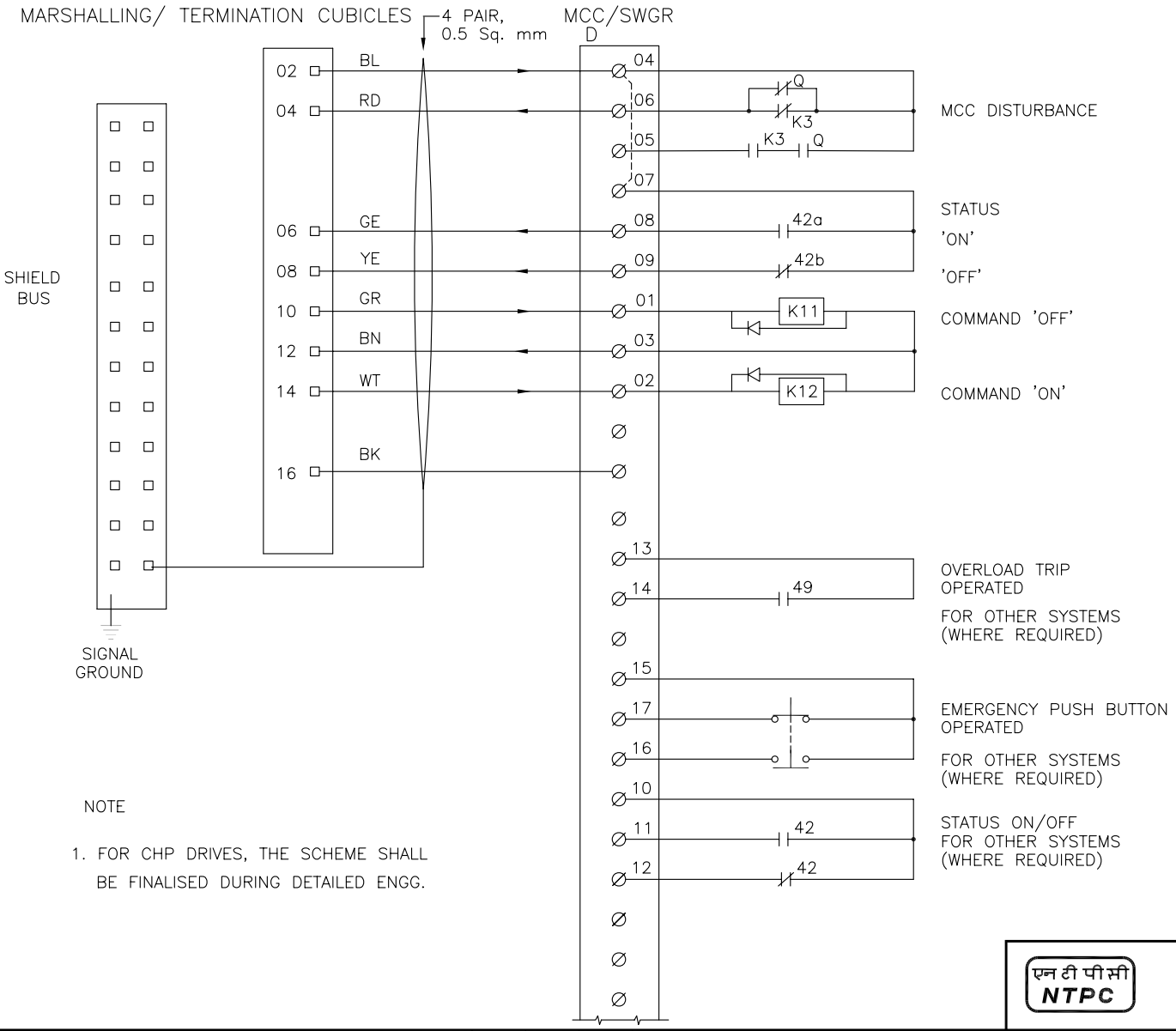
ENGINEERING DIVISION

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
B	INTERNAL WIRING FOR LIE/LIR MOUNTED SHOWN WIRING OF STAND ALONE TXTR SHOWN										21.08.12
A	FIRST ISSUE										12.1.05
					CLEARED BY						

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
4-20mA

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 04 OF 15	B



NOTE

1. FOR CHP DRIVES, THE SCHEME SHALL BE FINALISED DURING DETAILED ENGG.

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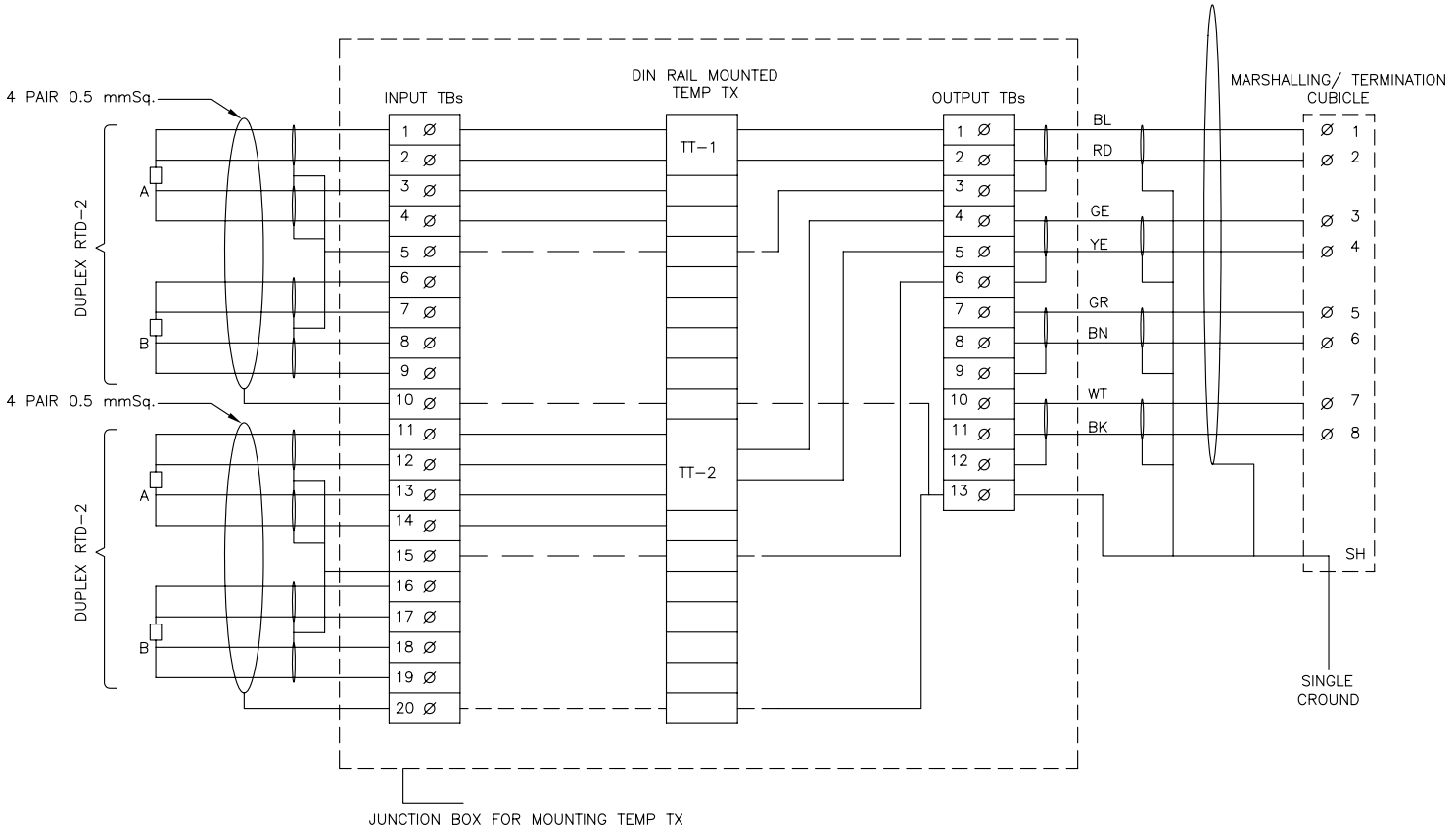
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR
(LT MOTORS)

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 05 OF 15	A



NOTE :– 1) ABOVE IS THE TYP. DRG. MOUNTED TEMP TRANSMITTER FRO T/C APPLICATION. EXACT TYPE OF TEMP TRANMITTERS SHALL BE AS PER PART–A OF SPECIFICATION.

2) THE EXACT GROUPING OF TEMP TXs SHALL BE FINISHED DURING DERAILED ENGG. STAGE.

3) PLEASE NOTE THAT THIS CONFIGURATION IS SHOWN FOR SINGLE INPUT DIN MOUNTED TT. FOR DUAL INPUT TT BOTH THE ELEMENTS OF RTD SHALL BE CONNECTED TO TT THROUGH INPUT TBs.

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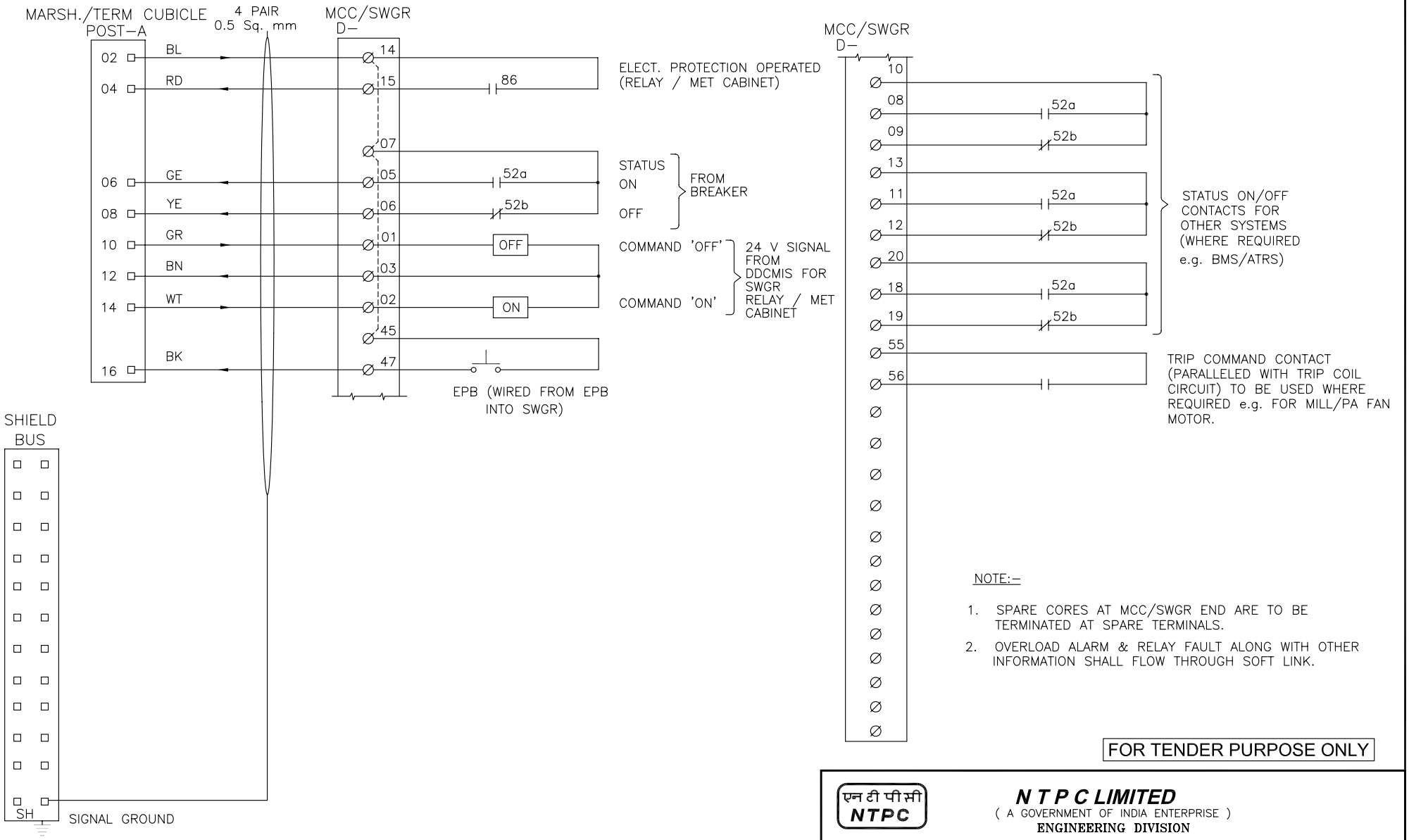
ENGINEERING DIVISION

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
TYPICAL RTD CONNECTION WITH TEMP TRANSMITTERS IN JBs

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 06 OF 15	A



NOTE:–

1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. OVERLOAD ALARM & RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

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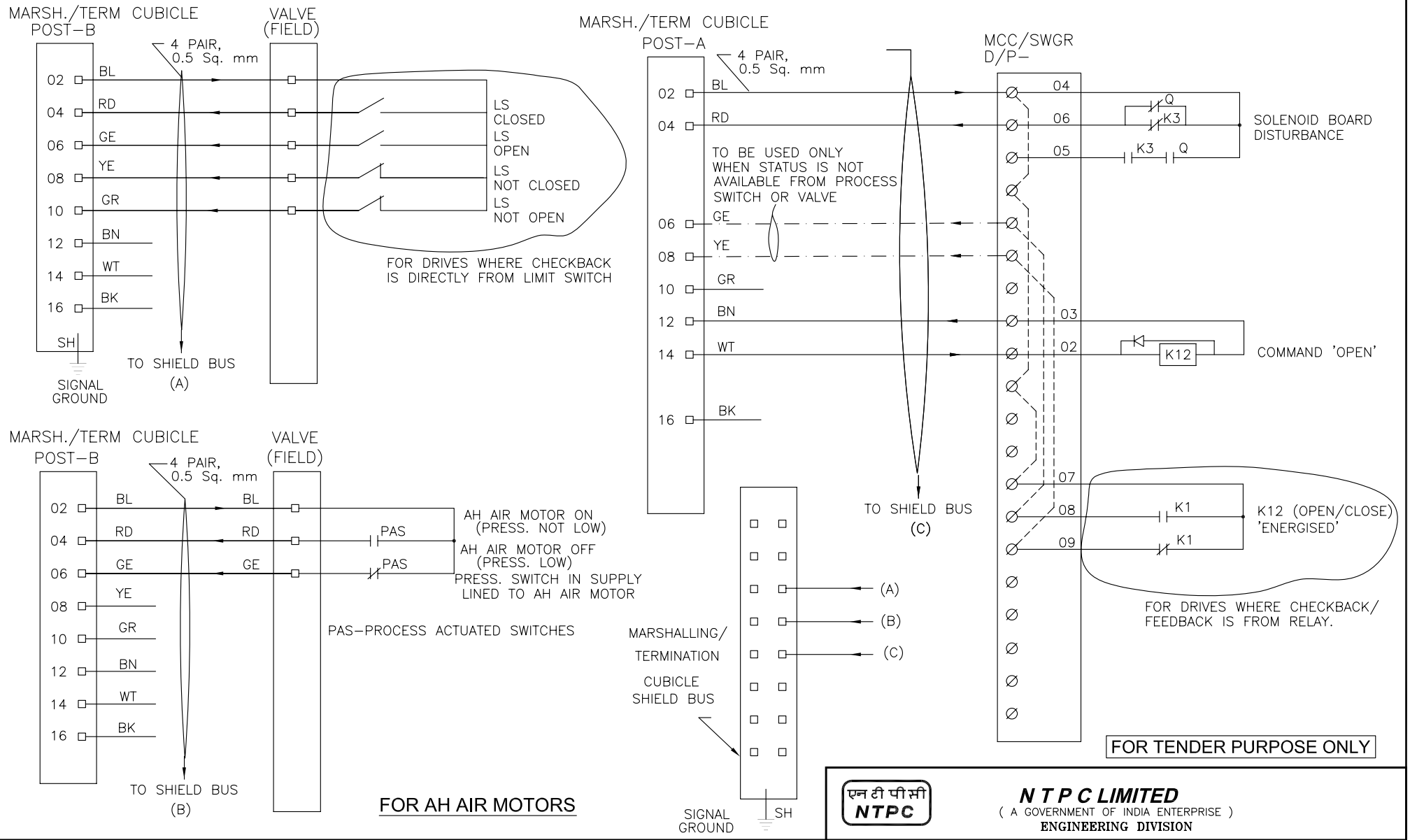
REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR
(HT MOTORS)

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 07 OF 15	B



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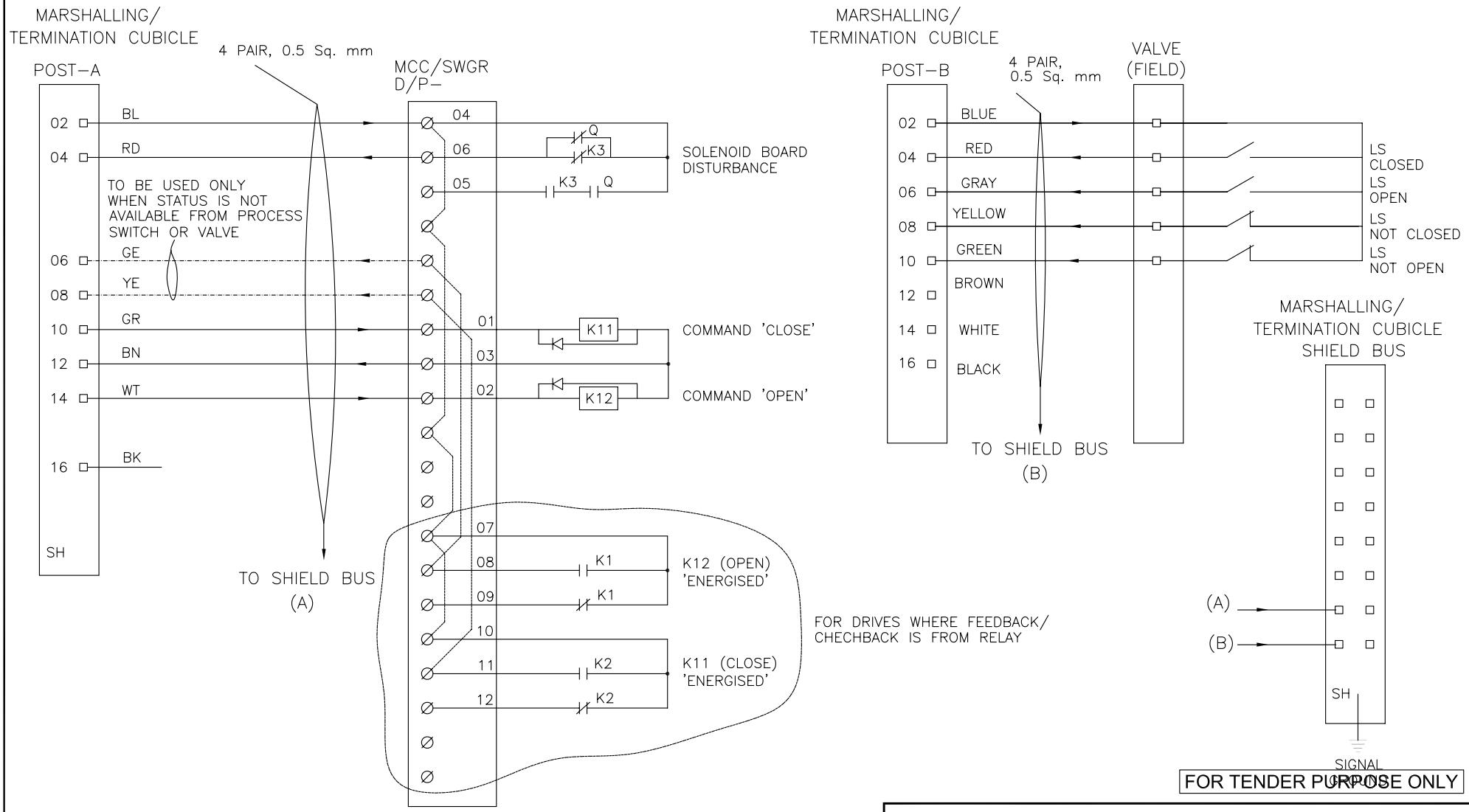
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR
(SINGLE COIL SOLENOID)

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 08 OF 15	A



FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

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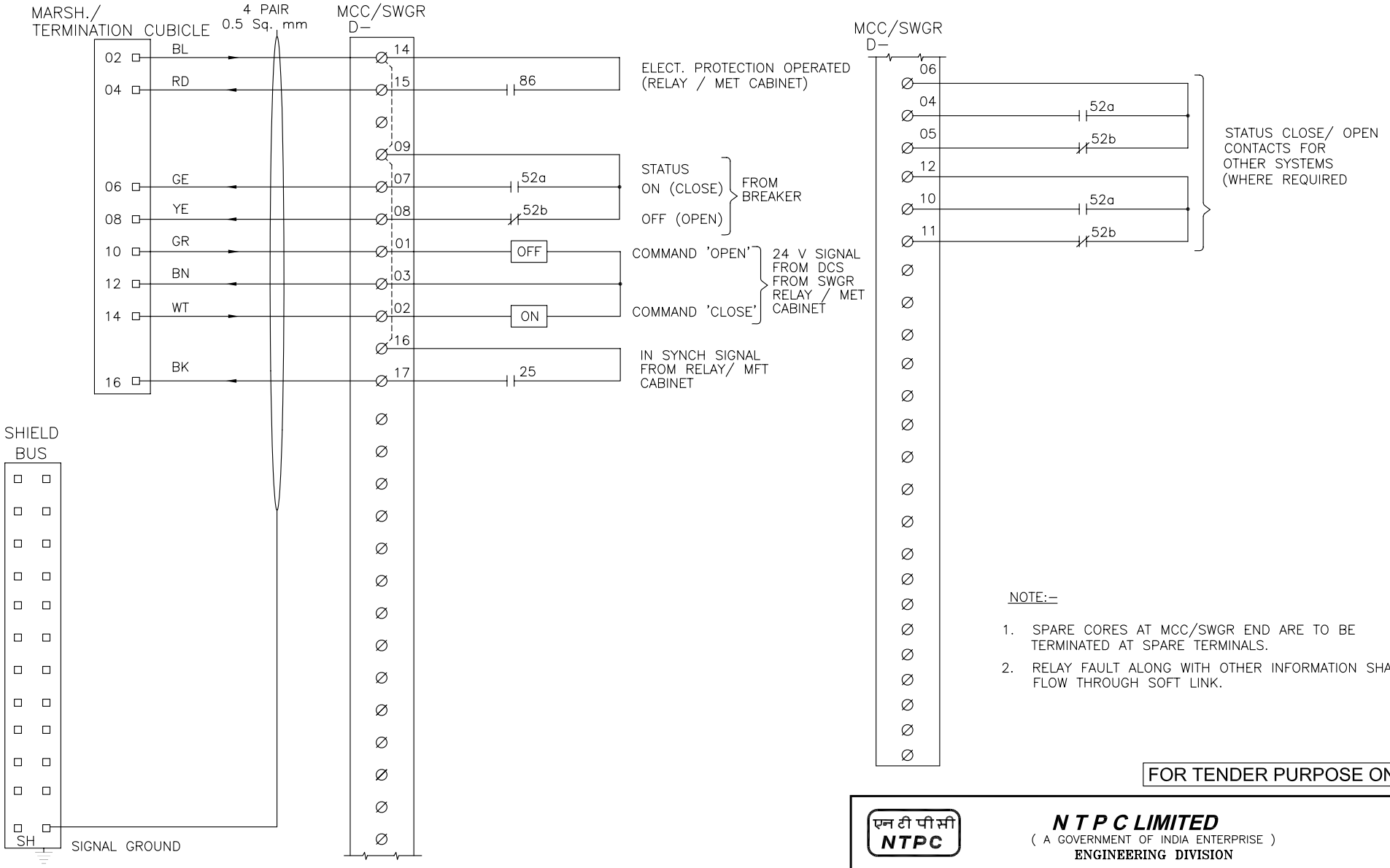
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS/PLC WITH MCC/SWGR/ACTUATOR
(DOUBLE COIL SOLENOIDS)

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065	A

SH 09 OF 15



NOTE:–

1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

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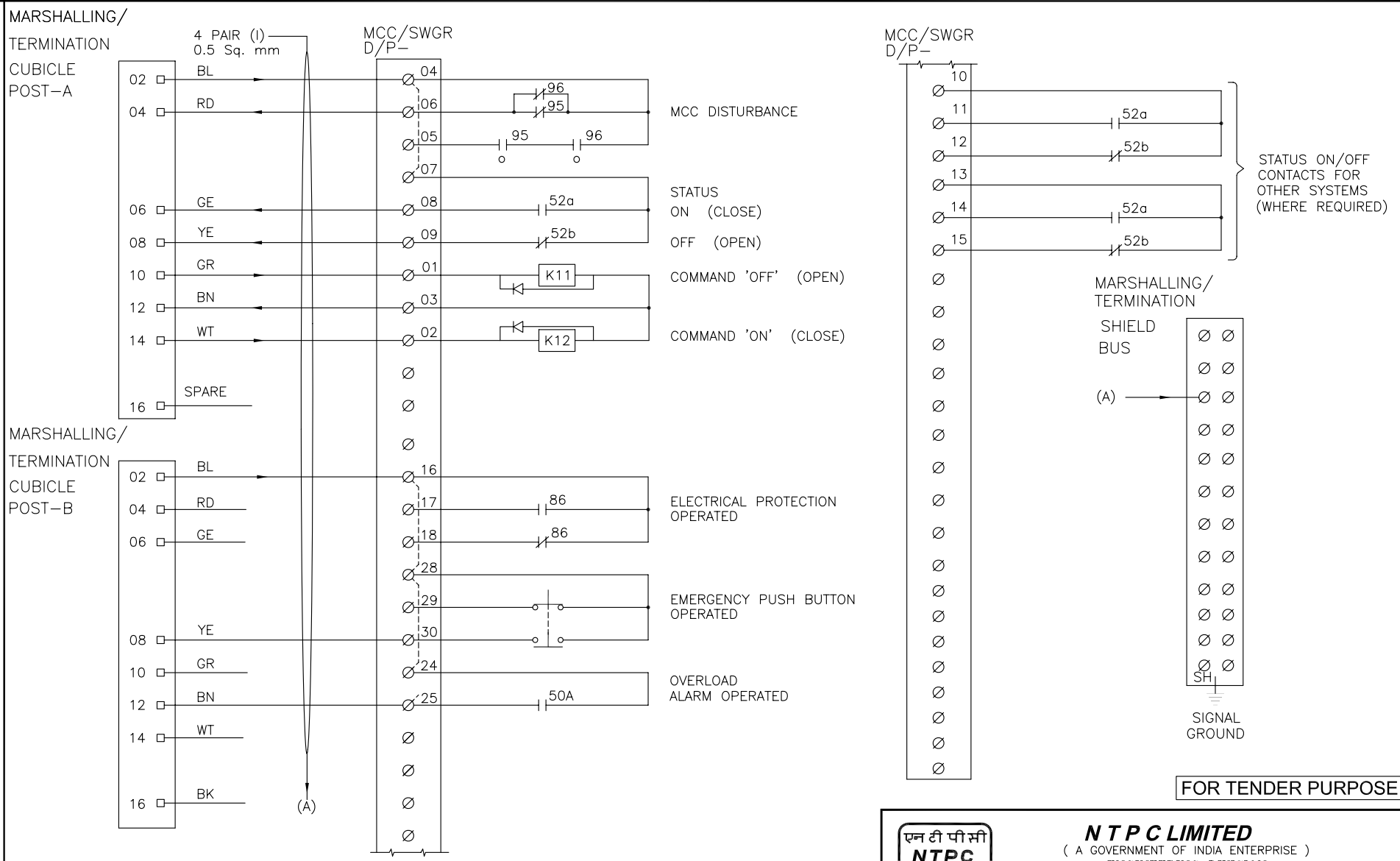
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR
(ELECT. BKR. SYNC.-LT)

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 10 OF 15	B



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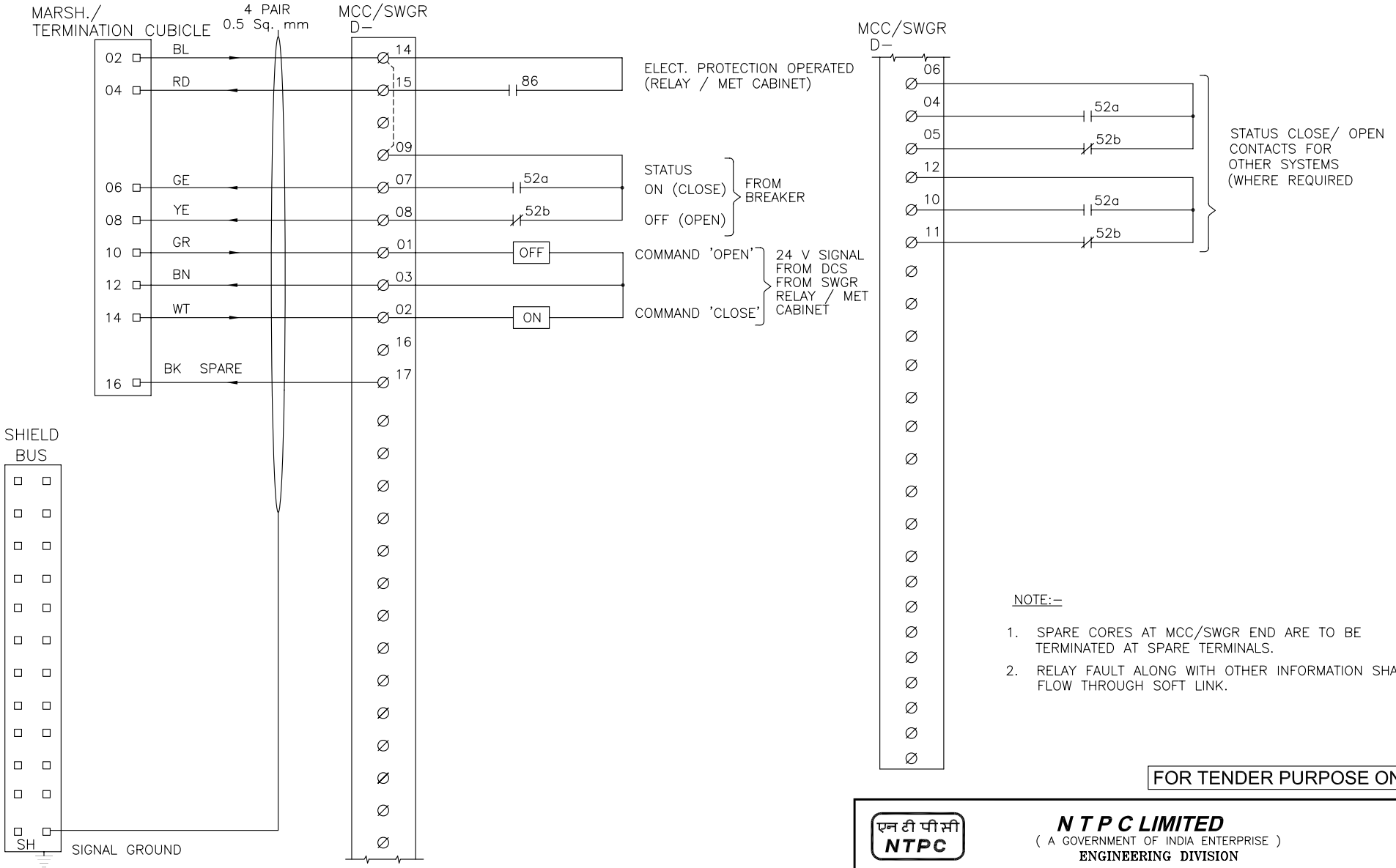
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR
(LT-A)

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12
					CLEARED BY						

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-405-POI-A-065 SH 11 OF 15	A



NOTE:–

1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12

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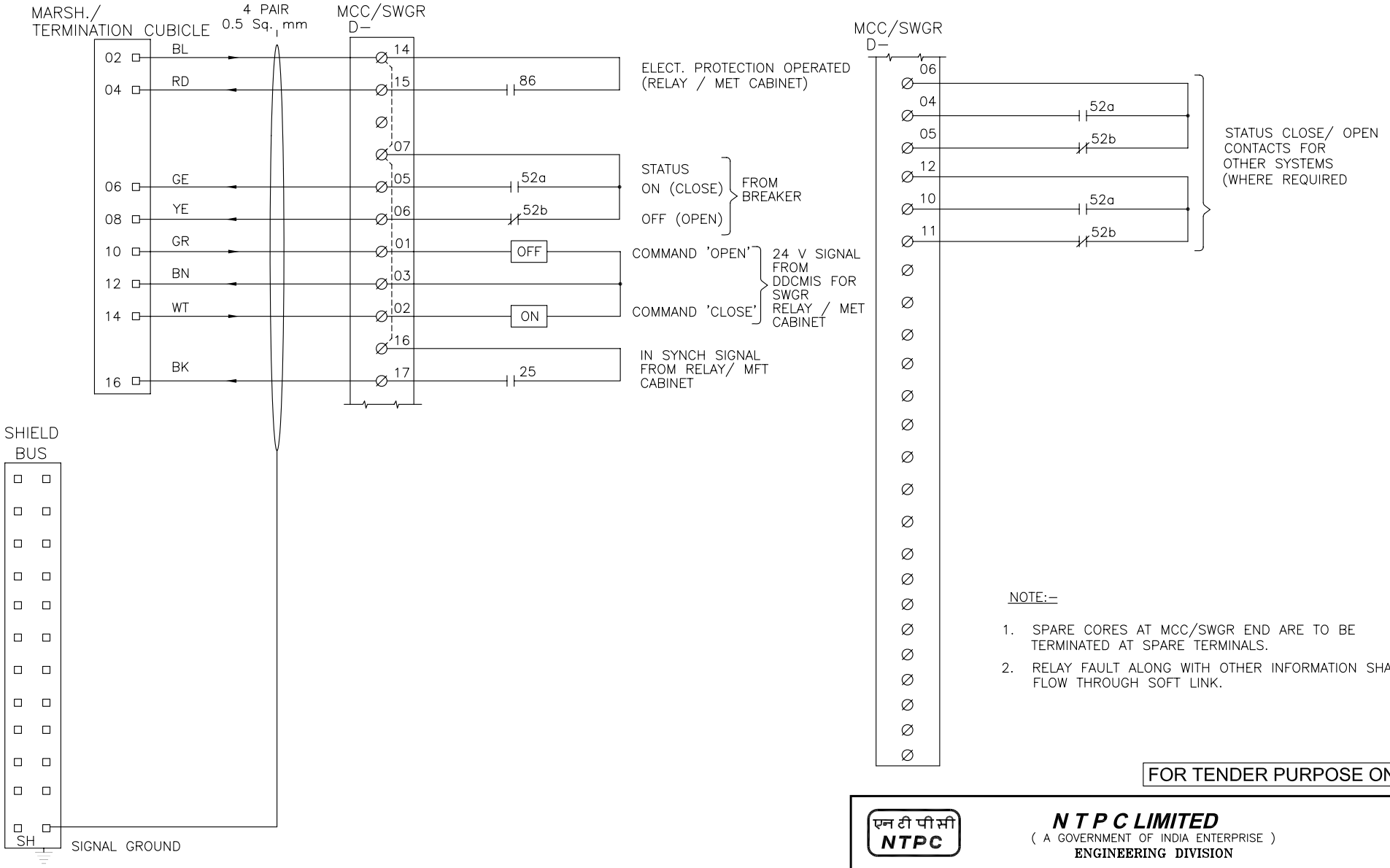
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR
(ELECT. BKR. SYNC-LT)

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 12 OF 15	B



NOTE:–

1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12

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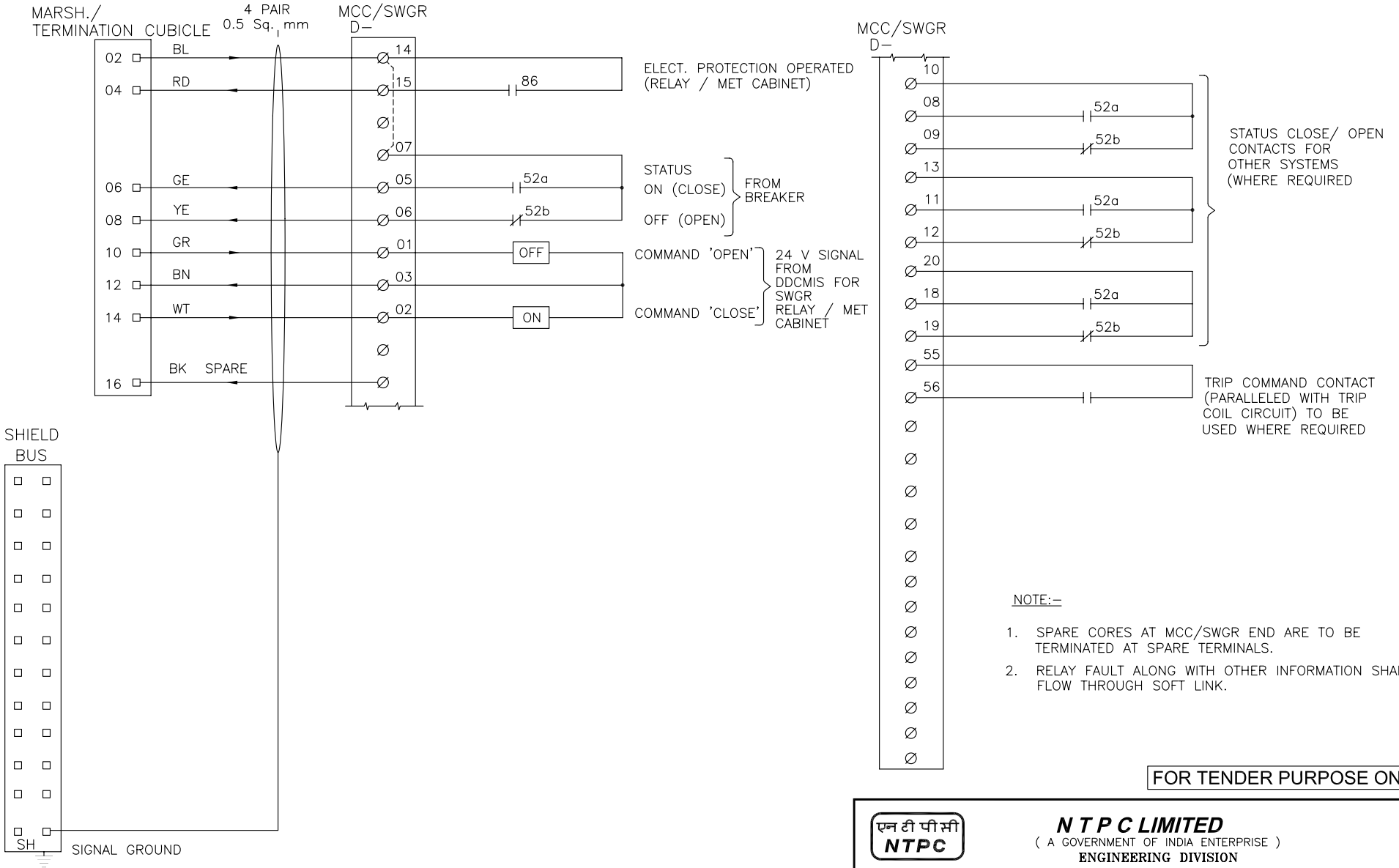
N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR
(Elect. Brkr.- Sync.-HT)

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 13 OF 15	B



NOTE:–

1. SPARE CORES AT MCC/SWGR END ARE TO BE TERMINATED AT SPARE TERMINALS.
2. RELAY FAULT ALONG WITH OTHER INFORMATION SHALL FLOW THROUGH SOFT LINK.

FOR TENDER PURPOSE ONLY

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N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

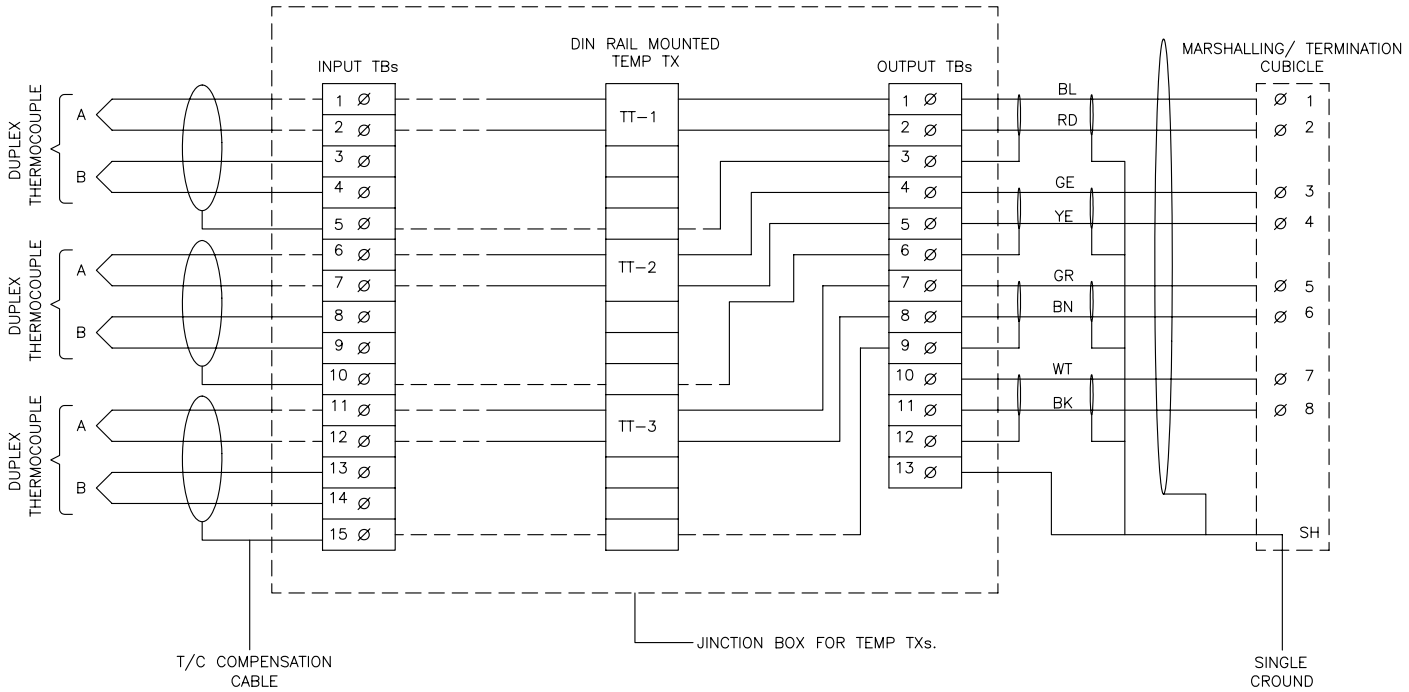
PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
INTERFACE OF DDCMIS WITH MCC/SWGR/ACTUATOR
(Elect. Brkr.- Non Sync.-HT)

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
A	FIRST ISSUE										21.08.12

CLEARED BY

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 14 OF 15	B



NOTE :– 1) ABOVE IS THE TYP. DRG. MOUNTED TEMP TRANSMITTER FRO T/C APPLICATION. EXACT TYPE OF TEMP TRANMITTERS SHALL BE AS PER PART–A OF SPECIFICATION.

2) THE EXACT GROUPING OF TEMP TXs SHALL BE FINISHED DURING DERAILED ENGG. STAGE.

3) AFTER GLADDING OF T/C CABLES ON JB. THE CABLE PAIR OF FIRST ELEMENT WILL BE DIRECTLY CONNECTED TO TT AND THE CABLE PAIR OF SECOND ELEMENT SHALL BE WIRED TO INPUT TBs FOR FUTURE USE.

4) PLEASE NOTE THAT THIS CONFIGURATION IS SHOWN FOR SINGLE INPUT DIN RAIL MOUNTED TT. FOR DUAL INPUT TT BOTH THE ELEMENT OF T/C SHALL BE CONNECTED DIRECTLY TO TT WITHOUT INPUT TBs. HOWEVER 5 NOS OF INPUTS TBs ARE TO PROVIDED FOR EACH T/C FOR FUTURE USE.

FOR TENDER PURPOSE ONLY

REV.NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C&I	ARCH.	APPD	DATE
B	CABLING OF 2ND RTD CHANGED TO MATCH COLOR CODE										21.08.12
A	FIRST ISSUE										29.04.06
					CLEARED BY						

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N T P C LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
ENGINEERING DIVISION

PROJECT: TYPICAL THERMAL POWER PROJECT

TITLE: INTERFACING OF FIELD INSTRUMENTS
TYPICAL T/C CONNECTION WITH TEMP TXs IN JBs

SIZE	SCALE	DRG. NO.	REV. NO.
A3	NTS	0000-999-POI-A-065 SH 15 OF 15	B