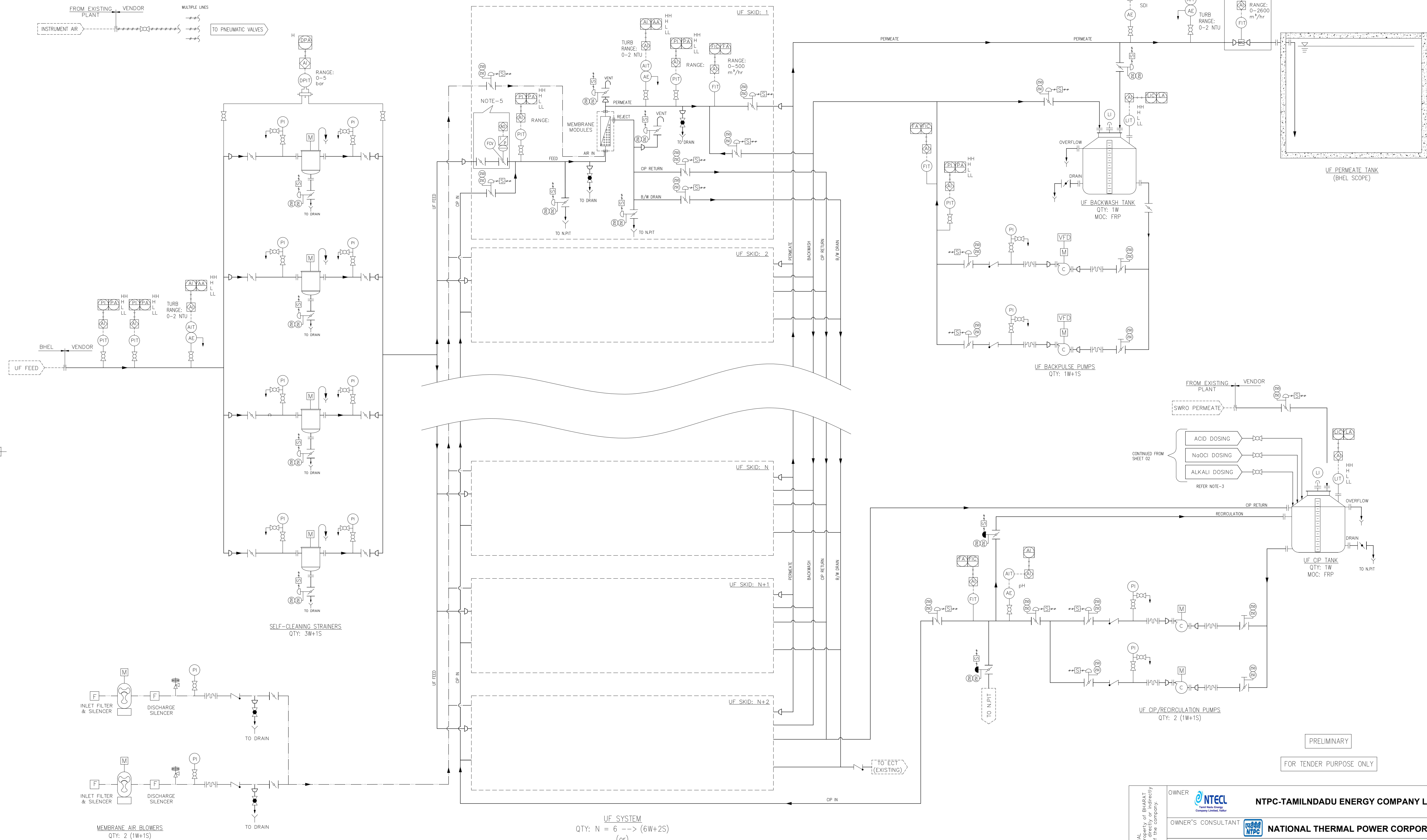


DRAWING NO. 1-WT-220-01030 [SHEET 01 OF 02]

ALL DIMENSIONS ARE IN MILLIMETRES

ADDITIONAL 1 SET OF THIS FLOW
INDICATOR & FITTINGS SHALL BE
PROVIDED AS LOOSE SUPPLY BY THE
BIDDER



NOTES:

1. EQUIPMENT, PIPING, VALVES, INSTRUMENTS AND THEIR QUANTITIES INDICATED IN THIS P&ID ARE TENTATIVE AND MINIMUM REQUIREMENT. HOWEVER, VENDOR TO FULFILL THE TENDER SPECIFICATION & PROCESS REQUIREMENTS.
2. ALL DRAINS / OVERFLOWS / VENTS ARE TO BE TERMINATED BY THE VENDOR IN THE NEAREST TRENCH LEADING TO N-PIT.
3. BIDDER SHALL SPECIFY THE CHEMICAL CLEANING REQUIREMENTS. THE BULK & DOSING CHEMICAL SYSTEMS SHOWN ARE INDICATIVE ONLY. BIDDER SHALL SUITABLY DECIDE & SUBMIT SUITABLE BULK & DOSING SYSTEMS FOR THEIR PROCESS.
4. SPECIAL CABLES (IF ANY) FOR INSTRUMENTS SHALL BE IN THE VENDOR'S SCOPE.
5. ONE SET OF ADDITIONAL VALVES (1 NO OF MANUAL BFV + 1 NO OF FCV WITH SMART POSITIONER) SHALL BE INCLUDED IN THE SCOPE OF THE BIDDER AS LOOSE SUPPLY.

UF SYSTEM

QTY: $N = 6 \rightarrow (6W + 2S)$

(or)

$$N = 8 \rightarrow (8W + 2S)$$

PRELIMINAR

FOR TENDER PURPOSE ONLY

REV	DATE	ALTERED:
		CHECKED:
ZONE		

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OWNER

 **NTECL**
Tamil Nadu Energy
Company Limited, Vellore

NTPC-TAMILNDADU ENERGY COMPANY LTD.

OWNER'S CONSULT

NATIONAL THERMAL POWER CORPORATION

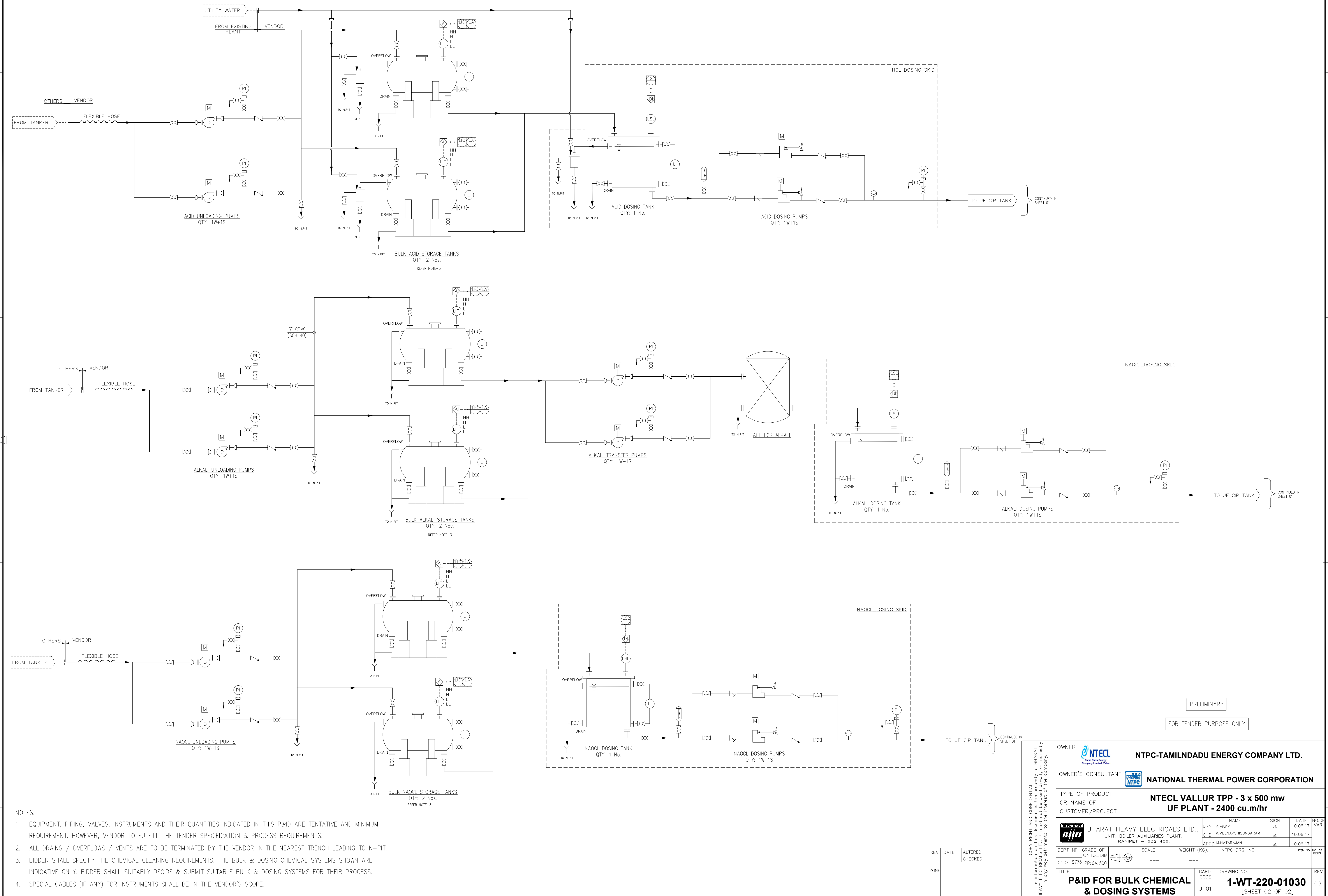
TYPE OF PRODUCT

NTECI VALIUR TPP - 3 x 500 mw

OR NAME OF

LIE PLANT - 2400 cu m/hr

		BHARAT HEAVY ELECTRICALS LTD., UNIT: BOILER AUXILIARIES PLANT, RAIPET - 532 406.		DRN	NAME	SIGN	NO. VISA
				SRV	S.VIVEK	sd	10.06.17
				CHD	K.MENAKSHISUNDARAM	sd	10.06.17
				APPD	M.NATARAJAN	sd	10.06.17
DEPT NP	GRADE OF UNTOLODIM		SCALE	WEIGHT (KG.)	NTPC DRG. NO:		ITEM NO.
CODE: 9776	PR: 04:500		---	---			
TITLE				CARD CODE	DRAWING NO.		RE
P & ID FOR UF SYSTEM				U 01	1-WT-220-01030 [SHEET 01 OF 02]		CO



NOTES:

1. EQUIPMENT, PIPING, VALVES, INSTRUMENTS AND THEIR QUANTITIES INDICATED IN THIS P&ID ARE TENTATIVE AND MINIMUM REQUIREMENT. HOWEVER, VENDOR TO FULFILL THE TENDER SPECIFICATION & PROCESS REQUIREMENTS.
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4. SPECIAL CABLES (IF ANY) FOR INSTRUMENTS SHALL BE IN THE VENDOR'S SCOPE.

2. ALL DRAINS / OVERFLOWS / VENTS ARE TO BE TERMINATED BY THE VENDOR IN THE NEAREST TRENCH LEADING TO N-PIT.

3. BIDDER SHALL SPECIFY THE CHEMICAL CLEANING REQUIREMENTS. THE BULK & DOSING CHEMICAL SYSTEMS SHOWN ARE INDICATIVE ONLY. BIDDER SHALL SUITABLY DECIDE & SUBMIT SUITABLE BULK & DOSING SYSTEMS FOR THEIR PROCESS.

4. SPECIAL CABLES (IF ANY) FOR INSTRUMENTS SHALL BE IN THE VENDOR'S SCOPE

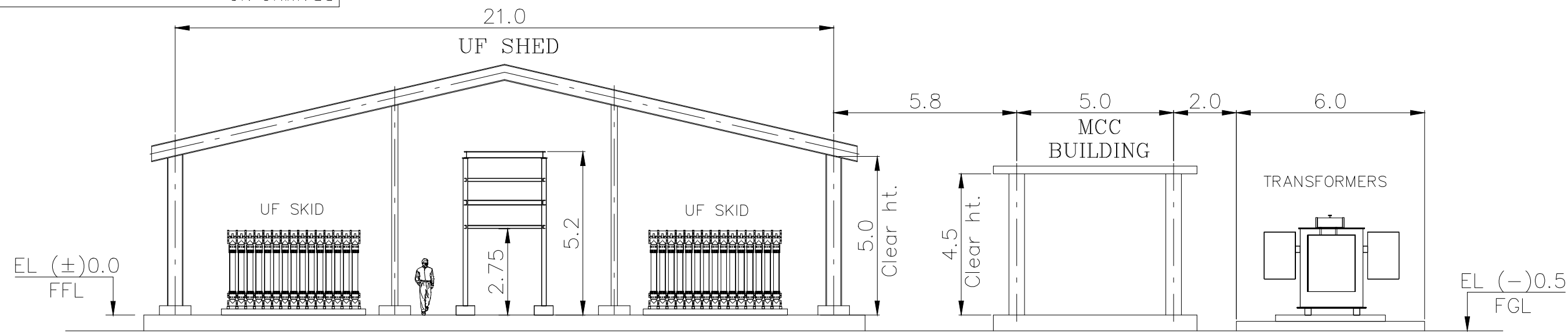
PRELIMINARY

FOR TENDER PURPOSE ONLY

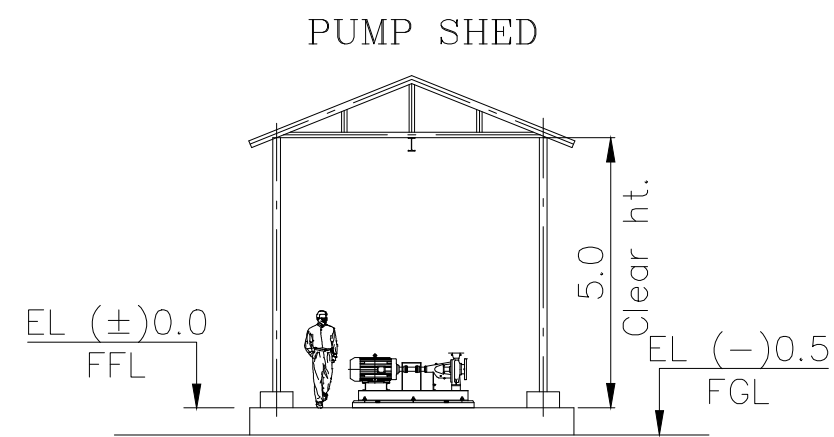
COPY RIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS and must not be disclosed in any way detrimental to the interest of the company.	OWNER  TAMIL NADU ENERGY COMPANY LIMITED	NTPC-TAMILNADU ENERGY COMPANY LTD.				
	OWNER'S CONSULTANT 	NATIONAL THERMAL POWER CORPORATION				
	TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	NTECL VALLUR TPP - 3 x 500 mw UF PLANT - 2400 cu.m/hr				
	 BHARAT HEAVY ELECTRICALS LTD., UNIT: BOILER AUXILIARIES PLANT, RANIPET - 632 406.		DRN SHD APPD	NAME S.VIVEK K.MEDANAKUSHUNDARAM M.NATARAJAN	SIGN 	DATE 10.06.17 10.06.17 10.06.17
DEPT NO CARD NO. 9776	GRADE OF UNTOOLDIM PR:QA:500		SCALE ---	WEIGHT (KG). ---	NTPC DRG. NO.:	REV NO. 00
TITLE P&ID FOR BULK CHEMICALS & DOSING SYSTEMS		CARD CODE U 01	DRAWING NO. 1-WT-220-01030 [SHEET 02 OF 02]			REV 00

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	 SCALE ---				CHD	K. MEENAKSHUNDARAM		10.06.17			
					APPD	M. NATARAJAN		10.06.17			
					DEPT NP GRADE OF UNLINTOLN CODE 9776 PR: QA: 500				NTPC DRG. NO:	ITEM NO.	NO. OF SHEET
					TITLE P&ID FOR BULK CHEMICAL & DOSING SYSTEMS				CARD CODE U 01	DRAWING NO. 1-WT-220-01030 [SHEET 02 OF 02]	

1-WT-220-01032
DRAWING NO.



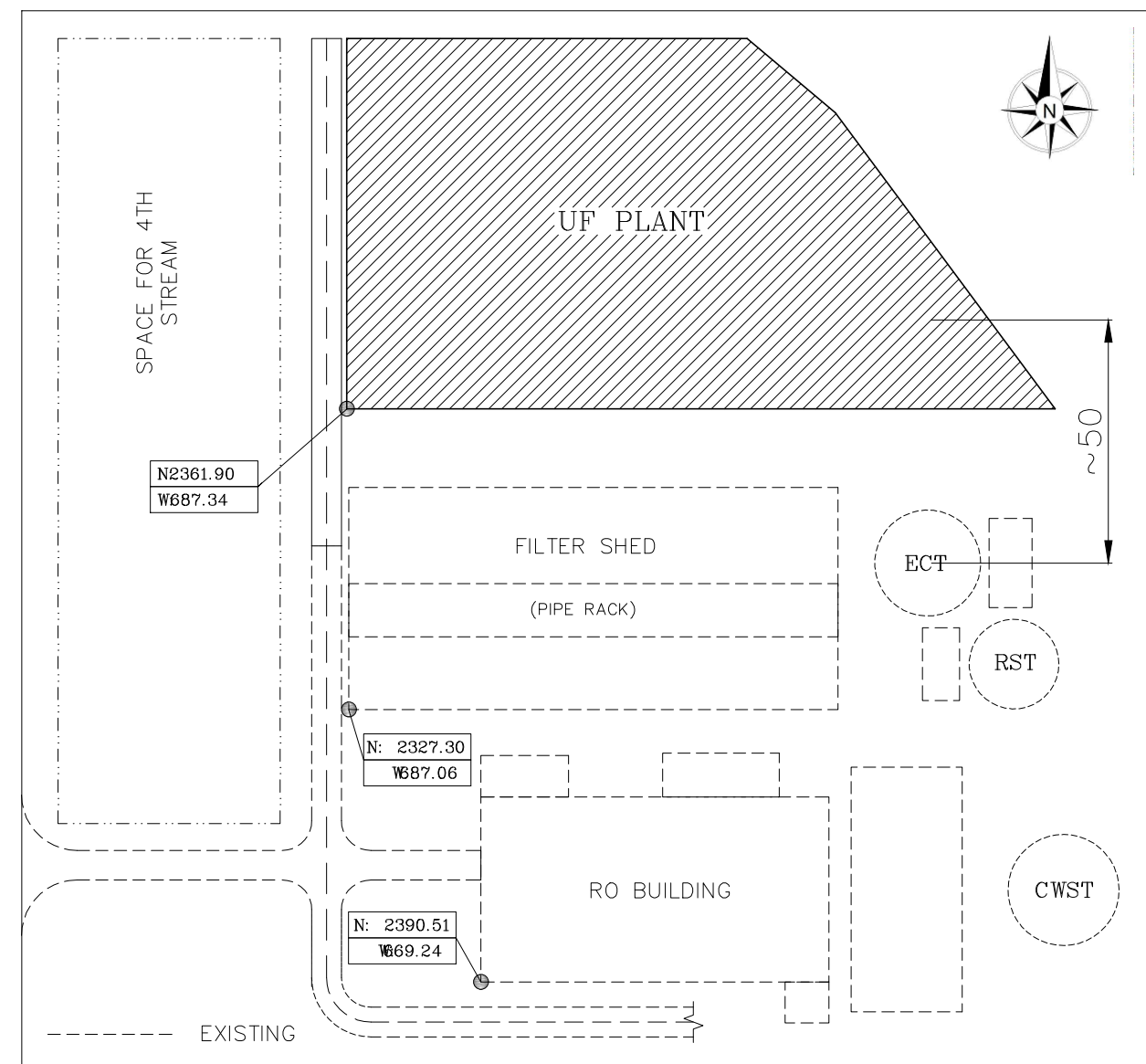
SECTION A-A



SECTION B-B

LEGEND:

- PIPE/CABLE RACK
- ACID / ALKALI RESISTANT TILED AREA
- PLINTH PROTECTION



KEY PLAN

NOTES:

- ALL DIMENSIONS, CO-ORDINATES, ELEVATIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
- UF PLANT AREA FGL IS (-)0.5 M WHICH CORRESPONDS TO RL (+)4.1 M AND THE BUILDINGS/SHED FFL IS (±)0.0 M WHICH CORRESPONDS TO RL (+) 4.6 M.
- EQUIPMENT SIZES, QUANTITY & LOCATION INDICATED ARE TENTATIVE.
- THIS LAYOUT IS FOR REFERENCE ONLY. BIDDER SHALL ENSURE THAT ALL THE EQUIPMENT (MORE SPECIFICALLY UF SKIDS, PUMPS, ETC.) ARE PLACED WITHIN THE ALLOTTED BUILDING SIZES WITH ADEQUATE SPACE FOR MOVEMENT. NO ADDITIONAL SPACE WILL BE PROVIDED.
- DIMENSIONS OF THE BUILDING & TANKS ARE CLEAR INSIDE / COLUMN C C TO C C DIMENSIONS ONLY.

PRELIMINARY

FOR INDENT PURPOSE ONLY

PLAN LAYOUT - PLAN

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OWNER 		NTPC-TAMILNDADU ENERGY COMPANY LTD.			
OWNER'S CONSULTANT 		NATIONAL THERMAL POWER CORPORATION			
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT		NTECL VALLUR TPP - 3 x 500 mw UF PLANT - 2400 cu.m/hr			
		DRN S.VIVEK	SIGN sd.	DATE 10.06.17	NO.OF VAR.
UNIT: BOILER AUXILIARIES PLANT, RANIPET - 632 406.		CHD G.RAJENDIRAN	sd.	10.06.17	
APPD M.NATARAJAN		sd.	10.06.17		
DEPT NP	GRADE OF UNTOL.DIM	SCALE	WEIGHT (KG).	REF. TO ASSY/OLD DRG.	ITEM NO. NO. OF ITEMS
CODE 9776	PR: QA:500	---	---		
TITLE PLANT EQUIPMENT LAYOUT		CARD CODE U 01	DRAWING NO. 1-WT-220-01032		REV 00

REV	DATE	ALTERED: CHECKED:
ZONE		

1	2	3	4	5	6	7	8	9	10	11	12																																																																																							
99600-022-LM-1						ALL DIMENSIONS ARE IN MILLIMETRES																																																																																												
<table><tr><th>VALVES & FITTINGS</th><th>ACCESSORIES</th><th>LINES</th><th>EQUIPMENT</th><th>EQUIPMENT (CONTD.)</th><td rowspan="12"> BCV – BRINE CONTROL VALVE FCV – FLOW CONTROL VALVE BBV – BCV BYPASS VALVE NO-DA – NORMALLY OPEN DOUBLE ACTING. NC-DA – NORMALLY CLOSE DOUBLE ACTING. NO-SA – NORMALLY OPEN SINGLE ACTING. NC-SA – NORMALLY CLOSE SINGLE ACTING. INSTRUMENT IDENTIFICATION AR – ANALYTICAL RECORDER L – ALARM LOW LL – ALARM LOW LOW TW – THERMO WELL TI – TEMPERATURE INDICATOR PI – PRESSURE INDICATOR PIT – PRESSURE INDICATING TRANSMITTER AE – ANALYZER ELEMENT AIT – ANALYZER INDICATING TRANSMITTER AI – ANALYSER INDICATOR AA – ANALYSER ALARM FE – FLOW ELEMENT FIT – FLOW INDICATING TRANSMITTER FIQ – FLOW INDICATING TOTALISER DPI – DIFFERENTIAL PRESSURE INDICATOR DPS – DIFFERENTIAL PRESSURE SWITCH DPIT – DIFFERENTIAL PRESSURE INDICATING TRANSMITTER DPA – DIFFERENTIAL PRESSURE ALARM LS – LEVEL SWITCH LI – LEVEL INDICATOR LIT – LEVEL INDICATING TRANSMITTER LA – LEVEL ALARM PA – PRESSURE ALARM TA – TEMPERATURE ALARM DI – DENSITY INDICATOR FS – FLOW SWITCH FA – FLOW ALARM W – WORKING S – STAND BY S – SAMPLE </td></tr><tr><td> NEEDLE VALVE</td><td> PULSATION DAMPENER</td><td> FLOW LINE</td><td> CENTRIFUGAL PUMP (HORIZONTAL)</td><td> CALIBRATION COLUMN</td></tr><tr><td> GLOBE VALVE</td><td> MOTOR DRIVEN MIXER</td><td> EXISTING LINE</td><td> CENTRIFUGAL PUMP (VERTICAL)</td><td> FUME ABSORBER</td></tr><tr><td> BALL VALVE</td><td> MANUAL MIXER</td><td> INSTRUMENT AIR LINE</td><td> SUBMERSSIBLE PUMP</td><td rowspan="2">INSTRUMENTS</td></tr><tr><td> BALL CHECK VALVE</td><td> DRAIN TO WASTE</td><td> AIR LINE</td><td> SELF CLEANING STRAINER</td></tr><tr><td> BUTTERFLY VALVE</td><td> VENT</td><td> DRAIN LINE TO NEUTRALISING PIT</td><td> CHEMICAL DOSING PUMP</td><td> LOCAL INSTRUMENT INCLUDING TRANSMITTER FOR SINGLE MEASURED VARIABLE</td></tr><tr><td> CHECK VALVE</td><td> MOTOR OPERATED</td><td> ACID LINE</td><td> CHEMICAL DOSING PUMP</td><td> RO – DM PLC PANEL DISPLAY</td></tr><tr><td> DIAPHRAGM VALVE</td><td> PNEUMATIC ACTUATOR</td><td> CAUSTIC LINE</td><td> RO MEMBRANES</td><td> TO PLC</td></tr><tr><td> SOLENOID VALVE</td><td> PISTON OPERATED</td><td> MANIFOLD</td><td> AIR BLOWER</td><td> RO – DM PLC PANEL INTERLOCK</td></tr><tr><td> RELIEF VALVE</td><td> SOLENOID OPERATED</td><td rowspan="4">ACCESSORIES (CONTD)</td><td> STATIC MIXER</td><td> ROTAMETER</td></tr><tr><td> 3 WAY VALVE</td><td> AIR RELEASE</td><td> RESIN TRAP</td><td> DIRECT FLOW MEASUREMENT (PADDLE WHEEL SENSOR)</td></tr><tr><td> REDUCER</td><td> THREE VALVE MANIFOLD</td><td> MEDIA TRAP</td><td> DIRECT FLOW MEASUREMENT (MAGNETIC SENSOR)</td></tr><tr><td> ENLARGER</td><td> ORIFICE PLATE</td><td> EJECTOR</td><td> REMOTE INSTRUMENT FOR SINGLE MEASURED VARIABLE</td></tr><tr><td> STRAINER</td><td> HEATING ELEMENT</td><td> FEED CONTROL VALVE (PNEU. 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CONTROLLED BFV)	FUME ABSORBER	VARIABLE FREQUENCY DRIVE	'T' TYPE STRAINER	CHEMICAL SEALED DIAPHRAGM	UF MEMBRANES--SUBMERGED	UF MEMBRANES--PRESSURIZED	TUR – TURBIDITY ORP – OXIDATION REDUCTION POTENTIAL SDI – SILT DENSITY INDEX COND – CONDUCTIVITY SiO2 – SILICA pH – pH CL – RESIDUAL CHLORINE ZSO – POSITION LIMIT SWITCH OPEN ZSC – POSITION LIMIT SWITCH CLOSE	'Y' TYPE STRAINER	PNEU. ACTUATED BFV NORMALLY OPEN	UF MEMBRANES--PRESSURIZED	TANK – TOP CLOSED		FLEXIBLE CONNECTOR	PNEU. ACTUATED BFV NORMALLY CLOSED	FEED CONTROL VALVE (PNEU. CONTROLLED GLOBE VALVE)	TANK – TOP OPEN		PUMP FOOT VALVE	DOUBLE COIL SOLENOID VALVE			
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UNIT KEY (9-COMMON) FUNCTION KEY AREA KEY X XXX XX XX XXX EQUIPMENT / INSTRUMENT NO. KEY EQUIPMENT KEY EXAMPLE REFERS TO INSTRUMENTS WITH CODE NOS. GCB 10 CP101-103 FROM GCB 10 CP 101 TO GCB 10 CP 103 EQUIPMENT KEY AA – VALVES AE – MOTORS AH – HEATERS AM – MIXERS AT – FILTERING ELEMENT BN – EJECTOR CF – FLOW MEASUREMENT CP – PRESSURE MEASUREMENT CT – TEMPERATURE MEASUREMENT CQ – ANALYTICAL MEASUREMENT CL – LEVEL MEASUREMENT CD – DENSITY MEASUREMENT PD – DIFF. PR. MEASUREMENT EQUIPMENT/INSTRUMENT NO. KEY FIELD INSTRUMENTS : 001 TO 099 ANALOG INSTRUMENTS – REMOTE 101 TO 199 PROCESS SWITCHES – LOCAL 501 TO 599 PROCESS INDICATORS – LOCAL VALVES : 051 TO 099 MOTORISED VALVE (INCHING DUTY) 101 TO 150 PNEU. ACTUATED VALVES 201 TO 299 SOLENOID OPERATED VALVES 401 TO 499 NON RETURN VALVES 501 TO 599 MANUAL VALVES – UF & RO SYSTEM 601 TO 699 MANUAL VALVES – MB, DOSING & CC SYSTEM 701 TO 799 PR. RELIEF VALVES REV DATE ALTERED CHECKED 2020 COPY RIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Ltd. and shall not be disclosed or used in any way detrimental to the interest of the company. OWNER NTPC-TAMILNDADU ENERGY COMPANY LTD. OWNER'S CONSULTANT NATIONAL THERMAL POWER CORPORATION TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT NTECL VALLUR TPP - 3 x 500 mw UF PLANT - 2400 cu.m/hr DEPT NP GRADE OF UNTOL DIM CODE 9776 SCALE --- WEIGHT (KG) --- NTPC DRG. NO: 0260-132G-PVM-L-003 DRAWING NO. 1-WT-220-00966 REV 00 DRN S.VIVEK DATE 05.05.17 CHD G.KABANDIRAN SIGN --- NO. OF VAR. APPD M.NATARAJAN DATE 05.05.17 LEGEND FOR P&ID U 01 <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>Size A1 12</td></tr>												1	2	3	4	5	6	7	8	9	10	11	Size A1 12																																																																											
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