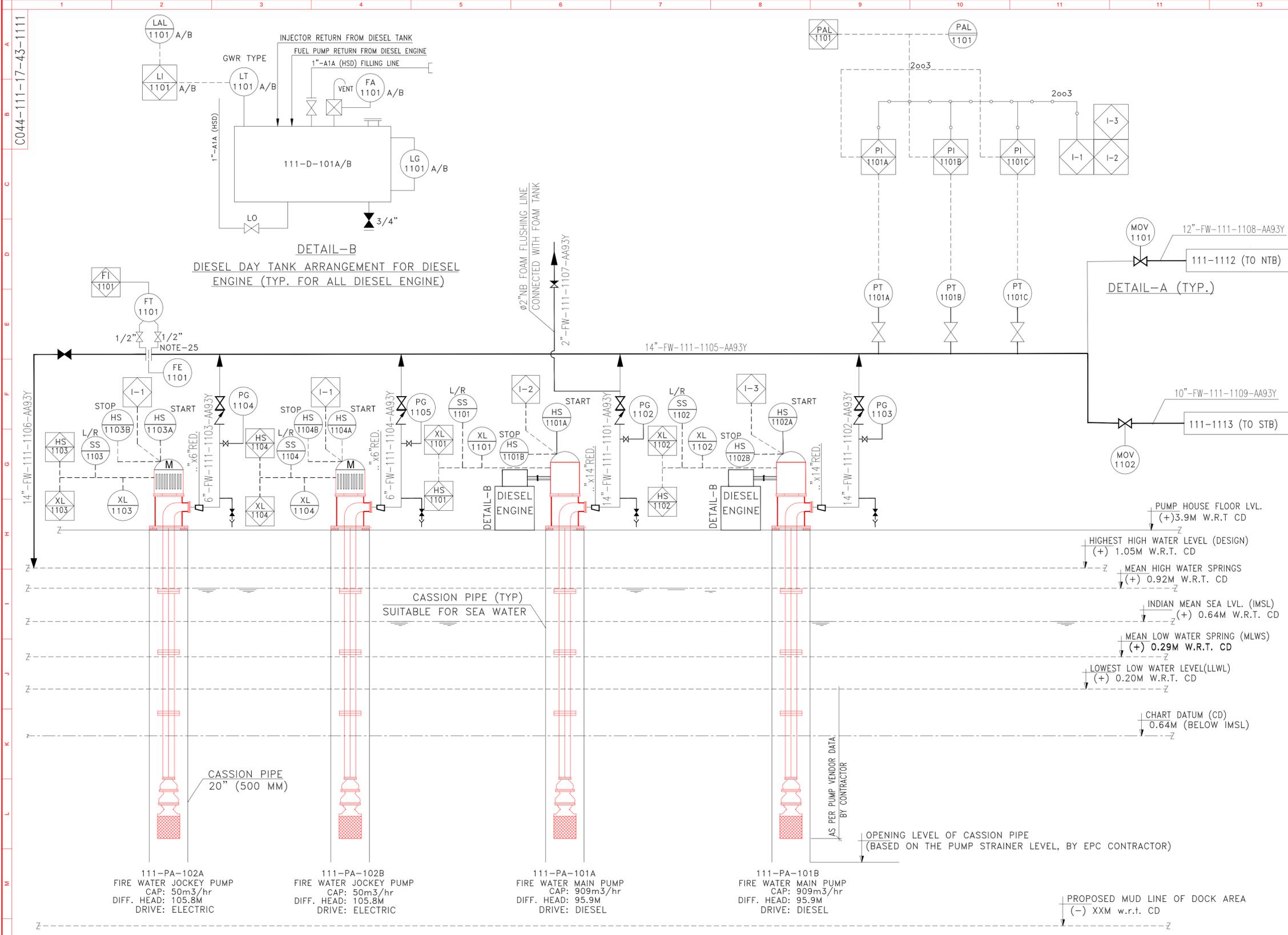


प्रस्तावित आरेख एवं सभी विवरण इंजीनियरिंग डिपार्टमेंट ऑफ़ फ़ायर प्रोटेक्शन विभाग, कोचिन पोर्ट अथॉरिटी, कोचिन द्वारा तैयार किए गए हैं और आरेखकर्ता ने यह स्पष्ट मांग किया है कि यह आरेख केवल सूचना के लिए है और इसे किसी भी प्रकार का निर्माण कार्य में नहीं इस्तेमाल किया जाना चाहिए।
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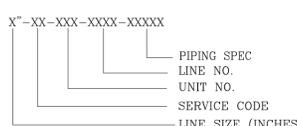
DETAIL-B
DIESEL DAY TANK ARRANGEMENT FOR DIESEL ENGINE (TYP. FOR ALL DIESEL ENGINE)

DETAIL-A (TYP.)

CASSION PIPE (TYP)
SUITABLE FOR SEA WATER

CASSION PIPE
20" (500 MM)

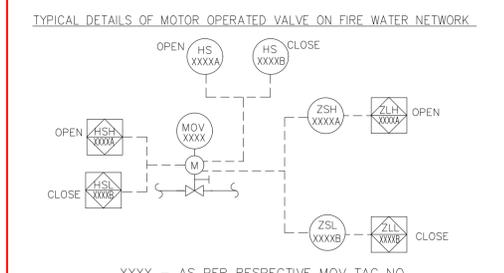
- LEGENDS:**
- PAL : PRESSURE ALARM (LOW)
 - PA : PUMP
 - PG : PRESSURE GAUGE
 - M : MOTOR
 - PI : PRESSURE INDICATOR
 - DE : DIESEL ENGINE
 - PT : PRESSURE TRANSMITTER
 - NC : NORMALLY CLOSE
 - XL : PUMP RUNNING LIGHT IND.
 - NO : NORMALLY OPEN
 - LJ : LEVEL INDICATOR
 - FA : FLAME ARRESTOR
 - LO : LOCK OPEN
 - HS : HAND SWITCH
 - LG : LEVEL GAUGE
 - PSV : PRESSURE SAFETY VALVE
 - FT : FLOW TRANSMITTER
 - Y : DRAIN
 - FI : FLOW INDICATOR
 - SS : SELECTOR SWITCH
 - LAL : LEVEL ALARM (LOW)
 - L/R : LOCAL/REMOTE
 - (M) : MOTOR OPERATED GATE VALVE (REMOTE OPERATED, TYP.)
 - N : CHECK VALVE
 - G : GATE VALVE(N.C)
 - G : GATE VALVE
 - E : ECC. REDUCER/ENLARGER
 - S : STRAINER (T-TYPE)
 - O : LOCAL INSTRUMENT
 - T : TERMINAL F&G PANEL
 - O : LOCAL PANEL INSTRUMENT
 - I : INTERLOCK



INTERLOCK DESCRIPTION			
S.NO.	INTERLOCK NO.	ACTUATED BY	ACTION
1	111-I-1	PT-1101A/B/C	START PUMP 111-PA-102A AT 10.3 kg/cm ² g AND STOP AT 10.8 kg/cm ² g. IN CASE OF FAILURE OF 111-PA-102A, START PUMP 111-PA-102B WITHIN 30 SECONDS.
2	111-I-2	PT-1101A/B/C	START PUMP 111-PA-101A AT 9.8 kg/cm ² g AND GENERATE AN ALARM IN LOCAL PANEL AS WELL AS CONTROL ROOM.
3	111-I-3	PT-1101A/B/C	IN CASE OF FAILURE OF 111-PA-101A PUMP 111-PA-101B STARTS AT 8.8 kg/cm ² g.

REF. DWG. NO.	REFERENCE DRAWING TITLE
SMP-PED-FE-1101-REV 2	GA DRAWING FOR REVAMPING OF FIREFIGHTING FACILITIES AT THE NTB & STB

- NOTES :-**
- ALL REDUCERS ARE ECCENTRIC TYPE.
 - ALL PUMPS SHALL HAVE MANUAL STARTING IN ADDITION TO AUTO START.
 - DIESEL DAY TANK SHALL BE SUPPLIED WITH DIESEL ENGINE.
 - ALL PUMPS SHALL BE STOPPED MANUALLY AFTER GETTING PROPER SIGNAL FROM THE FIRE MARSHAL.
 - ALL THE VALVES SHALL BE IN LOCK OPEN POSITION EXCEPT DRAIN VALVE, VENT VALVE, IFSC VALVE, HYDRANT VALVE AND MOV FOR TOWER MONITOR(S), BASE MONITOR(S) & JUMBO CURTAIN NOZZLES.
 - ALL FOAM MONITORS SHALL BE UL LISTED/FM APPROVED.
 - DIESEL TANK SHALL BE SUPPLIED ALONG WITH BREATHING VALVE, FLAME ARRESTOR, DRAIN VALVE, LEVEL GAUGE, LEVEL TRANSMITTER AND ALL CONNECTED PIPES AND FITTINGS AS REQUIRED FOR SAFE OPERATION OF THE TANK.
 - PUMP RUNNING INDICATION SHALL BE REPEATED IN THE FIRE CONTROL ROOM.
 - THE JOCKEY PUMPS SHALL RUN ON EMERGENCY POWER IN CASE OF MAIN POWER SUPPLY FAILURE. HENCE, PROVISION OF EMERGENCY POWER TO BE CONSIDERED FOR JOCKEY PUMPS.
 - INDEPENDENT BATTERIES WITH TRICKLE CHARGER FOR STARTING OF DIESEL ENGINE SHALL BE SUPPLIED BY ENGINE VENDOR.
 - DIESEL DAY TANK SHALL BE SUPPLIED WITH DIESEL ENGINE AND SHALL HAVE CAPACITY FOR 08 HRS. CONTINUOUS RUNNING OF ENGINE. THE ELEVATION OF THE DIESEL DAY TANK SHALL COMPLY TO THE REQUIREMENTS OF ENGINE MANUFACTURER. THE LOCATION OF THE ABOVE TANK SHALL BE SHOWN IN THE GA DRAWING.
 - EXHAUST FOR DIESEL ENGINE TO BE LOCATED ABOVE ROOF LEVEL OF PUMP HOUSE ROOF. EXHAUST OF DIESEL ENGINE SHALL BE INSULATED USING SUITABLE THERMAL INSULATING MATERIAL.
 - DIESEL OIL TANKS LEVEL GAUGES SHALL HAVE GRADUATED STRIPS ATTACHED.
 - DIESEL ENGINE COOLING RETURN PIPES FROM EACH ENGINE SHALL BE PROVIDED WITH WATER FLOW INDICATOR GLASS.
 - LOW LEVEL ALARM INDICATION FROM DIESEL DAY TANKS SHALL BE REPEATED IN THE FIRE CONTROL ROOM.
 - ALL DIESEL DAY TANKS SHALL BE PLACED AWAY FROM THE PUMPS.
 - START PUSH BOTTON SHALL BE LOCATED IN LOCAL PUSH BOTTON STATION NEAR THE PUMPS.
 - ALL NEW EQUIPMENT/INSTRUMENT TAG NO. SHALL BE PREFIXED BY UNIT NO. 111 (i.e. PG-1101 SHALL BE READ AS 111-PG-1101).
 - DRAIN FROM DIESEL DAY TANKS SHALL BE ROUTED TO CONTAINER (TO BE FIXED DURING DRAINING).
 - ALL MOVs SHALL BE OF REMOTE TYPE WITH MANUAL OVERRIDE AND FIELD AS WELL AS REMOTE INDICATION.
 - ALL FIREWATER PIPING AND EQUIPMENT SHALL BE SUITABLE FOR SEAWATER APPLICATION.
 - ALL SEA WATER PIPING WILL BE FLANGED JOINT AND SHALL CONFORM TO PMS CLASS-AA93Y.
 - EXISTING 10" & 6" FIRE WATER LINE TOWARDS NTB SHALL BE DISMANTLED FOR LAYING THE NEW FIRE WATER LINE FROM PUMP HOUSE TO NTB TERMINAL. LAYING OF NEW 10" FIREWATER LINE TO STB TERMINAL SHALL BE TAKEN UP LATER BY CoPA AND IS NOT INCLUDED IN THE SCOPE OF THE CONTRACTOR.
 - BOTH JOCKEY AND MAIN PUMP SHALL BE PROVIDED WITH SELECTOR SWITCH TO OPERATE THE PUMP FROM REMOTE OR FIELD.
 - STRAIGHT LENGTH AS PER VENDOR REQUIREMENT TO BE MAINTAINED UPSTREAM AND DOWNSTREAM OF FLOW METER. FLOW METER ASSEMBLY HAS TO BE ABOVE GROUND.
 - VENDOR TO ENSURE ADDITIONAL PROTECTION OF FIRE WATER PUMPS AS PER NFPA 20 REQUIREMENTS.
 - GLAND COOLING WATER FOR FIRE WATER PUMP SHALL BE PROVIDED FROM PUMP DISCHARGE PIPING BEFORE NRV. GLAND COOLING WATER RETURN LINE SHALL BE ROUTED TO THE SEA.



DETAIL-A (TYP.)

HOLDS:

REV.	DATE	DESCRIPTION	BY	CHKD	APPD	PEM
0	09.02.26	ISSUED FOR TENDER	BR	SK/IA	DK	
B	22.07.25	RE-ISSUED FOR COMMENTS	MCK	IA/JK	DK	
A	20.06.25	ISSUED FOR COMMENTS	MCK	IA/JK	DK	

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कोचिन बंदरगाह प्राधिकरण

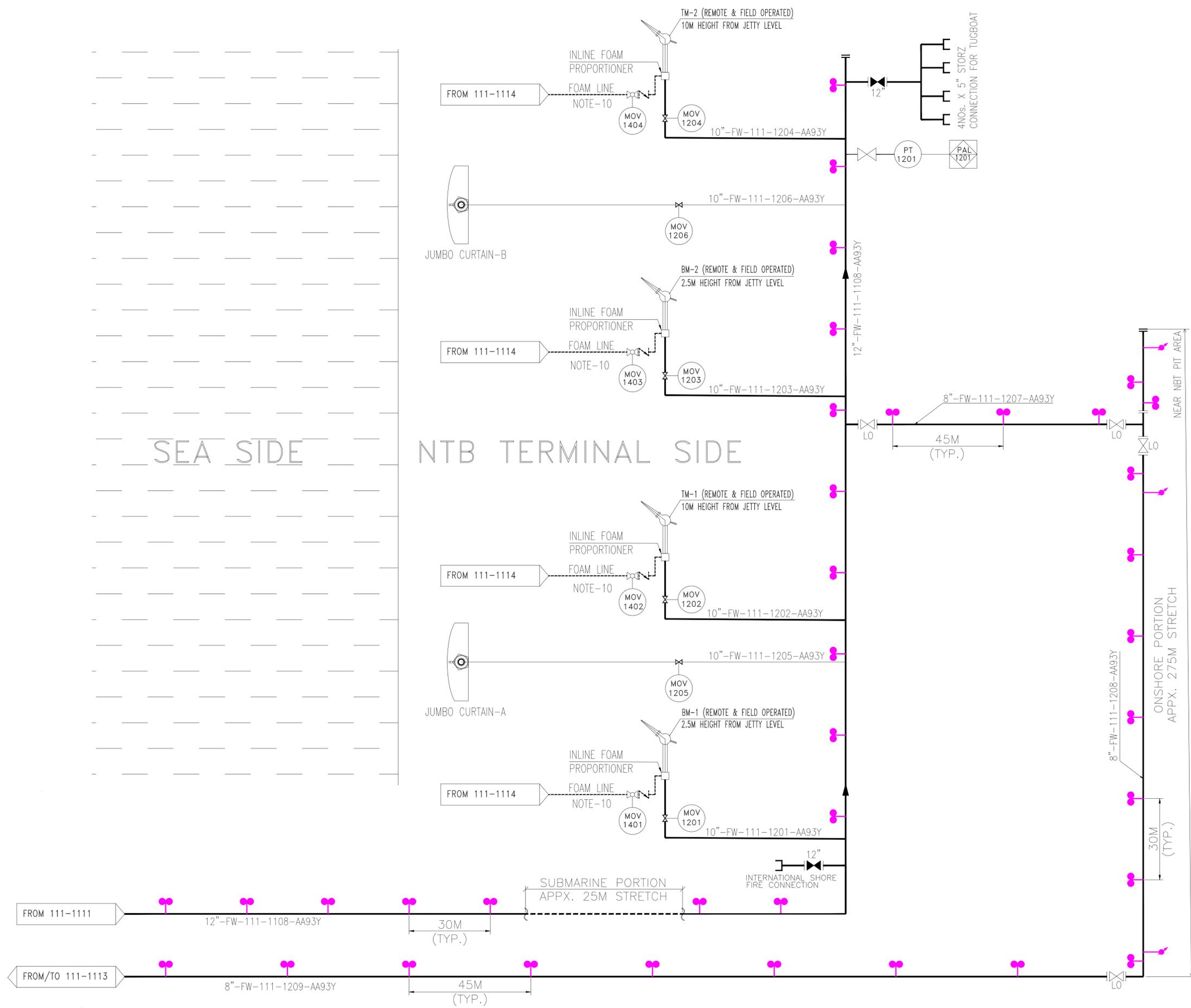
कोचिन बंदरगाह पर टैंकर टर्मिनलों को अग्निशामक सुविधाओं का उन्नयन
 नलिका एवं वॉयंग आरंभ के लिए अग्नि जल पम्पिंग प्रणाली, एन.टी.बी. और एस.टी.बी.

UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT
 P & ID FOR FIRE WATER PUMPING SYSTEM AT NTB & STB TERMINALS

SCALE	JOB NO.	UNIT	DIVN.	DEPT.	DWG. NO.	REV.
NTS	C 0 4 4	1 1 1	1 7	4 3	1 1 1 1	0

यसका अन्तर्गत यह इससे अधिक विस्तार के बिना प्रकल्प के अन्तर्गत ही है। ये प्रकल्प उभार दिए गए हैं और उभारने के लिए न तो उद्देश्य पूर्ण है और उभारने के लिए न तो उद्देश्य पूर्ण है।
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C044-111-17-43-1112



REF. DWG. NO.	REFERENCE DRAWING TITLE
SMP-PED-FE-1101-REV 2	GA DRAWING FOR REVAMPING OF FIREFIGHTING FACILITIES AT THE NTB & STB

- NOTES :-**
- FOR ADDITIONAL LEGENDS AND SYMBOLS, REFER P&ID NO.111-1111.
 - THE DESIGN FIRE WATER FLOWRATE SHALL BE 170.4 M³/HR (2840 LPM) FOR EACH TOWER MONITOR NETWORK. THESE SHALL BE REMOTE OPERATED FROM FIRE CONTROL ROOM IN ADDITION TO REMOTE OPERATION FROM FIELD PANEL LOCATED IN SAFE AREA. HORIZONTAL ROTATION OF TOWER MONITOR SHALL BE 340 DEGREE.
 - CONTRACTOR SHALL ENSURE THAT THE HEIGHT OF THE MONITOR IS SUCH THAT IT WILL COVER MANIFOLD AREA OF THE DECK OF THE LARGEST TANKER IN THE LIGHTEST CONDITION AT SPRING TIDES AT THE JETTY.
 - TOWER MONITORS SHALL BE LOCATED MINIMUM 15 M AWAY FROM THE HAZARDOUS AREA IT IS TO PROTECT.
 - STRUCTURE OF TOWER MONITOR SHALL BE PROVIDED WITH FIRE PROOFING PROVISION & FIRE RESISTANT CABLE SHALL BE USED FOR THE CONTROL CABLES OF TOWER MONITORS.
 - IN CASE FIRE PROOFING OF THE TOWER MONITOR STRUCTURE IS NOT POSSIBLE THEN FIXED WATER SPRAY SYSTEM @ 10.2 LPM/M² SHALL BE PROVIDED TO COOL THE STRUCTURE. HOWEVER, FIREPROOFING SHALL BE PREFERRED IN THE DESIGN.
 - NOS. OF HYDRANTS (DOUBLE HEADED) AND WATER CUM FOAM MONITORS AT NJRP AND STB PIT IN PROPOSED LINE ARE INDICATIVE (EXCEPT FOR TOWER AND BASE MONITOR AT JETTY HEAD) AND TO BE FINALIZED AS PER FIRE WATER LAYOUT DRAWING (BY THE CONTRACTOR) BASED ON SITE CONDITION CONSIDERING THAT ATLEAST ONE DOUBLE HYDRANT SHALL BE PROVIDED FOR EVERY 30 M LENGTH ON THE JETTY AND IN ENTIRE FIRE WATER RING MAIN.
 - ATLEAST ONE HYDRANT POST SHALL BE PROVIDED FOR EVERY 30 M LENGTH ON THE ENTIRE FIRE WATER RING MAIN EXCEPT IN THE WALKWAY FROM NTB AND STB TO THE SHORE SIDE WHERE DOUBLE HYDRANTS SHALL BE PROVIDED FOR EVERY 45 M LENGTH.
 - ALL MOVs SHALL BE OF REMOTE TYPE WITH MANUAL OVERRIDE AND FIELD AS WELL AS REMOTE INDICATION.
 - REFER FOAM SYSTEM P&ID NO.-C044-111-17-43-1114 OF THE FACILITY FOR DETAILS.
 - HOSE BOX WITH TWO 15 M EACH HOSES SHALL BE PROVIDED AT EVERY DOUBLE HYDRANT POST. TYPE OF HOSE BOX SHALL BE FRP HOSE BOX.
 - TWO NOS. JUMBO CURTAIN NOZZLES OF CAPACITY 3000 LPM EACH (180 M³/HR) SHALL BE PROVIDED BETWEEN LOADING/UNLOADING ARMS AND SHIP TANKER FOR SEGREGATION OF HAZARDOUS AREAS.
 - EXPANSION LOOP SHALL BE CONSIDERED IN THE FIRE WATER NETWORK WHEREVER REQUIRED TO AVOID OVERPRESSURE DUE TO THERMAL EXPANSION.
 - CONTRACTOR SHALL CONSIDER OPERATION OF RESPECTIVE MOV FOR TOWER/BASE MONITOR FROM FIELD (LOCAL PANEL) AS WELL AS FIRE CONTROL ROOM.
 - ALL NEW EQUIPMENT/INSTRUMENT TAG NO. SHALL BE PREFIXED WITH UNIT NO.-111.



REV.	DATE	DESCRIPTION	BY	CHKD	APPD	PEM
O	09.02.26	ISSUED FOR TENDER	BR	SK	IA	DK
B	22.07.25	RE-ISSUED FOR COMMENTS	MCK	IA	JKI	DK
A	20.06.25	ISSUED FOR COMMENTS	MCK	IA	JKI	DK

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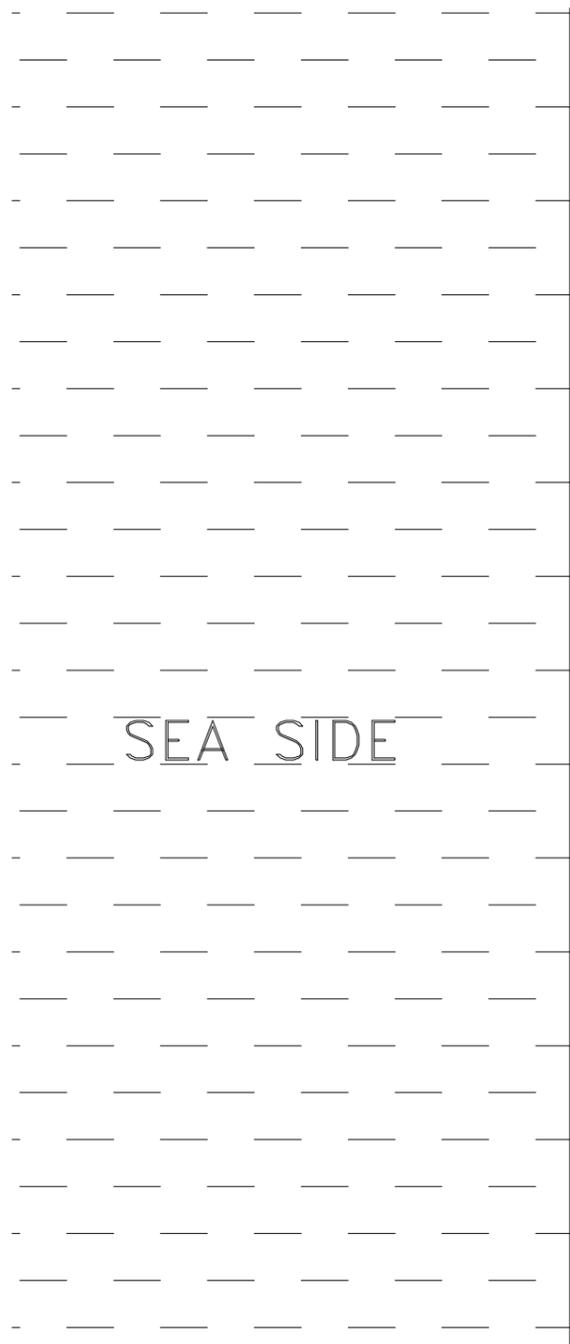
कोचिन बंदरगाह पर टैंकर टर्मिनलों को अग्निशामक सुविधाओं का उन्नयन
 UPGRADEATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT

नलिका एवं यंत्रण आरेख के लिए अग्नि जल परिमाण प्रणाली, एन.टी.वी.
 P&ID FOR FIRE WATER NETWORK AT NTB TERMINAL

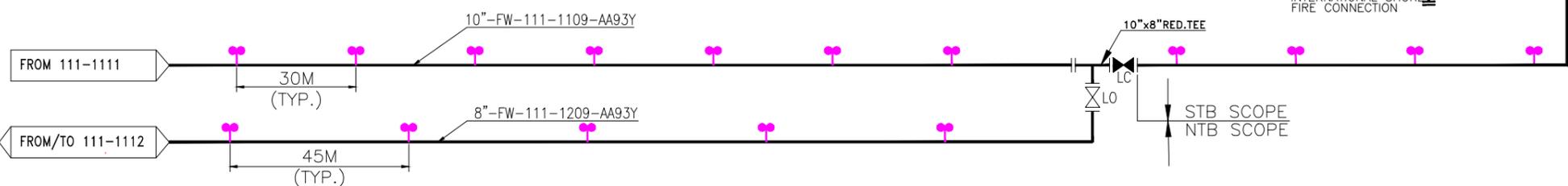
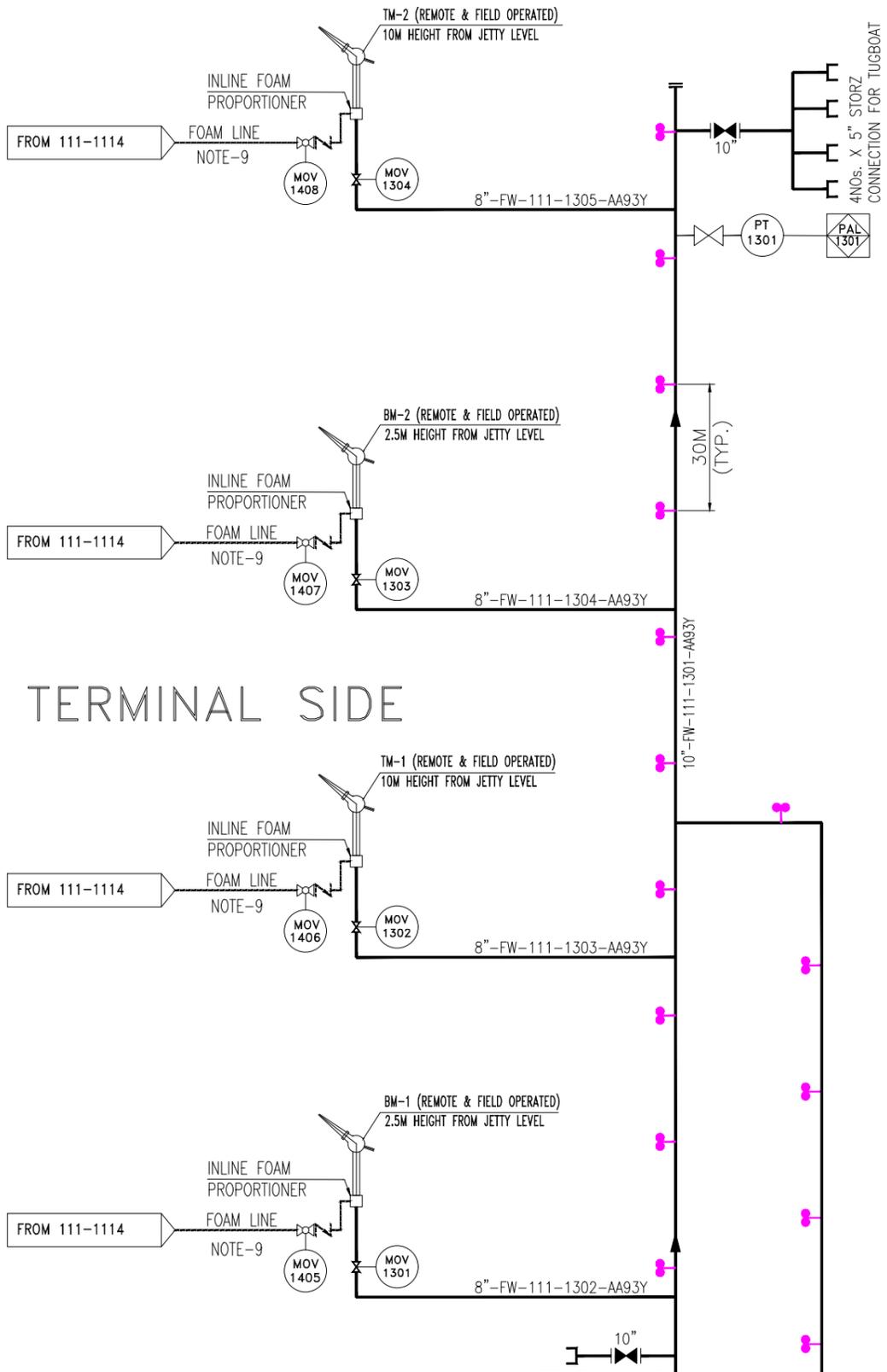
SCALE	JOB NO.	UNIT	DIVN.	DEPT.	DWG. NO.	REV.
NTS	C 0 4 4 1 1 1	1	1	7 4 3 1 1 1	2 0	0

C044-111-17-43-1113

प्रस्तुत आरेख एवं सभी विवरण इंजीनियरिंग डिपार्टमेंट की संमति से, न केवल तैयार किए गए हैं और उधार दिए गए हैं, न तो उन्हें पुनः प्रिंट किया जाएगा, न तब तक को ज्ञात, न उधार दिए जाएंगे, न प्रतिलिपि किए जाएंगे और न ही सीमित और किसी प्रकार के अनावश्यक कॉपी अन्य प्रकार की प्रतिलिपि से होगा।
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STB TERMINAL SIDE



REF. DWG. NO.		REFERENCE DRAWING TITLE	
SMP-PED-FE-1101-REV 2		GA DRAWING FOR REVAMPING OF FIREFIGHTING FACILITIES AT THE NTB & STB	

NOTES :-

- FOR ADDITIONAL LEGENDS AND SYMBOLS, REFER P&ID NO.111-1111.
- THE DESIGN FIRE WATER FLOWRATE SHALL BE 170.4 M³/HR (2840 LPM) FOR EACH TOWER MONITOR NETWORK. THESE SHALL BE REMOTE OPERATED FROM FIRE CONTROL ROOM IN ADDITION TO REMOTE OPERATION FROM FIELD PANEL LOCATED IN SAFE AREA. HORIZONTAL ROTATION OF TOWER MONITOR SHALL BE 340 DEGREE.
- CONTRACTOR SHALL ENSURE THAT THE HEIGHT OF THE MONITOR IS SUCH THAT IT WILL COVER MANIFOLD AREA OF THE DECK OF THE LARGEST TANKER IN THE LIGHTEST CONDITION AT SPRING TIDES AT THE JETTY.
- TOWER MONITORS SHALL BE LOCATED AT MINIMUM 15M AWAY FROM THE HAZARDOUS AREA IT IS TO PROTECT.
- STRUCTURE OF TOWER MONITOR SHALL BE PROVIDED WITH FIRE PROOFING PROVISION & FIRE RESISTANT CABLE SHALL BE USED FOR THE CONTROL CABLES OF TOWER MONITORS.
- IN CASE, FIRE PROOFING OF THE TOWER MONITOR STRUCTURE IS NOT POSSIBLE THEN FIXED WATER SPRAY SYSTEM @ 10.2 LPW/M² SHALL BE PROVIDED TO COOL THE STRUCTURE. HOWEVER, FIREPROOFING SHALL BE PREFERRED IN THE DESIGN.
- ALL MOVs SHALL BE OF REMOTE TYPE WITH MANUAL OVERRIDE AND FIELD AS WELL AS REMOTE VALVE POSITION INDICATION.
- ATLEAST ONE HYDRANT POST SHALL BE PROVIDED FOR EVERY 30 M LENGTH ON THE ENTIRE FIRE WATER RING MAIN EXCEPT IN THE WALKWAY FROM NTB AND STB TO THE SHORE SIDE WHERE DOUBLE HYDRANTS SHALL BE PROVIDED FOR EVERY 45 M LENGTH.
- REFER FOAM SYSTEM P&ID NO:-C044-111-17-43-1114 OF THE FACILITY FOR DETAILS.
- HOSE BOX WITH TWO 15 M EACH HOSES SHALL BE PROVIDED AT EVERY DOUBLE HYDRANT POST. TYPE OF HOSE BOX SHALL BE FRP HOSE BOX.
- EXPANSION LOOP SHALL BE CONSIDERED IN THE FIRE WATER NETWORK WHEREVER REQUIRED TO AVOID OVERPRESSURISATION DUE TO THERMAL EXPANSION.
- ALL NEW EQUIPMENT/INSTRUMENT TAG NO. SHALL BE PREFIXED WITH UNIT NO.-111.

LEGENDS:

HYDRANT

0	09.02.26	ISSUED FOR TENDER	BR	SK/IA	DK	
B	22.07.25	RE-ISSUED FOR COMMENTS	MCK	IA/JK	DK	
A	20.06.25	ISSUED FOR COMMENTS	MCK	IA/JK	DK	
REV.	DATE	DESCRIPTION	BY	CHKD	APPD	PEM

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 कोचिन बंदरगाह प्राधिकरण

कोचिन बंदरगाह पर टैंकर टर्मिनलों की अग्निशामक सुविधाओं का उन्नयन

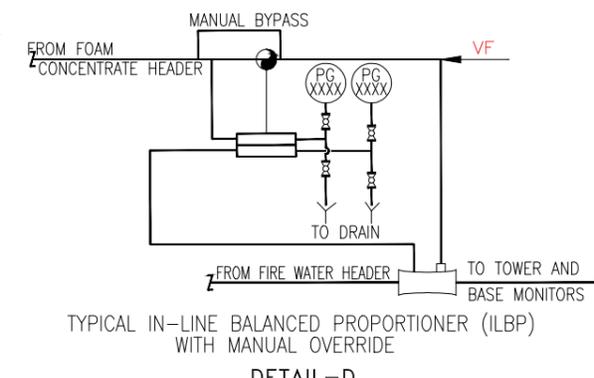
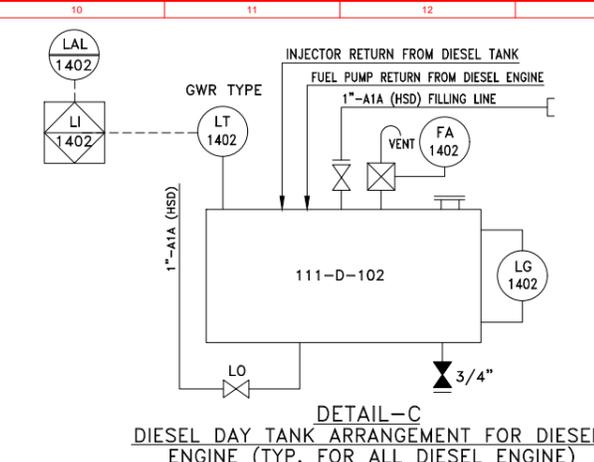
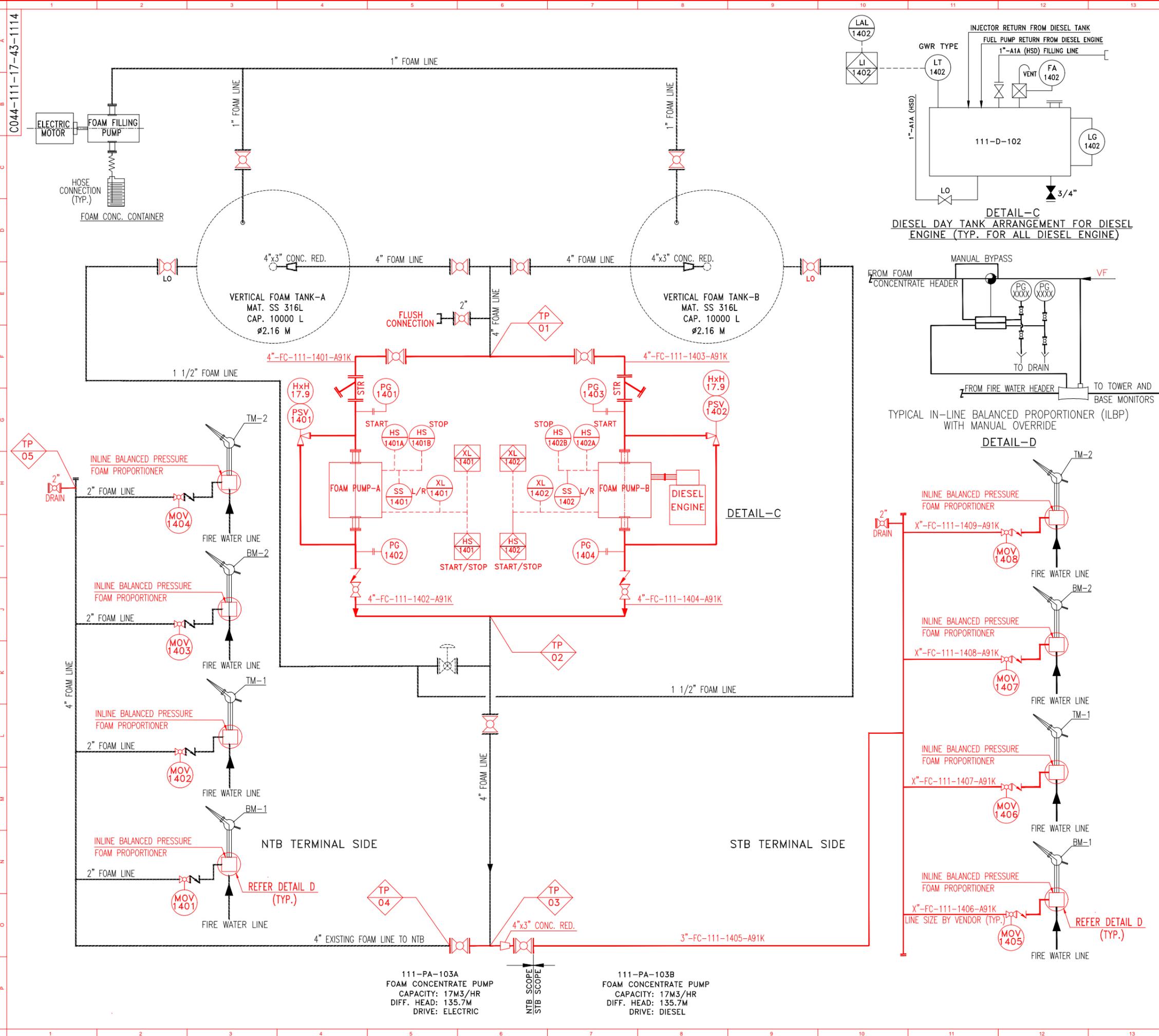
UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT

नलिका एवं यंत्रण आरेख के लिए अग्नि जल पम्पिंग प्रणाली, एस.टी.बी.

P&ID FOR FIRE WATER NETWORK AT STB TERMINAL

SCALE	JOB NO.	UNIT	DIVN.	DEPT.	DWG. NO.	REV.
NTS	C 0 4 4	1 1 1	1 7	4 3	1 1 1 3	0

प्रयुक्त आरेख एवं इसमें विहित विवरण इंजीनियरिंग डिपार्टमेंट की संमति है, ये मात्र उधार लिए गए हैं और उधारकर्ता ने यह स्पष्ट समझौता किया है कि न तो उन्हें पुनः प्रसारित किया जाएगा, न कौन भी जापान, न कौन भी देश, न कौन भी व्यक्ति को बिना अनुमति के इसका प्रयोग करेगा और न ही सीमित और निर्दिष्ट प्रयोग के अलावा इनका कोई अन्य प्रयोग करेगा और न ही सीमित और निर्दिष्ट प्रयोग के अलावा इनका कोई अन्य प्रयोग करेगा।
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REF. DWG. NO.	REFERENCE DRAWING TITLE		
ZMP-PED-PE-1101-REV 1	SCHEMATIC DIAGRAM FOR FOAM PUMP SYSTEM		

NOTES :-

- FOR ADDITIONAL LEGENDS AND SYMBOLS REFER P&ID, NO:111-1111.
- THIS P&ID IS ONLY INDICATIVE. CONTRACTOR SHALL DEVELOP THE DETAILED WORKING P&ID INCORPORATING ALL OPERATIONAL, SAFETY, NFPA AND OTHER APPLICABLE CODES REQUIREMENTS ALONG WITH VENDORS/SUPPLIERS AND CoPA'S REQUIREMENTS.
- IN LINE BALANCED PRESSURE FOAM PROPORTIONER (ILBP) IS A SYSTEM PACKAGE TO BE DEVELOPED BY RESPECTIVE SUB VENDOR FOR PROPER MIXING OF FOAM CONCENTRATE WITH FIRE WATER TO MAKE 3% FOAM SOLUTION.
- EXISTING FOAM TANKS SHALL BE UTILIZED FOR STORING OF FOAM CONCENTRATE.
- ILBP SUITABLE FOR 3000 LPM TOWER MONITOR AND 1500 LPM BASE MONITOR CAPACITY SHALL BE PROVIDED AND EXISTING ILBP ON EACH MONITOR LINE SHALL BE DISMANTLED.
- EXISTING FOAM CONCENTRATE TRANSFER PUMP SHALL BE DISMANTLED AND ONE DIESEL DRIVEN AND ONE DIESEL ENGINE DRIVEN PUMPS SHALL BE PROVIDED.
- EMERGENCY POWER SHALL BE PROVIDED FOR ELECTRIC DRIVEN FOAM CONCENTRATE PUMPS.
- FOAM PUMP SHALL BE STARTED MANUALLY FROM LOCAL PANEL IN THE PUMP HOUSE AS WELL AS FROM FIRE CONTROL ROOM. RUNNING/STOP INDICATION OF FOAM CONCENTRATE PUMP SHALL BE PROVIDED ON LOCAL PANEL AS WELL AS FIRE CONTROL ROOM.
- ALL NEW EQUIPMENT/INSTRUMENT TAG NO. SHALL BE PREFIXED WITH UNIT NO.-111.
- REFER FIRE WATER NETWORK P&ID NO:-C044-111-17-43-1112/1113 OF NTB & STB TERMINALS FOR RESPECTIVE TOWER AND BASE MONITOR DETAILS.
- PROVISION OF EXPANSION LOOP IN THE FOAM CONCENTRATE HEADER SHALL BE ENSURED BY CONTRACTOR WHEREVER REQUIRED TO AVOID OVERPRESSURISATION DUE TO THERMAL EXPANSION.
- DIESEL DAY TANK SHALL BE SUPPLIED WITH DIESEL ENGINE.
- DIESEL TANK SHALL BE SUPPLIED ALONG WITH BREATHING VALVE, FLAME ARRESTOR, DRAIN VALVE, LEVEL GAUGE, LEVEL TRANSMITTER AND ALL CONNECTED PIPES AND FITTINGS AS REQUIRED FOR SAFE OPERATION OF THE TANK.
- DIESEL DAY TANK SHALL BE SUPPLIED WITH DIESEL ENGINE AND SHALL HAVE CAPACITY FOR MIN. 04 HRS. CONTINUOUS RUNNING OF ENGINE. THE ELEVATION OF THE DIESEL DAY TANK SHALL COMPLY TO THE REQUIREMENTS OF ENGINE MANUFACTURER. THE LOCATION OF THE ABOVE TANK SHALL BE SHOWN IN THE GA DRAWING.
- EXHAUST FOR DIESEL ENGINE TO BE LOCATED ABOVE ROOF LEVEL OF PUMP HOUSE ROOF. EXHAUST OF DIESEL ENGINE SHALL BE INSULATED USING SUITABLE THERMAL INSULATING MATERIAL.
- DIESEL OIL TANKS LEVEL GAUGES SHALL HAVE GRADUATED STRIPS ATTACHED.
- DIESEL ENGINE COOLING RETURN PIPES FROM EACH ENGINE SHALL BE PROVIDED WITH WATER FLOW INDICATOR GLASS.
- LOW LEVEL ALARM INDICATION FROM DIESEL DAY TANKS SHALL BE REPEATED IN THE FIRE CONTROL ROOM.
- ALL DIESEL DAY TANKS SHALL BE PLACED AWAY FROM THE PUMPS.
- DRAIN FROM DIESEL DAY TANKS SHALL BE ROUTED TO CONTAINER (TO BE FIXED DURING DRAINING).

LEGENDS:

- EXISTING LINE/FACILITIES
- NEW LINE (RED COLOR)
- NEW MOV (BALL TYPE)
- NEW MANUAL BALL VALVE
- FC FOAM CONCENTRATE
- STR (STRAINER)
- INLET SIZE INCHES
- ORIFICE CODE LETTER
- OUTLET SIZE INCHES
- HxH xx.x SET PRESSURE, kg/cm2g
- PSV XXXX RELIEF VALVE NUMBER
- VF VENDOR FURNISH

HOLDS:

- SIZE OF PSV (BY VENDOR)

0	09.02.26	ISSUED FOR TENDER	BR	SK/IA	DK
B	22.07.25	RE-ISSUED FOR COMMENTS	MCK	IA/JK	DK
A	27.06.25	ISSUED FOR COMMENTS	MCK	IA/JK	DK

REV.	DATE	DESCRIPTION	BY	CHKD	APPD	PEM
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ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)

COCHIN PORT AUTHORITY
कोचिन बंदरगाह प्राधिकरण

कोचिन बंदरगाह पर टैंकर टर्मिनलों को अग्निशामक सुविधाओं का उन्नयन

एन.टी.बी. और एस.टी.बी. टर्मिनलों पर झाग प्रणाली के लिए नलिका एवं यंत्रण आरेख

UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT

P & ID FOR FOAM SYSTEM AT NTB & STB TERMINALS

SCALE	JOB NO.	UNIT	DIVN.	DEPT.	DWG. NO.	REV.
NTS	C 044	111	17	43	1114	0

3-1641-0501 REV.5/06.12.2024 A2-594x420



PUMP
PROCESS DATA SHEET

Document No.
C044-111-17-43-DS-1601
Rev. No. 0
Page 1 of 2

PROJECT	UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT		CLIENT	COCHIN PORT AUTHORITY				
UNIT	NTB & STB TERMINALS		JOB NO.	C044	UNIT NO.	111		
ITEM NO.	111-PA-101A/B							
DESIGN CASE	-							
SERVICE	FIRE WATER MAIN PUMP							
PARALLEL OPERATION	YES							
OPERATION	INTERMITTENT							
OPERATING	1							
STAND BY	1							
TYPE OF PUMP	VERTICAL TURBINE							
PROPERTIES OF LIQUID								
LIQUID HANDLED	SEA WATER							
PUMPING TEMPERATURE	deg C	AMBIENT						
VISCOSITY AT PUMPING TEMPERATURE	cP	1 to 2						
VAPOUR PRESSURE AT PUMPING TEMPERATURE	KG/CM2 A	0.02-0.07						
LIQUID DENSITY AT PUMPING TEMPERATURE	KG/M3	1020-1025						
PRESENCE OF CORROSIVE / TOXIC COMPONENTS	YES (CORROSIVE)							
SOLIDS IN SUSPENSION	YES (BY PUMP VENDOR BASED ON WATER QUALITY)							
POUR POINT (FOR CONGEALING SERVICE)	deg C	NA						
OPERATING CONDITIONS FOR ONE PUMP								
FLOW RATE	NORMAL	M3/HR						
	MAXIMUM	M3/HR	909 (4000 GPM) US GALLONS PER MINUTE)					
	MINIMUM	M3/HR						
SUCTION PRESSURE	KG/CM2 A	FLOODED SUCTION						
DISCHARGE PRESSURE	KG/CM2 A	10.8						
DIFFERENTIAL PRESSURE	KG/CM2	9.8						
DIFFERENTIAL HEAD	m	95.9						
NPSH AVAILABLE	m	BY VENDOR						
CAPACITY CONTROL FOR VOLUMETRIC PUMPS								
METHOD OF CONTROL	AS PER RESPECTIVE P&ID							
TYPE OF CONTROL								
CONTROL RANGE								
PRECISION AT MINIMUM RATE								
MECHANICAL DATA								
DESIGN PRESSURE	KG/CM2 G	15.4						
MAXIMUM SUCTION PRESSURE	KG/CM2 A	FLOODED SUCTION						
DESIGN TEMPERATURE	deg C	65						
MATERIAL OF CONSTRUCTION								
	CASING	SUPER DUPLEX STAINLESS STEEL (UNS S32750/S32)						
	IMPELLER / PISTON / PLUNGER	SUPER DUPLEX STAINLESS STEEL (UNS S32750/S32)						
LINE RATING								
	SUCTION	150#						
	DISCHARGE	150#						
SEAL TYPE	SINGLE MECHANICAL SEAL							
DRIVER TYPE	DIESEL ENGINE							
STEAM TURBINE DATA								
INLET PRESSURE	(MIN./NOR./MAX./DES.)	BARG						
INLET TEMPERATURE	(MIN./NOR./MAX./DES.)	deg C						
EXHAUST PRESSURE	(MIN./NOR./MAX./DES.)	BARG						
LINE RATING								
	INLET							
	OUTLET							
SAFETY VALVE REQUIRED ON STEAM TURBINE EXHAUST								
MOTOR DATA								
VARIABLE SPEED MOTOR REQUIRED	NO							
AUTO START/STOP OF PUMP REQUIRED	YES							
REACCELERATION REQUIRED	NO							
PUMP CONNECTED TO EMERGENCY POWER/STEAM SUPPLY	NO							
0	09.02.26	ISSUED FOR TENDER				SK	IA	DK
A	19.07.25	ISSUED FOR COMMENTS				IA	JKU	DK
Rev. No.	Date	Purpose				Prepared By	Reviewed By	Approved By

PUMP
PROCESS DATA SHEET

Document No. **C044-111-17-43-DS-1601**
 Rev. No. **0**
 Page **2** of **2**

PROJECT	UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT	CLIENT	COCHIN PORT AUTHORITY		
UNIT	NTB & STB TERMINALS	JOB NO.	C044	UNIT NO.	111

NOTES:

- 1 REFER P&ID NO. C044-111-17-43-1111 FOR MORE DETAILS.
- 2 THE PUMP SHALL BE SUPPLIED WITH DRIVE (DIESEL ENGINE) & DIESEL STORAGE DAY TANK. EACH DIESEL STORAGE TANK SHALL HAVE MINIMUM STORAGE CAPACITY OF 8 HOURS CONTINUOUS RUNNING OF THE ENGINE ON FULL LOAD. PUMP SHALL BE IN INTERMITTENT OPERATION.
- 3 EACH DIESEL DAY TANK SHALL BE SUPPLIED ALONG WITH BREATHER VALVE, FLAME ARRESTOR, VENT, DRAIN VALVE, INLET, OUTLET, LEVEL GAUGE, LEVEL (LOW) ALARM WITH TRANSMITTER AND ALL CONNECTED PIPES AND FITTINGS.
- 4 EXHAUST OF DIESEL ENGINE SHALL BE LOCATED AT SAFE HEIGHT CONSIDERING NEARBY FACILITIES WITHIN 15 M RADIUS OF EXHAUST.
- 5 MATCHING FLANGES ALONG WITH NUTS, BOLTS, GASKETS SHALL BE PROVIDED ALONG WITH PUMPS FOR SUCTION/DISCHARGE FLANGE.
- 6 PUMP SHALL BE CAPABLE OF DISCHARGING NOT LESS THAN 150% OF RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD SHUT OFF HEAD SHALL NOT EXCEED 140% OF RATED HEAD.
- 7 PUMP ENGINE SHALL BE SUITABLE FOR STARTING AGAINST FULLY OPEN DISCHARGE VALVE.
- 8 PUMP & ITS DRIVE TO COMPLY WITH REQUIREMENTS OF NFPA 20 LATEST CODE. ADDITIONALLY, PUMP VENDOR SHALL CHECK AND ENSURE REQUIREMENT OF AIR RELEASE VALVE AS PER NFPA-20.

Rev. No.	Date	Purpose	Prepared By	Reviewed By	Approved By
0	09.02.26	ISSUED FOR TENDER	SK	IA	DK
A	19.07.25	ISSUED FOR COMMENTS	IA	JKU	DK



PUMP
PROCESS DATA SHEET

PROJECT	UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT		CLIENT	COCHIN PORT AUTHORITY				
UNIT	NTB & STB TERMINALS		JOB NO.	C044	UNIT NO.	111		
ITEM NO.	111-PA-102A/B							
DESIGN CASE	-							
SERVICE	FIRE WATER JOCKEY PUMP							
PARALLEL OPERATION	YES							
OPERATION	INTERMITTENT							
OPERATING	1							
STAND BY	1							
TYPE OF PUMP	VERTICAL TURBINE							
PROPERTIES OF LIQUID								
LIQUID HANDLED	SEA WATER							
PUMPING TEMPERATURE	deg C	AMBIENT						
VISCOSITY AT PUMPING TEMPERATURE	cP	1 to 2						
VAPOUR PRESSURE AT PUMPING TEMPERATURE	KG/CM2 A	0.02-0.07						
LIQUID DENSITY AT PUMPING TEMPERATURE	KG/M3	1020-1025						
PRESENCE OF CORROSIVE / TOXIC COMPONENTS	YES (CORROSIVE)							
SOLIDS IN SUSPENSION	YES (BY PUMP VENDOR BASED ON WATER QUALITY)							
POUR POINT (FOR CONGEALING SERVICE)	deg C	NA						
OPERATING CONDITIONS FOR ONE PUMP								
FLOW RATE	NORMAL	M3/HR						
	MAXIMUM	M3/HR	50					
	MINIMUM	M3/HR						
SUCTION PRESSURE	KG/CM2 A	FLOODED SUCTION						
DISCHARGE PRESSURE	KG/CM2 A	11.8						
DIFFERENTIAL PRESSURE	KG/CM2	10.8						
DIFFERENTIAL HEAD	m	105.8						
NPSH AVAILABLE	m	BY VENDOR						
CAPACITY CONTROL FOR VOLUMETRIC PUMPS								
METHOD OF CONTROL	AS PER RESPECTIVE P&ID							
TYPE OF CONTROL								
CONTROL RANGE								
PRECISION AT MINIMUM RATE								
MECHANICAL DATA								
DESIGN PRESSURE	KG/CM2 G	15.4						
MAXIMUM SUCTION PRESSURE	KG/CM2 A	FLOODED SUCTION						
DESIGN TEMPERATURE	deg C	65						
MATERIAL OF CONSTRUCTION								
	CASING	SUPER DUPLEX STAINLESS STEEL (UNS S32750/S32)						
	IMPELLER / PISTON / PLUNGER	SUPER DUPLEX STAINLESS STEEL (UNS S32750/S32)						
LINE RATING								
	SUCTION	150#						
	DISCHARGE	150#						
SEAL TYPE	SINGLE MECHANICAL SEAL							
DRIVER TYPE	ELECTRIC MOTOR							
STEAM TURBINE DATA								
INLET PRESSURE	(MIN./NOR./MAX./DES.)	BARG						
INLET TEMPERATURE	(MIN./NOR./MAX./DES.)	deg C						
EXHAUST PRESSURE	(MIN./NOR./MAX./DES.)	BARG						
LINE RATING								
	INLET							
	OUTLET							
SAFETY VALVE REQUIRED ON STEAM TURBINE EXHAUST								
MOTOR DATA								
VARIABLE SPEED MOTOR REQUIRED	NO							
AUTO START/STOP OF PUMP REQUIRED	YES							
REACCELERATION REQUIRED	NO							
PUMP CONNECTED TO EMERGENCY POWER/STEAM SUPPLY	YES							
0	09.02.26	ISSUED FOR TENDER				SK	IA	DK
A	19.07.25	ISSUED FOR COMMENTS				IA	JKU	DK
Rev. No.	Date	Purpose				Prepared By	Reviewed By	Approved By

PUMP
PROCESS DATA SHEET

PROJECT	UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT	CLIENT	COCHIN PORT AUTHORITY		
UNIT	NTB & STB TERMINALS	JOB NO.	C044	UNIT NO.	111

NOTES:

- 1 REFER P&ID NO. C044-111-17-43-1111 FOR MORE DETAILS.
- 2 THE PUMP SHALL BE SUPPLIED WITH DRIVE (ELECTRIC MOTOR) WHICH SHOULD BE PROVIDED WITH EMERGENCY POWER SUPPLY.
MATCHING FLANGES ALONG WITH NUTS, BOLTS, GASKETS SHALL BE PROVIDED ALONG WITH PUMPS FOR SUCTION/DISCHARGE FLANGE.
- 3 PUMP SHALL BE CAPABLE OF DISCHARGING NOT LESS THAN 150% OF RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD
SHUT OFF HEAD SHALL NOT EXCEED 140% OF RATED HEAD.
- 4 PUMP MOTOR SHALL BE SUITABLE FOR STARTING AGAINST FULLY OPEN DISCHARGE VALVE.
- 5 PUMP & ITS DRIVE TO COMPLY WITH REQUIREMENTS OF NFPA 20 LATEST EDITION. ADDITIONALLY, PUMP VENDOR SHALL CHECK AND ENSURE REQUIREMENT OF AIR RELEASE VALVE AS PER NFPA-20.

Rev. No.	Date	Purpose	Prepared By	Reviewed By	Approved By
0	09.02.26	ISSUED FOR TENDER	SK	IA	DK
A	19.07.25	ISSUED FOR COMMENTS	IA	JKU	DK



PUMP
PROCESS DATA SHEET

Document No.
C044-111-17-43-DS-1603
Rev. No. 0
Page 1 of 2

PROJECT	UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT		CLIENT	COCHIN PORT AUTHORITY			
UNIT	NTB & STB TERMINALS		JOB NO.	C044	UNIT NO.	111	
ITEM NO.	111-PA-103A						
DESIGN CASE	-						
SERVICE	FOAM CONCENTRATE PUMP						
PARALLEL OPERATION	YES						
OPERATION	INTERMITTENT						
OPERATING	1						
STAND BY	0						
TYPE OF PUMP	ROTARY GEAR						
PROPERTIES OF LIQUID							
LIQUID HANDLED	FOAM CONCENTRATE (AQUEOUS FILM FORMING FOAM)						
PUMPING TEMPERATURE	deg C	AMBIENT					
VISCOSITY AT PUMPING TEMPERATURE	cP	01 to 10					
VAPOUR PRESSURE AT PUMPING TEMPERATURE	KG/CM2 A	0.02-0.07					
LIQUID DENSITY AT PUMPING TEMPERATURE	KG/M3	1010-1025					
PRESENCE OF CORROSIVE / TOXIC COMPONENTS	NO						
SOLIDS IN SUSPENSION	NO						
POUR POINT (FOR CONGEALING SERVICE)	deg C	NA					
OPERATING CONDITIONS FOR ONE PUMP							
FLOW RATE	NORMAL	M3/HR					
	MAXIMUM	M3/HR	17				
	MINIMUM	M3/HR					
SUCTION PRESSURE	KG/CM2 A	1.1					
DISCHARGE PRESSURE	KG/CM2 A	14.8					
DIFFERENTIAL PRESSURE	KG/CM2	13.7					
DIFFERENTIAL HEAD	m	135.7					
NPSH AVAILABLE	m	>8					
CAPACITY CONTROL FOR VOLUMETRIC PUMPS							
METHOD OF CONTROL	AS PER P&ID						
TYPE OF CONTROL							
CONTROL RANGE							
PRECISION AT MINIMUM RATE							
MECHANICAL DATA							
DESIGN PRESSURE	KG/CM2 G	18.9					
MAXIMUM SUCTION PRESSURE	KG/CM2 A	1.44					
DESIGN TEMPERATURE	deg C	65					
MATERIAL OF CONSTRUCTION							
	CASING	CF8M					
	IMPELLER / PISTON / PLUNGER	CF8M					
LINE RATING							
	SUCTION	150#					
	DISCHARGE	150#					
SEAL TYPE	SINGLE MECHANICAL SEAL						
DRIVER TYPE	ELECTRIC MOTOR						
STEAM TURBINE DATA							
INLET PRESSURE	(MIN./NOR./MAX./DES.)	BARG					
INLET TEMPERATURE	(MIN./NOR./MAX./DES.)	deg C					
EXHAUST PRESSURE	(MIN./NOR./MAX./DES.)	BARG					
LINE RATING							
	INLET						
	OUTLET						
SAFETY VALVE REQUIRED ON STEAM TURBINE EXHAUST							
MOTOR DATA							
VARIABLE SPEED MOTOR REQUIRED	NO						
AUTO START/STOP OF PUMP REQUIRED	NO						
REACCELERATION REQUIRED	NO						
PUMP CONNECTED TO EMERGENCY POWER/STEAM SUPPLY	YES						
0	09.02.26	ISSUED FOR TENDER			SK	IA	DK
A	19.07.25	ISSUED FOR COMMENTS			IA	JKU	DK
Rev. No.	Date	Purpose			Prepared By	Reviewed By	Approved By

PROJECT	UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT	CLIENT	COCHIN PORT AUTHORITY		
UNIT	NTB & STB TERMINALS	JOB NO.	C044	UNIT NO.	111

NOTES:

- 1 REFER P&ID NO. C044-111-17-43-1114 FOR MORE DETAILS.
- 2 THE PUMP SHALL BE GRAVITY FEED FROM FOAM CONCENTRATE TANKS.
- 3 MATCHING FLANGES ALONG WITH NUTS, BOLTS, GASKETS SHALL BE PROVIDED ALONG WITH PUMPS FOR DISCHARGE & SUCTION FLANGE.
- 4 PUMPS SHALL BE CONNECTED TO EMERGENCY POWER SUPPLY ALSO.

Rev. No.	Date	Purpose	Prepared By	Reviewed By	Approved By
0	09.02.26	ISSUED FOR TENDER	SK	IA	DK
A	19.07.25	ISSUED FOR COMMENTS	IA	JKU	DK



PUMP
PROCESS DATA SHEET

PROJECT	UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT		CLIENT	COCHIN PORT AUTHORITY			
UNIT	NTB & STB TERMINALS		JOB NO.	C044	UNIT NO. 111		
ITEM NO.	111-PA-103B						
DESIGN CASE	-						
SERVICE	FOAM CONCENTRATE PUMP						
PARALLEL OPERATION	YES						
OPERATION	INTERMITTENT						
OPERATING	1						
STAND BY	0						
TYPE OF PUMP	ROTARY GEAR						
PROPERTIES OF LIQUID							
LIQUID HANDLED	FOAM CONCENTRATE (AQUEOUS FILM FORMING FOAM)						
PUMPING TEMPERATURE	deg C	AMBIENT					
VISCOSITY AT PUMPING TEMPERATURE	cP	01 to 10					
VAPOUR PRESSURE AT PUMPING TEMPERATURE	KG/CM2 A	0.02-0.07					
LIQUID DENSITY AT PUMPING TEMPERATURE	KG/M3	1010-1025					
PRESENCE OF CORROSIVE / TOXIC COMPONENTS	NO						
SOLIDS IN SUSPENSION	NO						
POUR POINT (FOR CONGEALING SERVICE)	deg C	NA					
OPERATING CONDITIONS FOR ONE PUMP							
FLOW RATE	NORMAL	M3/HR					
	MAXIMUM	M3/HR	17				
	MINIMUM	M3/HR					
SUCTION PRESSURE	KG/CM2 A	1.1					
DISCHARGE PRESSURE	KG/CM2 A	14.8					
DIFFERENTIAL PRESSURE	KG/CM2	13.7					
DIFFERENTIAL HEAD	m	135.7					
NPSH AVAILABLE	m	>8					
CAPACITY CONTROL FOR VOLUMETRIC PUMPS							
METHOD OF CONTROL	AS PER P&ID						
TYPE OF CONTROL							
CONTROL RANGE							
PRECISION AT MINIMUM RATE							
MECHANICAL DATA							
DESIGN PRESSURE	KG/CM2 G	18.9					
MAXIMUM SUCTION PRESSURE	KG/CM2 A	1.44					
DESIGN TEMPERATURE	deg C	65					
MATERIAL OF CONSTRUCTION							
	CASING	CF8M					
	IMPELLER / PISTON / PLUNGER	CF8M					
LINE RATING							
	SUCTION	150#					
	DISCHARGE	150#					
SEAL TYPE	SINGLE MECHANICAL SEAL						
DRIVER TYPE	DIESEL ENGINE						
STEAM TURBINE DATA							
INLET PRESSURE	(MIN./NOR./MAX./DES.)	BARG					
INLET TEMPERATURE	(MIN./NOR./MAX./DES.)	deg C					
EXHAUST PRESSURE	(MIN./NOR./MAX./DES.)	BARG					
LINE RATING							
	INLET						
	OUTLET						
SAFETY VALVE REQUIRED ON STEAM TURBINE EXHAUST							
MOTOR DATA							
VARIABLE SPEED MOTOR REQUIRED	NO						
AUTO START/STOP OF PUMP REQUIRED	NO						
REACCELERATION REQUIRED	NO						
PUMP CONNECTED TO EMERGENCY POWER/STEAM SUPPLY	NO						
A	09.02.26	ISSUED FOR TENDER			SK	IA	DK
Rev. No.	Date	Purpose			Prepared By	Reviewed By	Approved By

PUMP
PROCESS DATA SHEET

PROJECT	UPGRADATION OF FIREFIGHTING FACILITIES OF TANKER TERMINALS AT COCHIN PORT	CLIENT	COCHIN PORT AUTHORITY		
UNIT	NTB & STB TERMINALS	JOB NO.	C044	UNIT NO.	111

NOTES:

- 1 REFER P&ID NO. C044-111-17-43-1114 FOR MORE DETAILS.
- 2 THE PUMP SHALL BE GRAVITY FEED FROM FOAM CONCENTRATE TANKS.
- 3 DIESEL DAY TANK OF THE PUMP SHALL BE SUPPLIED ALONG WITH BREATHER VALVE, FLAME ARRESTOR, VENT, DRAIN VALVE, INLET, OUTLET, LEVEL GAUGE, LEVEL (LOW) ALARM WITH TRANSMITTER AND ALL CONNECTED PIPES AND FITTINGS.
- 4 THE PUMP SHALL BE SUPPLIED WITH DRIVE (DIESEL ENGINE) & DIESEL STORAGE DAY TANK. DIESEL STORAGE TANK SHALL HAVE MINIMUM STORAGE CAPACITY OF 4 HOURS CONTINUOUS RUNNING OF THE ENGINE ON FULL LOADS. PUMP SHALL BE IN INTERMITTENT OPERATION.
- 5 MATCHING FLANGES ALONG WITH NUTS, BOLTS, GASKETS SHALL BE PROVIDED ALONG WITH PUMPS FOR SUCTION/DISCHARGE FLANGE.

Rev. No.	Date	Purpose	Prepared By	Reviewed By	Approved By
A	09.02.26	ISSUED FOR TENDER	SK	IA	DK



DOC. NO. : 1MP-PED-FE-1142

Rev. 2

DESCRIPTION :

DATA SHEET FOR SS FOAM CONCENTRATE
STORAGE TANK, CAP. 10000 LTR.

SH. 1 OF 2

DATA SHEET FOR SS FOAM CONCENTRATE STORAGE TANK, CAP. 10000 LTR.

OWNER : COCHIN PORT TRUST, COCHIN.

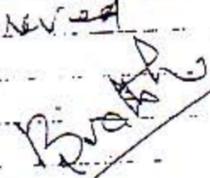
ORDER NO. : D/T-7 REFFFNBT&STB/11-M, Dated 05-07-2012

PROJECT NAME : REVAMPING OF FIRE FIGHTING FACILITIES
AT NORTH AND SOUTH TANKER BERTHS

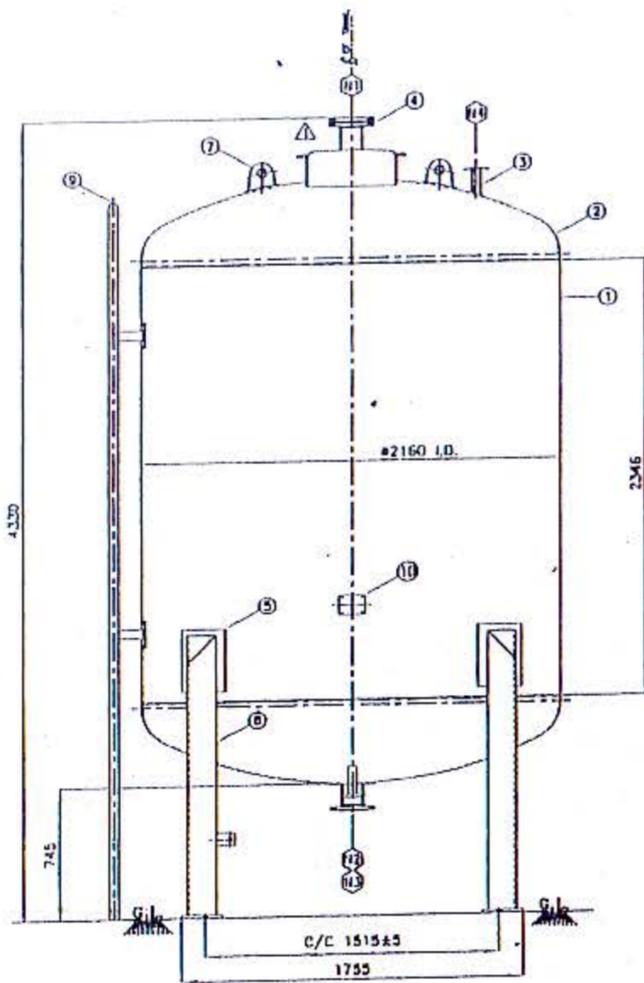
REV.	DESCRIPTION	PREP'D.	CHK'D	APPR'D	DATE
0	SUBMISSION FOR REVIEW AND APPROVAL	SLK	SPG	AKD	12.10.2012
1	REVISED AS PER COMMENTS	SLK	SPG	AKD	28.11.2012
2	REVISED AS PER COMMENTS	SLK	SPG	AKD	11.12.2012

ITEM	: FOAM STORAGE TANK - 10,000 LITERS
CLIENT	: M/s MATHER & PLATT PUMPS LIMITED
PROJECT	: COCHIN PORT TRUST
REF.	: YOUR LOI DT 02-12-2012

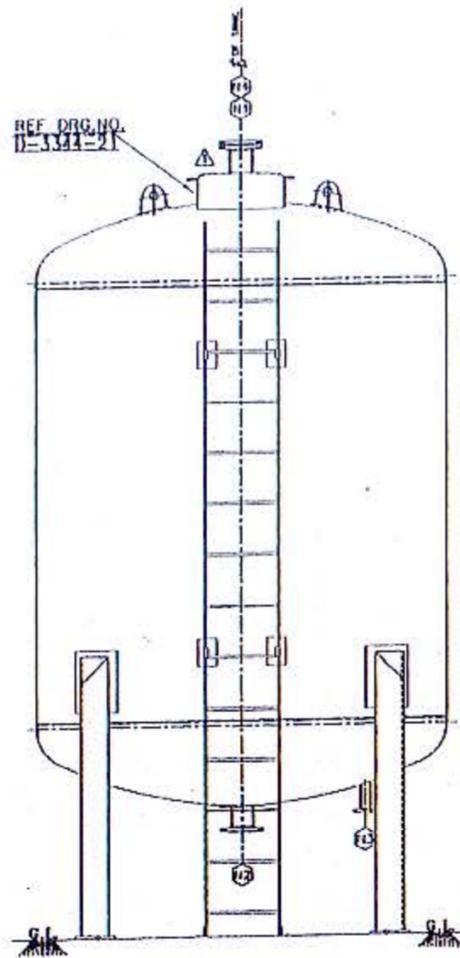
1.0	DESIGN DATA	ASME SEC.VIII DIV.1
1.1	DESIGN CODE	10,000 LITRES
1.2	CAPACITY	VERTICAL ON LEG SUPPORTS
1.3	MOUNTING TYPE	02 NOS.
1.4	QUANTITY	
1.5	MATERIAL OF CONSTRUCTION	
	a) DISHEND	SA-240 GR.316L (SS:316L)
	b) SHELL	SA-240 GR.316L (SS:316L)
	c) PIPE	SA-312 TP316L (SS:316L)
	d) FLANGES	SA-182 F316L (SS:316L)
	e) WEAR PAD	SA-240 GR.316L (SS:316L)
	f) LEG SUPPORT	SS 316 L
1.6	NOMINAL THICKNESS	6MM THK.
1.7	WORKING PRESSURE	ATMOSPHERIC
1.8	DESIGN PRESSURE	1.0 KG/SQ.CM
1.9	HYDROSTATIC TEST PRESSURE	1.5 KG/SQ.CM
1.10	DISHENDS	TORISPHERICAL
1.11	JOINT EFFICIENCY - SHELL	0.7
1.12	JOINT EFFICIENCY - DISHENDS	1
1.13	RADIOGRAPHY	NOT APPLICABLE
1.14	CORROSION ALLOWANCE	0mm
2.0	SURFACE TREATMENT	PICKLING & PASSIVATION
3.0	FINISH	NATURAL
3.1	INTERNAL	
3.2	EXTERNAL	1. 01 COAT OF ETCH PRIMER (5-10 MIC. DFT) 2. 02 COAT OF EPOXY PRIMER (30-40 MIC. DFT/COAT) 3. 02 COATS OF POLY SILOXANE - COLOUR YELLOW

Approved

 अधीक्षक इंजीनियर (यांत्रिक)
 SUPERINTENDING ENGINEER (MECHANICAL)
 टैंकर टर्मिनल/TANKER TERMINAL
 कोचिन पोर्ट ट्रस्ट/COCHIN PORT TRUST

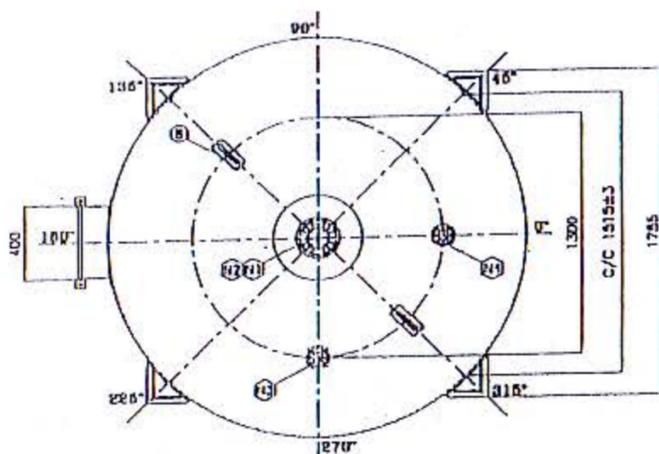
REV.	DATE	DESCRIPTION	PRP.BY	CHKD. BY	APPD. BY
1	11-12-2012	REVISED AS PER COMMENTS	KMR	MPR	
0	02-12-2012	ISSUED FOR APPROVAL	KMR	MPR	



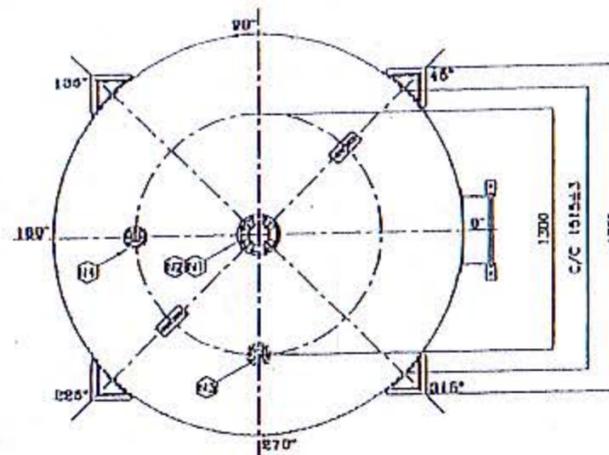
ELEVATION



SIDE VIEW



PLAN NOZZLE ORIENTATION TANK NO:-1



PLAN NOZZLE ORIENTATION TANK NO:-2

DESIGN DATA

1. DESIGN CODE	ASME SEC VII DIV.1
2. CAPACITY	10000 LITERS.
3. MOUNTING TYPE	VERTICAL ON LEG SUPPORT.
4. QUANTITY	02 NOS.
5. MATERIAL OF CONSTRUCTION	SS-316L
6. NOMINAL THICKNESS	6 MM THK.
7. WORKING PRESSURE	ATMOSPHERIC
8. DESIGN PRESSURE	1.0 KG/50.CM
9. HYDROSTATIC TEST PRESSURE	1.5 KG/50.CM
10. DISINCHES	TORSIONLESS
11. JOINT EFFICIENCY	0.7 (SHIELL), 1 (DISINCHES)
12. RADIOGRAPHY	NOT APPLICABLE
13. CORROSION ALLOWANCE	0mm
14. INTERNAL	NATURAL
15. EXTERNAL	1. 01 COAT OF ETCH PRIMER (5-10MIC.DFT) 2. 02 COAT OF EPOXY PRIMER (30-40 MIC.DFT/COAT) 3. 03 COATS OF POLYSILOXANE-YELLOW COLOUR (30-40 MIC.DFT/COAT)

NOTES:

1. ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE SPECIFIED.

NOZZLE SCHEDULE

NOZZLE NO.	NOZZLE/COUPLER	QTY.	FLANGE RATING	FLANGE TYPE	COUPLER RATING	COUPLER TYPE	SERVICE	MATERIAL
N1	100	1	3007	SOFF	--	--	BREATHER CAP/VENT.	SA-102 F316L (SS-316L)
N2	100	1	3007	SOFF	--	--	SUPPLY NOZZLE.	SA-102 F316L (SS-316L)
N3	40	1	3007	SOFF	--	--	RETURN NOZZLE.	SA-102 F316L (SS-316L)
N4	40	1	3007	SOFF	--	--	RETURN SUPPLY.	SA-102 F316L (SS-316L)

ID	NOZZLE PLATE	QTY.	MATERIAL	SIZE	REMARKS
9	NOZZLE PLATE	1	SS-316L	510	--
8	LADDER	1	MS GALVANISED	#18 X 400 LG.	--
7	LIFTING LUG PVD.	2	SA-210 GR.316L (SS-316L)	75X X 100X X 6 THK.	--
6	LIFTING LUG.	2	SA-210 GR.316L (SS-316L)	110X X 130X X 16 THK.	--
5	LEG SUPPORT	4	SS-316L	150 X 150 X 12 THK.	--
4	BEAM PVD	4	SA-210 GR.316L (SS-316L)	255X X 250X X 6 THK.	--
3	FLANGE	4	SA-102 F316L (SS-316L)	100NB/100D	--
2	PIPE	4	SA-312 TP316L (SS-316L)	100NB/100D	--
1	DISKEND	2	SA-210 GR.316L (SS-316L)	42435 X 6THK.	--
0	SHIELL	1	SA-210 GR.316L (SS-316L)	23504 X 6700X X 6 THK.	--

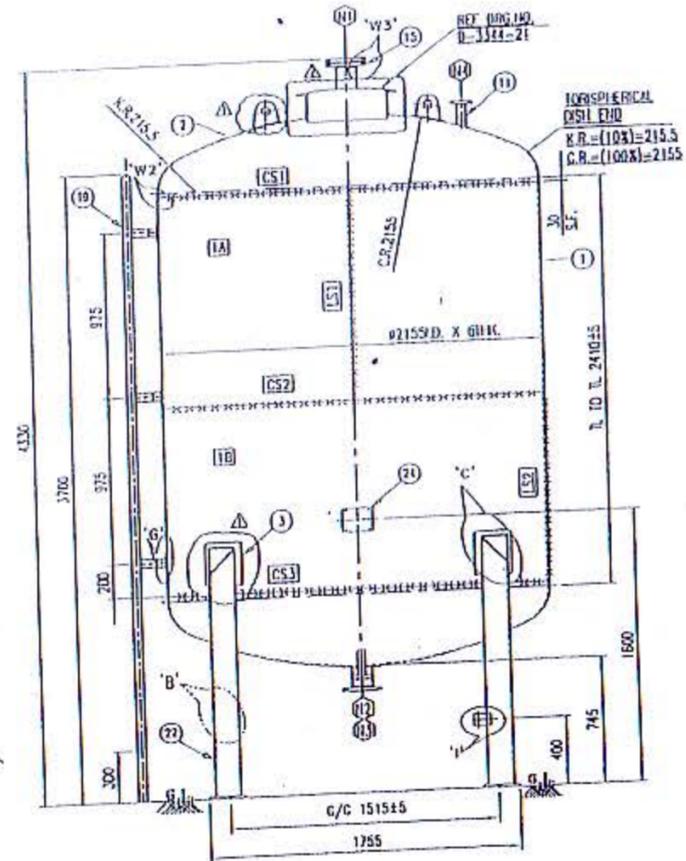
BILL OF MATERIAL

CLIENT:-MATHER & PLAIT PUMPS LTD.	2012	DATE
PROJECT:-COCHIN PORT TRUST.	17.10	DATE
CONSULTANT:-	17.10	DATE
TITLE:-FOAM STORAGE TANK - 10000 LITERS.	01	OF 01

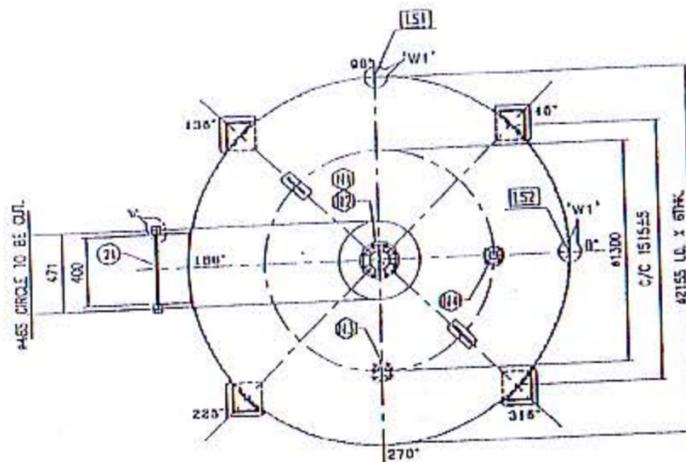
ISSUED FOR APPROVAL.	17.10	S.R.C.	KMR	---	
REV.	DESCRIPTION	DATE	DRN.	CHKD.	APPD.

FIRETECH EQUIPMENT & SYSTEMS PRIVATE LIMITED

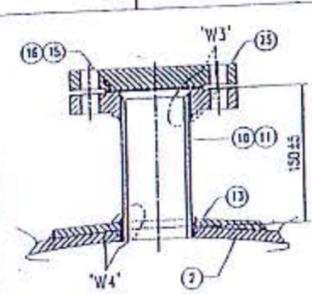
DRAWING NO.	REV.
D-3344-2	1



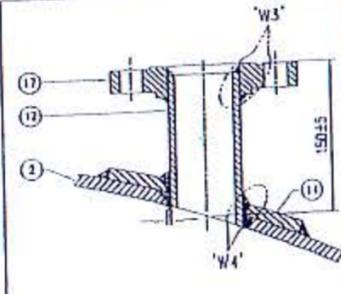
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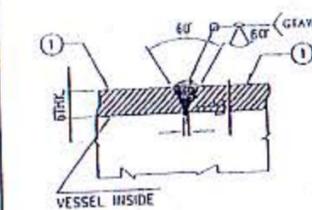
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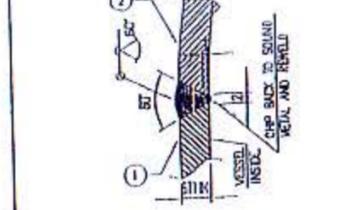
NOZZLE DETAIL-11,112



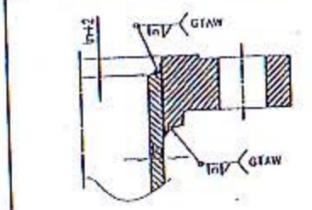
NOZZLE DETAIL-113,114



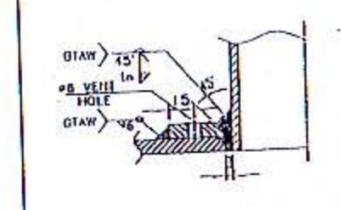
WELD DETAIL-W1-LONG SEAM



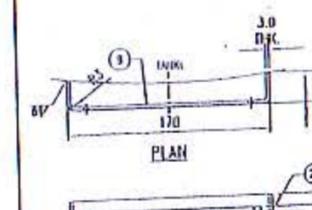
WELD DETAIL-W2-CIRC SEAM



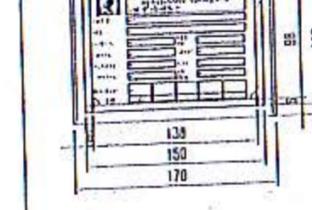
WELD DETAIL-W3



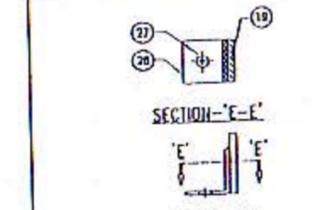
WELD DETAIL-W4



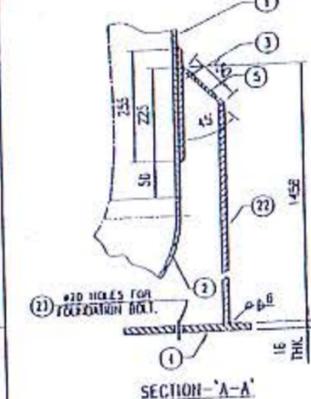
LADDER DETAIL



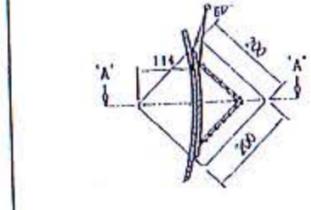
ELEVATION
DETAIL OF NAME PLATE



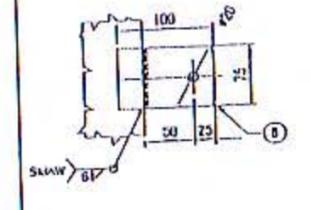
SECTION-E-E
DETAIL-D



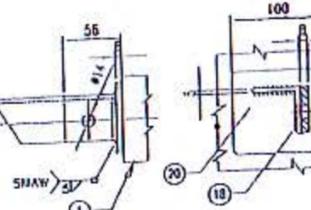
SECTION-A-A



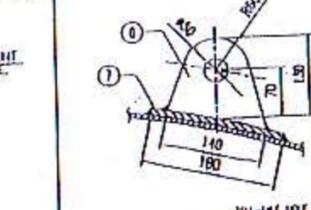
DETAIL-B



DETAIL-C



DETAIL-D



DETAIL-E

DESIGN DATA

1. DESIGN CODE	ASME SEC VIII DIV 1
2. CAPACITY	10000 LITERS
3. MOUNTING TYPE	VERTICAL ON LEG SUPPORT
4. QUANTITY	02 NOS.
5. MATERIAL OF CONSTRUCTION	SS-316
6. MATERIAL THICKNESS	6 MM THK.
7. WORKING PRESSURE	ATMOSPHERIC
8. DESIGN PRESSURE	1.0 KG/SQ CM
9. HYDROSTATIC TEST PRESSURE	1.5 KG/SQ CM
10. DASHED	ATMOSPHERIC
11. JOINT EFFICIENCY	0.7 (DISK), 1.0 (DISHEADS)
12. RADIOGRAPHY	ONLY FOR DISHEADS
13. CORROSION ALLOWANCE	0mm
14. TREATMENT	PATENT
15. EXTERNAL	1. 01 COAT OF ETCH PRIMER (5-10 MICRONS) 2. 02 COAT OF EPOXY PRIMER (30-40 MICRONS/COAT) 3. 03 COAT OF POLYURETHANE-VELOUR COLOUR (30-40 MICRONS/COAT)

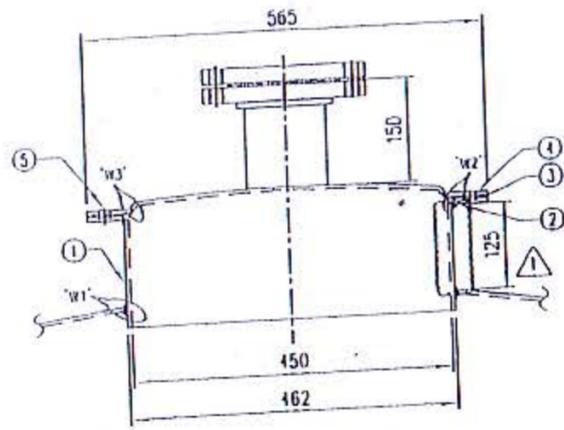
- NOTES:**
- ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED
 - DIM OF MATERIAL INDICATES THE FINISHED SIZE/NECESSARY ALLOWANCE TO BE KEPT AS HEAD
 - MATERIAL SHALL BE TESTED AS PER APPROVED SUP.
 - WELDING PROCEDURE TO BE CARRIED OUT AS PER APPROVED W.P.S.
 - ALL SWAMP CORNERS SHALL BE CHAMFERED SMOOTH
 - CARPENTRY CLEAR SHALL NOT BE PAINTED
 - HOLES OF DRILLED CONNECTIONS SHALL STRADDLE TO CENTRELINE OF VESSEL
 - LONGITUDINAL / CIRCUMFERENTIAL SEAMS SHALL CLEAR NOZZLE HEADINGS
 - ALL CORNERS SHALL BE BLANDED AND HELL-TAKE HOLES SHALL BE WITH GREASE FILLER BEFORE SHIPPING
 - THE PENETRANT TESTING OF ATTACHMENT OF WELDS AND NOZZLE WELDS SHALL BE CARRIED OUT WITH 100% FULL WELD AS PER SEC V
 - WATER USED FOR HYDROSTATIC TEST SHALL NOT HAVE CHLORINE CONTENT MORE THAN 25 PPM

NOZZLE SCHEDULE

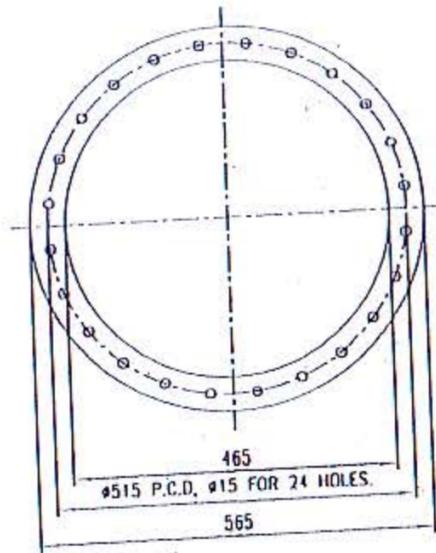
NOZZLE NO.	NOZZLE SIZE	QTY.	FLANGE TYPE	CORNER TYPE	SERVICE	MATERIAL
101	100	1	150J	SOFT	SUPPLY NOZZLE	SS-316L
102	100	1	150J	SOFT	SUPPLY NOZZLE	SS-316L
103	100	1	150J	SOFT	RETURN SUPPLY	SS-316L
104	100	1	150J	SOFT	RETURN SUPPLY	SS-316L

SR.NO.	DESCRIPTION	QTY.	MATERIAL	SIZE	REMARK
27	LADDER BOLTS/PLATE	2	US 15-1167	M12 X 150 MM LG.	
28	ANGLE LADDER	2	W.S.	50 X 50 X 5MM X 50 LG.	
29	BLIND FLANGE	1	SA-102 F316	100MM DIA/150X165.300J	
30	NAME PLATE	1	SS-316	110MM X 150 X 10MM.	
31	FOUNDATION BOLTS/PLATE	4	US 15-1167	M16 X 200 MM LG.	
32	ANGLE-LEG SUPPORT	1	SS-316L	150 X 150 X 12MM X 1450 LG.	
33	WIRE-LEG SUPPORT	1	W.S.GALVANIZED	M6 X 4000 MM LG.	
34	ROD LADDER	2	SS-316	100MM X 100 X 6 THK.	
35	PLAT LADDER	1	W.S.GALVANIZED	50MM X 6 THK X 7100 MM LG.	
36	ANGLE LADDER	6	SS-316	50 X 50 X 5MM X 200 MM LG.	
37	FLANGE-111	1	SA-102 F316	100MM DIA/150X165.300J	
38	FLANGE-112	1	SA-102 F316	100MM DIA/150X165.300J	
39	FLANGE-113	1	SA-102 F316	100MM DIA/150X165.300J	
40	RF-PLATE-111	2	SA-210 GR.316L	M20 X 6THK	
41	RF-PLATE-112	2	SA-210 GR.316L	M20 X 6THK	
42	RF-PLATE-113	2	SA-312 TP 316L	100MM, SULS, SCH10 X 120LG.	
43	RF-PLATE-114	2	SA-312 TP 316L	100MM, SULS, SCH10 X 160LG.	
44	RF-PLATE-115	1	SA-312 TP 316L	100MM, SULS, SCH10 X 165LG.	
45	RF-PLATE-116	1	SA-312 TP 316L	100MM, SULS, SCH10 X 165LG.	
46	RF-PLATE-117	1	SS-316	130MM X 170 X 3.0 THK.	
47	NAME PLATE BRACKET	1	SS-316L	75MM X 100 X 6 THK.	
48	CARPENTRY CLEAR	1	SS-316L	75MM X 100 X	

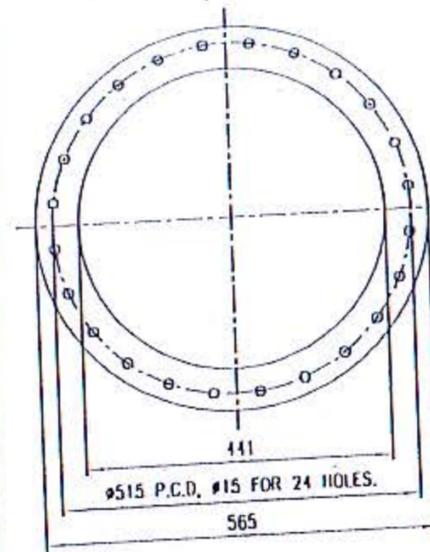
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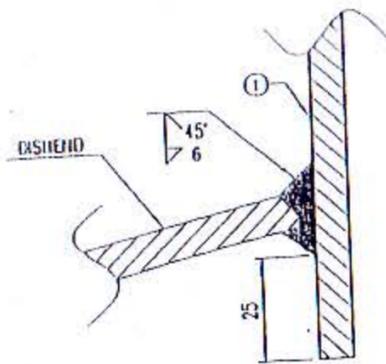
MANHOLE DETAIL



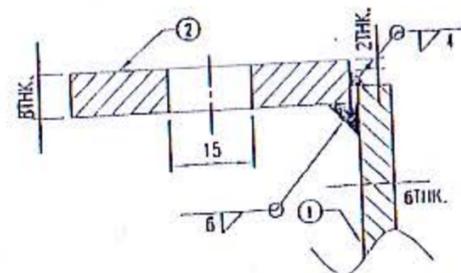
2 BOTTOM FLANGE



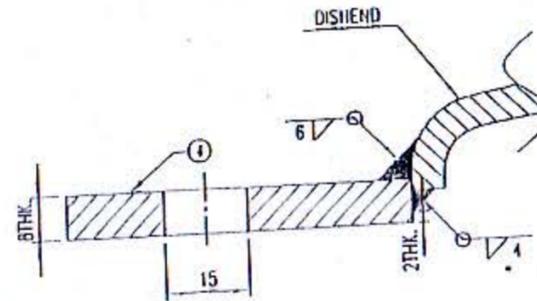
1 TOP FLANGE



WELD DETAIL 'W1'



WELD DETAIL 'W2'



WELD DETAIL 'W3'

SR.NO.	DESCRIPTION	QTY.	MATERIAL	SIZE	REMARK
05	STUD BOLT & NUT	24	SS:316L	1/2" x 35 LG.	---
04	TOP FLANGE (FLAT)	01	SA-240 GR.316L	62 X 1776 X 8 THK.	---
03	GASKET	01	PTIRILE.	O.D.565 X I.D.450 X 3/16" THK.	---
02	BOTTOM FLANGE (FLAT)	01	SA-240 GR.316L	50 X 1776 X 8 THK.	---
01	NECK	01	SA-240 GR.316L	160 X 1165 X 6 THK.	---

BILL OF MATERIAL

CLIENT:-MATHER & PLATT	DESIGNED	NAME	DATE
PROJECT:- COCHIN PORT TRUST.	DRAWN	ICPR	17.10.13
CONSULTANT:-	CHECKED	ICPR	17.10.13
TITLE:-MANHOLE FABRICATION DRAWING-10000LTRS.	STANDARD		
	APPROVED		
	SHEET NO.	01 OF 01	
	DRAWING NO.		REV.
	D-3344-21		1

REV.	DESCRIPTION	DATE	DRG.	CHKD.	APPD.
0	ISSUED FOR FABRICATION	17.10	SRS	XANT	---



FIRETECH EQUIPMENT & SYSTEMS PRIVATE LIMITED
MUMBAI 400 078, INDIA

DESIGN CALCULATION OF FOAM STORAGE TANK

CAPACITY - 10,000 LITERS

CLIENT	: MATHER & PLATT PUMPS LTD.
PROJECT	: COCHIN PORT TRUST
INSPECTION	: BY MPPL / CLIENT
DRG. REF NO	: D-3444-1

A DESIGN DATA:

1	Design Code	: ASME SEC.VIII DIV.1	
2	Vessel Nominal Capacity	: 10,000 Liter (Minimum)	
3	Service	: Foam Concentrate AFFF-3%	
4	Specific Gravity of Foam Concentrate	: 1.1 Max.	
	Maximum Static Head	: 3.751 MWC	
5	Working Pressure	: 0.3751 Kg/sq.cm	5.36 Psi
6	Design Pressure	: 1 Kg/sq.cm	14.28 Psi
7	Hydro-Test Pressure	: 1.50 Kg/sq.cm	21.42 Psi
8	Design Temperature	: 0 To 60 Centigrade	
9	Material of Construction	: SA-240 GR.316L	
10	Ultimate Tensile Stress	: 4850.00 Kg/sq.cm	69258.00 Psi
11	Allowable Design Stress	: 1150.00 Kg/sq.cm	16422.00 Psi
12	Joint Efficiency (E) - Shell	: 0.7	
13	Joint Efficiency (E) - Dishend	: 1	
14	Vessel - Inside Diameter (D)	: 216 cm	85.04 Inches
15	Vessel - Inside Radius (R)	: 108 cm	42.52 Inches
16	Corrosion Allowance	: 0 cm	0.000 Inches

NOTE: 1] Allowable Design Stress Reference - ASME Sec. II Part D Table 1a.

REV.NO	DATE	DESCRIPTION	PRP. BY	VER. BY	APPD. BY
0	14.06.2013	ISSUED FOR APPROVAL	KMR	KMR	

A] CALCULATION OF SHELL THICKNESS

$$T_s = \frac{PR}{SE - 0.6P}$$

UG - 27 OF ASME SEC.VIII DIV.I

$$T_s = \frac{1 \times 108}{1150.00 \times 0.7 - (0.6 \times 1)}$$

Ts= Shell Thickness
 P= 1.000 Kg/sq.cm
 R= 108.00 cm
 S= 1150.00 Kg/sq.cm
 E= 0.7

$$T_s = \frac{108.00}{804.40}$$

Ts = 0.134 cm

Ts = 1.34 mm

Ts = 1.34 mm + Corrosion Allowance (0 mm)

Ts = 1.34 mm

Ts = Requied Thickness of Shell Plate = 1.34 mm

Use Plate Thickness for Shell = 6 mm

B) CALCULATION OF DISH-END THICKNESS - (2:1 ELLIPSOIDAL)

UG - 32 OF ASME SEC.VIII DIV.I

$$T_d = \frac{0.885 PL}{SE - 0.1P}$$

$$T_d = \frac{0.885 \times 1.0 \times 216}{1150 \times 1.0 - 0.1 \times 1.0}$$

$$T_d = \frac{191.16}{1149.90}$$

Td= Dish End Thickness
 P= 1.00 Kg/sq.cm
 D= 216.00 cm
 S= 1150.00 Kg/sq.cm
 E= 1
 Thining Allowance = 1 mm
 L= 216 cm

Td = 0.17 cm

Td = 1.66 mm

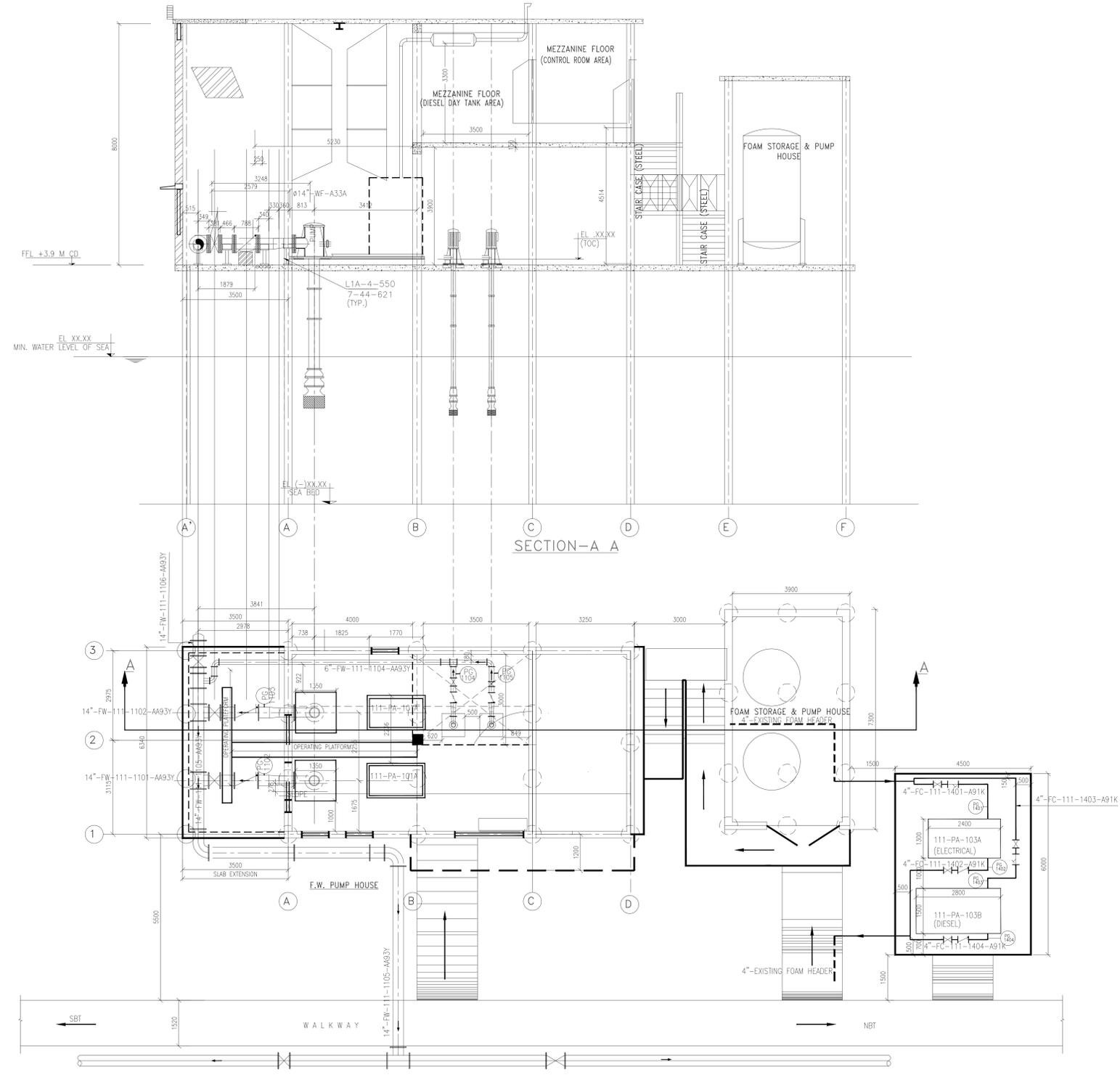
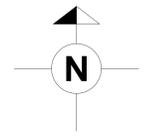
Td = 1.66 mm + Corrosion Allowance (0 mm) + Thining Allownace (1 mm)

Td = 2.66 mm (Inclusive of Thining Allowance)

Td = Requied Thickness of Dish-End = 2.66 mm

Use Plate Thickness for Dish-End = 6 mm

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SECTION-A A

REF. DWG. NO.	REFERENCE DRAWING TITLE
C044-111-17-43-1111	P&ID FOR FIRE WATER PUMPING SYSTEM AT NTB & STB TERMINALS
C044-111-17-43-1114	P&ID FOR FOAM SYSTEM AT NTB & STB TERMINALS

- NOTES :-**
- ALL DIMENSIONS ARE IN MM EXCEPT LEVELS AND CO-ORDINATES WHICH ARE IN METERS UNLESS OTHERWISE MENTIONED.
 - ABOVE GROUND PIPES SHALL BE PAINTED FIRE RED AS PER OIL SPECIFICATION.
 - FOR PIPING SUPPORTS REFER PIPING STANDARD 7-44-621.
 - ALL BRANCH CONNECTIONS TO BE MADE AS PER PIPING DISCHARGE LINE.
 - ALL VALVES SHALL BE IN NORMALLY OPEN POSITION IN SPECIFICATION.
 - DIMENSIONS OF FITTINGS, VALVES ETC. SHALL BE VERIFIED BEFORE TAKING UP FABRICATION OF PIPING.
 - ERECTOR OF PUMPS INCLUDING DRIVE SHALL BE STRICTLY AS PER VENDOR'S INSTALLATION MANUAL.
 - EXHAUST PIPING, SILENCER AND SUPPORTS SHALL BE SUPPLIED BY VENDOR.
 - FOLLOWING DETAILS SHALL BE FURNISHED BY PUMP VENDOR AND TO BE INSTALLED TO SUIT SITE CONDITION.
 - COOLING WATER PIPING TO DIESEL ENGINE
 - DRAINAGE FROM COOLING WATER
 - FUEL SUPPLY AND RETURN PIPING FROM DIESEL DAY TANK TO DIESEL ENGINE.
 - SUITABLE OPENING IN TOP SLAB PLATE AS REQUIRED TO FIX INSTRUMENTS SHALL BE PROVIDED TO SUIT SITE.
 - FOR INSTALLATION OF INSTRUMENT REFER INSTRUMENT VENDOR.
 - DRAWN OILY WATER SHALL BE PUMPED OUT WITH THE HELP OF A MOBILE PUMP FROM OIL DTL.
 - EARTHING STRIP SHALL BE PROVIDED IN FLOORING AS PER ELECTRICAL DWG.

LEGEND:-

	BOP	BOTTOM OF PIPE
	HL	HIGHEST/LOWEST POINT OF FLOOR
	BL	BED LEVEL

REV.	DATE	REVISIONS	BY	CHKD	APPD	PMPC
C	03.01.26	ISSUED FOR COMMENTS/CONFIRMATION AS-BUILT	KC	AWS	SM	
D	02.01.26	ISSUED FOR COMMENTS/CONFIRMATION AS-BUILT	KC	AWS	SM	
A	15.12.25	ISSUED FOR COMMENTS/CONFIRMATION AS-BUILT	KC	AWS	SM	

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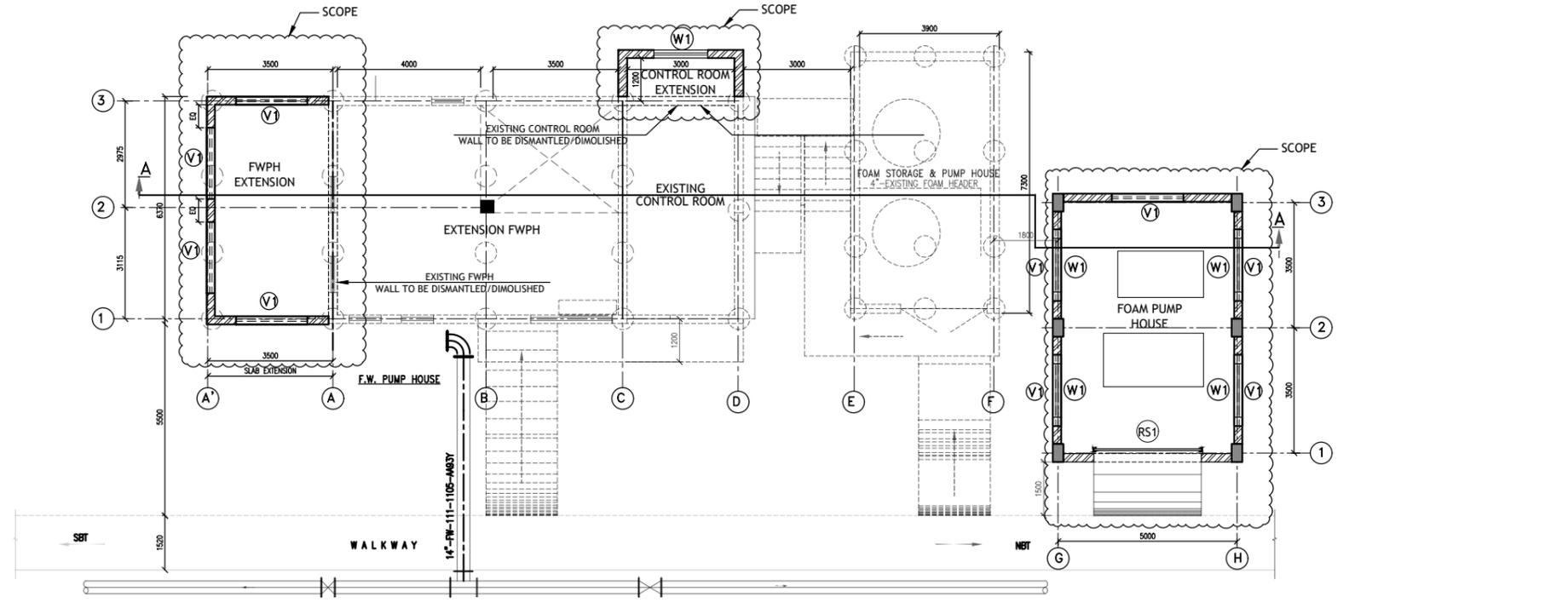
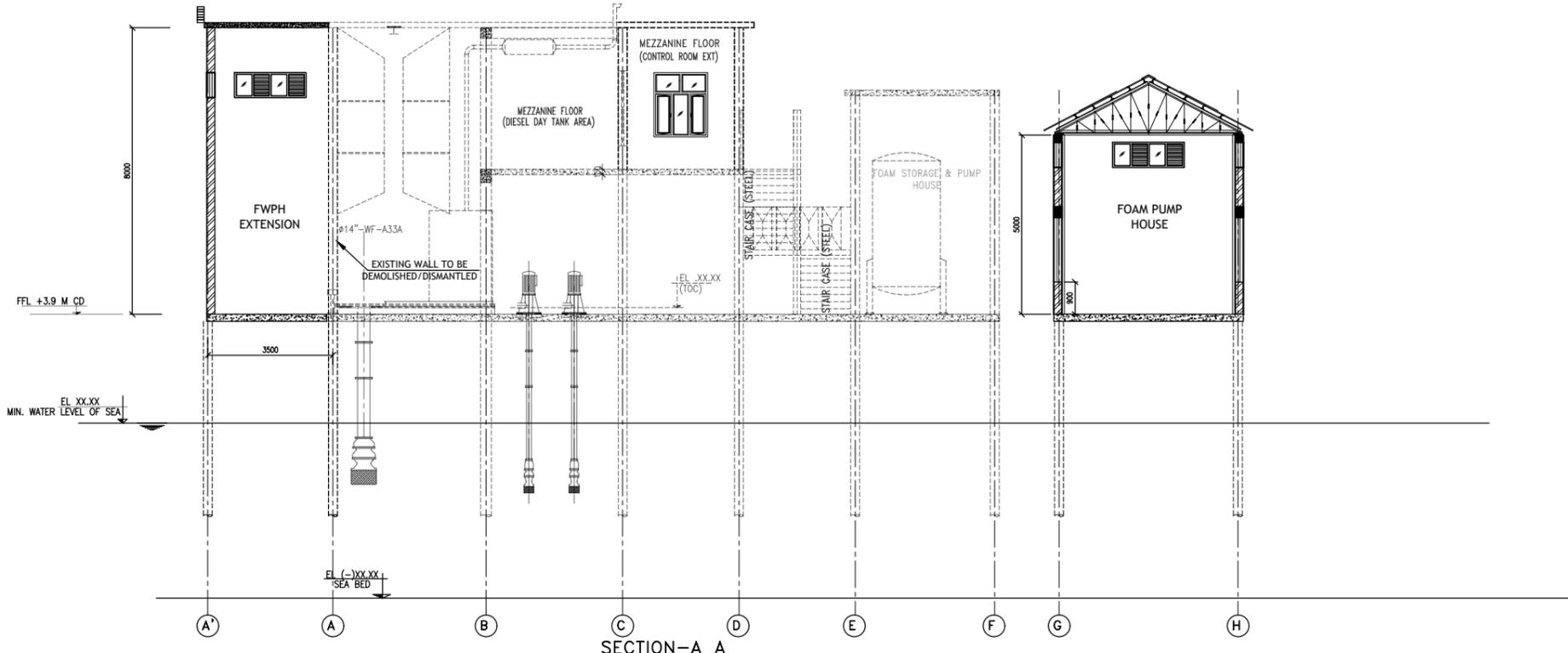
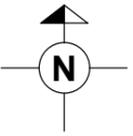
COCHIN PORT AUTHORITY

CONSULTANCY SERVICES FOR THE WORK OF UPGRADATION OF FIRE FIGHTING FACILITIES OF TANKER TERMINALS COT, Q-4 AND OTB (NTB-STB) AT COCHIN PORT

G.A. DRAWING FOR UPGRADING OF FIRE FIGHTING FACILITIES AT THE NTB & STB GA OF FIREWATER & FOAM PUMP HOUSE

SCALE	JOB NO.	UNIT	DIVN.	DEPT.	DWG. NO.	REV.
1:75	C04	00	00	08	1450	002

3-1641-0500 REV.2 A0-1169 x 841



REF. DWG. NO.	REFERENCE DRAWING TITLE
004-000-81-46-01002	03 SHED - PWS & SECTIONS

NOTES :-

- ALL DIMENSIONS ARE IN MM EXCEPT LEVELS AND CO-ORDINATES WHICH ARE IN METERS UNLESS OTHERWISE MENTIONED.
- ABOVE GROUND PIPES SHALL BE PAINTED FIRE RED AS PER EIL SPECIFICATION.
- FOR PIPING SUPPORTS REFER PIPING STANDARD 7-44-621.
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- ALL VALVES SHALL BE IN NORMALLY OPEN POSITION IN SPECIFICATION.
- DIMENSIONS OF FITTINGS, VALVES ETC. SHALL BE VERIFIED BEFORE TAKING UP FABRICATION OF PIPING.
- ERECTION OF PUMPS INCLUDING DRIVE SHALL BE STRICTLY AS PER VENDOR'S INSTALLATION MANUAL.
- EXHAUST PIPING, SILENCER AND SUPPORTS SHALL BE SUPPLIED BY VENDOR.
- FOLLOWING DETAILS SHALL BE FURNISHED BY PUMP VENDOR AND TO BE INSTALLED TO SUIT SITE CONDITION.
 - COOLING WATER PIPING TO DIESEL ENGINE
 - DRAINAGE FROM COOLING WATER
 - FUEL SUPPLY AND RETURN PIPING FROM DIESEL DAY TANK TO DIESEL ENGINE.
- SUITABLE OPENING IN TOP SLAB PLATE AS REQUIRED TO FIX INSTRUMENTS SHALL BE PROVIDED TO SUIT SITE.
- FOR INSTALLATION OF INSTRUMENT REFER INSTRUMENT VENDOR.
- DRAINED OILY WATER SHALL BE PUMPED OUT WITH THE HELP OF A MOBILE PUMP FROM OIL PIT.
- DRAINING STRIP SHALL BE PROVIDED IN FLOORING AS PER ELECTRICAL DWG.
- ALL DIMENSION TO BE RECHECK BY CONTRACTOR.

SCHEDULE OF DOORS AND WINDOWS					
TYPE	OPENING SIZE	FRAME SIZE	UNTEL LEVEL	DESCRIPTION	NOS.
W1	1500 x 1800	1480 x 1780	2700	POWDER COATED ALUMINIUM GLAZED WINDOW PART FIXED/PART OPEN WITH 6.5 MM THK. TOSHISED GLASS	05
V1	2000 x 0700	1980 x 0680	2700	POWDER COATED ALUMINIUM GLAZED VENTILATOR PARTLY FIXED /PARTLY LOUVERS AS/EIL STD.	09
RS1	3000 x 3500	-----	3500	STD. STEEL ROLLING SHUTTER	01

LEGEND:-

	AS/ EXISTING
	NEW BUILDING

NOTES

- * DWG IS A CONCEPTUAL REPRESENTATION OF THE WORK TO BE EXECUTED
- * ALL DIMENSIONS TO BE RECHECKED BY CONTRACTOR
- * PILE LOCATION AS/ STR.
- * CONTRACTOR TO FREEZE BUILDING DIMENSIONS AND SIZE DURING DETAILED ENGINEERING

REV	DATE	ISSUED FOR COMMENTS/TENDER	REVISIONS	BY	CHKD	APPD	PEMPC
A	09.02.26	ISSUED FOR COMMENTS/TENDER					

ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)

COCHIN PORT AUTHORITY

CONSULTANCY SERVICES FOR THE WORK OF UPGRADATION OF FIRE FIGHTING FACILITIES OF TANKER TERMINALS COT-4 AND OTB (NTB-STB) AT COCHIN PORT

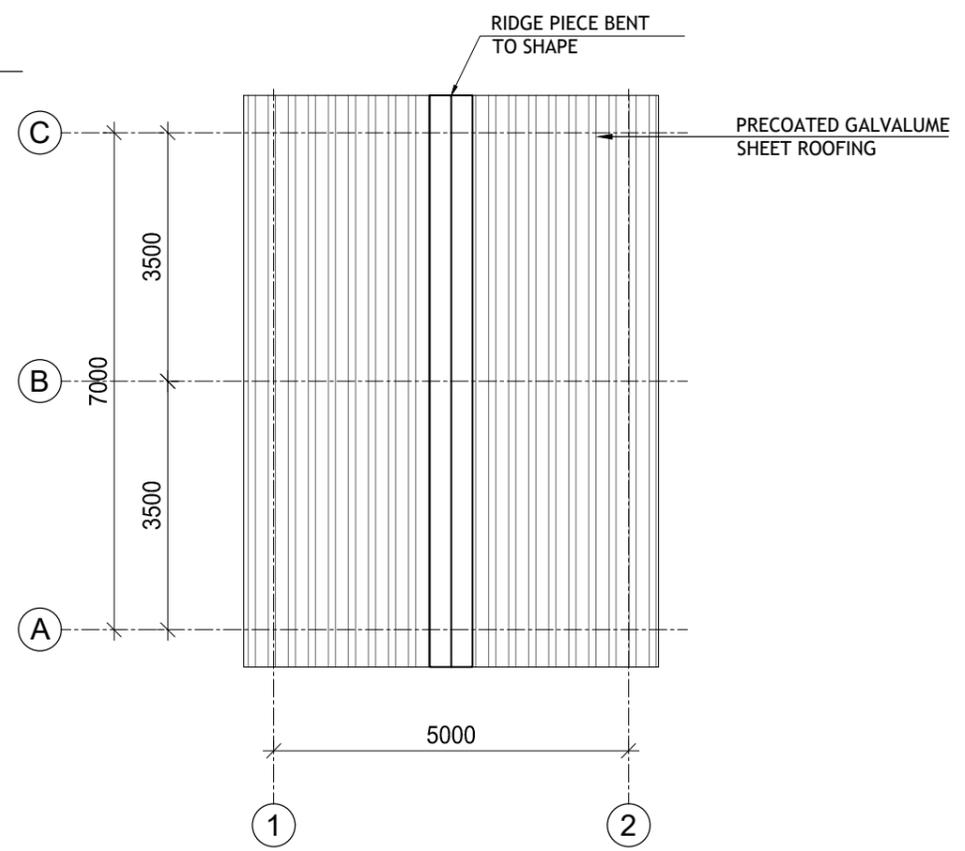
FIRE WATER PUMP HOUSE, CONTROL ROOM, FOAM PUMP HOUSE PLANS & SECTIONS

SCALE	JOB NO.	UNIT	DIVN.	DEPT.	DWG. NO.	REV.
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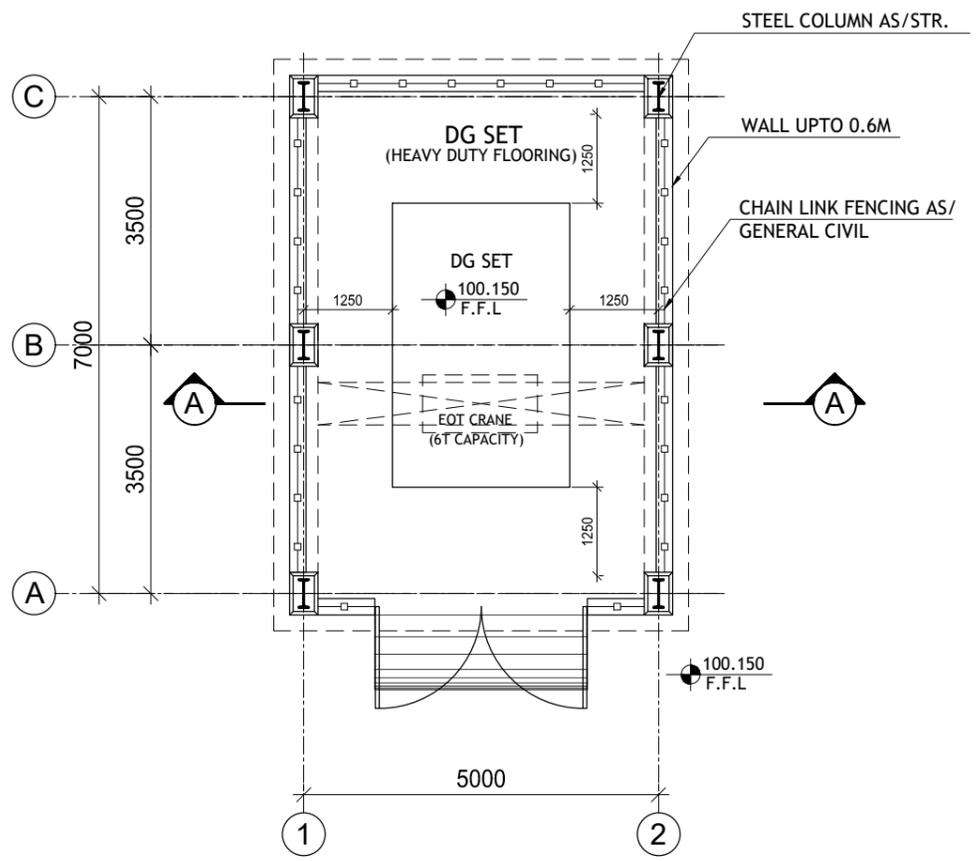
3-1641-0500 REV.2 A0-1189 x 841

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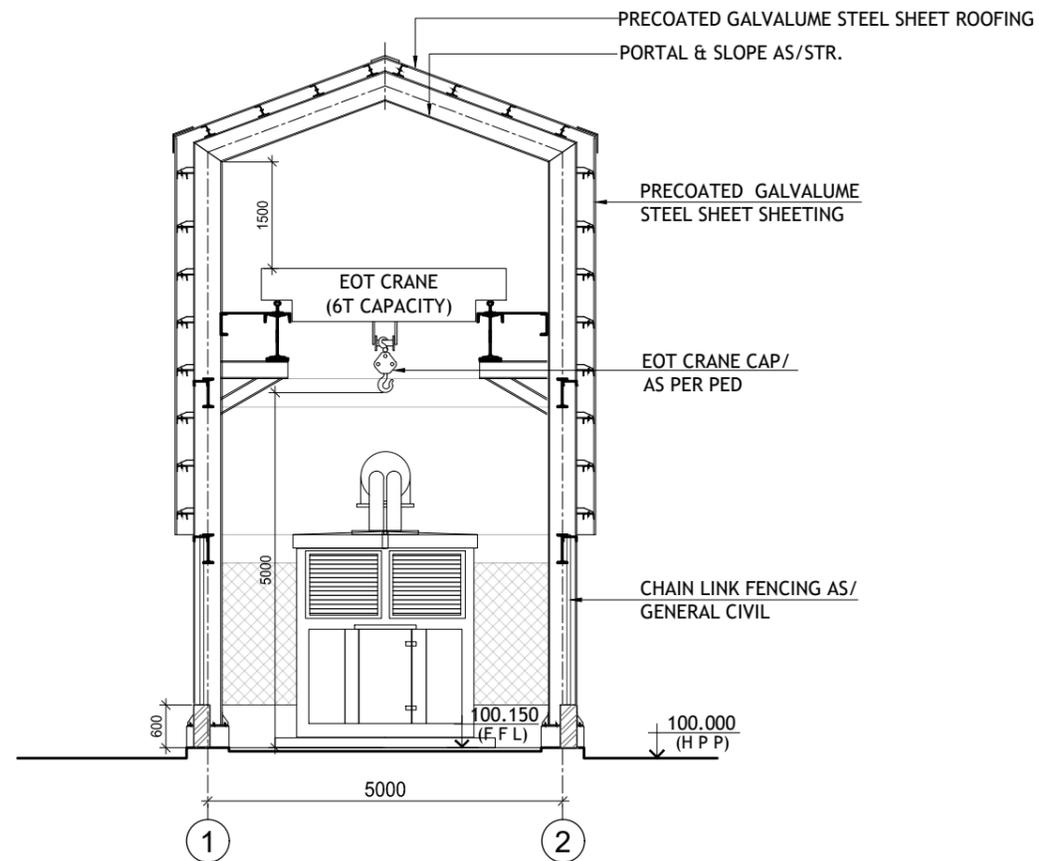
CO44-000-81-46-01002



TERRACE PLAN



GROUND FLOOR PLAN



SECTION A-A

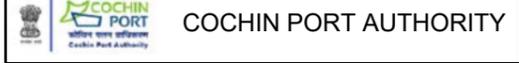
REF. DWG. NO.	REFERENCE DRAWING TITLE

- NOTES :-**
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. DRAWING IS NOT TO BE SCALED FOR ANY MISSING DIMENSION.
 3. ALL LEVELS & CO-ORDINATES ARE IN METRES.
 4. FOR FLASHING DETAIL REFER EIL STD. NO. 7-75-009.

- LEGEND :-**
- HPP = HIGHEST PAVEMENT LEVEL
 - FFL = FINISHED FLOOR LEVEL

- NOTES**
- * DWG IS A CONCEPTUAL REPRESENTATION OF THE WORK TO BE EXECUTED
 - * ALL DIMENSIONS TO BE RECHECKED BY CONTRACTOR
 - * PILE LOCATION AS/ STR.
 - * CONTRACTOR TO FREEZ BUILDING DIMENSIONS AND SIZE DURING DETAILED ENGINEERING

REV.	DATE	ISSUED FOR COMMENTS/TENDER	BY	CHKD	APPD	PMP/PC
A	09.02.26	ISSUED FOR COMMENTS/TENDER	Anjan	NS	MKV	



CONSULTANCY SERVICES FOR THE WORK OF UPGRADATION OF FIRE FIGHTING FACILITIES OF TANKER TERMINALS COT, Q-4 AND OTB (NTB-STB) AT COCHIN PORT

DG SHED
PLANS & SECTIONS

SCALE	JOB NO.	UNIT	DIVN.	DEPT.	DWG. NO.	REV.
1:50	C 0 4 4	0 0 0	8 1 4	6 0 1	0 0 2	A

