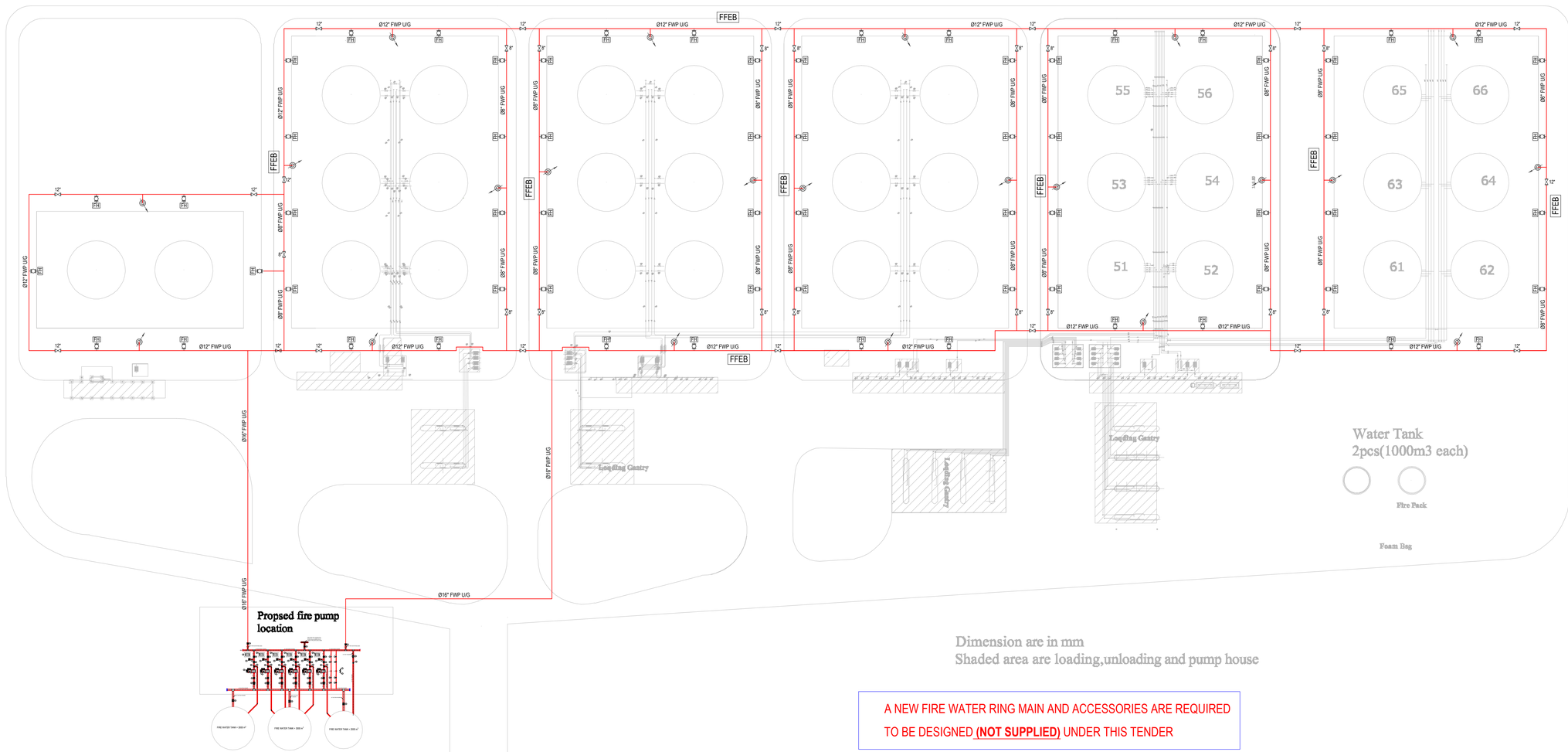


Water Tank
2pcs(3000m3 each)
1 pc(2000m3 each)

Dimension are in mm
Shaded area are loading,unloading and pump house

A NEW FIRE WATER RING MAIN AND ACCESSORIES ARE REQUIRED TO BE DESIGNED **(NOT SUPPLIED)** UNDER THIS TENDER

LEGENDS:

S. NO.	SYMBOL	DESCRIPTION
1.		FIRE HYDRANT
2.		FIXED FOAM MONITORS (FOAM ENABLED)
2.	FFEB	FIRE FIGHTING EQUIPMENT BOX
3.		POST INDICATOR ISOLATION VALVES IN PIT
4.		CHECK VALVE IN PIT

FIRE HYDRANT:

FIRE HYDRANTS SHALL BE ACCORDANCE WITH NFPA 20. HYDRANT SHALL BE SUBJECT TO A PRESSURE OF UP TO 16 BAR (232 PSI) UNDER NON FLOW CONDITIONS. IT SHALL BE FABRICATED FROM PIPE AND STANDARD FITTINGS, HAVING A 6 INCH DIA BARREL WITH DUAL VALVE 2-1/2 INCH DIA INSTANTANEOUS FEMALE COUPLINGS ACCORDING TO BS-336. HYDRANTS SHALL BE "WET" BARREL, VALVE TYPES WITH A 6 INCH DIA FLANGED INTLET AND OUTLET. ALL FIRE HYDRANT VALVES SHALL BE FIRE RATED, DIAPHRAGMS TYPE SUITABLE FOR BRACKISH WATER SERVICE FOR ON-SHORE APPLICATION. THE DIAPHRAGM SHALL BE MADE OF VITON OR TEFLON MATERIAL OR EQUAIVALENT. THE HYDRANT ASSEMBLY SHALL INCLUDE 6" BALL VALVE CLASS 300, 3/4" GATE VALVE, 3/4" BARREL NIPPLE AND 3/4" 3000# HALF COUPLING.

FIXED FOAM MONITORS (FOAM ENABLED):

FIXED WATER / FOAM MONITORS SHALL HAVE MINIMUM CAPACITY OF 2750 LPM (726. 5 GPM), WITH A RANGE (REACH) OF 60 M AT AN OPERATING PRESSURE OF 10 BAR (150 PSI). FIXED WATER / FOAM MONITORS SHALL BE CAPABLE OF THROWRING WATER / FOAM TO A DISTANCE OF 60 M AT AN ANGLE OF 38° FROM HORIZONTAL PLANE, AND SHALL BE CAPABLE OF REACHING A HEIGHT OF 20 M AT AN ANGLE OF 65°.

FIRE FIGHTING EQUIPMENT BOX:

FIRE FIGHTING EQUIPMENT BOXES SIZE L = 1650 X W = 700 X H = 1700 MM. THE FIRE BOX SHALL BE PAINTED WITH TWO COATS OF RED LEAD PRIMER AND ONE COAT OF RED COLOUR. TOWER BOLTS SHALL BE INSTALLED FOR THE LEFT SIDE DOOR (TOP AND BOTTOM) OPERABLE FROM OUTIDE. TOP HOOKS FOR LIFTING SHALL BE PROVIDED AND INSTALLED. SHALL BE TAGGED FIRE EQUIPMENT BOX WITH WHITE PAINT ON THE DOORS.
SHALL CONTAIN THE FOLLOWING:
(1) 08 NOS - FIRE FIGHTING HOSES (CANVAS HOSE) 2-1/2" X 30 MTR LONG, SHALL BE IIN ACCORDANCE WITH BS 6391, TYPE 3 AND SHALL BE UL LISTED AND FM APPROVED. SHALL BE SUBJECT TO BURST PRESSURE TEST OF 34 BAR (500 PSI)
(2) 04 NOS. - BRANCH PIPES FOG/SPRAY/JET TWIST GRIP COMPLETE WITH 16 MM NOZZLES MADE FROM LIGHT ALLOY OR GUNMETAL
(3) 08 NOS. - PLASTIC CONTAINERS OF3% FLUOREPROTEIN FOAM CONCENTRATE, EACH OF 25 L (6.6 USG).
(4) 02 NOS. - OPERATING HANDLES SUITABLE FOR USE TO OPERATE THE FIREWATER RING MAIN SECTIONING VALVES.
(5) 02 NOS. - FOAM MAKING BRANCH PIPE WITH NOZZLES FMB 10 OR EQUAL WITH MINIMUM 450 LPM DISCHARGE AT 7 BAR CAPABLE TO THROW AT 20 M DISTANCE

DESIGN BASIS:

1) FIRE WATER STORAGE TANKS SHALL BE PROVIDED WITH EIGHT (8) NOS OF 2-1/2 INCH MALE INSTANTANEOUS COUPLING TANKER FILLING CONNECTIONS / FIRE BRIGADE INLET.
2) EIGHT (8) WAY 2-1/2 INCH MALE INSTANTANEOUS COUPLING FIRE BRIGADE INLETS WITH GATE TYPE ISOLATION VALVE SHALL BE PROVIDED IN THE DISCHARGE HEADER / LINE NEAR THE FIRE PUMP HOUSE.
3) FIRE WATER NETWORK PIPING SHALL BE UNDERGROUND AND SHALL BE SIZED TO DELIVER THE REQUIRED FLOW RATE OF FIRE WATER AT THE FARTHEST POINT FROM THE FIRE WATER PUMPS AT A PRESSURE OF 150 PSI (10.3 BAR).
4) FIRE WATER RING MAINS SHALL NOT BE LESS THAN 12" DIAMETER. THE MAINS OF THE WATER DISTRIBUTION PIPING NETWORK SHALL BE LAID OUT IN CLOSED LOOPS WITH DUAL SUPPLY.
5) FIRE HYDRANTS SHALL NOT BE SPACED AT A DISTANCE GREATER THAN 30 METER AND ISOLATION VALVES SHALL BE PROVIDED AT 100 METERS SPACING.
6) FIRE WATER RING MAIN ISOLATION VALVES SHALL BE OF POST INDICATOR TYPE INSTALLED IN VALVE
7) HYDRANTS SHALL BE PROVIDED WITH CRASH BARRIERS. THE LOCATION SHALL NOT BE WITHIN TWO (2) M FROM CURB OF THE ROAD AND AT LEAST TEN (10) M FROM ROAD CROSSINGS, SHARP ROAD CURVES, BUILDINGS OR OTHER STRUCTURES AS PIPE RACK ETC.
8) 12 INCH FIRE ENGINE SUCTION RISER SHALL BE PROVIDED NEAR TO FIRE PUMP HOUSE DIRECTLY CONNECTED TO FIRE WATER STORAGE TANK.
9) FIRE FIGHTING EQUIPMENT BOXES SHALL COVER MAXIMUM 8 NOS. OF FIRE HYDRANT POSTS.
10) FIXED WATER / FOAM MONITORS SHALL BE PROVIDED AT CRITICAL LOCATIONS (E.G. TANKS FARMS, SEPARATORS, CRUDE TRANSFER PUMPS, MANIFOLDS.

CLIENT:
Ethiopian Petroleum Supply Enterprise(EPSE)

CONTRACTOR:
Navashastra Technologies Private Limited, India

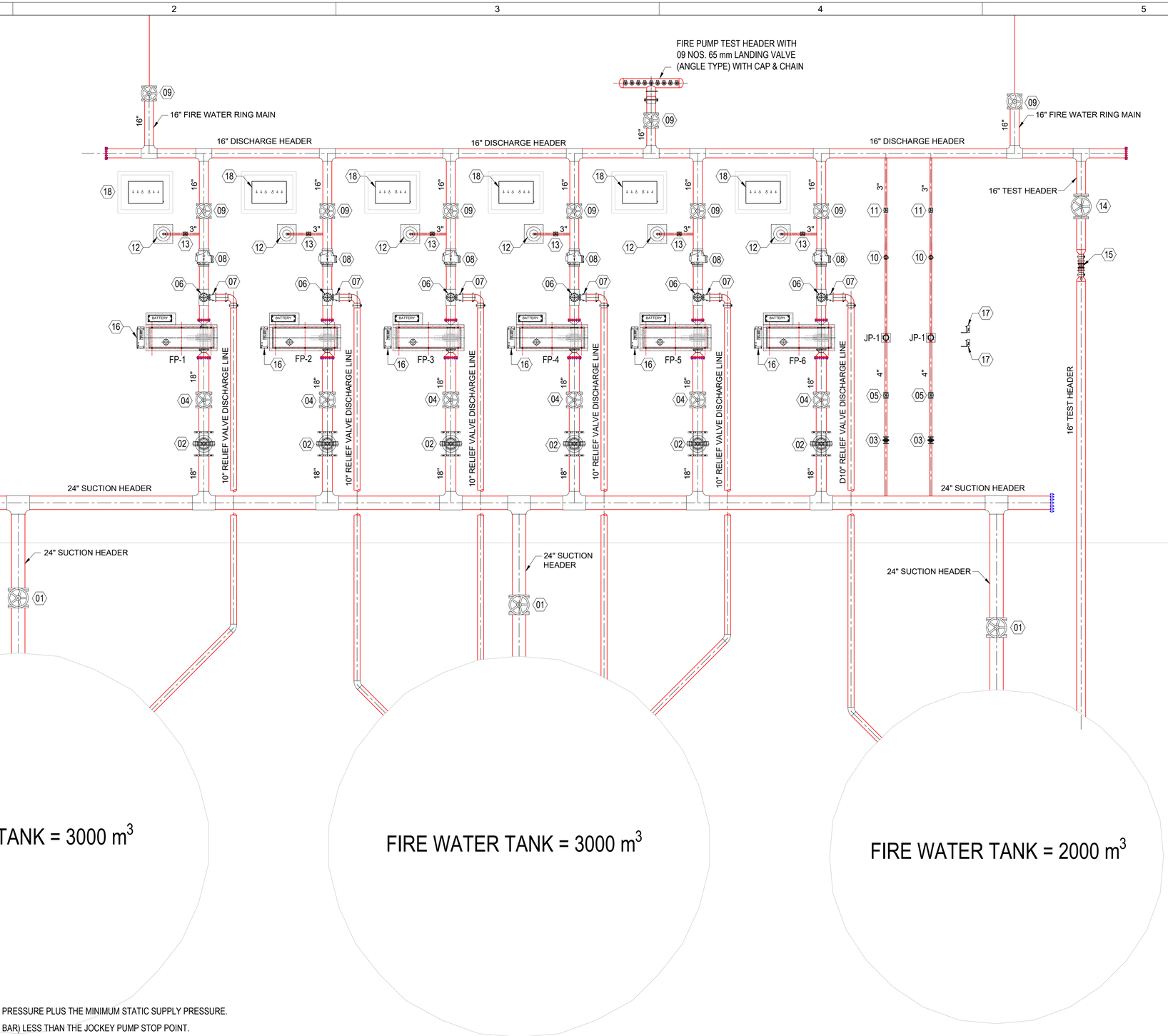
PROJECT NAME:
Awash Depot up-gradation
Awash,Ethiopia

DRAWING TITLE:
FIRE HYDRANT RING (NEW)
FIRE FIGHTING SYSTEM

DRAWING NUMBER:
NT-FP-FH-RING-101

GENERAL NOTES:

1. FIRE WATER PUMPING SYSTEM SHALL BE DESIGNED AS PER NFPA 20
2. THERE WILL BE SIX 2000 GPM @ 11 BAR DIESEL FIRE PUMPS. FOUR PUMPS WOULD BE REQUIRED TO OPERATE SIMULTANEOUSLY. TWO PUMPS ARE STANDBY.
3. THE PUMPS SHALL BE CAPABLE OF DISCHARGING 150% OF ITS RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD.
4. THE SHUT-OFF HEAD SHALL NOT EXCEED 120% OF RATED HEAD.
5. EACH DIESEL ENGINE SHALL HAVE AN INDEPENDENT FUEL TANK WHERE ITS CAPACITY SHOULD BE SIZED AS PER NFPA STANDARD FOR FUEL TERMINALS/DEPOTS FIREFIGHTING APPLICATIONS.
6. EVERY CENTRIFUGAL PUMP SHALL HAVE STRAINER ON SUCTION HEADER; NON-RETURN VALVE AND PRESSURE GAUGE ON DISCHARGE HEADER.
7. EACH DIESEL DAY TANK CAPACITY SHALL BE24 HRS OPERATION OF THE RESPECTIVE PUMP, DIESEL DAY TANKS AND ACCESSORIES SHALL BE AS PER THE REQUIREMENTS OF NFPA 20. REFER TO DRAWING # NT-FP-PID-03
8. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE. (REFER TO DRAWING NT-FP-PID-102).
9. DIESEL ENGINE EXHAUST TO BE FITTED WITH SILENCER. EXHAUST SILENCER SHALL BE FITTED WITH FLAME/SPARK ARRESTOR AND RAIN CAP.
10. FIREWATER PUMP ENGINE COOLING SHALL BE IN LINE WITH THE REQUIREMENTS OF NFPA 20.
11. ALL MATERIAL SHALL BE UL LISTED AND FM APPROVED
12. ABOVEGROUND FIRE PROTECTION PIPING SHALL BE ASTM A53/A53M, SCH 40 , BLACK STEEL PIPE.
13. SUCTION PIPING SHALL BE GALVANIZED ON THE INSIDE IN ACCORDANCE WITH NFPA 20.
14. CIRCULATING RELIEF VALVES ARE NOT REQUIRED FOR DIESEL ENGINE FIRE PUMP AS PER NFPA 20
15. PROVIDE LABELING ON THE SURFACES OF THE PIPING IN THE PUMP ROOM TO SHOW WATER FLOW DIRECTION AND PIPE FUNCTION (e.g. "SUCTION", "DISCHARGE", "TO TEST HEADER", "TO SPRINKLER SYSTEM").
16. FULL FLOW RELIEF VALVE PIPING MUST DISCHARGE BACK TO THE WATER TANK.



FIRE PUMP SETTINGS:

(a) THE JOCKEY PUMP STOP POINT SHOULD EQUAL THE PUMP CHURN PRESSURE PLUS THE MINIMUM STATIC SUPPLY PRESSURE.
(b) THE JOCKEY PUMP START POINT SHOULD BE AT LEAST 10 PSI (0.68 BAR) LESS THAN THE JOCKEY PUMP STOP POINT.
(c) THE MAIN FIRE PUMP START SHOULD BE 5 PSI (0.34 BAR) LESS THAN THE JOCKEY PUMP START POINT.
(d) USE 10 PSI (0.68 BAR) INCREMENTS FOR EACH ADDITIONAL PUMP.
(e) FIRE PUMP SHALL BE SHUT OF MANUALLY.
(f) WHERE THE OPERATING DIFFERENTIAL OF THE PRESSURE SWITCHES DOES NOT PERMIT THESE SETTINGS, THE SETTINGS SHOULD BE ESTABLISHED BY PRESSURES OBSERVED ON TEST GAUGES.

EQUIPMENT LIST - FIRE PUMP HOUSE

TAG NO.	DESCRIPTION
01	24" GATE VALVE @SUCTION
02	18" BASKET STRAINER
03	4" BASKET STRAINER
04	18" GATE VALVE W/ TAMPER SWITCH
05	4" GATE VALVE W/ TAMPER SWITCH
06	6" PRESSURE RELIEF VALVE
07	6" x 10" WASTE CONE
08	16" CHECK VALVE SWING TYPE
09	16" GATE VALVE W/ TAMPER SWITCH
10	3" CHECK VALVE SWING TYPE
11	3" GATE VALVE W/ TAMPER SWITCH
12	SURGE TANK, 500 L , 25 Bar
13	3" GATE VALVE
14	16" GLOBE VALVE FOR TEST LINE
15	8" FLOWMETER
16	DIESEL FIRE PUMP CONTROLLER
17	JOCKEY PUMP CONTROLLER
18	DAY TANK

FP-1, FP-2, FP-3 & FP-4 (DUTY)
FP-5 & FP-6 (STANDBY)

FM UL

DIESEL ENGINE DRIVEN FIRE PUMP
CAPACITY : 460 m^3/hr (2000 GPM)
DIFFERENTIAL HEAD : 11 BAR (160 PSI)
POWER : 276 HP

JP-1 (DUTY) FM UL
JP-2 (STANDBY)

ELECTRIC MOTOR DRIVEN FIRE PUMP
CAPACITY : 4 m^3/hr (17.6 GPM)
DIFFERENTIAL HEAD : 12.9 BAR (183.4 PSI)
MOTOR POWER : 3 kW
POWER SUPPLY : 50 Hz / 400 V

DAY TANK-1, 2, 3, 4, 5 & 6
CAPACITY : 285 GPM)
UL UL 142
(REFER TO NOTE 7)

CLIENT:
Ethiopian Petroleum Supply Enterprise(EPSE)

CONTRACTOR:
Navashastra Technologies Private Limited, India

PROJECT NAME:
Awash Depot up-gradation
Awash,Ethiopia

DRAWING TITLE:
FIRE PUMP ROOM PIPING DESIGN
FIRE FIGHTING SYSTEM

DRAWING NUMBER:
NT-FP-PUMPROOM-101

EXHAUST SYSTEM NOTES:

1) EXHAUST SYSTEM SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 20, SECTION 11.5 (2019)
2) EACH PUMP ENGINE SHALL HAVE AN INDEPENDENT EXHAUST SYSTEM.
3) THE EXHAUST PIPE SHALL BE NOT BE ANY SMALLER IN DIAMETER THAN THE ENGINE EXHAUST OUTLET.
4) THE EXHAUST PIPE SHALL BE COVERED WITH HIGH-TEMPERATURE INSULATION.
5) THE EXHAUST PIPE SHALL BE POSITIONED IN SUCH A WAY AS TO PREVENT EXHAUST GASES FROM RE-ENTERING THE PUMP ROOM.
6) EXHAUST SYSTEM SHALL TERMINATE OUTSIDE THE STRUCTURE AT A POINT WHERE HOT GASES, SPARKS, OR PRODUCTS OF COMBUSTION WILL DISCHARGE TO A SAFE LOCATION.

FLOW METER VENTURI TYPE, SIZE 8"

VENTURI TYPE, PAINTED RED, SIZE 8", GROOVED ENDS, PRESSURE RATING 500 PSI. METER SHALL BE ALUMINUM 4" (100mm) DIAL, 1/4" NPT CONNECTION, 304SS CASE WITH RUBBER RINGS, GLASS WINDOW AND SEAL, BALL VALVES AND FITTINGS SHALL BE BRASS (CA 360).
(UL LISTED FLOW METERS ARE NOT AVAILABLE WITH ANY MANUFACTURER. ALL FLOW METERS ARE ONLY "FM APPROVED")

AIR RELEASE VALVE 1/2"

INLET SIZE 1/2", OUTLET SIZE 1/2", MAXIMUM WORKING PRESSURE 300 PSI. SHALL BE UL LISTED AND FM APPROVED.

SUCTION AND DISCHARGE GAUGES

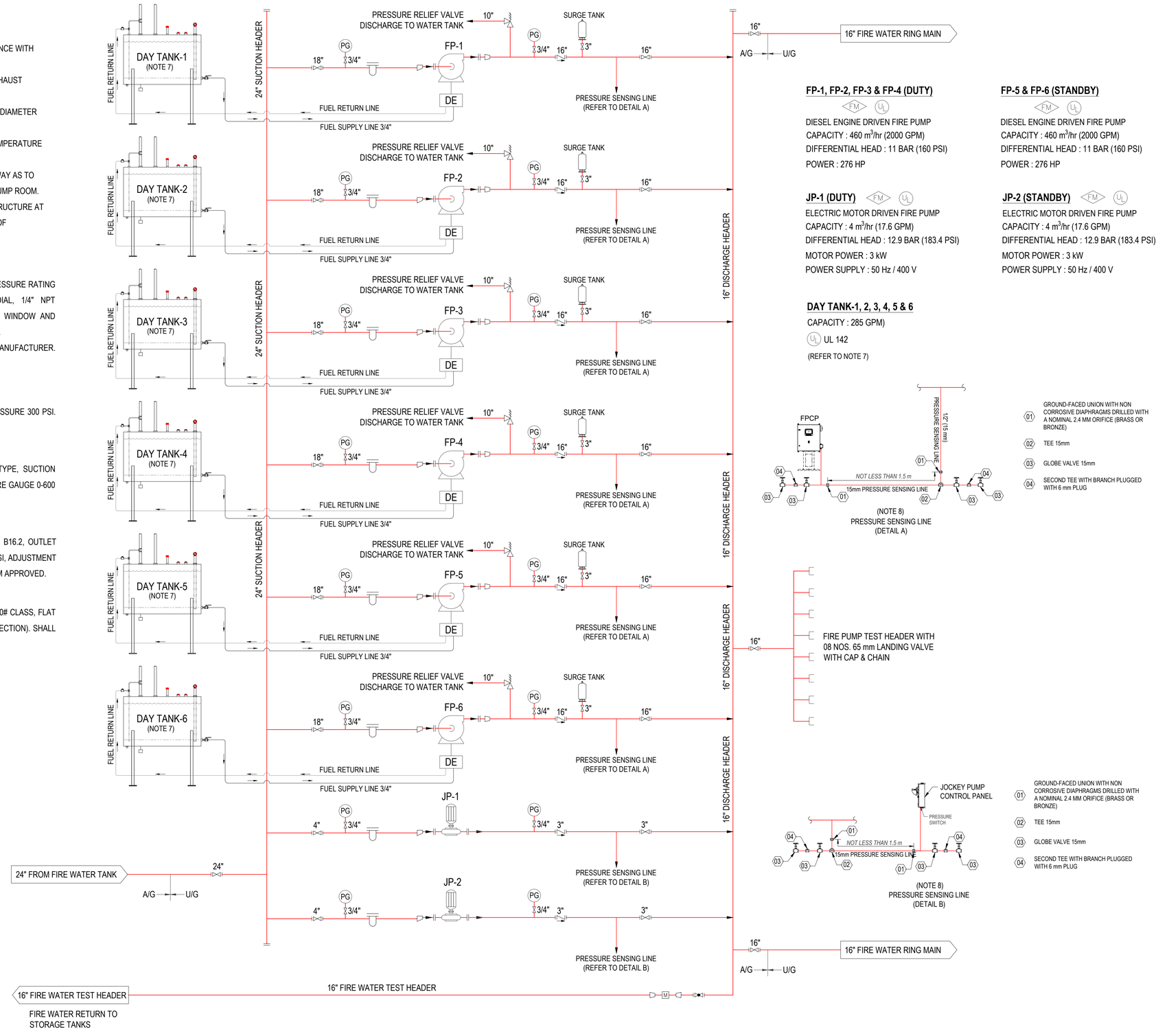
SIZE 4" (100 MM), 1/4" NPT LOWER MOUNT, OIL-FILLED TYPE, SUCTION PRESSURE RANGE 0-300 PSI (20 BAR). DISCHARGE PRESSURE GAUGE 0-600 PSI. SHALL BE UL LISTED AND FM APPROVED.

PRESSURE RELIEF VALVE (6")

SIZE DN150, INLET FLANGE CONNECTION CLASS 300 ANSI B16.2, OUTLET FLANGE CONNECTION CLASS 150. PRESSURE RATING 300 PSI, ADJUSTMENT RANGE 100-300 PSI (300 CLASS). SHALL BE UL LISTED AND FM APPROVED.

Waste Cone (6"x10")

INLET SIZE 6" (DN150), OUTLET SIZE 10" (DN250), FLANGE 150# CLASS, FLAT FACE (SHALL MATCH RELIEF VALVE MODEL FLANGE CONNECTION). SHALL BE UL LISTED AND FM APPROVED.



FP-1, FP-2, FP-3 & FP-4 (DUTY)

FM UL

DIESEL ENGINE DRIVEN FIRE PUMP
CAPACITY : 460 m^3/hr (2000 GPM)
DIFFERENTIAL HEAD : 11 BAR (160 PSI)
POWER : 276 HP

FP-5 & FP-6 (STANDBY)

FM UL

DIESEL ENGINE DRIVEN FIRE PUMP
CAPACITY : 460 m^3/hr (2000 GPM)
DIFFERENTIAL HEAD : 11 BAR (160 PSI)
POWER : 276 HP

JP-1 (DUTY)

FM UL

ELECTRIC MOTOR DRIVEN FIRE PUMP
CAPACITY : 4 m^3/hr (17.6 GPM)
DIFFERENTIAL HEAD : 12.9 BAR (183.4 PSI)
MOTOR POWER : 3 kW
POWER SUPPLY : 50 Hz / 400 V

JP-2 (STANDBY)

FM UL

ELECTRIC MOTOR DRIVEN FIRE PUMP
CAPACITY : 4 m^3/hr (17.6 GPM)
DIFFERENTIAL HEAD : 12.9 BAR (183.4 PSI)
MOTOR POWER : 3 kW
POWER SUPPLY : 50 Hz / 400 V

DAY TANK-1, 2, 3, 4, 5 & 6

CAPACITY : 285 GPM)
UL UL 142
(REFER TO NOTE 7)

LEGENDS

DE	DIESEL ENGINE DRIVEN FIRE PUMP
	ELECTRIC MOTOR DRIVE JOCKEY PUMP
	GATE VALE / ISOLATION VALVE
	BASKET STRAINER
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	PRESSURE RELIEF VALVE
	CHECK VALVE / NON-RETURN VALVE
	SURGE TANK
	GLOBE VALVE
M	FLOW METER
PG	PRESSURE GAUGE
A/G	ABOVE GROUND
U/G	UNDERGROUND GROUND
=	FLANGE

NOTES:

1. FIRE WATER PUMPING SYSTEM SHALL BE DESIGNED AS PER NFPA 20
2. THERE WILL BE SIX 2000 GPM @ 11 BAR DIESEL FIRE PUMPS. FOUR PUMPS WOULD BE REQUIRED TO OPERATE SIMULTANEOUSLY. TWO PUMPS ARE STANDBY.
3. THE PUMPS SHALL BE CAPABLE OF DISCHARGING 150% OF ITS RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD.
4. THE SHUT-OFF HEAD SHALL NOT EXCEED 120% OF RATED HEAD.
5. EACH DIESEL ENGINE SHALL HAVE AN INDEPENDENT FUEL TANK WHERE ITS CAPACITY SHOULD BE SIZED AS PER NFPA STANDARD FOR FUEL TERMINALS/DEPOTS FIREFIGHTING APPLICATIONS.
6. EVERY CENTRIFUGAL PUMP SHALL HAVE STRAINER ON SUCTION HEADER; NON-RETURN VALVE AND PRESSURE GAUGE ON DISCHARGE HEADER.
7. EACH DIESEL DAY TANK CAPACITY SHALL BE24 HRS OPERATION OF THE RESPECTIVE PUMP, DIESEL DAY TANKS AND ACCESSORIES SHALL BE AS PER THE REQUIREMENTS OF NFPA 20. REFER TO DRAWING # NT-FP-PID-03
8. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE. (REFER TO DRAWING NT-FP-PID-102).
9. DIESEL ENGINE EXHAUST TO BE FITTED WITH SILENCER. EXHAUST SILENCER SHALL BE FITTED WITH FLAME/SPARK ARRESTOR AND RAIN CAP.
10. FIREWATER PUMP ENGINE COOLING SHALL BE IN LINE WITH THE REQUIREMENTS OF NFPA 20.
11. ALL MATERIAL SHALL BE UL LISTED AND FM APPROVED
12. ABOVEGROUND FIRE PROTECTION PIPING SHALL BE ASTM A53/A53M, SCH 40 , BLACK STEEL PIPE.
13. SUCTION PIPING SHALL BE GALVANIZED ON THE INSIDE IN ACCORDANCE WITH NFPA 20.
14. CIRCULATING RELIEF VALVES ARE NOT REQUIRED FOR DIESEL ENGINE FIRE PUMP AS PER NFPA 20
15. PROVIDE LABELING ON THE SURFACES OF THE PIPING IN THE PUMP ROOM TO SHOW WATER FLOW DIRECTION AND PIPE FUNCTION (e.g. "SUCTION", "DISCHARGE", "TO TEST HEADER", "TO SPRINKLER SYSTEM").
16. FULL FLOW RELIEF VALVE PIPING MUST DISCHARGE BACK TO THE WATER TANK

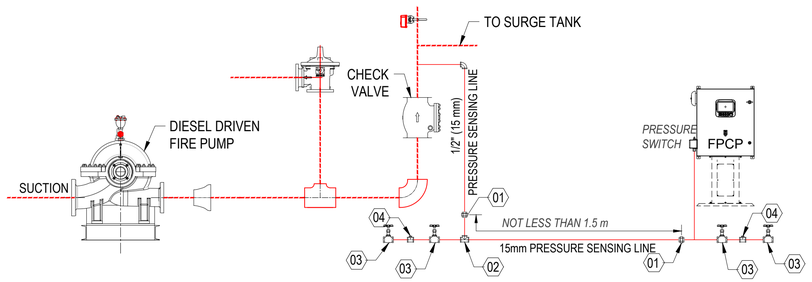
CLIENT:
Ethiopian Petroleum Supply Enterprise(EPSE)

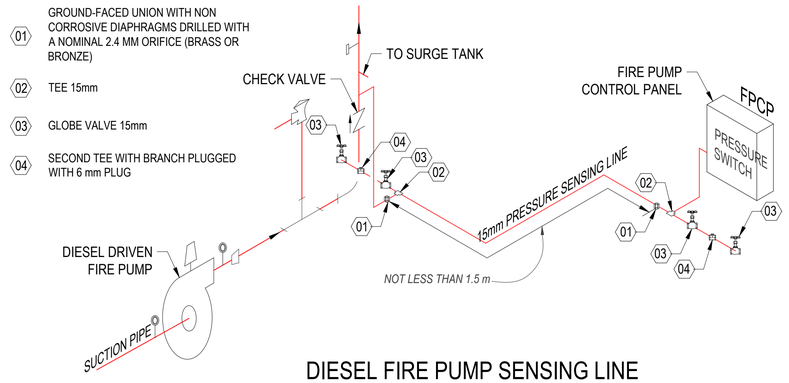
CONTRACTOR:
Navashastra Technologies Private Limited, India

PROJECT NAME:
Awash Depot up-gradation
Awash,Ethiopia

DRAWING TITLE:
PIPING & INSTRUMENTATION DIAGRAM
FIRE WATER PUMPS

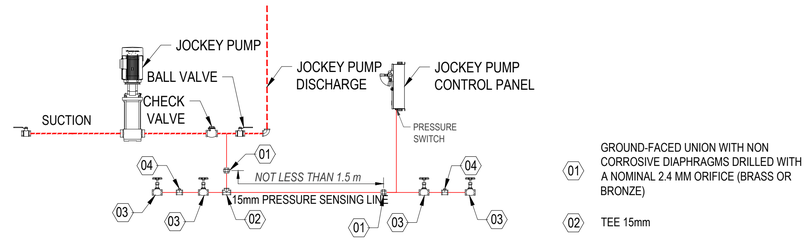
DRAWING NUMBER:
NT-FP-PID-101





DIESEL FIRE PUMP SENSING LINE

NTS (NOT TO SCALE)

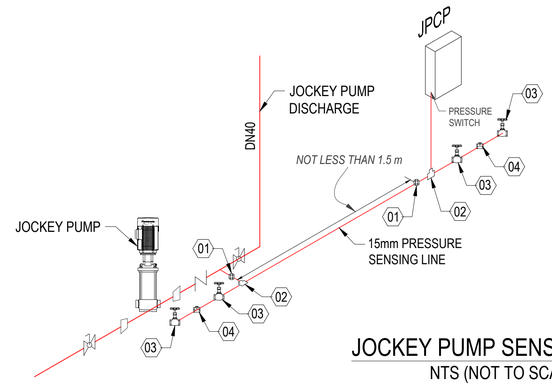


01 GROUND-FACED UNION WITH NON CORROSIVE DIAPHRAGMS DRILLED WITH A NOMINAL 2.4 MM ORIFICE (BRASS OR BRONZE)

02 TEE 15mm

03 GLOBE VALVE 15mm

04 SECOND TEE WITH BRANCH PLUGGED WITH 6 mm PLUG



JOCKEY PUMP SENSING LINE

NTS (NOT TO SCALE)

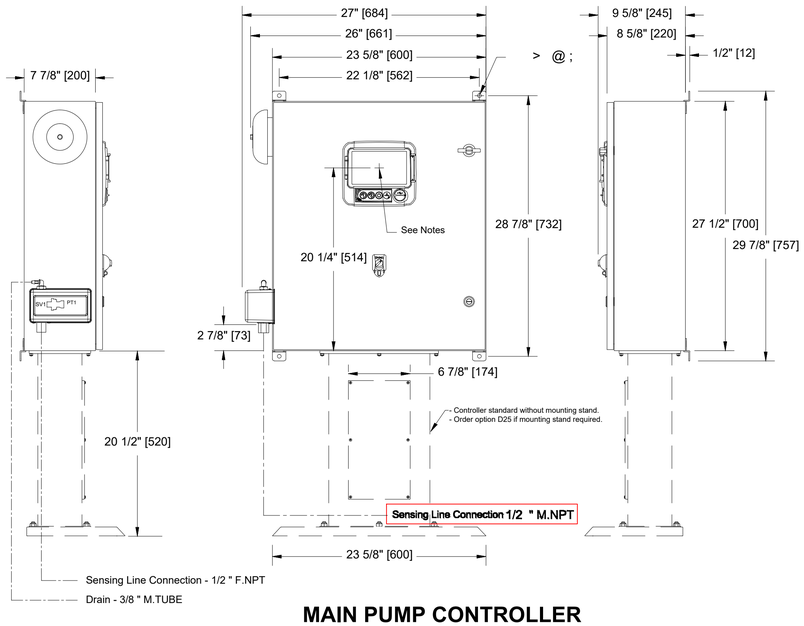
LEGENDS	
DE	DIESEL ENGINE DRIVEN FIRE PUMP
	ELECTRIC MOTOR DRIVE JOCKEY PUMP
	GATE VALE / ISOLATION VALVE
	BASKET STRAINER
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	PRESSURE RELIEF VALVE
	CHECK VALVE / NON-RETURN VALVE
	SURGE TANK
	GLOBE VALVE
U	FLOW METER
PG	PRESSURE GAUGE
A/G	ABOVE GROUND
U/G	UNDERGROUND GROUND
	FLANGE

NOTES:

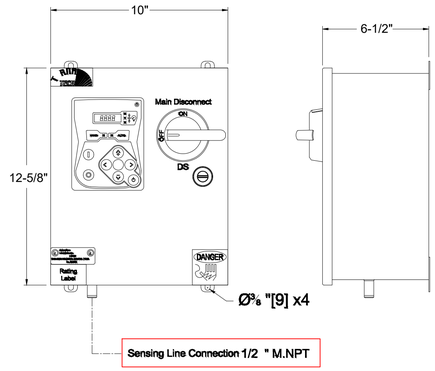
1. FIRE WATER PUMPING SYSTEM SHALL BE DESIGNED AS PER NFPA 20
2. THERE WILL BE SIX 2000 GPM @ 11 BAR DIESEL FIRE PUMPS. FOUR PUMPS WOULD BE REQUIRED TO OPERATE SIMULTANEOUSLY. TWO PUMPS ARE STANDBY.
3. THE PUMPS SHALL BE CAPABLE OF DISCHARGING 150% OF ITS RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD.
4. THE SHUT-OFF HEAD SHALL NOT EXCEED 120% OF RATED HEAD.
5. EACH DIESEL ENGINE SHALL HAVE AN INDEPENDENT FUEL TANK WHERE ITS CAPACITY SHOULD BE SIZED AS PER NFPA STANDARD FOR FUEL TERMINALS/DEPOTS FIREFIGHTING APPLICATIONS.
6. EVERY CENTRIFUGAL PUMP SHALL HAVE STRAINER ON SUCTION HEADER; NON-RETURN VALVE AND PRESSURE GAUGE ON DISCHARGE HEADER.
7. EACH DIESEL DAY TANK CAPACITY SHALL BE24 HRS OPERATION OF THE RESPECTIVE PUMP, DIESEL DAY TANKS AND ACCESSORIES SHALL BE AS PER THE REQUIREMENTS OF NFPA 20. REFER TO DRAWING # NT-FP-PID-03
8. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE. (REFER TO DRAWING NT-FP-PID-102).
9. DIESEL ENGINE EXHAUST TO BE FITTED WITH SILENCER. EXHAUST SILENCER SHALL BE FITTED WITH FLAME/SPARK ARRESTOR AND RAIN CAP.
10. FIREWATER PUMP ENGINE COOLING SHALL BE IN LINE WITH THE REQUIREMENTS OF NFPA 20.
11. ALL MATERIAL SHALL BE UL LISTED AND FM APPROVED
12. ABOVEGROUND FIRE PROTECTION PIPING SHALL BE ASTM A53/A53M, SCH 40 , BLACK STEEL PIPE.
13. SUCTION PIPING SHALL BE GALVANIZED ON THE INSIDE IN ACCORDANCE WITH NFPA 20.
14. CIRCULATING RELIEF VALVES ARE NOT REQUIRED FOR DIESEL ENGINE FIRE PUMP AS PER NFPA 20
15. PROVIDE LABELING ON THE SURFACES OF THE PIPING IN THE PUMP ROOM TO SHOW WATER FLOW DIRECTION AND PIPE FUNCTION (e.g. "SUCTION", "DISCHARGE", "TO TEST HEADER", "TO SPRINKLER SYSTEM").
16. FULL FLOW RELIEF VALVE PIPING MUST DISCHARGE BACK TO THE WATER TANK

NOTES:

1. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE.
2. THE PRESSURE SENSING PIPE SHALL BE BRASS, RIGID COPPER PIPE TYPES K,L OR M AND FITTINGS SHALL BE OF 1/2" (15MM) NOMINAL SIZE.
3. PRESSURE SENSING LINE SHALL BE ABLE TO WITHSTAND HIGH PRESSURE.
4. WHERE WATER IS CLEAN, GROUND-FACE UNIONS WITH NONCORROSIVE DIAPHRAGMS DRILLED WITH A NOMINAL 3/32 INCH (2.4 mm) ORIFICE SHALL BE PERMITTED IN PLACE OF THE CHECK VALVES.
5. THERE SHALL BE TWO INSPECTION TEST VALVES ATTACHED TO THE PRESSURE SENSING LINE THAT SHALL CONSIST OF A TEE, A VALVE, A SECOND TEE WITH THE BRANCH PLUGGED, AND A SECOND VALVE
6. THERE SHALL BE NO SHUTOFF VALVE IN THE PRESSURE SENSING LINE.



MAIN PUMP CONTROLLER



JOCKEY PUMP CONTROLLER

CLIENT:
Ethiopian Petroleum Supply Enterprise(EPSE)

CONTRACTOR:
Navashastra Technologies Private Limited, India

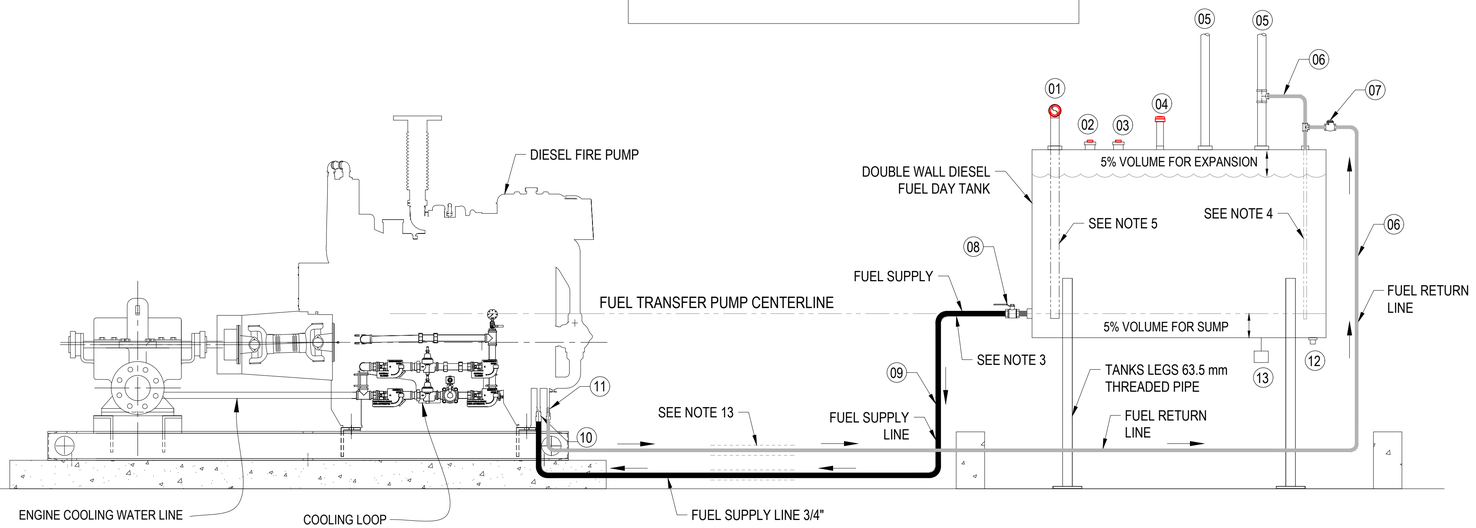
PROJECT NAME:
Awash Depot up-gradation
Awash,Ethiopia

DRAWING TITLE:
PRESSURE SENSING LINE
FIRE WATER PUMPS

DRAWING NUMBER:
NT-FP-PID-102

FUEL DAY TANK (DOUBLE WALL)

CAPACITY SHLL BE AS PER NFPA 20, SHALL INCLUDE LOW LEVEL SWITCH, LEVEL INDICATOR, TANK SUPPORT LEGS SHALL BE 63.5 MM, TANK HEIGHT SHALL MAINTAIN FUEL SUPPLY CONNECTION HEIGHT EQUAL TO FUEL TRANSFER PUMP CENTERLINE HEIGHT. SHALL PROVIDE THE COMPLETE FUEL SYSTEM ACCESSORIES NEEDED TO COMPLY TO UL 142 REQUIREMENTS.

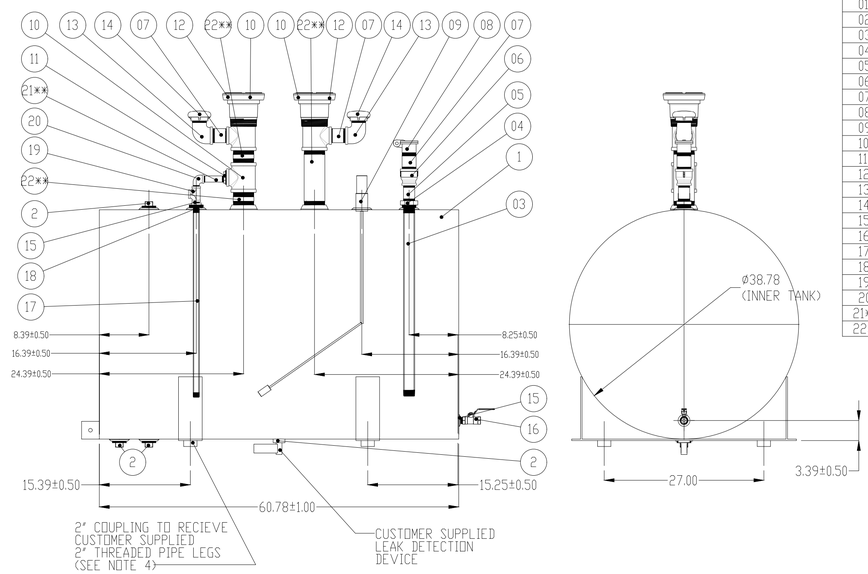


ITEM	DESCRIPTION	QTY
01	DN50 FILL CAP - WITH PROVISION FOR PADLOCK, COMBINED WITH REMOVABLE STRAINER (MAX 06 MESH)	01
02	PIPE PLUG, DN100 NPT (PROVISION FOR EMERGENCY RELIEF VENT)	01
03	PIPE PLUG, DN50 NPT (PROVISION FOR LOW FUEL ALARM ACCESS)	01
04	DIRECT READING TANK GAUGE	01
05	VENT PIPE DN50, EXTENDED TO THE OUTSIDE	02
06	FUEL RETURN LINE DN15	LOT
07	CHECK VALVE DN15	01
08	MANUAL COCK VALVE DN20, LOCKED OPEN	01
09	FUEL SUPPLY LINE DN20	LOT
10	FLEXIBLE SUPPLY CONNECTION HOSE	01
11	FLEXIBLE RETURN CONNECTION HOSE	01
12	PIPE PLUG FOR DRAIN, DN25 NPT	01
13	INTERSTITIAL SPACE SUPERVISORY SIGNAL	

NOTES:

1. AS PER NFPA 20, 2019, FUEL SUPPLY TANK SHALL BE SIZED FOR A MINIMUM OF 12 HOURS OF ENGINE RUN TIME BASED ON THE FUEL SUPPLY RATE REQUIREMENTS OF THE ENGINE, PLUS 5% VOLUME FOR EXPANSION AND 5% VOLUME FOR SUMP.
2. AS PER NFPA 20, 2019 WHEN THE FUEL SUPPLY RATE REQUIREMENTS OF THE ENGINE ARE NOT KNOWN, FUEL SUPPLY TANK SHALL HAVE A CAPACITY AT LEAST EQUAL TO 1 Gal / HP, PLUS 5% VOLUME FOR EXPANSION AND 5% VOLUME FOR SUMP.
3. FUEL TANK OUTLET SHALL NOT BE LOWER THAN THE FUEL TRANSFER PUMP.
4. DOWNPIPE RECOMMENDED FOR FUEL RETURN LINE TO PREVENT FOAMING INSIDE TANK. TERMINATE 76 - 150 mm FROM THE TANK BOTTOM.
5. DOWNPIPE RECOMMENDED FOR FUEL SUPPLY LINE TO PREVENT FOAMING INSIDE THE TANK. TERMINATE 76-150 mm FROM TANK BOTTOM.
6. THE ENGINE MANUFACTURER'S FUEL PUMP STATIC HEAD PRESSURE LIMITS SHALL NOT BE EXCEEDED WHEN LEVEL OF FUEL IN THE TANK IS AT A MAXIMUM.
7. FUEL PIPING SHALL BE BLACK STEEL AND FITTINGS SHALL BE MALLEABLE IRON.
8. FUEL PIPING SHALL NOT BE GALVANIZED STEEL OR COPPER.
9. THE FUEL SUPPLY TANK AND FUEL SHALL BE RESERVED EXCLUSIVELY FOR THE FIRE PUMP DIESEL ENGINE.
10. THE GRADE OF THE FUEL OIL SHALL BE INDICATED ON THE FUEL TANK BY LETTERS THAT ARE A MINIMUM OF 152 mm IN HEIGHT AND IN CONTRASTING COLOR OF THE TANK.
11. EACH TANK SHALL BE EQUIPPED WITH LEVEL GAUGE.
12. FILL LINE SHALL BE EQUIPPED WITH 16 MESH REMOVABLE WIRE SCREEN.
13. A GUARD, PIPE PROTECTION, OR A DOUBLED WALLED PIPE SHALL BE PROVIDED FOR ALL FUEL LINES EXPOSED TO TRAFFIC OR POSSIBLE DAMAGE.
14. VENT PIPING OUTLET SHALL TERMINATE AT LEAST 1.5 m FROM BUILDING OPENING AND AT LEAST 3.7 m ABOVE THE FINISHED GROUND LEVEL.

MANUFACTURER FABRICATION DRAWING



ITEM NO.	DESCRIPTION	QTY
01	285 GAL DOUBLE WALLED FUEL TANK	1
02	PLUG - 2"	4
03	PIPE - T x PE - 1.5" X 36" L	1
04	DOUBLE TAP BUSHING - 2" X 1.5"	1
05	PIPE - 1.5" X 4" L	1
06	REDUCER - 2" X 1.5"	1
07	PIPE - 2" X 4" L	3
08	LOCKABLE FUEL CAP - 2"	1
09	FUEL LEVEL GAUGE - 2"	1
10	PIPE TEE - 3" X 3" X 2"	3
11	BUSHING - 2" X 0.75"	1
12	EMERGENCY VENT - 3"	2
13	STREET ELBOW - 2"	2
14	SCREENED VENT - 2"	2
15	PIPE NIPPLE - 0.75"	2
16	LOCKABLE BALL VALVE - 0.75"	1
17	PIPE - T x PE - 0.75" X 36" L	1
18	DOUBLE TAP BUSHING - 2" X 0.75"	1
19	PIPE TEE - 0.75"	1
20	STREET ELBOW - 0.75"	1
21**	PIPE/TUBING - 0.75"	-
22**	PIPE - 3"	-

NOTE: **CUSTOMER SUPPLIED EQUIPMENT

NOTES:

1. THIS DRAWING IS THE PROPERTY OF SPP PUMPS, LP AND MUST NOT BE USED OR COPIED WITHOUT ITS PERMISSION.
2. TANK TO BE BUILT AND LABELED PER UL. SPEC. 142.
3. TANK TO BE PITCHED TOWARD DRAIN 1/4" PER FOOT.
4. OUTLET TO BE AT SAME ELEVATION AS ENGINE FUEL PUMP. LEGS TO BE SUPPLIED BY CUSTOMER.
5. COMPONENTS TO BE SHIPPED LOOSE FOR FIELD ASSEMBLY.
6. FUEL SUPPLY AND RETURN LINES TO BE SUPPLIED BY CUSTOMER.
7. ALL DIMESNIONS ARE IN INCHES.

DIMENSIONAL TOLERANCE:	±1/16"
THIRD ANGLE PROJECTION	

JOB #	
SAP #	
DOUBLE WALL FUEL TANK 285 GAL	
DRAWING TYPE	GENERAL ASSEMBLY
BORDER SIZE	B
DRAWING NUMBER	FTDW285GAL
SHEET	1 OF 1

LEGENDS

DE	DIESEL ENGINE DRIVEN FIRE PUMP
	ELECTRIC MOTOR DRIVE JOCKEY PUMP
	GATE VALE / ISOLATION VALVE
	BASKET STRAINER
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	PRESSURE RELIEF VALVE
	CHECK VALVE / NON-RETURN VALVE
	SURGE TANK
	GLOBE VALVE
M	FLOW METER
PG	PRESSURE GAUGE
A/G	ABOVE GROUND
U/G	UNDERGROUND GROUND
	FLANGE

NOTES:

1. FIRE WATER PUMPING SYSTEM SHALL BE DESIGNED AS PER NFPA 20
2. THERE WILL BE SIX 2000 GPM @ 11 BAR DIESEL FIRE PUMPS. FOUR PUMPS WOULD BE REQUIRED TO OPERATE SIMULTANEOUSLY. TWO PUMPS ARE STANDBY.
3. THE PUMPS SHALL BE CAPABLE OF DISCHARGING 150% OF ITS RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD.
4. THE SHUT-OFF HEAD SHALL NOT EXCEED 120% OF RATED HEAD.
5. EACH DIESEL ENGINE SHALL HAVE AN INDEPENDENT FUEL TANK WHERE ITS CAPACITY SHOULD BE SIZED AS PER NFPA STANDARD FOR FUEL TERMINALS/DEPOTS FIREFIGHTING APPLICATIONS.
6. EVERY CENTRIFUGAL PUMP SHALL HAVE STRAINER ON SUCTION HEADER; NON-RETURN VALVE AND PRESSURE GAUGE ON DISCHARGE HEADER.
7. EACH DIESEL DAY TANK CAPACITY SHALL BE24 HRS OPERATION OF THE RESPECTIVE PUMP, DIESEL DAY TANKS AND ACCESSORIES SHALL BE AS PER THE REQUIREMENTS OF NFPA 20. REFER TO DRAWING # NT-FP-PID-03
8. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE. (REFER TO DRAWING NT-FP-PID-102).
9. DIESEL ENGINE EXHAUST TO BE FITTED WITH SILENCER. EXHAUST SILENCER SHALL BE FITTED WITH FLAME/SPARK ARRESTOR AND RAIN CAP.
10. FIREWATER PUMP ENGINE COOLING SHALL BE IN LINE WITH THE REQUIREMENTS OF NFPA 20.
11. ALL MATERIAL SHALL BE UL LISTED AND FM APPROVED
12. ABOVEGROUND FIRE PROTECTION PIPING SHALL BE ASTM A53/A53M, SCH 40 , BLACK STEEL PIPE.
13. SUCTION PIPING SHALL BE GALVANIZED ON THE INSIDE IN ACCORDANCE WITH NFPA 20.
14. CIRCULATING RELIEF VALVES ARE NOT REQUIRED FOR DIESEL ENGINE FIRE PUMP AS PER NFPA 20
15. PROVIDE LABELING ON THE SURFACES OF THE PIPING IN THE PUMP ROOM TO SHOW WATER FLOW DIRECTION AND PIPE FUNCTION (e.g. "SUCTION", "DISCHARGE", "TO TEST HEADER", "TO SPRINKLER SYSTEM").
16. FULL FLOW RELIEF VALVE PIPING MUST DISCHARGE BACK TO THE WATER TANK.

CLIENT:
Ethiopian Petroleum Supply Enterprise(EPSE)

CONTRACTOR:
Navashastra Technologies Private Limited, India

PROJECT NAME:
Awash Depot up-gradation
Awash,Ethiopia

DRAWING TITLE:
DIESEL FUEL SYSTEM
FIRE WATER PUMPS

DRAWING NUMBER:
NT-FP-PID-103

EXHAUST SYSTEM NOTES:

1) EXHAUST SYSTEM SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 20, SECTION 11.5 (2019)
2) EACH PUMP ENGINE SHALL HAVE AN INDEPENDENT EXHAUST SYSTEM.
3) THE EXHAUST PIPE SHALL BE NOT BE ANY SMALLER IN DIAMETER THAN THE ENGINE EXHAUST OUTLET.
4) THE EXHAUST PIPE SHALL BE COVERED WITH HIGH-TEMPERATURE INSULATION.
5) THE EXHAUST PIPE SHALL BE POSITIONED IN SUCH A WAY AS TO PREVENT EXHAUST GASES FROM RE-ENTERING THE PUMP ROOM.
6) EXHAUST SYSTEM SHALL TERMINATE OUTSIDE THE STRUCTURE AT A POINT WHERE HOT GASES, SPARKS, OR PRODUCTS OF COMBUSTION WILL DISCHARGE TO A SAFE LOCATION.

FLOW METER VENTURI TYPE, SIZE 8"

VENTURI TYPE, PAINTED RED, SIZE 8", GROOVED ENDS, PRESSURE RATING 500 PSI. METER SHALL BE ALUMINUM 4" (100mm) DIAL, 1/4" NPT CONNECTION, 304SS CASE WITH RUBBER RINGS, GLASS WINDOW AND SEAL, BALL VALVES AND FITTINGS SHALL BE BRASS (CA 360).
(UL LISTED FLOW METERS ARE NOT AVAILABLE WITH ANY MANUFACTURER. ALL FLOW METERS ARE ONLY "FM APPROVED")

AIR RELEASE VALVE 1/2"

INLET SIZE 1/2", OUTLET SIZE 1/2", MAXIMUM WORKING PRESSURE 300 PSI. SHALL BE UL LISTED AND FM APPROVED.

SUCTION AND DISCHARGE GAUGES

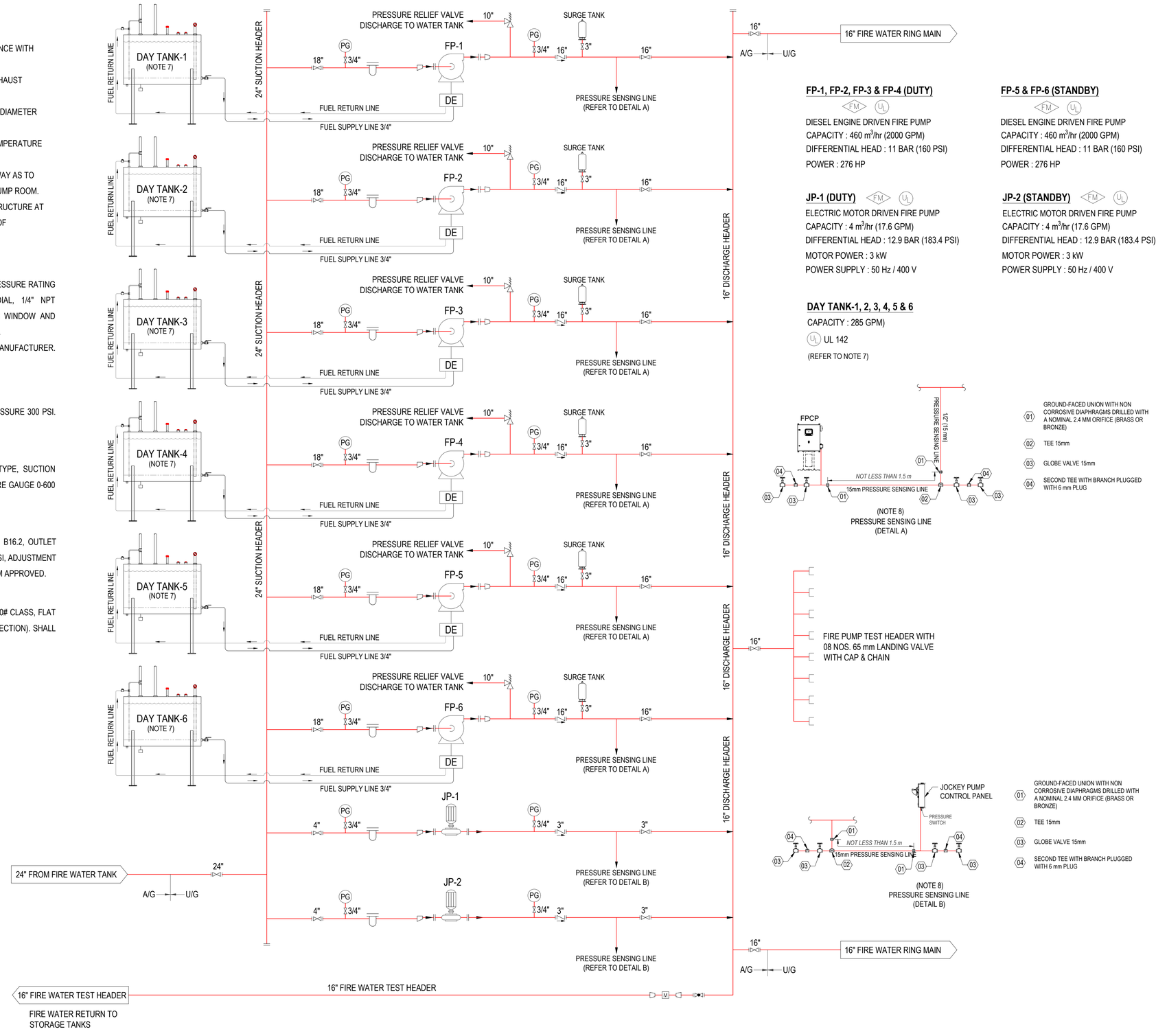
SIZE 4" (100 MM), 1/4" NPT LOWER MOUNT, OIL-FILLED TYPE, SUCTION PRESSURE RANGE 0-300 PSI (20 BAR). DISCHARGE PRESSURE GAUGE 0-600 PSI. SHALL BE UL LISTED AND FM APPROVED.

PRESSURE RELIEF VALVE (6")

SIZE DN150, INLET FLANGE CONNECTION CLASS 300 ANSI B16.2, OUTLET FLANGE CONNECTION CLASS 150. PRESSURE RATING 300 PSI, ADJUSTMENT RANGE 100-300 PSI (300 CLASS). SHALL BE UL LISTED AND FM APPROVED.

Waste Cone (6"x10")

INLET SIZE 6" (DN150), OUTLET SIZE 10" (DN250), FLANGE 150# CLASS, FLAT FACE (SHALL MATCH RELIEF VALVE MODEL FLANGE CONNECTION). SHALL BE UL LISTED AND FM APPROVED.



FP-1, FP-2, FP-3 & FP-4 (DUTY)

FM UL

DIESEL ENGINE DRIVEN FIRE PUMP
CAPACITY : 460 m^3/hr (2000 GPM)
DIFFERENTIAL HEAD : 11 BAR (160 PSI)
POWER : 276 HP

FP-5 & FP-6 (STANDBY)

FM UL

DIESEL ENGINE DRIVEN FIRE PUMP
CAPACITY : 460 m^3/hr (2000 GPM)
DIFFERENTIAL HEAD : 11 BAR (160 PSI)
POWER : 276 HP

JP-1 (DUTY)

FM UL

ELECTRIC MOTOR DRIVEN FIRE PUMP
CAPACITY : 4 m^3/hr (17.6 GPM)
DIFFERENTIAL HEAD : 12.9 BAR (183.4 PSI)
MOTOR POWER : 3 kW
POWER SUPPLY : 50 Hz / 400 V

JP-2 (STANDBY)

FM UL

ELECTRIC MOTOR DRIVEN FIRE PUMP
CAPACITY : 4 m^3/hr (17.6 GPM)
DIFFERENTIAL HEAD : 12.9 BAR (183.4 PSI)
MOTOR POWER : 3 kW
POWER SUPPLY : 50 Hz / 400 V

DAY TANK-1, 2, 3, 4, 5 & 6

CAPACITY : 285 GPM)
UL UL 142
(REFER TO NOTE 7)

LEGENDS

DE	DIESEL ENGINE DRIVEN FIRE PUMP
	ELECTRIC MOTOR DRIVE JOCKEY PUMP
	GATE VALE / ISOLATION VALVE
	BASKET STRAINER
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	PRESSURE RELIEF VALVE
	CHECK VALVE / NON-RETURN VALVE
	SURGE TANK
	GLOBE VALVE
M	FLOW METER
PG	PRESSURE GAUGE
A/G	ABOVE GROUND
U/G	UNDERGROUND GROUND
=	FLANGE

NOTES:

1. FIRE WATER PUMPING SYSTEM SHALL BE DESIGNED AS PER NFPA 20
2. THERE WILL BE SIX 2000 GPM @ 11 BAR DIESEL FIRE PUMPS. FOUR PUMPS WOULD BE REQUIRED TO OPERATE SIMULTANEOUSLY. TWO PUMPS ARE STANDBY.
3. THE PUMPS SHALL BE CAPABLE OF DISCHARGING 150% OF ITS RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD.
4. THE SHUT-OFF HEAD SHALL NOT EXCEED 120% OF RATED HEAD.
5. EACH DIESEL ENGINE SHALL HAVE AN INDEPENDENT FUEL TANK WHERE ITS CAPACITY SHOULD BE SIZED AS PER NFPA STANDARD FOR FUEL TERMINALS/DEPOTS FIREFIGHTING APPLICATIONS.
6. EVERY CENTRIFUGAL PUMP SHALL HAVE STRAINER ON SUCTION HEADER; NON-RETURN VALVE AND PRESSURE GAUGE ON DISCHARGE HEADER.
7. EACH DIESEL DAY TANK CAPACITY SHALL BE24 HRS OPERATION OF THE RESPECTIVE PUMP, DIESEL DAY TANKS AND ACCESSORIES SHALL BE AS PER THE REQUIREMENTS OF NFPA 20. REFER TO DRAWING # NT-FP-PID-03
8. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE. (REFER TO DRAWING NT-FP-PID-102).
9. DIESEL ENGINE EXHAUST TO BE FITTED WITH SILENCER. EXHAUST SILENCER SHALL BE FITTED WITH FLAME/SPARK ARRESTOR AND RAIN CAP.
10. FIREWATER PUMP ENGINE COOLING SHALL BE IN LINE WITH THE REQUIREMENTS OF NFPA 20.
11. ALL MATERIAL SHALL BE UL LISTED AND FM APPROVED
12. ABOVEGROUND FIRE PROTECTION PIPING SHALL BE ASTM A53/A53M, SCH 40 , BLACK STEEL PIPE.
13. SUCTION PIPING SHALL BE GALVANIZED ON THE INSIDE IN ACCORDANCE WITH NFPA 20.
14. CIRCULATING RELIEF VALVES ARE NOT REQUIRED FOR DIESEL ENGINE FIRE PUMP AS PER NFPA 20
15. PROVIDE LABELING ON THE SURFACES OF THE PIPING IN THE PUMP ROOM TO SHOW WATER FLOW DIRECTION AND PIPE FUNCTION (e.g. "SUCTION", "DISCHARGE", "TO TEST HEADER", "TO SPRINKLER SYSTEM").
16. FULL FLOW RELIEF VALVE PIPING MUST DISCHARGE BACK TO THE WATER TANK

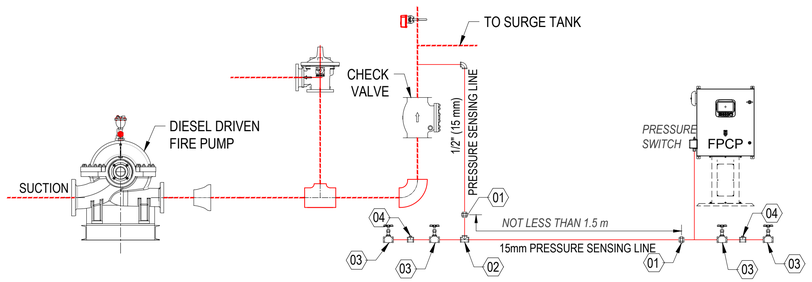
CLIENT:
Ethiopian Petroleum Supply Enterprise(EPSE)

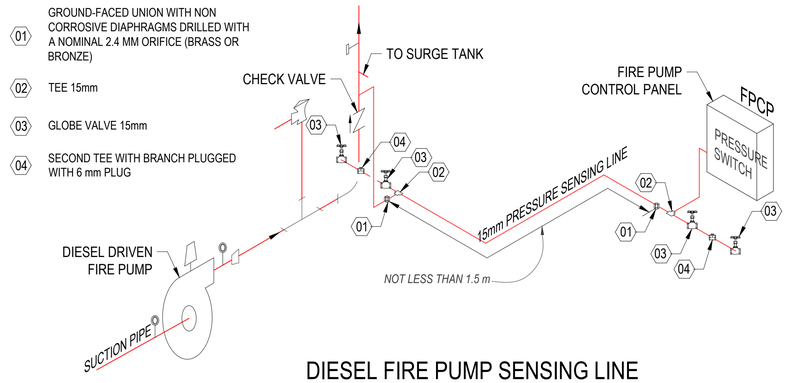
CONTRACTOR:
Navashastra Technologies Private Limited, India

PROJECT NAME:
Awash Depot up-gradation
Awash,Ethiopia

DRAWING TITLE:
PIPING & INSTRUMENTATION DIAGRAM
FIRE WATER PUMPS

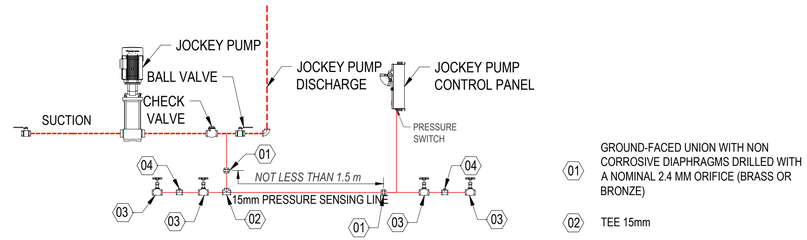
DRAWING NUMBER:
NT-FP-PID-101





DIESEL FIRE PUMP SENSING LINE

NTS (NOT TO SCALE)

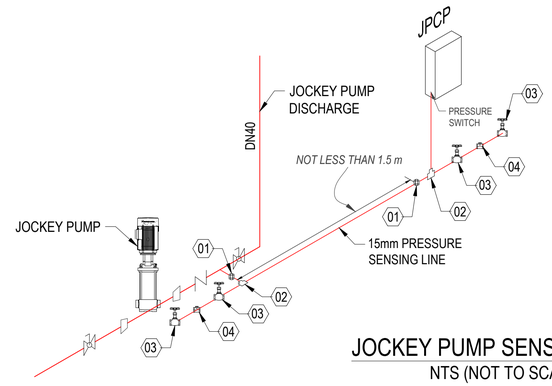


01 GROUND-FACED UNION WITH NON CORROSIVE DIAPHRAGMS DRILLED WITH A NOMINAL 2.4 MM ORIFICE (BRASS OR BRONZE)

02 TEE 15mm

03 GLOBE VALVE 15mm

04 SECOND TEE WITH BRANCH PLUGGED WITH 6 mm PLUG



JOCKEY PUMP SENSING LINE

NTS (NOT TO SCALE)

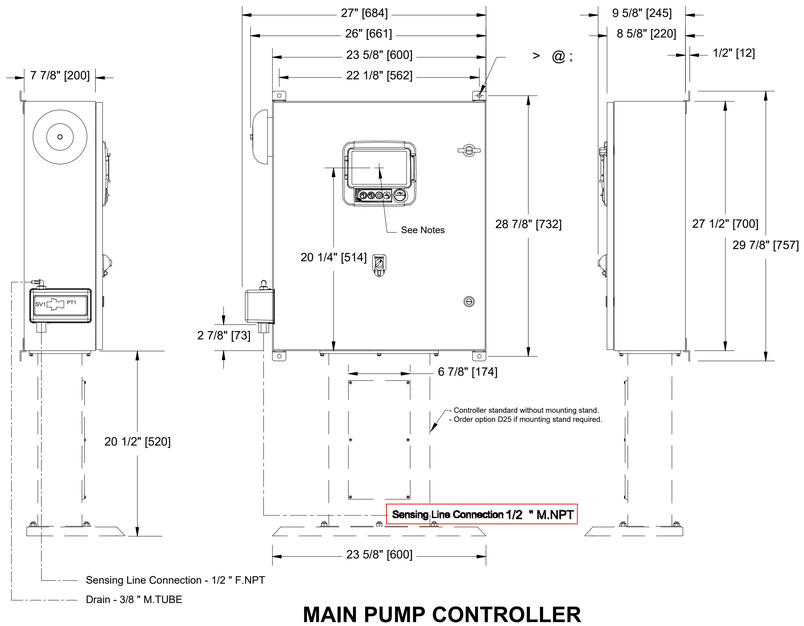
LEGENDS	
DE	DIESEL ENGINE DRIVEN FIRE PUMP
	ELECTRIC MOTOR DRIVE JOCKEY PUMP
	GATE VALE / ISOLATION VALVE
	BASKET STRAINER
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	PRESSURE RELIEF VALVE
	CHECK VALVE / NON-RETURN VALVE
	SURGE TANK
	GLOBE VALVE
U	FLOW METER
PG	PRESSURE GAUGE
A/G	ABOVE GROUND
U/G	UNDERGROUND GROUND
	FLANGE

NOTES:

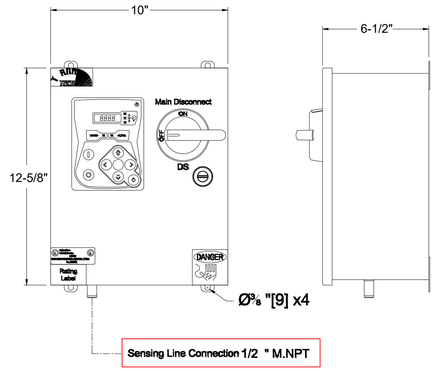
1. FIRE WATER PUMPING SYSTEM SHALL BE DESIGNED AS PER NFPA 20
2. THERE WILL BE SIX 2000 GPM @ 11 BAR DIESEL FIRE PUMPS. FOUR PUMPS WOULD BE REQUIRED TO OPERATE SIMULTANEOUSLY. TWO PUMPS ARE STANDBY.
3. THE PUMPS SHALL BE CAPABLE OF DISCHARGING 150% OF ITS RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD.
4. THE SHUT-OFF HEAD SHALL NOT EXCEED 120% OF RATED HEAD.
5. EACH DIESEL ENGINE SHALL HAVE AN INDEPENDENT FUEL TANK WHERE ITS CAPACITY SHOULD BE SIZED AS PER NFPA STANDARD FOR FUEL TERMINALS/DEPOTS FIREFIGHTING APPLICATIONS.
6. EVERY CENTRIFUGAL PUMP SHALL HAVE STRAINER ON SUCTION HEADER; NON-RETURN VALVE AND PRESSURE GAUGE ON DISCHARGE HEADER.
7. EACH DIESEL DAY TANK CAPACITY SHALL BE24 HRS OPERATION OF THE RESPECTIVE PUMP, DIESEL DAY TANKS AND ACCESSORIES SHALL BE AS PER THE REQUIREMENTS OF NFPA 20. REFER TO DRAWING # NT-FP-PID-03
8. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE. (REFER TO DRAWING NT-FP-PID-102).
9. DIESEL ENGINE EXHAUST TO BE FITTED WITH SILENCER. EXHAUST SILENCER SHALL BE FITTED WITH FLAME/SPARK ARRESTOR AND RAIN CAP.
10. FIREWATER PUMP ENGINE COOLING SHALL BE IN LINE WITH THE REQUIREMENTS OF NFPA 20.
11. ALL MATERIAL SHALL BE UL LISTED AND FM APPROVED
12. ABOVEGROUND FIRE PROTECTION PIPING SHALL BE ASTM A53/A53M, SCH 40 , BLACK STEEL PIPE.
13. SUCTION PIPING SHALL BE GALVANIZED ON THE INSIDE IN ACCORDANCE WITH NFPA 20.
14. CIRCULATING RELIEF VALVES ARE NOT REQUIRED FOR DIESEL ENGINE FIRE PUMP AS PER NFPA 20
15. PROVIDE LABELING ON THE SURFACES OF THE PIPING IN THE PUMP ROOM TO SHOW WATER FLOW DIRECTION AND PIPE FUNCTION (e.g. "SUCTION", "DISCHARGE", "TO TEST HEADER", "TO SPRINKLER SYSTEM").
16. FULL FLOW RELIEF VALVE PIPING MUST DISCHARGE BACK TO THE WATER TANK

NOTES:

1. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE.
2. THE PRESSURE SENSING PIPE SHALL BE BRASS, RIGID COPPER PIPE TYPES K,L OR M AND FITTINGS SHALL BE OF 1/2" (15MM) NOMINAL SIZE.
3. PRESSURE SENSING LINE SHALL BE ABLE TO WITHSTAND HIGH PRESSURE.
4. WHERE WATER IS CLEAN, GROUND-FACE UNIONS WITH NONCORROSIVE DIAPHRAGMS DRILLED WITH A NOMINAL 3/32 INCH (2.4 mm) ORIFICE SHALL BE PERMITTED IN PLACE OF THE CHECK VALVES.
5. THERE SHALL BE TWO INSPECTION TEST VALVES ATTACHED TO THE PRESSURE SENSING LINE THAT SHALL CONSIST OF A TEE, A VALVE, A SECOND TEE WITH THE BRANCH PLUGGED, AND A SECOND VALVE
6. THERE SHALL BE NO SHUTOFF VALVE IN THE PRESSURE SENSING LINE.



MAIN PUMP CONTROLLER



JOCKEY PUMP CONTROLLER

CLIENT:
Ethiopian Petroleum Supply Enterprise(EPSE)

CONTRACTOR:
Navashastra Technologies Private Limited, India

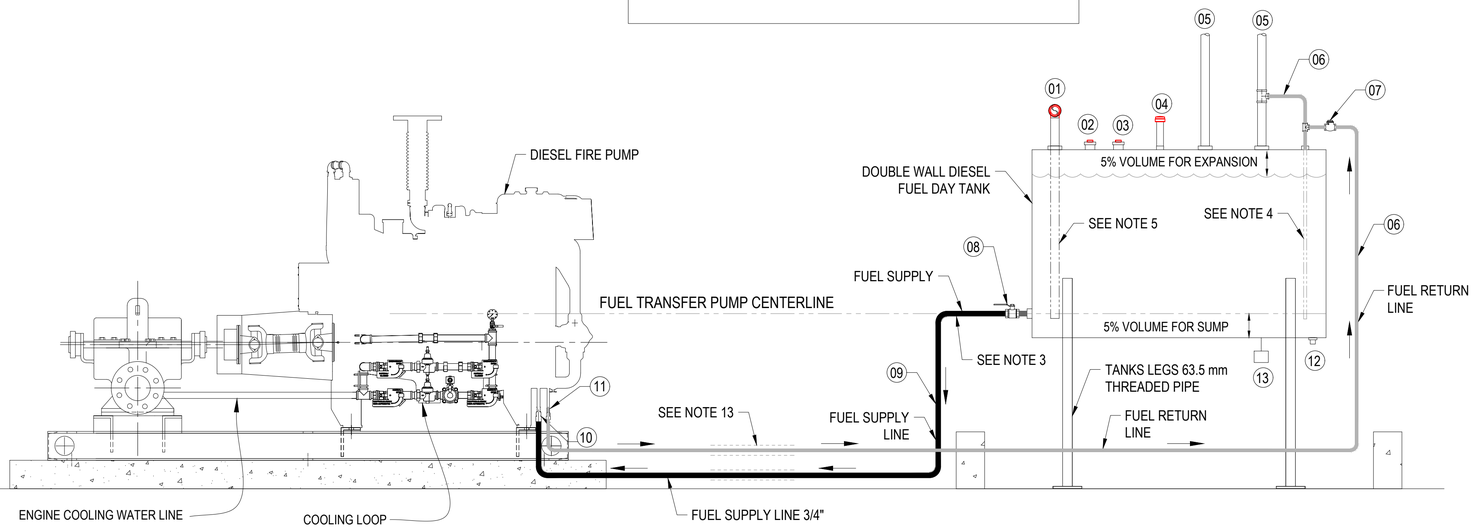
PROJECT NAME:
Awash Depot up-gradation
Awash,Ethiopia

DRAWING TITLE:
PRESSURE SENSING LINE
FIRE WATER PUMPS

DRAWING NUMBER:
NT-FP-PID-102

FUEL DAY TANK (DOUBLE WALL)

CAPACITY SHLL BE AS PER NFPA 20, SHALL INCLUDE LOW LEVEL SWITCH, LEVEL INDICATOR, TANK SUPPORT LEGS SHALL BE 63.5 MM, TANK HEIGHT SHALL MAINTAIN FUEL SUPPLY CONNECTION HEIGHT EQUAL TO FUEL TRANSFER PUMP CENTERLINE HEIGHT. SHALL PROVIDE THE COMPLETE FUEL SYSTEM ACCESSORIES NEEDED TO COMPLY TO UL 142 REQUIREMENTS.

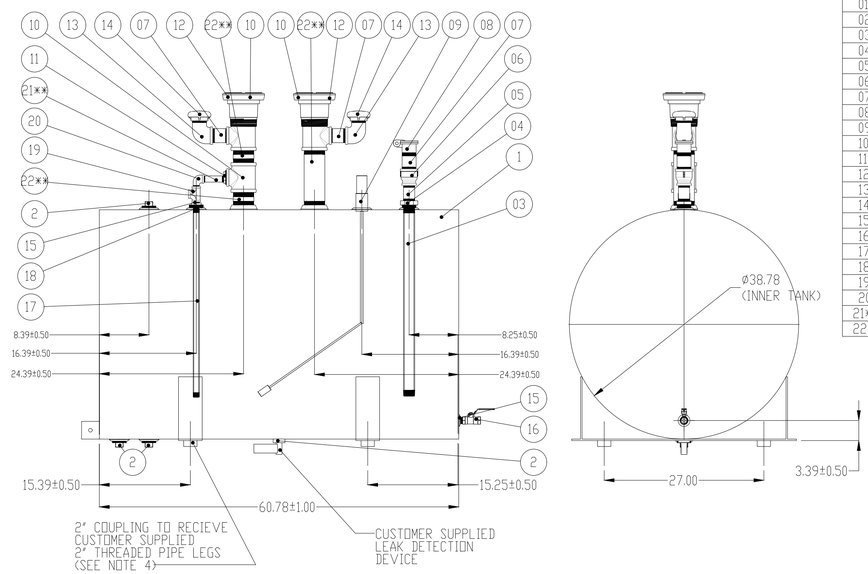


ITEM	DESCRIPTION	QTY
01	DN50 FILL CAP - WITH PROVISION FOR PADLOCK, COMBINED WITH REMOVABLE STRAINER (MAX 06 MESH)	01
02	PIPE PLUG, DN100 NPT (PROVISION FOR EMERGENCY RELIEF VENT)	01
03	PIPE PLUG, DN50 NPT (PROVISION FOR LOW FUEL ALARM ACCESS)	01
04	DIRECT READING TANK GAUGE	01
05	VENT PIPE DN50, EXTENDED TO THE OUTSIDE	02
06	FUEL RETURN LINE DN15	LOT
07	CHECK VALVE DN15	01
08	MANUAL COCK VALVE DN20, LOCKED OPEN	01
09	FUEL SUPPLY LINE DN20	LOT
10	FLEXIBLE SUPPLY CONNECTION HOSE	01
11	FLEXIBLE RETURN CONNECTION HOSE	01
12	PIPE PLUG FOR DRAIN, DN25 NPT	01
13	INTERSTITIAL SPACE SUPERVISORY SIGNAL	

NOTES:

1. AS PER NFPA 20, 2019, FUEL SUPPLY TANK SHALL BE SIZED FOR A MINIMUM OF 12 HOURS OF ENGINE RUN TIME BASED ON THE FUEL SUPPLY RATE REQUIREMENTS OF THE ENGINE, PLUS 5% VOLUME FOR EXPANSION AND 5% VOLUME FOR SUMP.
2. AS PER NFPA 20, 2019 WHEN THE FUEL SUPPLY RATE REQUIREMENTS OF THE ENGINE ARE NOT KNOWN, FUEL SUPPLY TANK SHALL HAVE A CAPACITY AT LEAST EQUAL TO 1 Gal / HP, PLUS 5% VOLUME FOR EXPANSION AND 5% VOLUME FOR SUMP.
3. FUEL TANK OUTLET SHALL NOT BE LOWER THAN THE FUEL TRANSFER PUMP.
4. DOWNPIPE RECOMMENDED FOR FUEL RETURN LINE TO PREVENT FOAMING INSIDE TANK. TERMINATE 76 - 150 mm FROM THE TANK BOTTOM.
5. DOWNPIPE RECOMMENDED FOR FUEL SUPPLY LINE TO PREVENT FOAMING INSIDE THE TANK. TERMINATE 76-150 mm FROM TANK BOTTOM.
6. THE ENGINE MANUFACTURER'S FUEL PUMP STATIC HEAD PRESSURE LIMITS SHALL NOT BE EXCEEDED WHEN LEVEL OF FUEL IN THE TANK IS AT A MAXIMUM.
7. FUEL PIPING SHALL BE BLACK STEEL AND FITTINGS SHALL BE MALLEABLE IRON.
8. FUEL PIPING SHALL NOT BE GALVANIZED STEEL OR COPPER.
9. THE FUEL SUPPLY TANK AND FUEL SHALL BE RESERVED EXCLUSIVELY FOR THE FIRE PUMP DIESEL ENGINE.
10. THE GRADE OF THE FUEL OIL SHALL BE INDICATED ON THE FUEL TANK BY LETTERS THAT ARE A MINIMUM OF 152 mm IN HEIGHT AND IN CONTRASTING COLOR OF THE TANK.
11. EACH TANK SHALL BE EQUIPPED WITH LEVEL GAUGE.
12. FILL LINE SHALL BE EQUIPPED WITH 16 MESH REMOVABLE WIRE SCREEN.
13. A GUARD, PIPE PROTECTION, OR A DOUBLED WALLED PIPE SHALL BE PROVIDED FOR ALL FUEL LINES EXPOSED TO TRAFFIC OR POSSIBLE DAMAGE.
14. VENT PIPING OUTLET SHALL TERMINATE AT LEAST 1.5 m FROM BUILDING OPENING AND AT LEAST 3.7 m ABOVE THE FINISHED GROUND LEVEL.

MANUFACTURER FABRICATION DRAWING



ITEM NO.	DESCRIPTION	QTY
01	285 GAL DOUBLE WALLED FUEL TANK	1
02	PLUG - 2"	4
03	PIPE - T x PE - 1.5" X 36" L	1
04	DOUBLE TAP BUSHING - 2" X 1.5"	1
05	PIPE - 1.5" X 4" L	1
06	REDUCER - 2" X 1.5"	1
07	PIPE - 2" X 4" L	3
08	LOCKABLE FUEL CAP - 2"	1
09	FUEL LEVEL GAUGE - 2"	1
10	PIPE TEE - 3" X 3" X 2"	3
11	BUSHING - 2" X 0.75"	1
12	EMERGENCY VENT - 3"	2
13	STREET ELBOW - 2"	2
14	SCREENED VENT - 2"	2
15	PIPE NIPPLE - 0.75"	2
16	LOCKABLE BALL VALVE - 0.75"	1
17	PIPE - T x PE - 0.75" X 36" L	1
18	DOUBLE TAP BUSHING - 2" X 0.75"	1
19	PIPE TEE - 0.75"	1
20	STREET ELBOW - 0.75"	1
21**	PIPE/TUBING - 0.75"	-
22**	PIPE - 3"	-

NOTE: **CUSTOMER SUPPLIED EQUIPMENT

NOTES:

1. THIS DRAWING IS THE PROPERTY OF SPP PUMPS, LP AND MUST NOT BE USED OR COPIED WITHOUT ITS PERMISSION.
2. TANK TO BE BUILT AND LABELED PER UL. SPEC. 142.
3. TANK TO BE PITCHED TOWARD DRAIN 1/4" PER FOOT.
4. OUTLET TO BE AT SAME ELEVATION AS ENGINE FUEL PUMP. LEGS TO BE SUPPLIED BY CUSTOMER.
5. COMPONENTS TO BE SHIPPED LOOSE FOR FIELD ASSEMBLY.
6. FUEL SUPPLY AND RETURN LINES TO BE SUPPLIED BY CUSTOMER.
7. ALL DIMESNIONS ARE IN INCHES.

DIMENSIONAL TOLERANCE:	±1/16"
THIRD ANGLE PROJECTION	

JOB #	
SAP #	
DOUBLE WALL FUEL TANK 285 GAL	
DRAWING TYPE	GENERAL ASSEMBLY
BORDER SIZE	B
DRAWING NUMBER	FTDW285GAL
SHEET	1 OF 1

LEGENDS

DE	DIESEL ENGINE DRIVEN FIRE PUMP
	ELECTRIC MOTOR DRIVE JOCKEY PUMP
	GATE VALE / ISOLATION VALVE
	BASKET STRAINER
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	PRESSURE RELIEF VALVE
	CHECK VALVE / NON-RETURN VALVE
	SURGE TANK
	GLOBE VALVE
M	FLOW METER
PG	PRESSURE GAUGE
A/G	ABOVE GROUND
U/G	UNDERGROUND GROUND
	FLANGE

NOTES:

1. FIRE WATER PUMPING SYSTEM SHALL BE DESIGNED AS PER NFPA 20
2. THERE WILL BE SIX 2000 GPM @ 11 BAR DIESEL FIRE PUMPS. FOUR PUMPS WOULD BE REQUIRED TO OPERATE SIMULTANEOUSLY. TWO PUMPS ARE STANDBY.
3. THE PUMPS SHALL BE CAPABLE OF DISCHARGING 150% OF ITS RATED CAPACITY AT A MINIMUM OF 65% OF THE RATED HEAD.
4. THE SHUT-OFF HEAD SHALL NOT EXCEED 120% OF RATED HEAD.
5. EACH DIESEL ENGINE SHALL HAVE AN INDEPENDENT FUEL TANK WHERE ITS CAPACITY SHOULD BE SIZED AS PER NFPA STANDARD FOR FUEL TERMINALS/DEPOTS FIREFIGHTING APPLICATIONS.
6. EVERY CENTRIFUGAL PUMP SHALL HAVE STRAINER ON SUCTION HEADER; NON-RETURN VALVE AND PRESSURE GAUGE ON DISCHARGE HEADER.
7. EACH DIESEL DAY TANK CAPACITY SHALL BE24 HRS OPERATION OF THE RESPECTIVE PUMP, DIESEL DAY TANKS AND ACCESSORIES SHALL BE AS PER THE REQUIREMENTS OF NFPA 20. REFER TO DRAWING # NT-FP-PID-03
8. THE PRESSURE SENSING LINE CONNECTION FOR EACH PUMP, INCLUDING JOCKEY PUMPS, SHALL BE MADE BETWEEN THAT PUMP'S DISCHARGE CHECK VALVE AND DISCHARGE ISOLATION VALVE. (REFER TO DRAWING NT-FP-PID-102).
9. DIESEL ENGINE EXHAUST TO BE FITTED WITH SILENCER. EXHAUST SILENCER SHALL BE FITTED WITH FLAME/SPARK ARRESTOR AND RAIN CAP.
10. FIREWATER PUMP ENGINE COOLING SHALL BE IN LINE WITH THE REQUIREMENTS OF NFPA 20.
11. ALL MATERIAL SHALL BE UL LISTED AND FM APPROVED
12. ABOVEGROUND FIRE PROTECTION PIPING SHALL BE ASTM A53/A53M, SCH 40 , BLACK STEEL PIPE.
13. SUCTION PIPING SHALL BE GALVANIZED ON THE INSIDE IN ACCORDANCE WITH NFPA 20.
14. CIRCULATING RELIEF VALVES ARE NOT REQUIRED FOR DIESEL ENGINE FIRE PUMP AS PER NFPA 20
15. PROVIDE LABELING ON THE SURFACES OF THE PIPING IN THE PUMP ROOM TO SHOW WATER FLOW DIRECTION AND PIPE FUNCTION (e.g. "SUCTION", "DISCHARGE", "TO TEST HEADER", "TO SPRINKLER SYSTEM").
16. FULL FLOW RELIEF VALVE PIPING MUST DISCHARGE BACK TO THE WATER TANK.

CLIENT:
Ethiopian Petroleum Supply Enterprise(EPSE)

CONTRACTOR:
Navashastra Technologies Private Limited, India

PROJECT NAME:
Awash Depot up-gradation
Awash,Ethiopia

DRAWING TITLE:
DIESEL FUEL SYSTEM
FIRE WATER PUMPS

DRAWING NUMBER:
NT-FP-PID-103