MATERIAL SCHEDULE

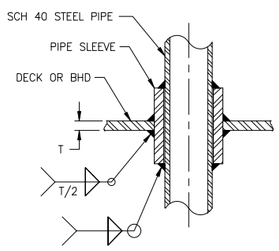
SERVICE	SIZE	PIPE	TAKEDOWN JOINTS			VALVES		FITTINGS	FLEXIBLE CONNECTIONS
			MATERIAL	GASKETS	BOLTING	BODY	TRIM		
FUEL OIL MAWP: 15 PSIG MAX TEMP: 120°F	ALL	CARBON STEEL ASTM ASTM A53 OR A106, GRADE B SEAMLESS ANSI B36.10 SCH 40	UNION GROUND JOINT CARBON STEEL ASTM A105 ANSI B16.11 SOCKET WELD	–	–	BALL: CARBON STEEL ASTM A216 GR WCB SOCKET WELD 3–PIECE 1500 PSI SWING CHECK: CARBON STEEL ASTM A216 GR WCB 150#, SOCKET WELD GATE VALVE: CARBON STEEL ASTM A216 GR WCB FLANGED SEE NOTES 12&14	BALL: CHROME PLATED CARBON STEEL BALL RPTFE SEATS SWING CHECK: STAINLESS STEEL GATE VALVE: STAINLESS STEEL	CARBON STEEL ASTM A105 ANSI B16.11 3000# SOCKET WELD	SAE J1942 COMPLIANT HOSE SEE NOTE 6

EQUIPMENT & PUMP LIST

QTY	SERVICE	TYPE	MODEL	CAPACITY	REMARKS
1	FUEL OIL TRANSFER PUMP	HAND OPERATED ROTARY VANE	–	10 GAL/ 115 REV	INLINE INSTALLATION
2	MAIN ENGINE FUEL OIL FILTER	TURBINE FILTER 2 ELEMENT	–	6 GPM 10 MICRON	ASTM F1201
2	SSDG FUEL OIL FILTER	TURBINE FILTER 1 ELEMENT	–	3 GPM 10 MICRON	ASTM F1201
1	EDG FUEL OIL FILTER	TURBINE FILTER 1 ELEMENT	–	3 GPM 10 MICRON	ASTM F1201
1	SIGHT FLOW INDICATOR	VISUAL	–	–	–

SYMBOLS LIST

	SUPPLY PIPE
	RETURN PIPE
	PIPE UP
	PIPE DOWN
	BULKHEAD PENETRATION
	REDUCER
	PLUG
	REMOTE ACTUATED VALVE
	BALL VALVE
	SWING CHECK VALVE
	SIMPLEX FILTER
	FLEXIBLE CONNECTION
	DUPLEX FILTER
	SPILL CONTAINMENT/DRIP PAN
	MANUALLY OPERATED PUMP
	SIGHT FLOW INDICATOR
LS	LEVEL SENSOR



DETAIL 1–6A
TYP DECK/BHD PENETRATION

GENERAL NOTES (CONT)

10. ALL VALVES LOCATED BELOW THE FLOOR PLATES SHALL BE PROVIDED WITH REACH RODS. ALL VALVES SHALL BE PROVIDED WITH VISUAL CLOSURE STATUS.
11. PIPE THREAD SEALING TAPE, GALVANIZED PIPE, OR FITTINGS SHALL NOT BE USED.
12. VALVES CONSTRUCTED OF DUCTILE IRON, ASTM A395, MAY BE SUBSTITUTED WHERE PERMITTED BY ABS AND USCG REQUIREMENTS.
13. PIPE BENDS MAY BE USED IN LIEU OF ELBOWS WHERE PRACTICABLE. BENDS SHALL HAVE A BEND RADIUS OF FIVE TIMES NOMINAL DIAMETER WHEREVER PRACTICAL, WITH A MINIMUM RADIUS OF THREE TIMES NOMINAL DIAMETER.
14. TANK SHUT–OFF VALVES SHALL BE POSITIVE SHUTOFF AND HAVE FIRE SAFE METALLIC SEATS.
15. EACH FUEL OIL TANK SHALL BE FITTED WITH A LEVEL SENSOR. EACH SENSOR SHALL BE INSTALLED THROUGH THE TOP OF THE TANK AND INTERFACED WITH THE SHIPS ALARM AND MONITORING SYSTEM. CONFIGURE TO PROVIDE CONTINUOUS LEVEL INDICATION, LOW & HIGH LEVEL ALARMS. SEE REF 1.
16. PIPING SHALL BE CLEANED AND TESTED IN ACCORDANCE WITH USCG REQUIREMENTS. SEE REF 1.
17. ARRANGE LEVEL INDICATOR TO PROVIDE INDICATION THROUGH THE GREATEST RANGE OF TANK LEVEL AS PRACTICABLE.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD
A	SHT 2 2–3A	1. REMOVED PROPRIETARY DETAILS 2. ADDED EGEN FUEL TANK VENT.	MWR	7/28/17	LGB
B	2–3B	1. INCREASED SIZE OF SUPPLY CROSS CONNECT FROM 2". 2. REMOVED TANK PENETRATIONS FROM RETURN LINES.	LGB	8/30/17	LGB

GENERAL NOTES

1. VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
2. THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. EQUIPMENT LAYOUT IN A GIVEN AREA IS APPROXIMATE. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED FROM THE SHIP AND MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.
3. PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PIPE SPOOLS SHALL BE SIZED AND ARRANGED TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING, AND REPLACEMENT OF PIPING, VALVES, FITTINGS, AND EQUIPMENT WITHOUT CUTTING STRUCTURE OR PIPING.
4. PIPING SHALL BE ADEQUATELY SUPPORTED BY HANGERS IN ACCORDANCE WITH ASTM F708. HANGERS SHALL BE ATTACHED TO THE PIPE WITH BOLTED CLAMPS AND WELDED TO THE BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES.
5. WHERE PIPES PENETRATE TANK BOUNDARIES, BULKHEADS, OR DECKS HEAVY WEIGHT SPOOL PIECES OR REINFORCING PENETRATION FITTINGS SHALL BE USED. SEE DETAIL 1–6A.
6. FLEXIBLE HOSE SECTIONS BETWEEN THE ENGINE ATTACHED CONNECTIONS AND VESSEL PIPING SHALL BE 37° SAE FLARE SWIVEL ON BOTH ENDS. FLEXIBLE HOSE SHALL BE FLAME RESISTANT IN ACCORDANCE WITH 46 CFR 56.60–25. HOSE ASSEMBLIES SHALL NOT BE LESS THAN 9" IN LENGTH NOR MORE THAN 24" IN LENGTH.
7. DO NOT ROUTE PIPING CONTAINING FUEL OIL NEAR ANY ELECTRICAL DEVICES OR EQUIPMENT. DO NOT LOCATE TAKEDOWN JOINTS AROUND, NEAR, OR OVER ELECTRICAL EQUIPMENT. ROUTE ALL FUEL OIL PIPING AT LEAST 18 INCHES AWAY FROM ANY SURFACE THAT NORMALLY HAS AN OPERATING TEMPERATURE OF 450°F OR GREATER.
8. FUEL OIL SUCTION BELLMOUTH AREA SHALL BE AT LEAST 1 1/2 TIMES THE SUCTION PIPE INTERNAL AREA.
9. DRIP PANS WITH UP–TURNED, SEALED, FLANGED EDGES SHALL BE PROVIDED BENEATH ALL FILTERS, PUMPS, STRAINERS, AND ANY OTHER EQUIPMENT THAT CONTAINS OIL AND REQUIRES PERIODIC MAINTENANCE. DRIP PANS SHALL BE PROVIDED WITH DRAIN VALVES.

REFERENCES

1. 16101–200–832–1 TECHNICAL SPECIFICATION
2. 16101–200–506–1 FILLS, VENTS, AND SOUNDS

LYDIA G. BENGER
STATE OF WASHINGTON
21201
REGISTERED
PROFESSIONAL ENGINEER
8/30/2017

NORTH CAROLINA FERRY SYSTEM
8500 SHIPYARD RD WANG HARBOR, NC 27953

Elliott Bay Design Group
North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
RALEIGH, NORTH CAROLINA
PROJECT: NEW RIVER CLASS FERRY

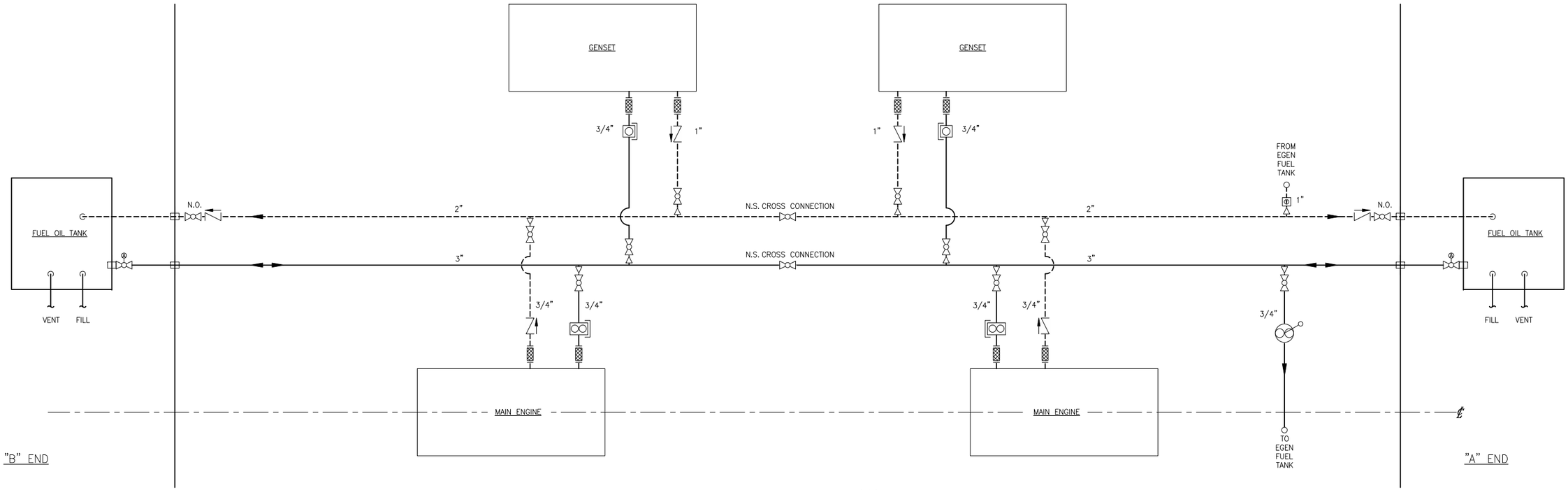
TITLE: FUEL OIL PIPING SCHEMATIC

SIZE	DWG NO.	REV
D	16101–200–261–1	B

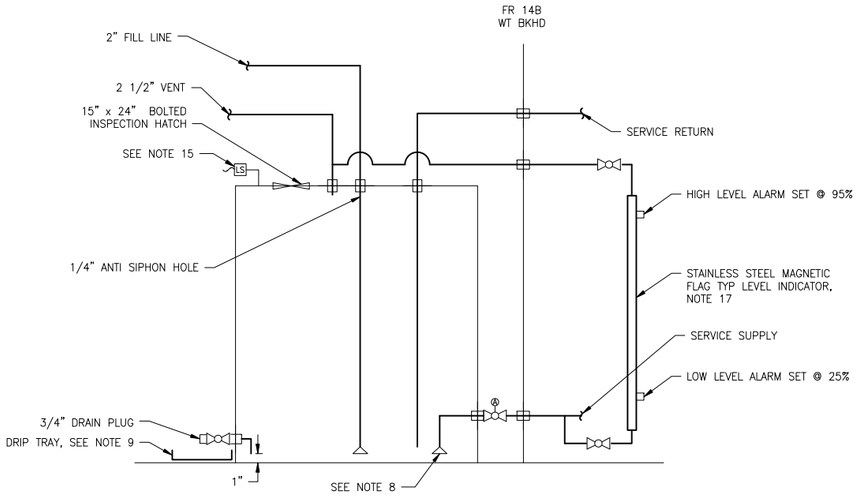
SCALE	FILE NAME	SHEET	OF
NONE	16101–200–261–1B	1	2

DWN	MOD	CKD	APVD	APVD DATE
MWR		NJB	LGB	7/21/17

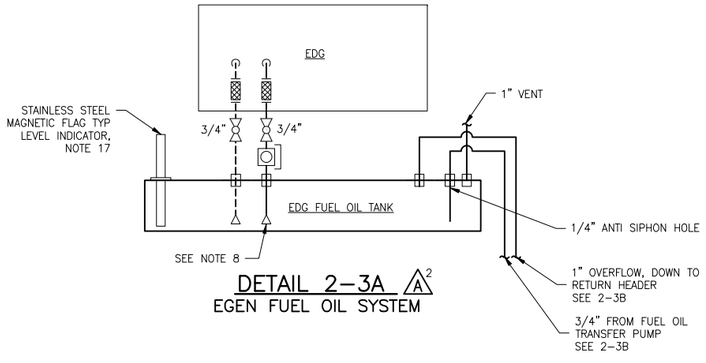
8/30/2017 3:01:01 PM



PLAN 2–3B (B 1,2)
FUEL OIL SYSTEM LAYOUT



DETAIL 2–5A
TYP STORAGE TANK
"B" END SHOWN, "A" SIMILAR



DETAIL 2–3A (A 2)
EGEN FUEL OIL SYSTEM

LYDIA G. BERGER
STATE OF WASHINGTON
21201
REGISTERED PROFESSIONAL ENGINEER
8/30/2017

(A 1)

SIZE	DWG NO.	REV
D	16101–200–261–1	B
SCALE NONE	FILE NAME 16101–200–261–1B	SHEET 2 OF 2

8/30/2017 3:01:05 PM