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GENERAL NOTES (CONT)

- CLEANOUTS CONCEALED IN JOINER BULKHEADS OR SUSPENDED CEILINGS SHALL BE ACCESSIBLE VIA REMOVABLE PANEL. PROVIDE 18" OF CLEAR SPACE IN FRONT OF THE CLEANOUT. ACCESS PANELS SHALL BE CLEARLY LABELED.
- BLACK AND GRAY WATER WASTE DRAIN PIPING SHALL BE SLOPED DOWNWARD AT NO LESS THAN 1/4" PER FOOT IN TRANSVERSE DIRECTION & 1/8" PER FOOT LONGITUDINALLY.
- AIR ADMITTANCE VALVES CONCEALED IN JOINER BULKHEADS OR SUSPENDED CEILINGS SHALL BE ACCESSIBLE VIA REMOVABLE PANEL OR CEILING TILE. INSTALL AIR ADMITTANCE VALVES ABOVE FLOOD RIM OF FIXTURE SERVED.
- THE HOLDING TANKS SHALL BE FITTED WITH LEVEL SENSORS TO INTERFACE WITH THE ALARM AND MONITORING SYSTEM. THE SENSOR SHALL HAVE A HIGH LEVEL ALARM AT 75% FULL. SEE REF 1.
- MSD AND HOLDING TANK VENTS SHOWN ON REFERENCE 2.
- CPVC PIPE AND FITTINGS SHALL HAVE A USCG CERTIFICATE OF APPROVAL THAT STATES CPVC PIPE AND FITTINGS MEET LOW FLAME SPREAD AND TOXICITY REQUIREMENTS OF THE FTP CODE ANNEX 1, PARTS 2 AND 5. INSTALL PIPING IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION GUIDELINES.
- WHERE PLASTIC PIPING PENETRATES BULKHEADS OR DECKS, STEEL PENETRATION SLEEVES WITH USCG APPROVED SEALANT AND CRUSHING SLEEVES SHALL BE USED. SEALANT AND SLEEVES SHALL BE RATED FOR WATERTIGHT AND A-60 APPLICATIONS. INSTALL PIPING TRANSITS IN ACCORDANCE WITH MANUFACTURER'S APPROVED INSTALLATION DETAILS.
- PROVIDE A STAINLESS STEEL DRIP TRAY BELOW ZERO DISCHARGE PUMPS.
- CREW HEAD AND DAY ROOM DRAINS SHALL BE ROUTED IN THE UNDER DECK STRUCTURE AS HIGH AS PRACTICABLE AND CLEAR OF THE VEHICLE LANES BELOW. ALL DRAINS EXPOSED TO WEATHER SHALL BE CARBON STEEL.
- FIT OVERBOARD DISCHARGE WITH A REACH ROD TO THE MAIN DECK. TERMINATE REACH ROD IN AN ACCESSIBLE LOCATION OUTSIDE OF VEHICLE LANES AND CLEAR OF OBSTRUCTIONS.

REVISION HISTORY

REV	ZONE	DESCRIPTION	DWN	DATE	APVD

GENERAL NOTES

- VESSEL TO BE CONSTRUCTED IN ACCORDANCE WITH 46 CFR SUBCHAPTER H REGULATIONS.
- 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 MANUFACTURER'S CERTIFIED DRAWINGS AS APPROPRIATE.
- 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.
- 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 BASIC SHIP STRUCTURE. HANGERS SHALL NOT BE WELDED DIRECTLY TO PIPES.
- TDH OF PUMP FOR REQUIRED FLOW IS APPROXIMATE ONLY. THE CONTRACTOR SHALL PROVIDE A PUMP MEETING THE REQUIRED FLOW WITH THE INSTALLED PIPING SYSTEM. PUMP MOTORS SHALL BE SELECTED TO PREVENT MOTOR OVERLOAD OVER THE ENTIRE PUMP OPERATING RANGE.
- SANITARY DRAIN PIPING IN THE ACCOMMODATIONS AREAS SHALL BE CONCEALED BEHIND JOINER BULKHEADS OR SUSPENDED CEILINGS.
- CHANGES OF DIRECTION IN HORIZONTAL DRAIN PIPING SHALL BE MADE WITH WYES OR BENDS OF 45° OR LESS. INTERSECTIONS BETWEEN BRANCHES OF DRAIN PIPING SHALL BE ACCOMPLISHED WITH THE USE OF LATERALS WYES OR SWEEP TEES. IN NO CASE SHALL TWO PIPES INTERSECT AT 90°.
- HORIZONTAL DRAINAGE LINES WHICH CONNECT DIRECTLY WITH A VERTICAL STACK, SHALL ENTER THROUGH 45° WYE, 60° WYE, COMBINATION WYE AND 45° BEND, SANITARY TEE OR BRANCHES OF EQUIVALENT SWEEP.
- CLEANOUTS WITH PLUGS SHALL BE FITTED AT THE UPPER TERMINAL OF EACH HORIZONTAL RUN, AT INTERVALS OF NO LESS THAN 1 PER 50 LINEAR FEET OF PIPE IN STRAIGHT RUNS, AND WHEREVER THE AGGREGATE HORIZONTAL CHANGE IN DIRECTION OF HORIZONTAL PIPING EXCEEDS 135°.

REFERENCES

- 18026-200-832-1 TECHNICAL SPECIFICATION
- 18026-200-506-1 FILLS, VENTS, AND SOUNDS

MATERIAL SCHEDULE

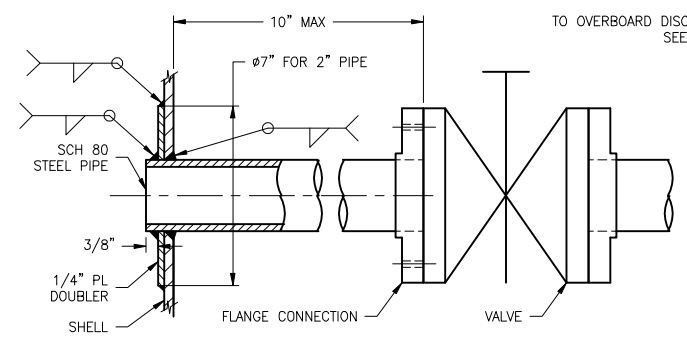
SERVICE	PIPING		TAKEDOWN JOINTS		BOLTING	VALVES		FITTINGS	FLEX CONNECTIONS	REMARKS
	SIZE	MATERIAL	MATERIAL	GASKETS		BODY	TRIM			
SANITARY DRAINS MAWP: 50 PSIG TEMP: AMBIENT	ALL	CPVC SCH 80 ASTM D1784 ASTM F441	SOCKET FLANGE CPVC ASTM F439 ANSI B16.3, 150#	EPDM RUBBER ASTM-D-1331 FULL FACE	BOLTS: STAINLESS STEEL ASTM A193 GRADE B8M ANSI B18.2.1 NUTS: STAINLESS STEEL ASTM A194 GRADE 8M ANSI B18.2.2	BALL: CPVC, UNION ENDS CHECK: CPVC, UNION ENDS	BALL: CPVC BALL, SS STEM, EPDM SEALS, FULL PORT CHECK: CPVC, EPDM SEAL	CPVC ASTM F439	-	SEE NOTE 15
SHELL CONNECTIONS AND DRAIN PIPING EXPOSED TO WEATHER MAWP: 50 PSIG MAX TEMP: AMBIENT	ALL	CARBON STEEL ASTM A53 OR A106, GR B, ANSI B36.10 SCH 40	FLANGE CARBON STEEL ASTM A105 ANSI B16.5 SLIP-ON OR WELD NECK, 150#	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE-SAFE TYPE APPROVED	-	GATE: DUCTILE IRON ASTM A395 OR CARBON STEEL ASTM A216 FLANGED, 150#	GATE: STAINLESS STEEL RENEWABLE DISC AND SEAT ASTM A182	CARBON STEEL ASTM A234, GR WPB ANSI B16.9 BUTT WELD SCH 80	-	-
VENTS EXPOSED TO WEATHER MAWP: 50 PSIG MAX TEMP: AMBIENT	ALL	STAINLESS STEEL ASTM A312 TYPE 316 ANSI B36.10 SCH 40	FLANGE STAINLESS STEEL ASTM A182 TY 316 ANSI B16.5 150# SLIP-ON OR WELD NECK	INORGANIC FIBER WITH NITRILE BINDER ABS FIRE-SAFE TYPE APPROVED	-	-	-	STAINLESS STEEL ASTM A182 TYPE 316 ANSI B16.9 BUTT WELD LONG RADIUS	-	-

SYMBOLS LIST

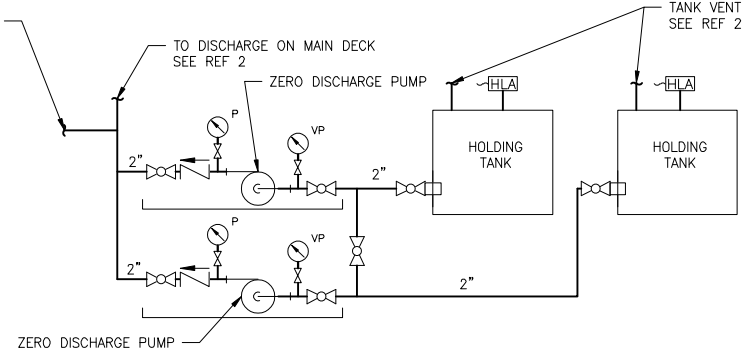
	PIPE
	BALL VALVE
	CLEAN OUT
	P-TRAP
	REDUCER
	VACUUM PRESSURE GAUGE
	PRESSURE GAUGE
	CENTRIFUGAL PUMP
	DECK DRAIN
	PIPE FLANGE
	HIGH LEVEL ALARM
	GATE VALVE
	CHECK VALVE
	DRIP TRAY
	OVERBOARD DISCHARGE
	MATERIAL TRANSITION
	PIPE PENETRATION, DECK/BHD
	VENT

EQUIPMENT LIST

QTY.	SERVICE	TYPE	MODEL	CAPACITY	DRIVE
2	ZERO DISCHARGE PUMP	SELF-PRIMING CENTRIFUGAL	-	105 GPM @ 75 FT TDH	5 HP 3450 RPM TEFC MOTOR 208V/3P/60HZ
1	MARINE SANITATION DEVICE (MSD)	-	-	-	BLOWER: 1 HP PUMP: 1/2 HP 208V/3P/60HZ



**DETAIL 1-5A
OVERBOARD DISCHARGE**



**DETAIL 1-3A
ZERO DISCHARGE SYSTEM
TANK FILLS NOT SHOWN, SEE 2-3A**



Elliott Bay Design Group
 North Carolina, PLLC

CLIENT: NORTH CAROLINA D.O.T.
 RALEIGH, NORTH CAROLINA
 PROJECT: DOUBLE-ENDED AZIMUTH DRIVE FERRY

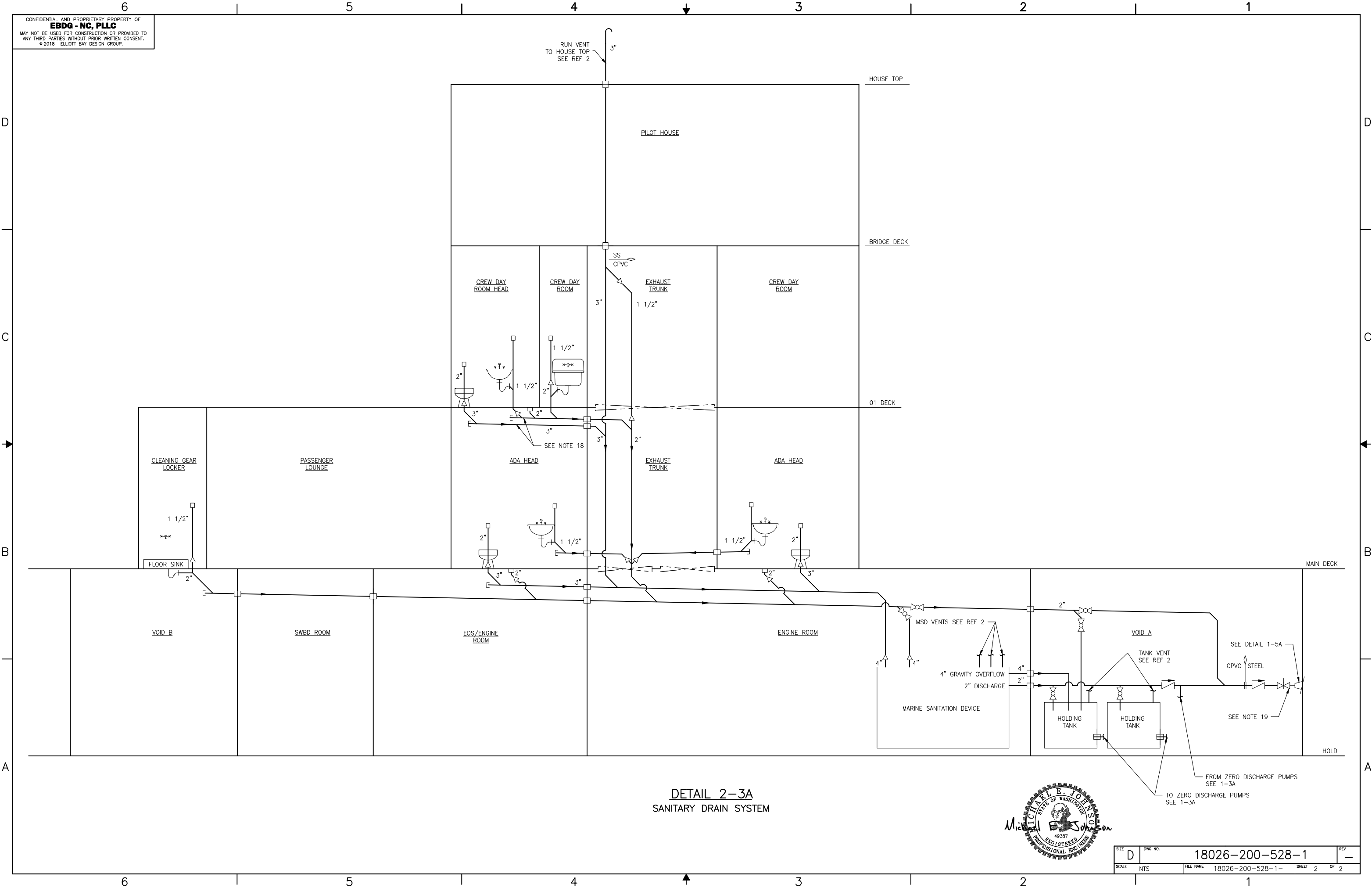


SANITARY DRAIN PIPING SCHEMATIC

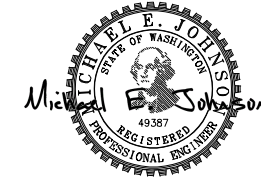
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			MEJ	APVD DATE	7/31/18

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DETAIL 2-3A
 SANITARY DRAIN SYSTEM



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