SYMBOLS LIST

	FIREMAIN PIPING
	BILGE SYSTEM PIPING
	MATERIAL TRANSITION
	REDUCER
	BHD PENETRATION
	GATE VALVE
	SWING CHECK VALVE
	BUTTERFLY VALVE
	BALL VALVE
	HYDRANT VALVE
P	PRESSURE GAUGE
VP	VACUUM/PRESSURE GAUGE
	FIRE STATION, SEE NOTE 9
	CENTRIFUGAL PUMP
	OVERBOARD DISCHARGE
	SEA CHEST
	SIMPLEX STRAINER
C	BILGE SUCTION STRAINER BOX

MATERIAL SCHEDULE

SYSTEM	SIZE	PIPE	TAKEDOWN JOINTS	VALVE BODY	VALVE TRIM	FITTINGS	BOLTS/ BOLT STUDS	NUTS	GASKETS
BILGE MAWP: 125 PSIG MAX TEMP: 120 °F	ALL	GALVANIZED STEEL SCH 40 ASTM A106 GR B ANSI B36.10	FLANGE SLIP-ON OR WELD NECK ASTM A105 150#, ANSI B16.5	GATE, GLOBE, CHECK DUCTILE IRON FLANGED, 125# ASTM A395 ANSI B16.10 B16.34	BRONZE TRIM RENEWABLE DISC & SEAT	STEEL BUTTWELD SCH 80 ASTM A234 ANSI B16.9	CARBON STEEL ASTM A307 GR B ANSI B18.2.1	HEX-HEAD CARBON STEEL ASTM A563 GR A ANSI B18.2.2	GARLOCK STYLE 3000
FIRE MAWP: 200 PSIG MAX TEMP: 120 °F	ALL	GALVANIZED STEEL SCH 40 ASTM A106 GR B ANSI B36.10 STAINLESS STEEL (ABOVE DECK) SCH 40 ASTM A312 316L	FLANGE SLIP-ON OR WELD NECK ASTM A105 150#, ANSI B16.5 STAINLESS STEEL (ABOVE DECK) ASTM A403 316L	GATE, GLOBE, CHECK, BUTTERFLY, 3WAY DUCTILE IRON FLANGED, 125# ASTM A395 ANSI B16.10 B16.34 GATE, GLOBE, CHECK, BUTTERFLY, 3 WAY STAINLESS STEEL(ABOVE DECK) FLANGED, 150# ASTM A351	BRONZE TRIM RENEWABLE DISC & SEAT	STEEL BUTTWELD SCH 80 ASTM A234 ANSI B16.9 STAILESS STEEL (ABOVE DECK) BUTTWELD SCH 80 ASTM A403	CARBON STEEL ASTM A307 GR B ANSI B18.2.1	HEX-HEAD CARBON STEEL ASTM A563 GR A ANSI B18.2.2	GARLOCK STYLE 3000

EQUIPMENT LIST

QTY.	SERVICE	TYPE	MAKE/MODEL	CAPACITY	DRIVE	REMARKS
1	FIRE/BILGE PUMP	STRAIGHT CENTRIFUGAL HIGH HEAD PUMP		235 PSI 200 FT TDH	20 HP TEFC MOTOR 208V/3PH/60HZ 3500RPM	2000 GPM@200PSI AT FIRE MONITOR USCG REQUIRED 80 GPM AT TWO HIGHEST FIRE STATIONS
1	BILGE PUMP	SELF-PRIMING CENTRIFUGAL		175 GPM 125 FT TDH	7.5 HP TEFC MOTOR 208/3PH/60HZ	
1	FIRE PUMP STRAINER	SIMPLEX BASKET		2000 GPM 1 PSID		BRONZE BODY SS PERFORATED BASKET
1	BILGE PUMP STRAINER	SIMPLEX BASKET		73 GPM 1 PSID		BRONZE BODY SS PERFORATED BASKET
3	FIRE STATION	1½" HOSE, VALVE, NOZZLE UNIT; 50'x1-1/2" UL19, FIRE HOSE W/ BRASS FITTINGS (NFPA 1963), 1-1/2" SHIPBOARD VARI-NOZZLE (AKRON BRASS CO. MODEL 3022) OR (USCG EQUIPMENT CLASS 162.027)				
1	FIRE MONITOR	2000 GPM @200PSI CAPABLE, ELECTRIC OR MANUAL CONTROL, 4" INET, 2-½" NOZZLE				

- GENERAL NOTES -

NO.	DESCRIPTION
1.	MATERIAL AND WORKMANSHIP SHALL CONFORM TO U.S. COAST GUARD REQUIREMENTS FOR SUBCHAPTER "M" VESSELS.
2.	THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL FROM THE SHIP AND NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.
3.	PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS AND WITH SUFFICIENT TAKE DOWN JOINTS TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING AND REPLACEMENT OF EQUIPMENT.
4.	PROVIDE GAUGE ASSEMBLIES TO BE IN ACCORDANCE WITH ASTM F721. VALVES, TUBING, AND FITTINGS SHALL BE 316 STAINLESS STEEL.
5.	AVOID POCKETS IN THE PIPE LINES. BOSSES AND VALVES OR SCREWED PLUGS SHALL BE FITTED TO ENABLE COMPLETE DRAINING OF PIPES WHERE POCKETS DO OCCUR.
6.	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 ATTACHED BY WELDING DIRECTLY TO PIPES.
7.	WHERE PIPING PENETRATES BULKHEADS OR DECKS, THE PENETRATION SHALL MAINTAIN THE WATERTIGHT INTEGRITY OF THE SPACE. PIPE PENETRATIONS SHALL BE IN ACCORDANCE WITH DETAIL 3-1C.
8.	BOTH PUMPS SHALL BE CAPABLE OF REMOTE STARTING FROM THE BRIDGE.
	316 STAINLESS STEEL.

- GENERAL NOTES -

NO.	DESCRIPTION
9.	EACH FIRE STATION SHALL HAVE A STAINLESS STEEL ENCLOSURE CONTAINING A 1 1/2" HYDRANT VALVE, 50 FEET OF 1 1/2" LINED COMMERCIAL FIRE HOSE CONFORMING TO UL19, A HOSE WRENCH, AND A USCG APPROVED COMBINATION FIRE NOZZLE. THE HOSE SHALL BE CONNECTED AND STOWED IN AN APPROVED HOSE RACK.
10.	THE FIRE/BILE PUMP IS SIZED TO EXCEED THE MINIMUM REQUIREMENTS OF ABS . THE PUMP CAPACITY SHALL MEET THE FLOW DEMANDS OF THE FOLLOWING SCENARIOS: 1) WATER FLOW SHALL BE AT LEAST 80 GPM FROM THE HIGHEST TWO FIRE STATIONS OPERATING SIMULTANEOUSLY, 2) THREE FIRE STATIONS OPERATING SIMULTANEOUSLY, EACH PROVIDING WATER SPRAY TO A DIFFERENT LOCATION ON DECK.
11.	VALVE HANDWHEELS AND CONTROLS TO BE FITTED WITH LABEL PLATES INDICATING FUNCTION.
12.	BILGE SUCTION STRAINER BOXES SHALL BE IN ACCORDANCE WITH ASTM F986, TYPE I, HOT DIP GALVANIZED AFTER FABRICATION. STRAINER OPEN AREA SHALL BE GREATER THAN THREE TIMES THE AREA OF THE BILGE PIPE.
13.	A REMOTE PRESSURE GAUGE FOR THE FIREMAIN SHALL BE LOCATED IN THE PILOT HOUSE.
14.	FIREMAIN PIPING SHALL BE TIG WELDED.
15.	PIPING SHALL BE THOROUGHLY CLEANED BEFORE TESTING.

WILLIAM HAYDEN
LICENSE
NO. 60106
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

William M. Hayden, PE

Digitally signed by William M. Hayden, PE
Date: 2018.10.16 21:29:34 -05'00'

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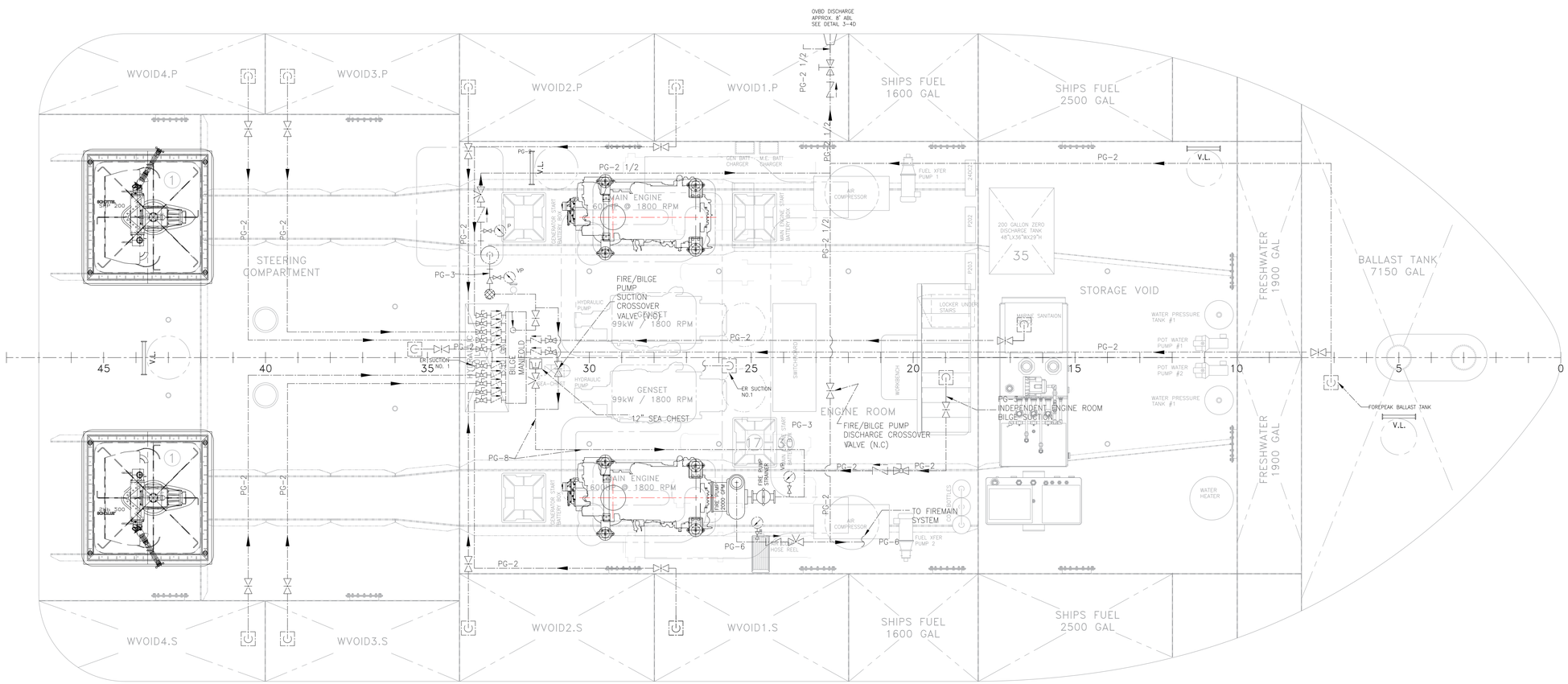
Title: 70.5'x30'x11' NCDOT TOWBOAT

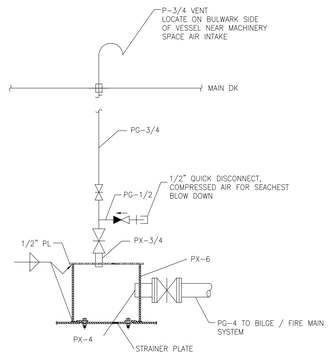
BILGE & FIREMAIN SYSTEM

Dwg. No. 17-1372-521
Alt. No. 1
Sht. 1 of 3

Drawn By: JACOB CONNALLY Date: JUNE 05, 2018
Checked By: Date:
App'd By: Scale: 1/2" = 1'-0"
ABS App'l: USCG App'l.:

ANSI-D (24"x36")





DETAIL 2-6A
SEA CHEST

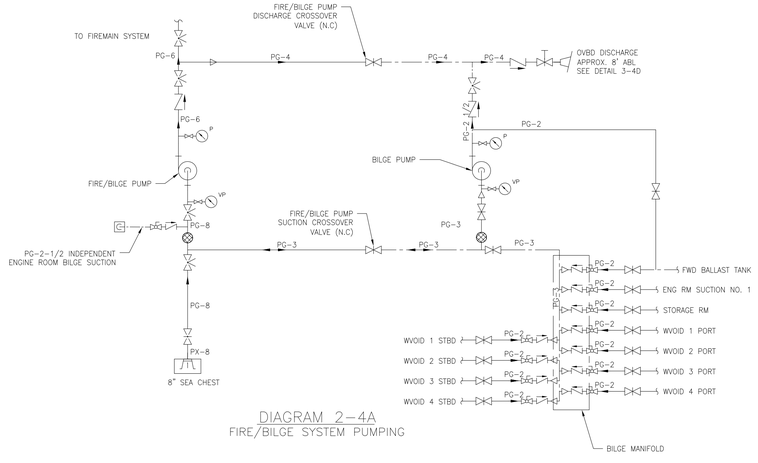


DIAGRAM 2-4A
FIRE/BILGE SYSTEM PUMPING

NO.	- GENERAL NOTES - DESCRIPTION	NO.	- GENERAL NOTES - DESCRIPTION
1.	MATERIAL AND WORKMANSHIP SHALL CONFORM TO U.S. COAST GUARD REQUIREMENTS FOR SUBCHAPTER "M" VESSELS.	9.	EACH FIRE STATION SHALL HAVE A STAINLESS STEEL ENCLOSURE CONTAINING A 1 1/2" HYDRANT VALVE, 50 FEET OF 1 1/2"
2.	THIS DRAWING IS DIAGRAMMATIC AND DOES NOT REPRESENT A COMPLETE DETAILED DESIGN. THE CONTRACTOR SHALL DEVELOP A DETAILED DESIGN THAT PROVIDES A FULLY FUNCTIONAL ARRANGEMENT SUITABLE FOR INSTALLATION, TAKING INTO ACCOUNT ALL FROM THE SHIP AND NECESSARY SYSTEM INTERFACES AND INTERFERENCES. DIMENSIONS SHALL BE VERIFIED MANUFACTURERS' CERTIFIED DRAWINGS AS APPROPRIATE.		LINED COMMERCIAL FIRE HOSE CONFORMING TO UL19, A HOSE WRENCH, AND A USCG APPROVED COMBINATION FIRE NOZZLE. THE HOSE SHALL BE CONNECTED AND STOWED IN AN APPROVED HOSE RACK.
3.	PIPING SHALL BE RUN AS DIRECTLY AS PRACTICABLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS AND WITH SUFFICIENT TAKE DOWN JOINTS TO PROVIDE FOR REMOVAL, INSPECTION, SERVICING AND REPLACEMENT OF EQUIPMENT.	10.	THE FIRE/BILE PUMP IS SIZED TO EXCEED THE MINIMUM REQUIREMENTS OF ABS . THE PUMP CAPACITY SHALL MEET THE FLOW DEMANDS OF THE FOLLOWING SCENARIOS: 1) WATER FLOW SHALL BE AT LEAST 80 GPM FROM THE HIGHEST TWO FIRE STATIONS OPERATING SIMULTANEOUSLY, 2) THREE FIRE STATIONS OPERATING SIMULTANEOUSLY, EACH PROVIDING WATER SPRAY TO A DIFFERENT LOCATION ON DECK.
4.	PROVIDE GAUGE ASSEMBLIES TO BE IN ACCORDANCE WITH ASTM F721. VALVES, TUBING, AND FITTINGS SHALL BE 316 STAINLESS STEEL.	11.	VALVE HANDWHEELS AND CONTROLS TO BE FITTED WITH LABEL PLATES INDICATING FUNCTION.
5.	AVOID POCKETS IN THE PIPE LINES. BOSSES AND VALVES OR SCREWED PLUGS SHALL BE FITTED TO ENABLE COMPLETE DRAINING OF PIPES WHERE POCKETS DO OCCUR.	12.	BILGE SUCTION STRAINER BOXES SHALL BE IN ACCORDANCE WITH ASTM F986, TYPE I, HOT DIP GALVANIZED AFTER FABRICATION. STRAINER OPEN AREA SHALL BE GREATER THAN THREE TIMES THE AREA OF THE BILGE PIPE.
6.	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 ATTACHED BY WELDING DIRECTLY TO PIPES. HANGERS SUPPORTING CU-NI TUBING SHALL UTILIZE A RESILIENT NONMETALLIC LINER BETWEEN THE TUBING AND STEEL HANGER.	13.	A REMOTE PRESSURE GAUGE FOR THE FIREMAIN SHALL BE LOCATED IN THE PILOT HOUSE.
		14.	FIREMAIN PIPING SHALL BE TIG WELDED.
		15.	PIPING SHALL BE THOROUGHLY CLEANED BEFORE TESTING.
7.	WHERE PIPING PENETRATES BULKHEADS OR DECKS, THE PENETRATION SHALL MAINTAIN THE WATERTIGHT INTEGRITY OF THE SPACE. PIPE PENETRATIONS SHALL BE IN ACCORDANCE WITH DETAIL 3-1C.		
8.	BOTH PUMPS SHALL BE CAPABLE OF REMOTE STARTING FROM THE BRIDGE. 316 STAINLESS STEEL.		

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Title: 70.5'x30'x11' NCDOT TOWBOAT

BILGE & FIREMAIN SYSTEM

Dwg. No. 17-1372-521
Alt. No. 1
Sht. 2 of 3

Drawn By: JACOB CONNALLY
Date: JUNE 05, 2018
Checked By:
Date:
App'd By:
Scale: 1/2" = 1'-0"
ABS App'l:
USCG App'l.:

WILLIAM HAYDEN
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NO. 60106
STATE OF
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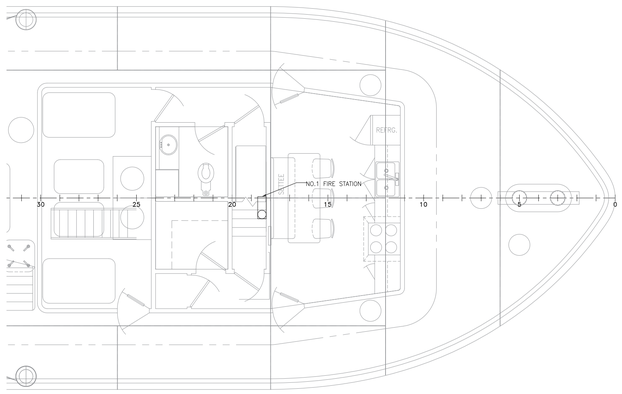
PROFESSIONAL ENGINEER

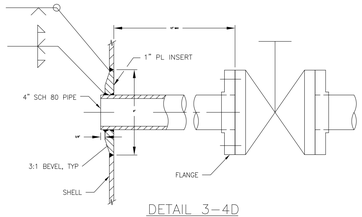
William M. Hayden, PE

Digitally signed by William M. Hayden, PE
Date: 2018.10.16 21:29:08 -05'00'

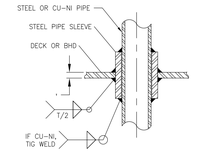
ANSI-D (24"x36")



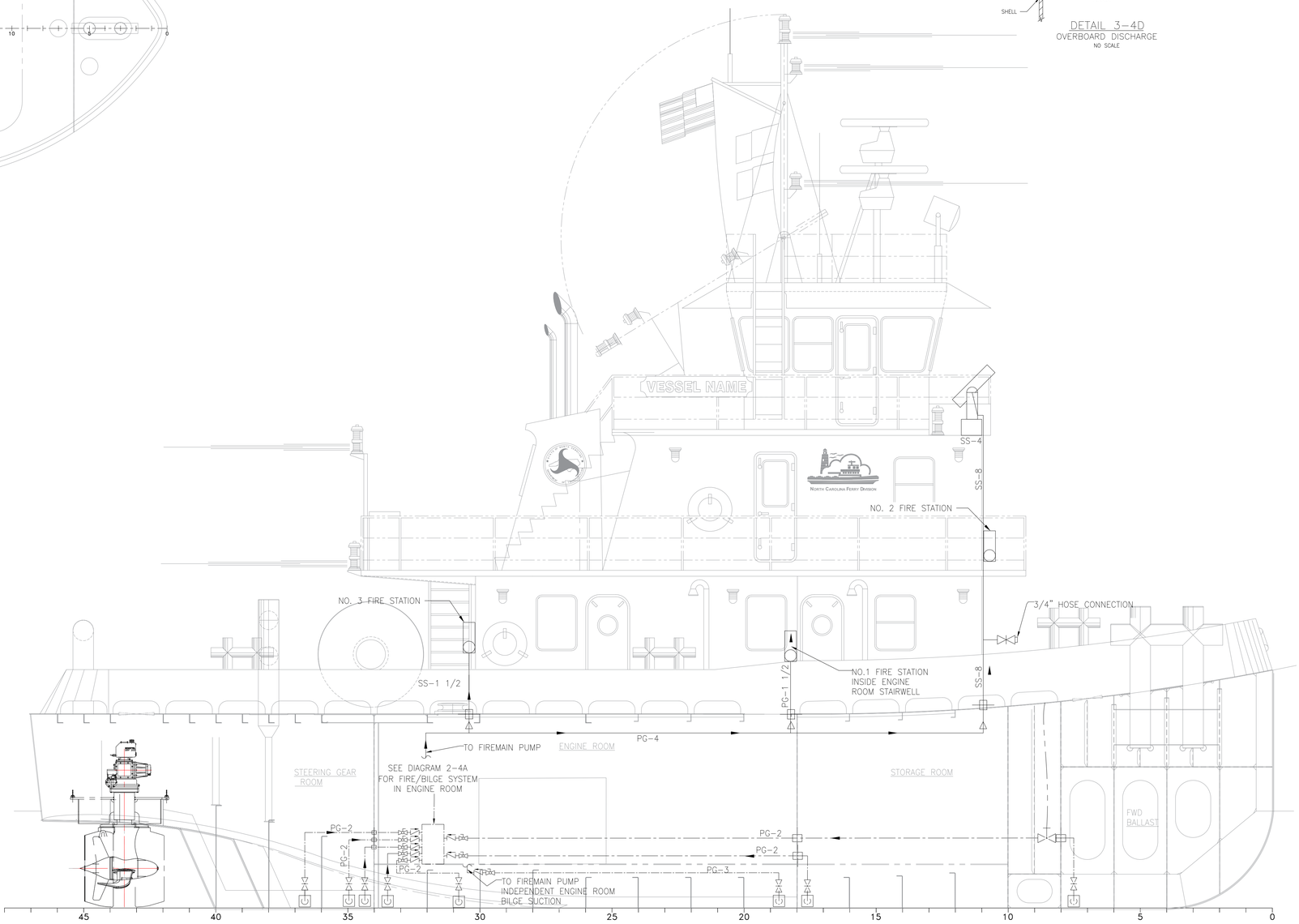
MAIN DECK



DETAIL 3-4D
OVERBOARD DISCHARGE
NO SCALE



DETAIL 3-1C
TYP. DECK OR BULKHEAD PENETRATION
NO SCALE



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William M. Hayden, PE

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BILGE & FIREMAIN SYSTEM

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