

MATERIAL SCHEDULE											
SERVICE	SIZE	PIPE	COMPONENTS				VALVES		BOLTING		REMARKS
			TAKEDOWN JOINTS	FITTINGS	FLEX CONNECT	GASKETS	BODY	TRIM	BOLTS/STUDS	NUTS/WASHERS	
MAIN ENGINE EXHAUST PIPING MAWP: 27" H2O MAWT: 703°F	ALL	S.S.321 SCH 20, SEAMLESS, ASTM A312, ANSI B36.10	FLANGES: WELD NECK OR SOCKET WELD, S.S. 321 ASTM A182, ANSI B16.5	FLANGED: ASTM SA182 F321, ANSI B16.5  BUTTWELD: S.S.321, ASTM A403/SA403, ANSI B16.9 OR B16.28;	SEE NOTE 7	FLEXITALLIC STYLE CG W/ FLEXICARD GRAPHITE OR 304L SS SPIRAL WOUND METALLIC W/ GRAPHITE FILLER	DRAIN VALVES (GATE) FORGED STEEL ASTM A105	STAINLES STEEL	BOLTS/STUDS: CRES, ASTM A193/193M, GRADE B8T ANSI B18.2.1;	NUTS: CRES, ASTM A194/194M, GRADE B8T, ANSI B18.2.2;	-
EXHAUST PIPING EXPOSED TO WEATHER	ALL	STAINLESS STEEL ASTM A312, GR TP304L, ANSI B36.10  SCH 40 -6"	-	-	-	-	-	-	-	-	-

EQUIPMENT LIST						
ITEM	QTY	SERVICE	SIZE	TYPE	MAKE/MODEL	REMARKS
1	2	MAIN ENGINE SILENCER	6"	CRITICAL GRADE SPARK ARRESTING	(END IN/END OUT)	SEE NOTE 14
2	2	MAIN ENGINE TURBO OUTLET EXPANSION JOINT	VENDOR SUPPLY	-	-	SEE NOTES 6 & 7
3	2	MAIN ENGINE EXPANSION JOINT ENGINE EXHAUST	6"	-	-	SEE NOTES 6 & 7
4	2	EXHAUST RAIN CAP	6"	-	-	SEE DETAIL 1-1A
5	AS REQD	EXHAUST BLANKET	-	-	-	SEE NOTE 9
PS-6"	AS REQD	EXHAUST PIPE	6"	SCHED 40, 316 SS	-	SEE MATERIAL SCHEDULE
F-6"	AS REQD	EXHAUST PIPE FITTINGS	6"	SCHED 40, 316 SS	-	SEE MATERIAL SCHEDULE ALL ELBOWS LONG RADIUS

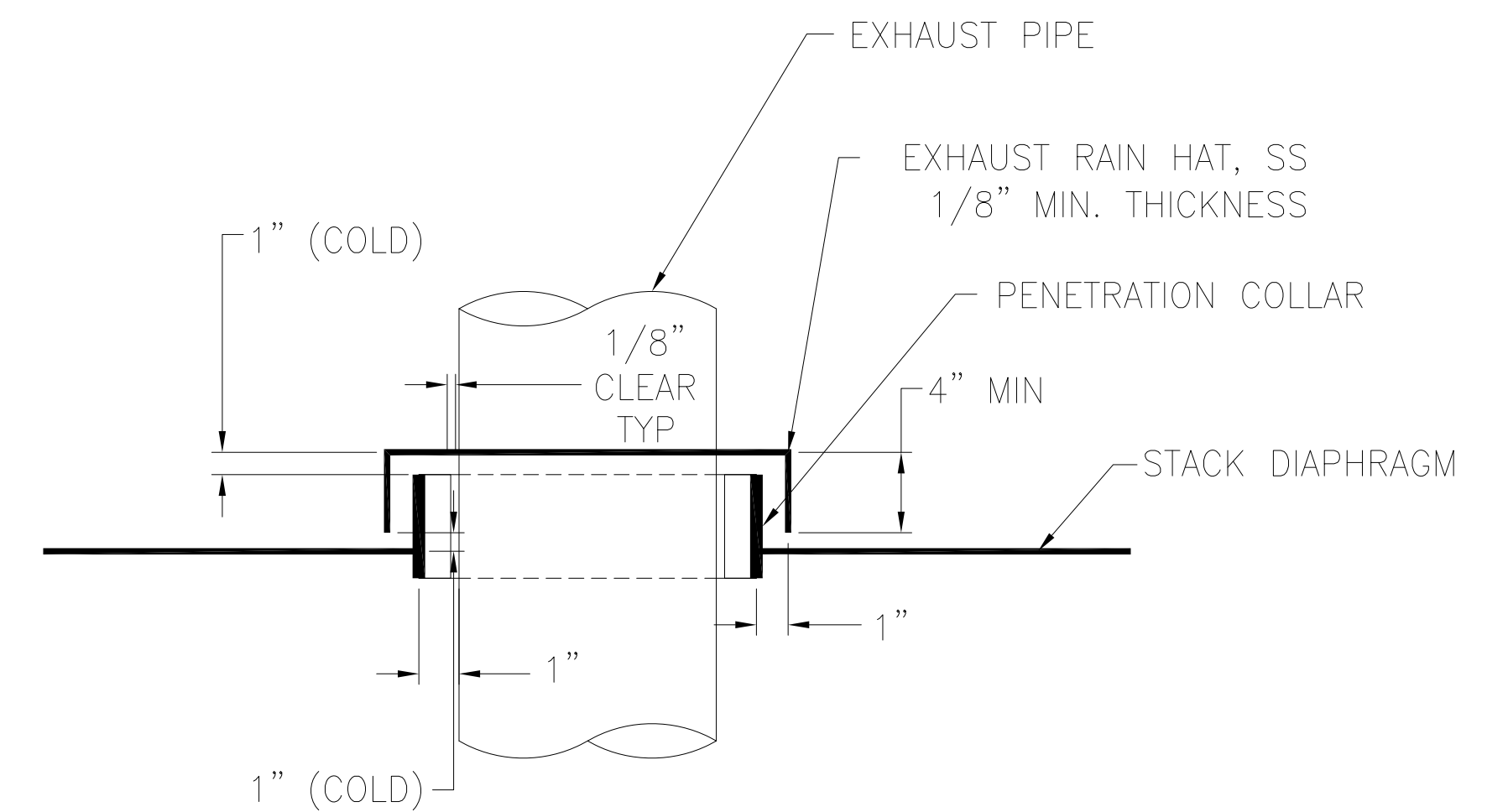
**SPECIFIC NOTES**

SYSTEM DETAILS:  
EX: EXHAUST PIPING ANCHOR, RAINCAP, AND GUIDE DETAILS SHOW PRELIMINARY CONFIGURATION AND LOCATIONS FOR PIPING SUPPORT SYSTEM. FINAL DIMENSIONING AND DETAILING ARE TO BE COMPLETED BY CONTRACTOR AND ARE SUBJECT TO OWNER APPROVAL. PIPE HANGERS SHALL BE RUBBER DESIGN OR EQUAL.

PRELIMINARY DESIGN NOTES:  
EX: EXHAUST PIPING ROUTING SHOWS PRELIMINARY CONFIGURATION AND LOCATIONS FOR PIPING SUPPORT SYSTEM. FINAL DIMENSIONING AND DETAILING ARE TO BE COMPLETED BY CONTRACTOR AND ARE SUBJECT TO OWNER APPROVAL. PIPE HANGERS SHALL BE LO-REZ OR EQUAL.

EX: ENGINE DETAILS SHOWN ARE NOT FROM CERTIFIED VENDOR DRAWINGS. CONTRACTOR TO VERIFY ENGINE CONNECTIONS AND EXHAUST SYSTEM REQUIREMENTS.

PARTS EXPOSED TO WEATHER:  
EX: TAIL PIPE, RAIN HAT, HEAT SHIELD, FASTENERS & HANGERS EXPOSED TO WEATHER AT THE NAV/BRIDGE DECK LEVEL AND ABOVE SHALL BE ASTM A312 TYPE 316L STAINLESS STEEL.



DETAIL 1-1A  
TYP RAIN HAT DETAIL  
NO SCALE

- GENERAL NOTES -

NO.	DESCRIPTION
1	ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH 46 CFR SUBCHAPTER M
2	PIPING SHALL BE RUN AS DIRECTLY AS POSSIBLE WITH A MINIMUM NUMBER OF BENDS AND FITTINGS. PROVIDE A SUFFICIENT NUMBER OF TAKEDOWN JOINTS TO ALLOW FOR REMOVAL & INSPECTION
3	PRIOR TO FABRICATION OF MATING PIPE ASSEMBLIES, VERIFY EQUIPMENT CONNECTIONS FOR SIZE, LOCATION AND TYPE IN ACCORDANCE WITH MANUFACTURER CERTIFIED DRAWINGS, OR DIRECTLY FROM THE EQUIPMENT. TEMPLATE BOLTING PATTERNS AND CONNECTIONS AS REQUIRED.
4	ALL BOLTED FLANGES ARE TO BE MATED UP FREE OF STRAIN.
5	PIPE HANGERS SHALL MEET THE REQUIREMENTS OF ASTM F708. THE CONTRACTOR SHALL DESIGN AND INSTALL PIPE HANGERS AS NECESSARY TO ADEQUATELY SUPPORT EXHAUST SYSTEMS UNDER STATIC AND DYNAMIC LOADS IMPOSED BY VESSEL MOTIONS, VIBRATION AND THERMAL EXPANSION. THERMAL INSULATION GASKETS SHALL BE INSTALLED BETWEEN THE EXHAUST PIPE AND THE HANGER ATTACHMENT TO THE SHIP.
6	PROVIDE EXPANSION JOINTS WHERE REQUIRED TO ACCOMMODATE THERMAL GROWTH OF EXHAUST PIPES. EXPANSION JOINTS ARE TO BE STAINLESS STEEL MULTI-PLY LAMINATE TYPE MANUFACTURED TO EJMA STANDARDS. EACH EXPANSION JOINT SHALL HAVE ONE END FIXED FLANGE AND THE OTHER END WITH A FLOATING FLANGE. A FLOW DIRECTION ARROW SHALL BE PERMANENTLY MARKED ON EACH EXPANSION JOINT.
7	EXHAUST ELBOW AND EXPANSION JOINT AT ENGINE TURBO OUTLET SHALL BE SUPPLIED BY THE ENGINE MANUFACTURER. ALL OTHERS SHALL BE DME, AMERICAN BOA, OR EQUAL.
8	WEIGHT TRANSMITTED TO EACH ENGINE EXHAUST OUTLET CONNECTION IS NOT TO EXCEED THE MANUFACTURERS' RECOMMENDATIONS IN ANY CONDITION.
9	INSULATION FOR ENGINE EXHAUST PIPING AND SILENCERS SHALL BE REMOVABLE INSULATION BLANKETS HAVING A 2" MINIMUM THICKNESS. BLANKETS SHALL BE FASTENED WITH STAINLESS STEEL HOOKS AND INSULATION MATERIALS AND INSTALLATION DETAILS SHALL BE IN ACCORDANCE WITH ASTM F683.
10	1/4" PIPE TAPS SHALL BE INSTALLED ON ENGINE EXHAUST OUTLET PIPING TO FACILITATE BACK PRESSURE MEASUREMENTS.
11	TAIL PIPE, TOP HAT, AND HANGERS EXPOSED TO WEATHER AT THE BRIDGE DECK LEVEL AND ABOVE SHALL BE ASTM A312 TYPE 316L STAINLESS STEEL.
12	VERTICAL EXHAUST PIPING RUNS SHALL BE FITTED WITH VALVED DRAINS LOCATED AT THE LOWEST POINT. EACH DRAIN SHALL CONSIST OF A THREADED STEEL WELDOLET OR HALF COUPLING WELDED TO THE PIPE, FITTED WITH A SCHEDULE 40 PIPE, AND CAPPED WITH A 1" INCH GATE VALVE.
13	PRIOR TO BEING PLACED INTO SERVICE THE EXHAUST PIPING SHALL BE CLEANED AND CHECKED FOR LEAKS.
14	WEIGHT TRANSMITTED TO THE ENGINE CONNECTION IS NOT TO EXCEED THE MANUFACTURERS' RECOMMENDATIONS IN HOT AND COLD CONDITIONS.
15	CONTRACTOR SHALL VERIFY ENGINE EXHAUST BACK PRESSURE REQUIREMENTS AND CONNECTION DETAILS PRIOR TO ORDERING MATERIALS.

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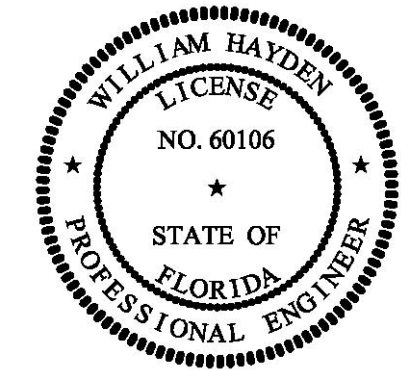
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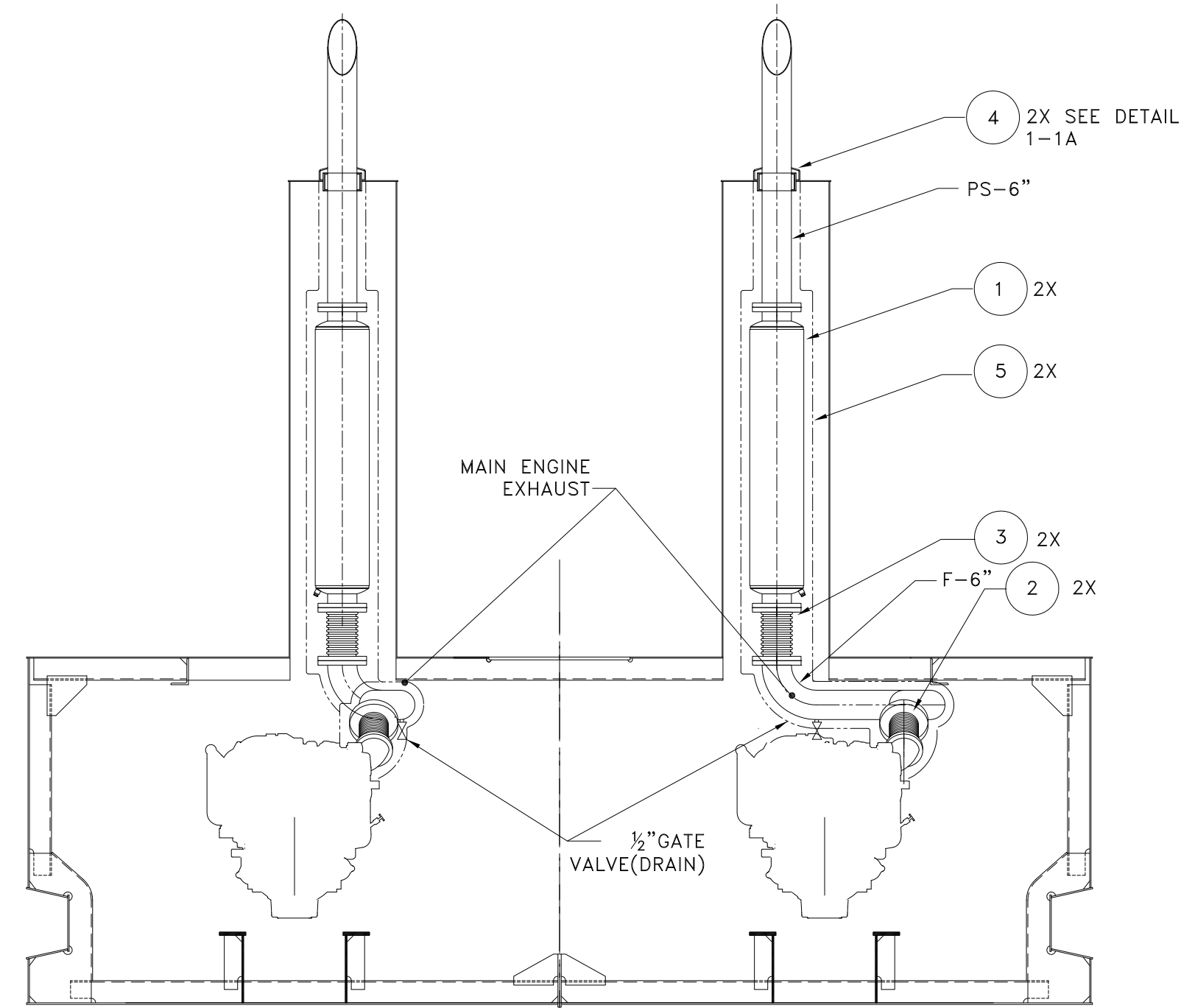
Title: 45.5'x20'x6.5' NCDOT PUSHBOAT

**MAIN ENGINE EXHAUST ARRANGEMENT**

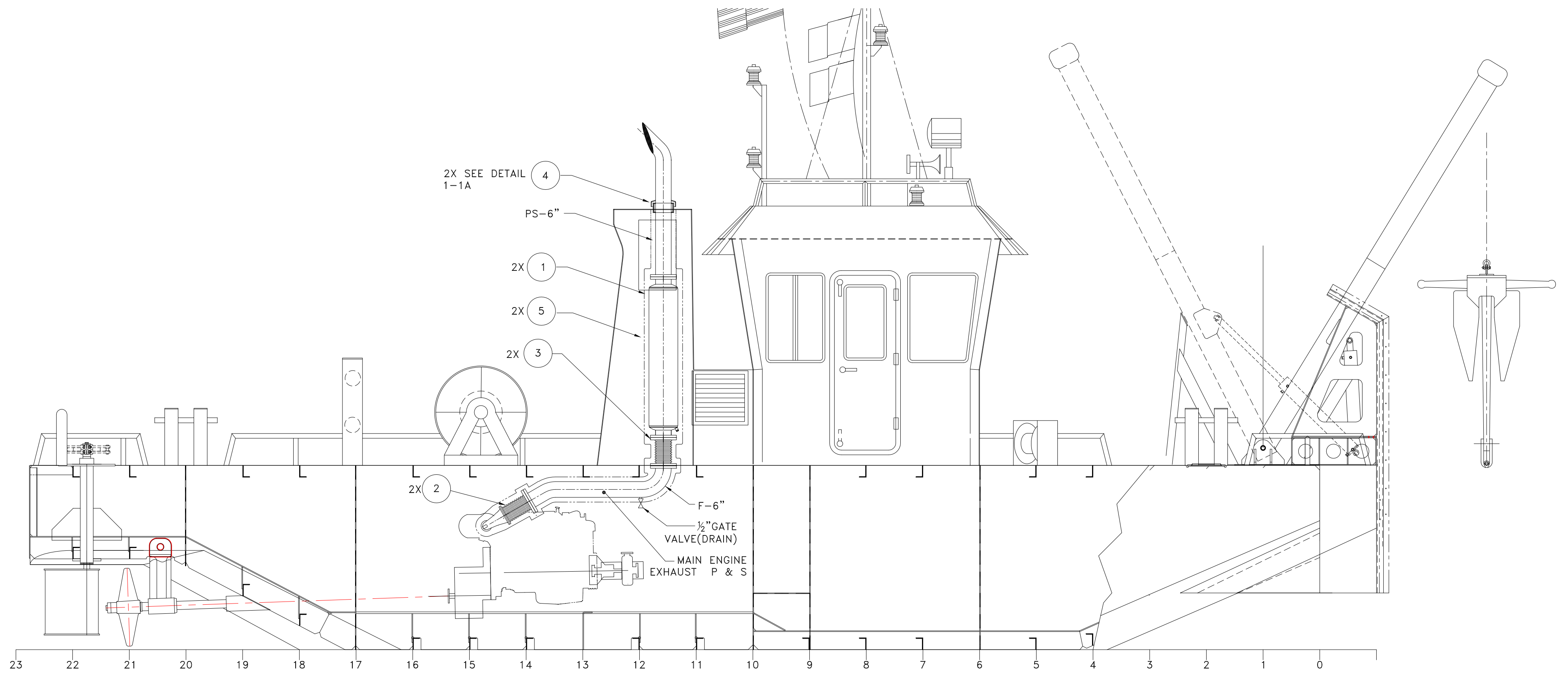
Dwg. No. 17-1393-259 Alt. No. 0  
Shr. 1 of 2

Drawn By: JAH Date: DECEMBER 7, 2013  
Checked By: \_\_\_\_\_ Date: \_\_\_\_\_  
App'd By: \_\_\_\_\_ Scale: NONE  
ABS App'l: \_\_\_\_\_ USCG App'l: \_\_\_\_\_

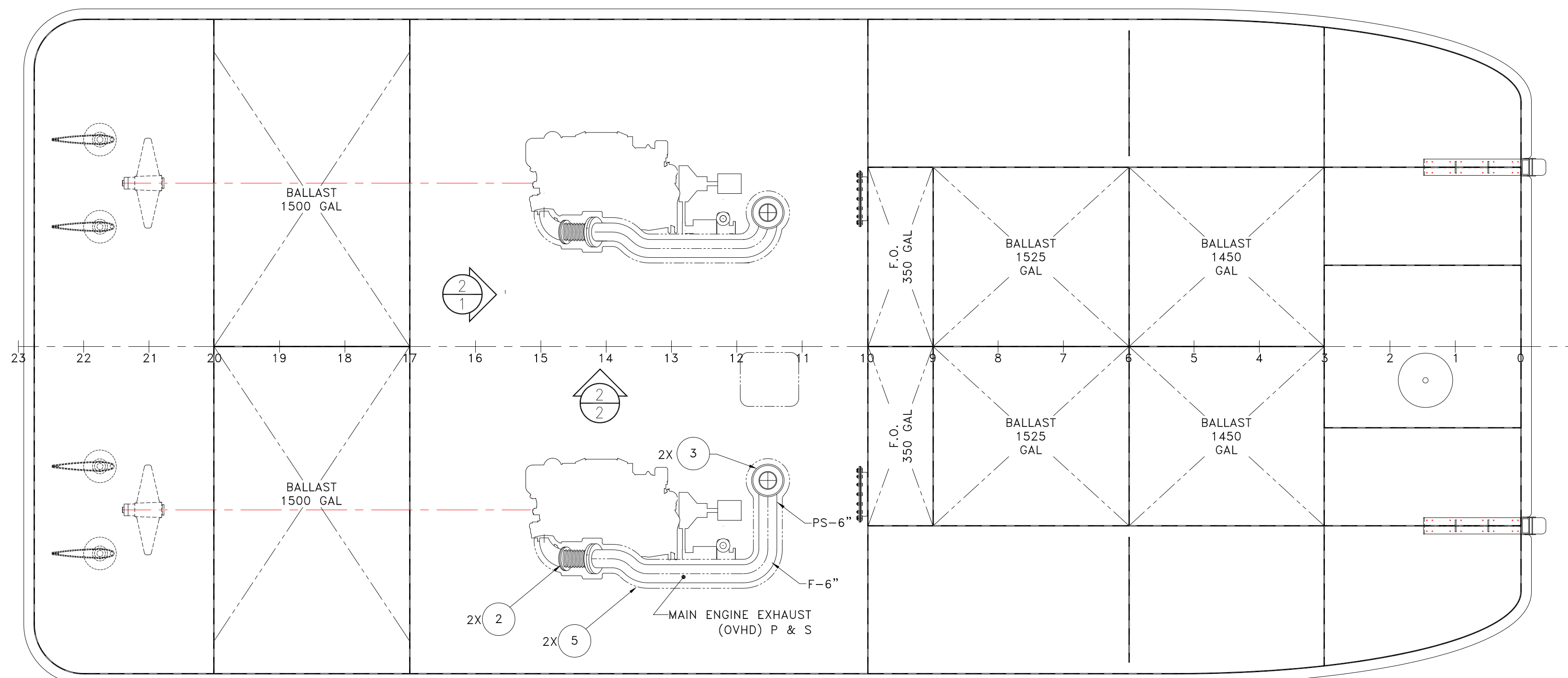




1 MAIN ENGINE EXHAUST SECTION  
SCALE: 3/8" = 1'-0"



1 MAIN ENGINE EXHAUST PROFILE  
SCALE: 3/8" = 1'-0"




MAIN ENGINE EXHAUST PLAN

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Dwg. No. 17-1393-259 Alt. No. 0  
 Shk. 2 of 2

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