

**SCHEDULE OF HEAT EXCHANGERS**

JOB NAME  
CONTRACT NO. AG-85/86  
DOCUMENT NO. HCR 10075  
SHEET NO. OF

		MCKEE ORIGINAL		GUARANTEE PROPOSAL				MCKEE ORIGINAL		GUARANTEE PROPOSAL			
DESCRIPTIONS	EQUIPMENT NO.	1-E-1003 A.B.C		1-E-1003 A.B.C				1-E-1004 A.B		1-E-1004 A.B			
	NO. OF SHELLS	3		3				2		2			
	SHELL ARRANGEMENT	PARA. SERIES		PARA. SERIES		PARA. SERIES		PARA. SERIES		PARA. SERIES		PARA. SERIES	
SERVICE		DEB. OVERHEAD TRIM COND.						NAPHTHA SPLIT NET OVHD. CLR					
TYPE		AES						AES					
CODE AND REGULATION		ASME VIII, TEMA "R"						ASME VIII, TEMA "R"					
		SHELL S.	TUBE S.	SHELL S.	TUBE S.	SHELL S.	TUBE S.	SHELL S.	TUBE S.	SHELL S.	TUBE S.	SHELL S.	TUBE S.
FLUID NAME		HC + VAPOR WATER						HC LIQ. WATER					
FLOW RATE	LB/HR	41050		DITTO				31652		15500		DITTO	
SPECIFIC GRAVITY MAXIMUM	AV.	0.522 (40°)						0.622		0.984			
VISCOSITY-INLET, OUTLET	CP	0.1 / 0.1		0.913 / 0.582				0.1 / 0.20		0.913 / 0.582			
TEMPERATURE-INLET	°F	129		75				135		75			
OUTLET	°F	100		115				100		115			
DESIGN	°F	200		150				250		250			
PRESSURE OPERATING	PSIG	155		40				93		40			
DESIGN	PSIG	200		75				150		75			
VELOCITY	FT/SEC	2.55		2.42				3.1		1.21		3.04	
PRESSURE DROP ALLOW/CAL.	PSI	5/2.47		10/6.35		5/3.5		10/5.59		8/3.81		10/5.45	
FOULING FACTOR	HR.FT <sup>2</sup> /BTU	0.001		0.0018		0.001		0.0018		0.001		0.0018	
TOTAL HEAT EXCHANGED	BTU/HR	1.56 x 10 <sup>6</sup>		1.56 x 10 <sup>6</sup>				0.62 x 10 <sup>6</sup>		0.62 x 10 <sup>6</sup>			
L. M. T. D. CORRECTION FACTOR	°F	11.1 x		11.1 x		x		19.58 x		19.5 x		x	
OVERALL HEAT TRANSFER RATE (DESIGN)	BTU/HR.FT <sup>2</sup>	104.65		104.57				113.23		116.43			
SURFACE AREA REQ'D/SHELL	FT <sup>2</sup>	448 / SHELL		447.9 / SHELL				140 / SHELL		136.5 / SHELL			
MARGIN	%	12.6 %		17.02 %				14.9 %		14.98 %			
SHELL SIDE	INSIDE DIAMETER	IN		17.25		17.244		9.913		9.913			
	NO. OF PASSES	1		1				1		1			
BAFFLE SIDE	BAFFLE SPACING AND CUT	17.17" / 20 %		17.17" / 20 %		1		17.17" / 15 %		17.17" / 15 %		1	
	NOZZLE SIZE & RATING	8" x ANSI 150 RF		8" x ANSI 150 RF				3" x ANSI 150 RF		3" x ANSI 150 RF			
TUBE SIDE	O. D. x THK x LENGTH	0.75 x 0.065 x 16'		0.75 x 0.065 x 16'		x x		0.75 x 0.065 x 16'		0.75 x 0.065 x 16'		x x	
	NO. OF PASSES	4		4				4		4			
TUBE SIDE	NO. OF TUBES	145		145				45		44			
	PITCH & TUBE ARRANGEMENT	15/16" x Δ		15/16" Δ				15/16" x Δ		15/16" Δ			
TUBE SIDE	NOZZLE SIZE & RATING	3" x ANSI 150 RF		3" x ANSI 150 RF				2" x ANSI 150 RF		2" x ANSI 150 RF			
	FILM COEFFICIENT	BTU/HR.FT <sup>2</sup>		267.02		788.24				325.97		800.87	
OVERALL COEFFICIENT (CLEAN)	BTU/HR.FT <sup>2</sup>	175.7		186.22				203.9		214.25			
	(ACTUAL)	127.8		127.36				129		133.87			
BAFFLE TYPE		VERT. CUT SEGM		VERT. SEGM				HORIZ. CUT SEGM		HORIZ. SEGM			
NO.		9 /		9 /		1 /		18 /		18 /		1 /	
GUARANTEE				YES				NO		YES			
REMARKS													
TOTAL FLUID ENTERING		LB/HR		71913									
VAPOR				5305									
LIQUID				76608									
STEAM													
NON CONDENSABLES				1258									
FLUID VAPORIZED OR CONDENSED		LB/HR		4057									