

Jackson Barracks 141st Field Artillery Battalion Readiness Center

PUMP CALCULATIONS

May 3, 2006

35% Design Submittal

141 st RC CHILLED WATER PUMP CALCULATIONS			
CHILLER PD	0 ft H ₂ O	FLOW RATE	771.6 GPM
LARGEST COIL PD	18.7 ft H ₂ O		
CONTROL VALVE PD	15 ft H ₂ O		
PIPE PD	37.5 ft H ₂ O	PIPE LENGTH	1200 FT
			0.25 Unions Elbows and fittings 2.5 PD/100FT
SUBTOTAL HEAD	71.20		
S.F. 10%	10%		
TOTAL HEAD	78.32 FT HEAD		
TOTAL	GPM	FT HEAD	
	771.6	78.3	

141 st RC CHILLED WATER DEMAND		
Unit	GPM	ΔP
AHU 1-1	21.6	5.7
AHU 1-2	42.4	11.6
AHU 1-3	24.8	6.6
AHU 1-4	7.2	1.4
AHU 1-5	104	13.8
AHU 2-1	2.8	1.1
AHU 2-2	6.7	0.8
AHU 2-3	28.2	6.4
AHU 2-4	50.5	18.7
AHU 3-1	28.4	6.5
AHU 3-2	59.1	16
AHU 3-3	55.5	9.9
AHU 3-4	28.8	6.7
AHU 4-1	27.1	7.7
AHU 4-2	37.7	11.7
ERU-1	246.8	6
Total	771.6	

SECONDARY CHILLED WATER PUMP CALCULATIONS			
CHILLER PD	0 ft H ₂ O	FLOW RATE	1290 GPM *
LARGEST COIL PD	0 ft H ₂ O		
CONTROL VALVE PD	0 ft H ₂ O		
PIPE PD	87.5 ft H ₂ O	PIPE LENGTH	2800 FT
			0.25 Unions Elbows and fittings 2.5 PD/100FT
SUBTOTAL HEAD	87.50		
S.F.	10%		
TOTAL HEAD	96.25 FT HEAD		
TOTAL	GPM	FT HEAD	
	1290	96.3	

SECONDARY CHILLED WATER LOOP FOR 12°F ΔT		
	Tons	GPM
141 st RC	325	650
61 st RC	200	400
Dining Hall	120	240
Future Museum	300	600
Total	945	1890

*Secondary pump size excluding future expansion

PRIMARY CHILLED WATER PUMP CALCULATIONS			
CHILLER PD	13 ft H ₂ O	FLOW RATE	720 GPM
AIR SEPARATOR	8 ft H ₂ O		
CONTROL VALVE PD	0 ft H ₂ O		
PIPE PD	7.8125 ft H ₂ O	PIPE LENGTH	250 FT
			0.25 Unions Elbows and fittings 2.5 PD/100FT
SUBTOTAL HEAD	28.81		
S.F.	10%		
TOTAL HEAD	31.69 FT HEAD		
TOTAL	GPM	FT HEAD	
	720	31.7	

CONDENSER WATER PUMP CALCULATIONS			
Tower PD	10 ft H ₂ O	FLOW RATE	900 GPM
CHILLER PD	10 ft H ₂ O		
CONTROL VALVE PD	10 ft H ₂ O		
PIPE PD	16.875 ft H ₂ O	PIPE LENGTH	450 FT
			0.25 Unions Elbows and fittings 3 PD/100FT
SUBTOTAL HEAD	46.88		
S.F.	10%		
TOTAL HEAD	51.56 FT HEAD		
TOTAL	GPM	FT HEAD	
	900	51.6	