ADDISON SMITH

Mechanical Contractor, Inc.

HPPG 89ki EXPANSION PROJECT

Heat Exchangers Submittal Data

Spec 15755

JOHN Q. BULLARD ASSOC. INC.

HEAT EXCHANGERS * PUMPS * FLOW MEASURING * BOILERS * TANKS * WATER HEATERS * COILS * PUMP PARTS

1448 TULLIE ROAD, N. E. *PHONE 404 - 633 - 2507*
ATLANTA, GA 30329 *FAX 404 - 321 - 5094*

SECTION 15755 – HEAT EXCHANGERS SUBMITTAL
January 8, 2014

Project:	Honda Precision Parts of Georgia – 89KI Expansion Tallapoosa, GA
Engineer:	SSOE, Inc. 1001 Madison Avenue Toledo, OH 43604
Contractor:	Addison Smith Mechanical Contractor, Inc. 110 Kingsbridge Drive Carrollton, GA 30117
Specification Section:	15755 – Heat Exchangers
Drawing Number:	P600
Manufacturer / Model:	Armstrong Shell and Tube Model W-2808-422-4-CSSSSNN-18 Armstrong Plate and Frame Model S-76-1250-60
Tag:	HX-1, HX-2 (Shell and Tube) HX-3, HX-4 (Plate and Frame)
Exceptions to Specification:	No exceptions taken
Representative:	John Q. Bullard Assoc., Inc. 1448 Tullie Rd NE Atlanta, GA 30329 (404) 633-2507

ARMSTRONG SUBMITTAL

Project #: 393950.1 rev2

TagNum: HX-1,-2

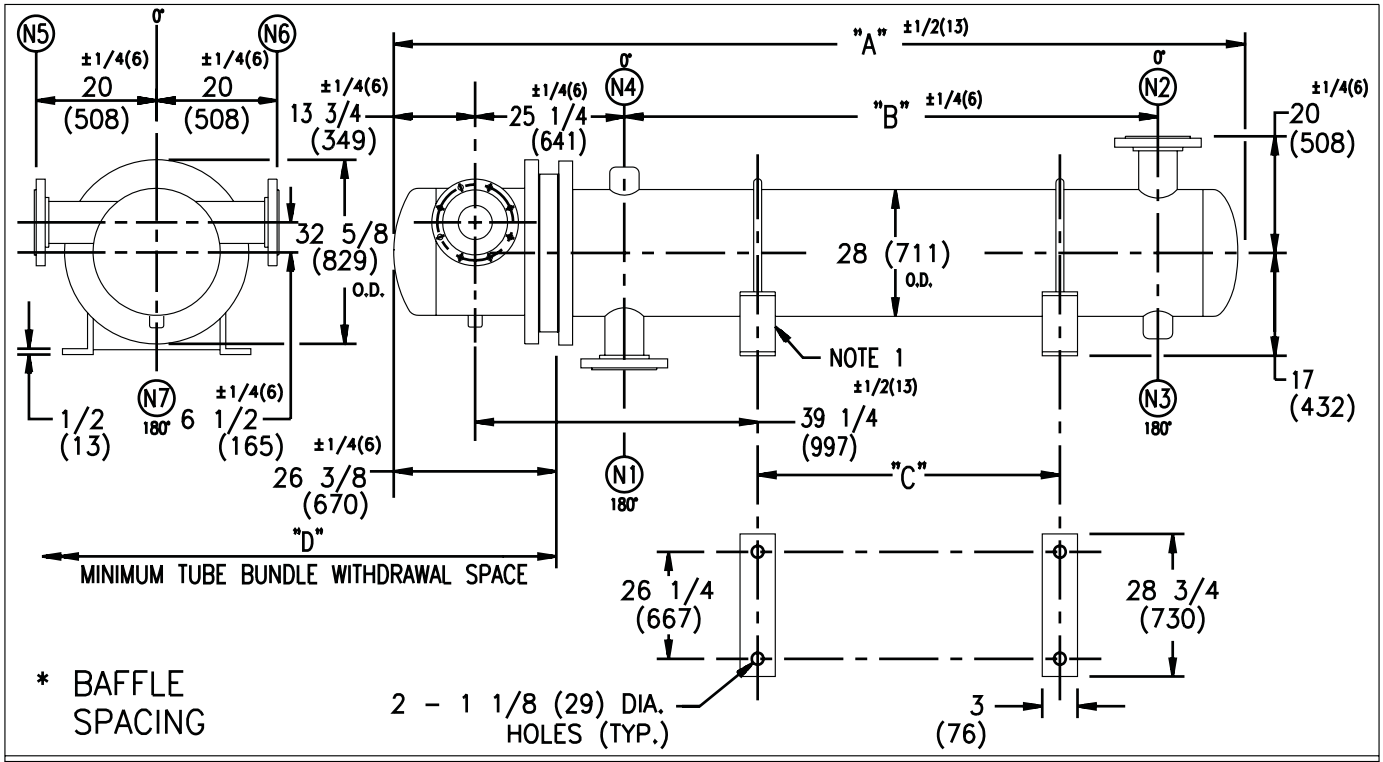
Product: Shell & Tube
Model: W-2808-422-4-CSSSSNN-18

Project Number:	393950.1.2	**Representative:** John Q. Bullard Associates		
Name:	HPPG Quality & Die	1448 Tullie Rd NE		
Reference:	393950.1.2	Atlanta, GA 30329		
Location:	Tallapoosa, GA	Phone: 404-633-2507, Fax: 404-321-5094		
Engineer:	SSOE, Inc.	**Order No:**	**Date:**	1/3/2014
Contractor:	Addison Smith	**Submitted by:** John Norris	**Date:**	1/8/2014
		Approved by:	**Date:**	

Process Conditions		
	Shell Side	**Tube Side**
Fluid	water	water
Flow Rate	1500.0 USgpm	800.0 USgpm
Inlet Temperature	67 °F	42 °F
Outlet Temperature	59 °F	57 °F
Operating Pressure	150.0 psi	125.0 psi
Density	62.3 lb/ft³	62.4 lb/ft³
Viscosity	41 SSU	50 SSU
Specific Heat	1.0 Btu/lb•°F	1.0 Btu/lb•°F
Thermal Conductivity	0.4 Btu/hr•ft•°F	0.3 Btu/hr•ft•°F
Specified Limits		
Maximum Velocity	4.0 ft/s	7.5 ft/s
Maximum Pressure Drop	15.0 psi	15.0 psi
Fouling Requested	0.0001	0.0001
Maximum Exchanger Length	15 ft	
Required Tube Passes	n/a	
Performance		
Total Surface Area	1,015.2 ft²	
Velocity	3.8 ft/s	4.7 ft/s
Pressure Drop	2.6 psi	2.5 psi
Heat Transfer Coeff.	1461.3 Btu/hr.ft².°F	1003 Btu/hr.ft².°F
Heat Load	6013532.0 Btu/hr	
Corrected LMTD	12 °F	
Overall Heat Transfer Coeff.	513.5 Btu/hr.ft².°F	
Total Fouling Used	0.0001 hr.ft².°F/Btu	
Required Heating Surface	1014.9ft² dirty and 966.1ft² clean	
Design Details		
	150 psi at 375°F	150 psi at 375°F
Passes	1	4
	14inch ANSI RF	10inch 150lb ANSI RF
Outlet Nozzle	14inch ANSI RF	10inch 150lb ANSI RF
Materials - Tubes		copper -18ga
Materials - Tubesheets		carbon stl
Materials - Head		carbon stl
Materials - Shell	carbon stl	
Materials - Baffles	carbon stl	
Materials - Gasket	non - asbestos	non - asbestos
Materials - Studs/Nuts	carbon stl	

Design, test, and fabrication in accordance with ASME Code Sect. VIII, Div. 1

ARMSTRONG®



EXCHANGER SIZE	DIMENSIONS											
	A		B		C		D		(N1)		(N2)	
*-BAFFLE SPACING	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
W-284-4*-4	79 1/2	2019	25	635	3	76	55	1397	14	356	14	356
W-285-4*-4	91 1/2	2324	37	940	15	381	67	1702	14	356	14	356
W-286-4*-4	103 1/2	2629	49	1245	27	686	79	2007	14	356	14	356
W-287-4*-4	115 1/2	2934	61	1549	39	991	91	2311	14	356	14	356
W-288-4*-4	127 1/2	3239	73	1854	51	1295	103	2616	14	356	14	356
W-289-4*-4	139 1/2	3543	85	2159	63	1600	115	2921	14	356	14	356
W-2810-4*-4	151 1/2	3848	97	2464	75	1905	127	3226	14	356	14	356
W-2811-4*-4	163 1/2	4153	109	2769	87	2210	139	3531	14	356	14	356
W-2812-4*-4	175 1/2	4458	121	3073	99	2515	151	3835	14	356	14	356
W-2813-4*-4	187 1/2	4763	133	3378	111	2819	163	4140	14	356	14	356
W-2814-4*-4	199 1/2	5067	145	3683	123	3124	175	4445	14	356	14	356
W-2815-4*-4	211 1/2	5372	157	3988	135	3429	187	4750	14	356	14	356

NOZZLE SCHEDULE				
SERVICE	MARK	SHELL SIDE	MARK	TUBE SIDE
INLET	(N1)	AS PER TABLE ANSI (RF) FLG	(N5)	10 (254) ANSI (RF) FLG
OUTLET	(N2)	AS PER TABLE ANSI (RF) FLG	(N6)	10 (254) ANSI (RF) FLG
DRAIN	(N3)	3/4 (19) NPT	(N7)	3/4 (19) NPT
VENT	(N4)	3/4 (19) NPT		

NOTES:
1. SUPPORTS SUPPLIED ONLY IF SPECIFIED ON ORDER.
2. NOZZLE SIZES SHOWN ARE RECOMMENDED FOR MAXIMUM EXCHANGER LIFE.
3. FABRICATED TO ASME CODE SECTION VIII DIVISION 1 AND LATEST ADDENDA.
4. DRAWING IS NOT TO SCALE.
5. ALL DIMN'S ±1/8 (3) UNLESS OTHERWISE SHOWN.

DESIGN CONDITIONS		
	SHELL	TUBES
DESIGN PRESSURE	150 PSIG (1034 kpa)	150 PSIG (1034 kpa)
DESIGN TEMPERATURE	375 °F (191 °C)	375 °F (191 °C)
MIN. DESIGN METAL TEMP.	40 °F (4.4°C)	40 °F (4.4°C)
HYDRO. TEST PRESSURE	225 PSIG (1551 kpa)	225 PSIG (1551 kpa)
CONTENTS	WATER	WATER

CUSTOMER: Addison Smith Mechanical Contractors
LOCATION: Carrollton, GA

ORDER No.:
PROJECT/JOB: Honda Precision Parts of GA - 89KI Exp.
LOCATION: Tallapoosa, GA
TAG: HX-1, HX-2 (QUOTE # 9309)

TITLE 150 LB. W SERIES HEAT EXCHANGERS
DATE :-SEP./15/99 BY :- AP/AG

A R M S T R O N G

TORONTO - CANADA TEL : (416) 755-2291
MONTREAL - CANADA TEL : (514) 421-2424
BUFFALO - N. Y. TEL: (716) 693-8813
COLCHESTER - U.K. TEL: (44) 120-657-9491

NUMBER W-28-4P-4

REV.

Plate Heat Exchanger

CUSTOMER	: Addison Smith Mechanical Contractors	**QUOTATION NO. :**	9309
REFERENCE	: HX-3, HX-4	**DATE :**	01/08/2014
PROJECT	: Honda Precision Parts of Georgia - 89KI Expansion		
SERVICE OF UNIT	:		
MODEL	: S-76-1250		

NO. OF UNITS: 2 **CONNECTED IN :** Single

PERFORMANCE OF UNIT

		COLD SIDE		HOT SIDE	
FLUID CIRCULATED		water		water	
TOTAL FLUID ENTERING		873.0 gpm		570.4 gpm	
		434,670.2 lb/h		283,514.5 lb/h	
FLUID TYPE		Liquid	Gas	Liquid	Gas
DENSITY	lb/ft³	62.08		61.97	
SPECIFIC HEAT	Btu/lb·°F	0.999		0.999	
THERMAL CONDUCTIVITY	Btu/h·ft·°F	0.359		0.363	
DYNAMIC VISCOSITY	cP	0.742		0.672	
LATENT HEAT	Btu/lb				
TEMPERATURE IN / SAT.	°F	**85.0** —›		**113.0** —›	
TEMPERATURE OUT	°F	—› **100.0**		—› **90.0**	
OPERATING PRESSURE	PSI				
PRESSURE DROP		9.95 PSI		4.77 PSI	
HEAT EXCHANGED	Btu/h	6,517,933.0			
LMTD	°F	8.37			

CONSTRUCTION OF SINGLE UNIT

DESIGN PRESSURE	PSI	150.0	
TEST PRESSURE	PSI	195.0	
OPERATING TEMPERATURE	°F	210.0	
PLATE MATERIAL	AISI 316L	GASKET MATERIAL:	EPDM
		GASKET TYPE:	mechanically Fixed
PLATE THICKNESS (mm)	0.60	TIE RODS:	Zinc Plated
FRAME MATERIAL:	Carbon Steel	SHROUD:	Aluminum

CONNECTIONS

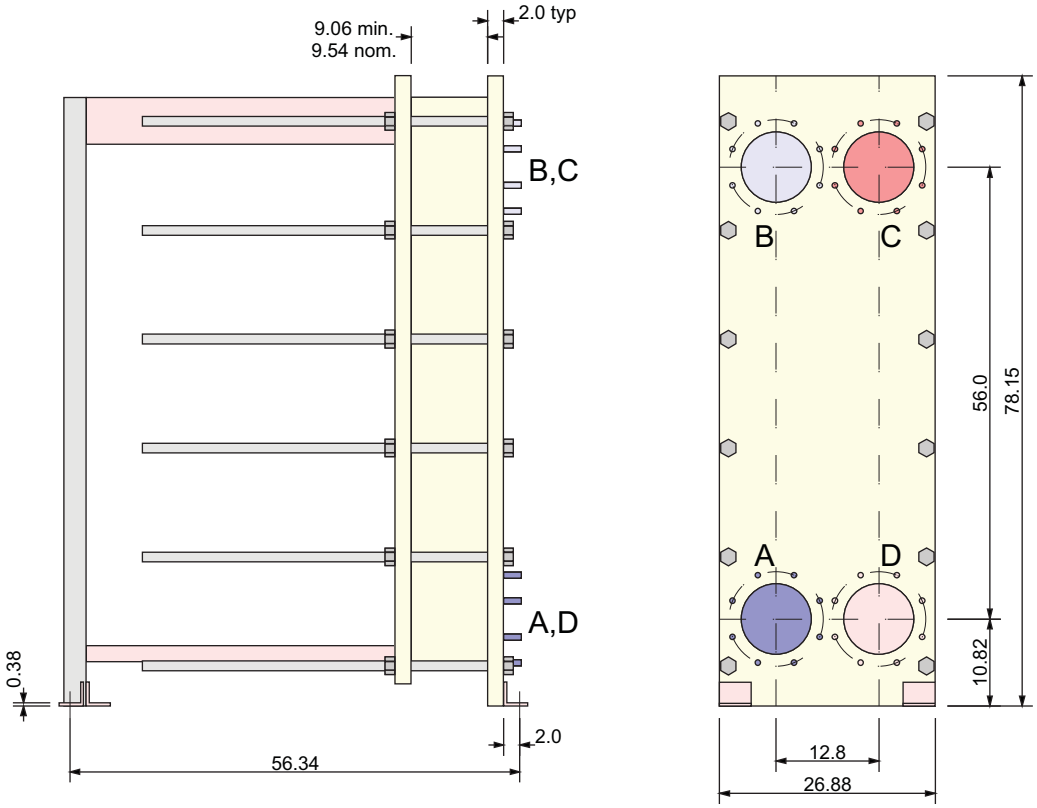
COLD SIDE	pos.	type	HOT SIDE	pos.	type
in	A	8" - 150# Studded Carbon Steel	in	C	8" - 150# Studded Carbon Steel
out	B	8" - 150# Studded Carbon Steel	out	D	8" - 150# Studded Carbon Steel

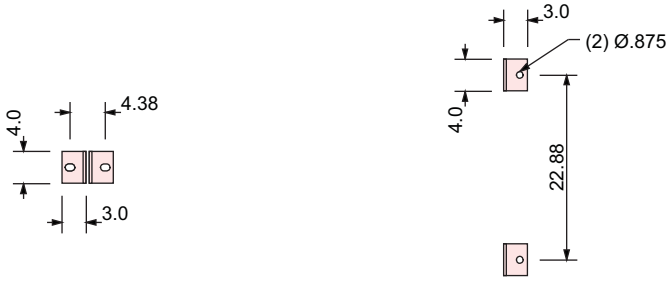
weight (lb):		FLOODED VOLUME (gal)	21.795 / 21.795
empty / flooded (H20)	3,107 | 3,471		

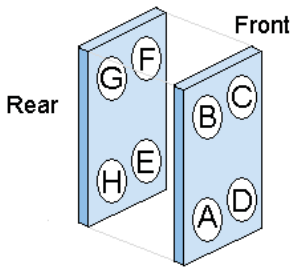
CODE REQUIREMENTS:

NOTES:

- Includes stainless steel shroud







Nozzle Arrangement

NOTES:
Dimensions shown in Inches
TOLERANCE:
Nozzle centerline & face: ±0.125"
Frame foundation & bolt hole locations: ±0.25"

Connections

Fluid	Port	Size	Type	Material
Hot (in)	C	8	150# Studded	Carbon Steel
Hot (out)	D	8	150# Studded	Carbon Steel
Cold (in)	A	8	150# Studded	Carbon Steel
Cold (out)	B	8	150# Studded	Carbon Steel

Design Conditions

	Hot	Cold
Design Pres. (PSIG)	150	150
Test Pres. (PSIG)	195	195
Design Temp. (F)	210	210
Min. Temp. (F)	32	32
Weight Dry/Filled (lb)	3107	3471

Construction

Frame Size	1250
Plate Arr't	
Plate Mtl.	316L SS / 0.6 mm
Gasket Mtl.	EPDM - Clip

ARMSTRONG

Job No.			
Part No.	S-76-1250-60 Rev.		
Made	Oct 18, 2013	By	Ryan Doering
Check	Oct 18, 2013	By	Ryan Doering