



3679 S. Huron St., Suite 404
 Englewood, CO 80110
 Phone: (303) 789-4111 FAX: (303) 789-4310

SUBMITTAL TRANSMITTAL

09 November, 2011
 WCM Submittal No. 06602 - 001.B

PROJECT: HAROLD D. THOMPSON W.R.F.
 9001 Birdsell Road.
 Fountain, Colorado 80817

ENGINEER: G.M.S. Inc.
 611 North Weber St. # 300
 Colorado Springs, CO 80239
 719-475-2935 Roger Sams

OWNER: Lower Fountain Metropolitan Sewage Disposal District
 901 South Santa Fe Avenue
 Fountain, CO 80817

CONTRACTOR: **Plasti-Fab**
JQueen@goblesampson.com -Local Rep
 Goble Sampson Associates
 2460 W. 26th Ave. #30C
 Denver, CO 80120
 303-730-3059

SUBJECT Resubmittal of FRP Flume for Headworks Building.
 • **GMS review comments attached.**

SPEC SECTION: 06602 - Fiberglass Reinforced Plastic Fabricationbs

PREVIOUS SUBMISSION DATES: 07 October 2011
DEVIATIONS FROM SPEC: ____ YES X NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver Construction Management and approved with respect to the means, methods, techniques, & safety precautions & programs incidental thereto. Weaver Construction Management also warrants that this submittal complies with contracted documents and comprises on deviations thereto.

<p>Contractor's Stamp:</p> <p>Date: 11-09-2011 Reviewed by: <u>H.C. Myers</u> <input checked="" type="checkbox"/> Reviewed Without Comments <input type="checkbox"/> Reviewed With Comments</p>	<p>Engineer's Stamp:</p>
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ENGINEER'S COMMENTS: _____

GMS, INC.
CONSULTING ENGINEERS
611 NORTH WEBER, SUITE 300
COLORADO SPRINGS, COLORADO 80903-1074

TELEPHONE (719) 475-2935
TELEFAX (719) 475-2938

EDWARD D. MEYER, P.E.
ROGER J. SAMS, P.E.
GREGORY R. WORDEN, P.E.
THOMAS A. McCLERNAN, P.E.

KEN L. WHITE, P.L.S.
DAVID R. FRISCH, P.L.S.
MARK A. MORTON, P.E.
JASON D. MEYER, P.E.

September 20, 2011

Mr. Wes Weaver, President
Weaver Construction Management, Inc.
3679 South Huron Street, Suite 404
Englewood, CO 80110

Via Email to: wes@weavergc.com
No Hard Copy to Follow

Re: Harold D. Thompson Regional Water Reclamation Facility (HDTRWRF)
Lower Fountain Metropolitan Sewage Disposal District (LFMSDD)

Dear Wes:

Reference is made to your shop submittal identified as follows:

Submittal No.:	06602-001
Date of Submittal:	September 16, 2011
Title:	FRP Parshall Flume for Headworks Building
Specification Section:	06602 – Fiberglass Reinforced Plastic
Manufacturer:	Plasti-Fab

The referenced submittal has been stamped "**Revise and Resubmit**". Our comments are as follows:

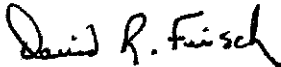
1. We take no exception to the Plasti-Fab Parshall flume(s) proposed for use for the Headworks Building. Per the project specifications, Parshall flumes are to be installed in the Headworks and the Pumping and Disinfection Buildings. We acknowledge this submittal is the unit for the flume channel in the Headworks Building only. ←
2. Provide a manufacturer's cut sheet stating:
 - Tensile strength at break with ASTM D638 conformance 14000 psi
 - Flexural strength with ASTM D790 conformance 23000 psi
 - Flexural modulus of elasticity with ASTM D790 conformance 0.80×10^6 psi
3. Provide confirmation that the plastic laminate with resin layer is at least 5 mils thick. 10 to 15 mil
4. Provide the design capacity for the 9-inch flume and the 18-inch flume being provided. Per the project specifications, the design capacity should be 5.73 mgd and 15.81 mgd, respectively. ✓
5. Provide certified calibration curves for the Parshall flumes. ✓
6. Submittal Drawing No. 111426-1A-01:
 - a. The weight is provided on this sheet for the Parshall flumes. It is not noted whether the 352.68 pounds is for one flume or both flumes. Please provide clarification. #360 for both flumes

Mr. Wes Weaver
September 20, 2011
Page 2

- b. The Elevation View of the two Parshall flumes would indicate the 9-inch flume rests on the bottom of the 18-inch flume. We request elevation information be provided on the detail drawing showing the elevations the Parshall flumes will be placed. Please reference Construction Drawing HW-16 for the appropriate elevations for installation. ✓
- c. We request installation instructions be provided for the installation of the flumes. ✓ ~~E1 54.16.0~~ ~~54.16.5~~
- d. The drawing indicates the head gage will be calibrated in "100^{THS} OF A FOOT & CENTIMETERS". We request the gage only be marked in 100^{ths} of a foot. ✓

Please call if you should have any questions.

Sincerely,



David R. Frisch, P.L.S.

DRF/kmw

ec (letter only):

Mr. Jim Heckman, Manager, LFMSDD, lfmanager@lfmsdd.org

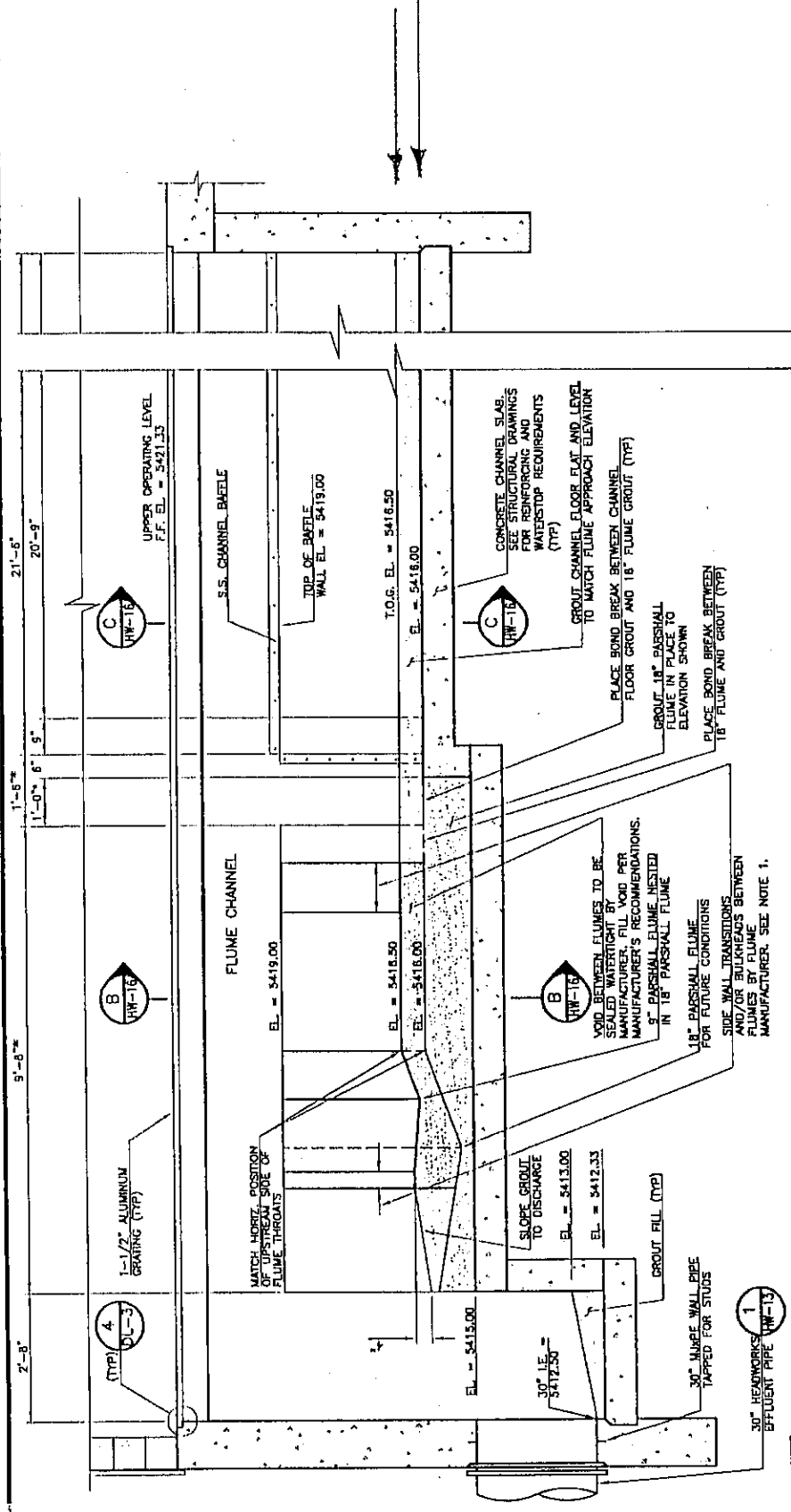
Ms. Cindy Murray, Office Manager, Fountain Sanitation District, fsdistrict@fsd901.org

Mr. Jeff Burst, Project Supt., Weaver Construction Management, Inc., jeff@weaverqc.com

Mr. John Jacob, Project Mgr., Weaver Construction Management, Inc., john@weaverqc.com

Ms. Leslie Brown, Weaver Construction Management, Inc., leslie@weaverqc.com

cc: Mr. Jerry Miller, Resident Project Representative, GMS, Inc.



SECTION A-A
SCALE: 1/2" = 1'-0"

NOTE:
1. SIDEWALL TRANSITIONS/BULKHEADS TO BE PROVIDED ON UPSTREAM AND DOWNSTREAM SIDES OF 9" FLUME. SIDEWALL TRANSITIONS/BULKHEADS SHALL INCLUDE FLOOR EXTENSIONS OR HAVE THE GROUT FLOOR NEATLY PLACED BETWEEN THEM SO THE FLOW THROUGH THE FLUME AND ITS MEASUREMENT ARE NOT ADVERSELY EFFECTED.

Drawing HW-16

Leslie Brown

From: John Jacob
Sent: Tuesday, November 08, 2011 3:04 PM
To: Leslie Brown
Cc: Jeff Burst
Subject: FW: Revisions for Approval- Job# 111426, Customer PO#9103-6610
Attachments: NPF-Spec.doc; 9in Parshall Flume.pdf; 18in Parshall Flume.pdf; 111426-1A 10.05.11.pdf

Leslie,

Have Horace review this submittal.

From: Danielle Kirtland [mailto:dkirtland@plasti-fab.com]
Sent: Tuesday, November 08, 2011 2:53 PM
To: John Jacob; JQueen@goblesampson.com
Cc: Kurt Rogers
Subject: Revisions for Approval- Job# 111426, Customer PO# 9103-6610



Harry Reed
Chief Engineer
P: (503) 692-5460
C: (503) 476-6783
F: (503) 692-1145
hreed@plasti-fab.com

November 8, 2011

Goble Sampson

Attn: Josh Queen/John Jacob

Re: Revisions- Job# 111426, Customer PO#9103-6610

Josh/John,

Attached is our resubmittal which includes a revised drawing that shows the gel coat thickness in answer to engineer's comment #3, the weight of the flumes in answer to engineer's comment #6A, the revised elevations for the 9" flume in answer to engineer's comment 6B and the gage increments has been changed to 100th of a foot only in answer to engineer's comment 6D.

We have enclosed our typical specification which includes physical properties as referenced in engineer's comment #2 as well as calibration curves for the 9" and 18" Parshall flumes in answer to engineer's comment #'s 4 & 5. Installation instructions as required by engineer's comment 6C are included in the above mentioned typical specification.

We are holding production until your approval is received.

Thank you!

Harry Reed
Chief Engineer
Plasti-Fab, Inc.



TYPICAL SPECIFICATIONS NESTED PARSHALL FLUMES

The flumes shall be a 9 inch Parshall nested in a 18 inch Parshall for measuring flows to 5.73 $\sqrt{\text{MGD}}$ and 15.81 $\sqrt{\text{MGD}}$ respectively.

The flumes shall be full length, molded fiberglass reinforced polyester laminated in one piece. The interior surface shall have a 10 to 15 mil white gelcoat backed by a resin rich layer of resin and chopped glass to form a water and chemical resistant surface. The remainder of the laminate shall be fiberglass reinforced polyester containing not less than 30% glass content by weight. The thickness of the walls and floor of the flume shall be not less than 1/4". The outer chopped strand shall be Type E glass with silane finish and a styrene-soluble binder. The outer flume shall be reinforced with box section stiffeners down the sides and across the bottom. The stiffeners shall be joined together at the knee to form a rigid dimensionally stable flume. The flume shall be capable of being free standing, holding all dimensions without distortion, with a full head of water flowing through it. There shall be locking clips fastened along the side of the flume to be used for anchorage into the concrete.

The nested flume

1. will be constructed such that its approach and throat floor of the smaller flume will sit flat on top of the larger flume's approach and throat sections.
2. shall have flared entrance wing walls as needed and an outlet bulkhead to mate to the larger flume.
3. seating surfaces and joints to be sealed. Attachment to be done with T-304/T-316 stainless steel fasteners of adequate number to secure flume in place.
4. the smaller flume shall be strong enough to be free-standing and not require additional exterior supports to hold it dimensionally true.
5. flumes with a side stilling well will be provided with a side flow transition box mounted at the base of the smaller flume. The box will be designed to seat against the vertical wall and floor of the larger flume. It is to provide access from the smaller flume measurement point at H_a to the larger flume measurement point at H_a without additional holes. For nested flumes that where the space between the flumes is large enough; alternative flow transition methods may be used as long as they are easily accessible or a separate stilling well having at least an 8" diameter may be used.

Stiffeners across the top shall be permanent FRP pultruded cross supports for the smaller

flume and may be either the fiberglass or temporary wood spreaders for the larger flume as required for the job, and shall provide sufficient strength and structural support to resist the stresses that occur during shipping and proper installation of the flume. The flume shall be brace and supported during installation per manufactures suggestions. The flume shall be provided with: (Please select from the follow options. **Indicate right or left side of flume as viewed from the approach looking down stream.)

An adjustable T-304 stainless steel support bracket to mount an ultrasonic transducer over the waterway.

The Parshall flume shall be equipped with a molded in head gage graduated in 100ths of a foot and centimeters.

Typical physical properties shall be

ASTM D 638	Tensile strength	14,000 psi
ASTM D 790	Flexural strength	23,000 psi
ASTM D 790	Flexural modulus	0.80 x 10 ⁶ psi
ASTM D 256	Notched Izod Impact	10 ft. lbs./in.
ASTM D 2583	Barcol hardness	30
ASTM D 570	Water Absorption	<0.2% (in 24 hrs.)

Flume dimensions shall be within plus or minus 1/16th inch for flumes 12" and smaller. For 18" to 24" flumes the tolerance shall be plus or minus 3/32nd inch in the throat and plus or minus 1/8 inch elsewhere. Flumes 30" through 48" shall be plus or minus 1/8" in the throat and plus or minus 1/4" elsewhere.

INSTALLATION COMMENTS FOR NESTED FLUMES

1. The flume(s) should be installed level end-to-end and side-to-side.
2. Place the flume to be nested so that flat approach and throat sections rest directly on approach and throat of larger unit.
3. The leading edge of the throat section on both flumes should be aligned. (See print).
4. If the order calls for both flumes (not just one retrofit flume), the factory will run a bead of silicon sealant has been placed between the flanges, bulkhead and other contacting surfaces of the insert flume to provide a water tight seal. Retrofit flumes should also be sealed in the same manner.
5. If desired, the space between the sidewalls of the two flumes may be filled with sand or pea gravel and covered with a layer of breakable grout sloped toward the flume to help limit water collecting between flumes. Water will likely seep between the two flumes.

This will in no way affect the accuracy of the flume or compromise the flume in any manner.

6. At times it may be a good idea to remove the smaller flume during the installation to facilitate supporting the larger flume. Follow standard installation instructions that will come with the flume describing how to support and secure the flume in place. If both flumes installed together; the contractor will need to take extra time to pour smaller lifts (3"-4") along the walls to prevent the walls from bowing in during the installation. Some contractors have sealed off the ends of the flume and filled them with water to help provide inside support. Then lifts could be 4"-6". If the smaller flume is removed, the lifts could be up to 10" deep per layer.
7. Please note that these flumes are designed to be freestanding, and require no additional external support in order to maintain their dimensional integrity during operation.

The flume shall be as manufactured by Plasti-Fab, Inc. of Tualatin, Oregon.

Please consult your local representative or contact
Plasti-Fab, Inc., PO Box 100, Tualatin, Oregon, 97062.
PHONE 503-692-5460 FAX 503-692-1145
E-MAIL SALES@PLASTI-FAB.COM WEB WWW.PLASTI-FAB.COM



Flow Chart for 9" Parshall Flume

Head (feet)	MGD	CFS	GPM
0.06			
0.07			
0.08			
0.09			
0.10	0.05845	0.09060	40.662
0.11	0.06763	0.10483	47.046
0.12	0.07726	0.11975	53.745
0.13	0.08733	0.13535	60.747
0.14	0.09781	0.15161	68.040
0.15	0.10870	0.16848	75.616
0.16	0.11998	0.18597	83.463
0.17	0.13164	0.20404	91.575
0.18	0.14367	0.22269	99.944
0.19	0.15606	0.24190	108.56
0.20	0.16880	0.26165	117.43
0.21	0.18189	0.28193	126.53
0.22	0.19531	0.30272	135.86
0.23	0.20905	0.32403	145.42
0.24	0.22312	0.34583	155.21
0.25	0.23750	0.36812	165.21
0.26	0.25218	0.39088	175.43
0.27	0.26717	0.41412	185.86
0.28	0.28246	0.43781	196.49
0.29	0.29804	0.46196	207.33
0.30	0.31391	0.48656	218.37
0.31	0.33006	0.51159	229.60
0.32	0.34649	0.53705	241.03
0.33	0.36319	0.56294	252.65
0.34	0.38016	0.58925	264.46
0.35	0.39740	0.61597	276.45
0.36	0.41491	0.64310	288.63
0.37	0.43267	0.67064	300.98
0.38	0.45069	0.69857	313.52
0.39	0.46896	0.72689	326.23
0.40	0.48748	0.75560	339.11
0.41	0.50625	0.78469	352.17
0.42	0.52526	0.81416	365.40
0.43	0.54452	0.84401	378.79
0.44	0.56401	0.87422	392.35
0.45	0.58374	0.90480	406.08

Head (feet)	MGD	CFS	GPM
0.46	0.60371	0.93575	419.96
0.47	0.62390	0.96705	434.01
0.48	0.64433	0.99871	448.22
0.49	0.66498	1.0307	462.58
0.50	0.68585	1.0631	477.11
0.51	0.70695	1.0958	491.78
0.52	0.72827	1.1288	506.61
0.53	0.74981	1.1622	521.59
0.54	0.77156	1.1959	536.73
0.55	0.79353	1.2300	552.01
0.56	0.81571	1.2643	567.44
0.57	0.83810	1.2991	583.02
0.58	0.86070	1.3341	598.74
0.59	0.88351	1.3694	614.60
0.60	0.90652	1.4051	630.61
0.61	0.92974	1.4411	646.76
0.62	0.95316	1.4774	663.06
0.63	0.97678	1.5140	679.49
0.64	1.0006	1.5509	696.06
0.65	1.0246	1.5882	712.77
0.66	1.0488	1.6257	729.61
0.67	1.0733	1.6635	746.60
0.68	1.0979	1.7017	763.71
0.69	1.1227	1.7401	780.96
0.70	1.1476	1.7788	798.35
0.71	1.1728	1.8179	815.86
0.72	1.1982	1.8572	833.51
0.73	1.2237	1.8968	851.29
0.74	1.2495	1.9367	869.19
0.75	1.2754	1.9769	887.23
0.76	1.3015	2.0174	905.39
0.77	1.3278	2.0581	923.68
0.78	1.3543	2.0991	942.10
0.79	1.3809	2.1405	960.64
0.80	1.4078	2.1821	979.31
0.81	1.4348	2.2239	998.10
0.82	1.4620	2.2661	1,017.0
0.83	1.4893	2.3085	1,036.0
0.84	1.5169	2.3512	1,055.2
0.85	1.5446	2.3941	1,074.5



Flow Chart for 9" Parshall Flume

0.86	1.5725	2.4374	1,093.9	1.26	2.8208	4.3723	1,962.3
0.87	1.6006	2.4809	1,113.4	1.27	2.8551	4.4255	1,986.1
0.88	1.6288	2.5246	1,133.1	1.28	2.8896	4.4789	2,010.1
0.89	1.6572	2.5687	1,152.8	1.29	2.9242	4.5325	2,034.2
0.90	1.6858	2.6129	1,172.7	1.30	2.9590	4.5864	2,058.4
0.91	1.7145	2.6575	1,192.7	1.31	2.9939	4.6405	2,082.7
0.92	1.7434	2.7023	1,212.8	1.32	3.0289	4.6948	2,107.0
0.93	1.7725	2.7474	1,233.0	1.33	3.0641	4.7493	2,131.5
0.94	1.8017	2.7927	1,253.4	1.34	3.0994	4.8041	2,156.1
0.95	1.8311	2.8383	1,273.8	1.35	3.1349	4.8590	2,180.7
0.96	1.8607	2.8841	1,294.4	1.36	3.1705	4.9142	2,205.5
0.97	1.8905	2.9302	1,315.1	1.37	3.2062	4.9696	2,230.4
0.98	1.9204	2.9766	1,335.9	1.38	3.2421	5.0252	2,255.3
0.99	1.9504	3.0232	1,356.8	1.39	3.2781	5.0810	2,280.4
1.00	1.9806	3.0700	1,377.8	1.40	3.3142	5.1371	2,305.5
1.01	2.0110	3.1171	1,399.0	1.41	3.3505	5.1933	2,330.8
1.02	2.0416	3.1644	1,420.2	1.42	3.3869	5.2498	2,356.1
1.03	2.0723	3.2120	1,441.6	1.43	3.4235	5.3064	2,381.5
1.04	2.103	3.260	1,463.027	1.44	3.4602	5.3633	2,407.1
1.05	2.1342	3.3079	1,484.6	1.45	3.4970	5.4204	2,432.7
1.06	2.1653	3.3563	1,506.3	1.46	3.5340	5.4777	2,458.4
1.07	2.1967	3.4048	1,528.1	1.47	3.5711	5.5352	2,484.2
1.08	2.2282	3.4536	1,550.0	1.48	3.6083	5.5929	2,510.1
1.09	2.2598	3.5027	1,572.0	1.49	3.6457	5.6508	2,536.1
1.10	2.2916	3.5520	1,594.1	1.50	3.6832	5.7090	2,562.2
1.11	2.3235	3.6015	1,616.3	1.51	3.7208	5.7673	2,588.4
1.12	2.3556	3.6513	1,638.7	1.52	3.7586	5.8258	2,614.6
1.13	2.3879	3.7012	1,661.1	1.53	3.7965	5.8846	2,641.0
1.14	2.4203	3.7515	1,683.7	1.54	3.8345	5.9435	2,667.5
1.15	2.4529	3.8019	1,706.3	1.55	3.8727	6.0027	2,694.0
1.16	2.4856	3.8526	1,729.1	1.56	3.9110	6.0620	2,720.6
1.17	2.5184	3.9036	1,751.9	1.57	3.9494	6.1216	2,747.4
1.18	2.5514	3.9547	1,774.9	1.58	3.9880	6.1814	2,774.2
1.19	2.5846	4.0061	1,798.0	1.59	4.0267	6.2413	2,801.1
1.20	2.6179	4.0578	1,821.1	1.60	4.0655	6.3015	2,828.1
1.21	2.6514	4.1096	1,844.4	1.61	4.1044	6.3618	2,855.2
1.22	2.6850	4.1617	1,867.8	1.62	4.1435	6.4224	2,882.4
1.23	2.7187	4.2140	1,891.2	1.63	4.1827	6.4831	2,909.6
1.24	2.7526	4.2665	1,914.8	1.64	4.2220	6.5441	2,937.0
1.25	2.7866	4.3193	1,938.5	1.65	4.2614	6.6052	2,964.4



Flow Chart for 9" Parshall Flume

1.66	4.3010	6.6666	2,992.0
1.67	4.3407	6.7281	3,019.6
1.68	4.3806	6.7899	3,047.3
1.69	4.4205	6.8518	3,075.1
1.70	4.4606	6.9139	3,103.0
1.71	4.5008	6.9763	3,130.9
1.72	4.5411	7.0388	3,159.0
1.73	4.5816	7.1015	3,187.1
1.74	4.6222	7.1644	3,215.4
1.75	4.6629	7.2275	3,243.7
1.76	4.7037	7.2908	3,272.1
1.77	4.7447	7.3542	3,300.6
1.78	4.7857	7.4179	3,329.2
1.79	4.8269	7.4818	3,357.8
1.80	4.8683	7.5458	3,386.6
1.81	4.9097	7.6100	3,415.4
1.82	4.9513	7.6745	3,444.3
1.83	4.9929	7.7391	3,473.3
1.84	5.0348	7.8039	3,502.4
1.85	5.0767	7.8688	3,531.5

1.86	5.1187	7.9340	3,560.8
1.87	5.1609	7.9994	3,590.1
1.88	5.2032	8.0649	3,619.5
1.89	5.2456	8.1306	3,649.0
1.90	5.2881	8.1966	3,678.6
1.91	5.3307	8.2627	3,708.3
1.92	5.3735	8.3289	3,738.0
1.93	5.4164	8.3954	3,767.9
1.94	5.4594	8.4620	3,797.8
1.95	5.5025	8.5289	3,827.8
1.96	5.5457	8.5959	3,857.8
1.97	5.5891	8.6631	3,888.0
1.98	5.6325	8.7304	3,918.2
1.99	5.6761	8.7980	3,948.5
2.00	5.7198	8.8657	3,978.9



Flow Chart for 18" Parshall Flume

Head (feet)	MGD	CFS	GPM
0.16			
0.17			
0.18			
0.19			
0.20	0.326	0.505	226.56
0.21	0.351	0.544	244.22
0.22	0.377	0.585	262.33
0.23	0.404	0.626	280.89
0.24	0.431	0.668	299.89
0.25	0.459	0.712	319.33
0.26	0.488	0.756	339.18
0.27	0.517	0.801	359.45
0.28	0.546	0.847	380.13
0.29	0.577	0.894	401.21
0.30	0.608	0.942	422.68
0.31	0.639	0.991	444.55
0.32	0.671	1.040	466.79
0.33	0.704	1.091	489.42
0.34	0.737	1.142	512.41
0.35	0.770	1.194	535.77
0.36	0.804	1.247	559.50
0.37	0.839	1.300	583.58
0.38	0.874	1.355	608.01
0.39	0.910	1.410	632.79
0.40	0.946	1.466	657.92
0.41	0.982	1.523	683.39
0.42	1.019	1.580	709.19
0.43	1.057	1.638	735.32
0.44	1.095	1.697	761.79
0.45	1.134	1.757	788.58
0.46	1.173	1.817	815.69
0.47	1.212	1.879	843.12
0.48	1.252	1.940	870.87
0.49	1.292	2.003	898.93
0.50	1.333	2.066	927.30
0.51	1.374	2.130	955.98
0.52	1.416	2.195	984.96
0.53	1.458	2.260	1,014.2
0.54	1.501	2.326	1,043.8
0.55	1.543	2.392	1,073.7

Head (feet)	MGD	CFS	GPM
0.56	1.587	2.460	1,103.9
0.57	1.631	2.527	1,134.3
0.58	1.675	2.596	1,165.1
0.59	1.719	2.665	1,196.1
0.60	1.764	2.735	1,227.4
0.61	1.810	2.805	1,259.0
0.62	1.856	2.876	1,290.9
0.63	1.902	2.948	1,323.1
0.64	1.949	3.020	1,355.5
0.65	1.996	3.093	1,388.2
0.66	2.043	3.167	1,421.2
0.67	2.091	3.241	1,454.5
0.68	2.139	3.316	1,488.0
0.69	2.188	3.391	1,521.8
0.70	2.237	3.467	1,555.8
0.71	2.286	3.543	1,590.2
0.72	2.336	3.620	1,624.7
0.73	2.386	3.698	1,659.6
0.74	2.436	3.776	1,694.7
0.75	2.487	3.855	1,730.0
0.76	2.538	3.934	1,765.6
0.77	2.590	4.014	1,801.5
0.78	2.642	4.094	1,837.6
0.79	2.694	4.175	1,873.9
0.80	2.746	4.257	1,910.5
0.81	2.799	4.339	1,947.4
0.82	2.853	4.422	1,984.5
0.83	2.906	4.505	2,021.8
0.84	2.960	4.589	2,059.4
0.85	3.015	4.673	2,097.3
0.86	3.070	4.758	2,135.3
0.87	3.125	4.843	2,173.6
0.88	3.180	4.929	2,212.2
0.89	3.236	5.015	2,251.0
0.90	3.292	5.102	2,290.0
0.91	3.348	5.190	2,329.2
0.92	3.405	5.278	2,368.7
0.93	3.462	5.366	2,408.4
0.94	3.520	5.455	2,448.4
0.95	3.577	5.545	2,488.5



Flow Chart for 18" Parshall Flume

0.96	3.635	5.635	2,528.9
0.97	3.694	5.725	2,569.6
0.98	3.753	5.816	2,610.4
0.99	3.812	5.908	2,651.5
1.00	3.871	6.000	2,692.8
1.01	3.931	6.093	2,734.3
1.02	3.991	6.186	2,776.1
1.03	4.051	6.279	2,818.0
1.04	4.112	6.373	2,860.2
1.05	4.173	6.468	2,902.6
1.06	4.234	6.563	2,945.3
1.07	4.295	6.658	2,988.1
1.08	4.357	6.754	3,031.2
1.09	4.420	6.850	3,074.4
1.10	4.482	6.947	3,117.9
1.11	4.545	7.045	3,161.6
1.12	4.608	7.142	3,205.5
1.13	4.671	7.241	3,249.7
1.14	4.735	7.340	3,294.0
1.15	4.799	7.439	3,338.5
1.16	4.864	7.539	3,383.3
1.17	4.928	7.639	3,428.3
1.18	4.993	7.739	3,473.4
1.19	5.058	7.840	3,518.8
1.20	5.124	7.942	3,564.4
1.21	5.190	8.044	3,610.2
1.22	5.256	8.147	3,656.2
1.23	5.322	8.249	3,702.4
1.24	5.389	8.353	3,748.8
1.25	5.456	8.457	3,795.3
1.26	5.523	8.561	3,842.1
1.27	5.591	8.666	3,889.1
1.28	5.659	8.771	3,936.3
1.29	5.727	8.876	3,983.7
1.30	5.795	8.982	4,031.3
1.31	5.864	9.089	4,079.1
1.32	5.933	9.196	4,127.1
1.33	6.002	9.303	4,175.3
1.34	6.072	9.411	4,223.7
1.35	6.141	9.519	4,272.3

1.36	6.212	9.628	4,321.0
1.37	6.282	9.737	4,370.0
1.38	6.353	9.847	4,419.1
1.39	6.424	9.957	4,468.5
1.40	6.495	10.067	4,518.0
1.41	6.566	10.178	4,567.8
1.42	6.638	10.289	4,617.7
1.43	6.710	10.401	4,667.8
1.44	6.782	10.513	4,718.1
1.45	6.855	10.625	4,768.6
1.46	6.928	10.738	4,819.2
1.47	7.001	10.851	4,870.1
1.48	7.074	10.965	4,921.2
1.49	7.148	11.079	4,972.4
1.50	7.222	11.194	5,023.8
1.51	7.296	11.309	5,075.4
1.52	7.370	11.424	5,127.2
1.53	7.445	11.540	5,179.2
1.54	7.520	11.656	5,231.3
1.55	7.595	11.773	5,283.7
1.56	7.671	11.890	5,336.2
1.57	7.747	12.007	5,388.9
1.58	7.823	12.125	5,441.8
1.59	7.899	12.243	5,494.8
1.60	7.975	12.362	5,548.1
1.61	8.052	12.481	5,601.5
1.62	8.129	12.600	5,655.1
1.63	8.207	12.720	5,708.9
1.64	8.284	12.840	5,762.8
1.65	8.362	12.961	5,816.9
1.66	8.440	13.082	5,871.2
1.67	8.518	13.204	5,925.7
1.68	8.597	13.325	5,980.4
1.69	8.676	13.447	6,035.2
1.70	8.755	13.570	6,090.2
1.71	8.834	13.693	6,145.4
1.72	8.914	13.816	6,200.8
1.73	8.994	13.940	6,256.3
1.74	9.074	14.064	6,312.0
1.75	9.154	14.189	6,367.9

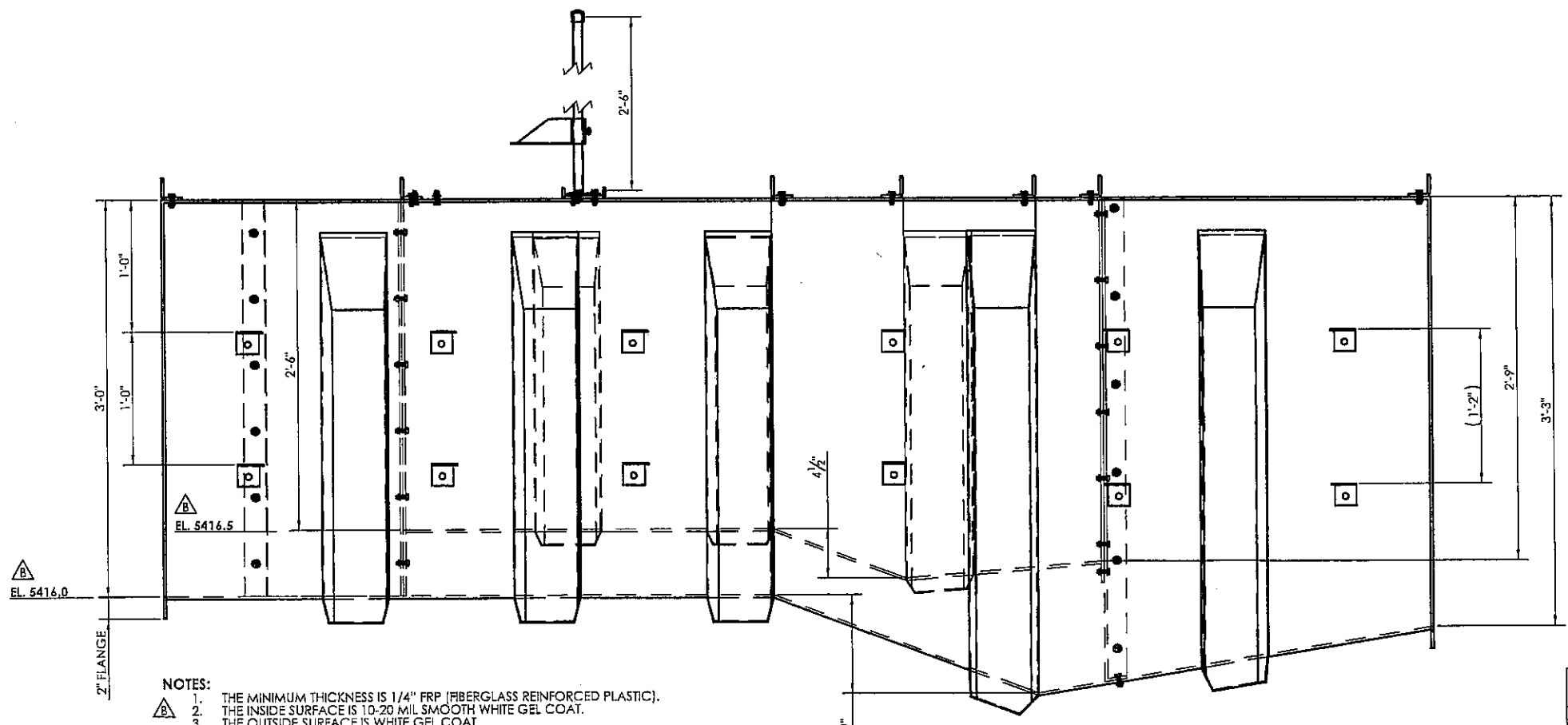
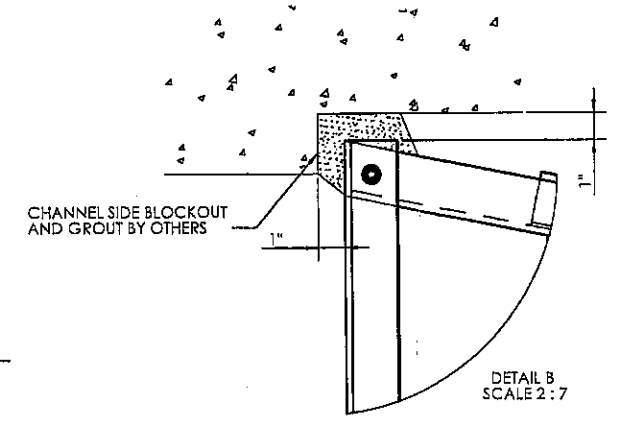
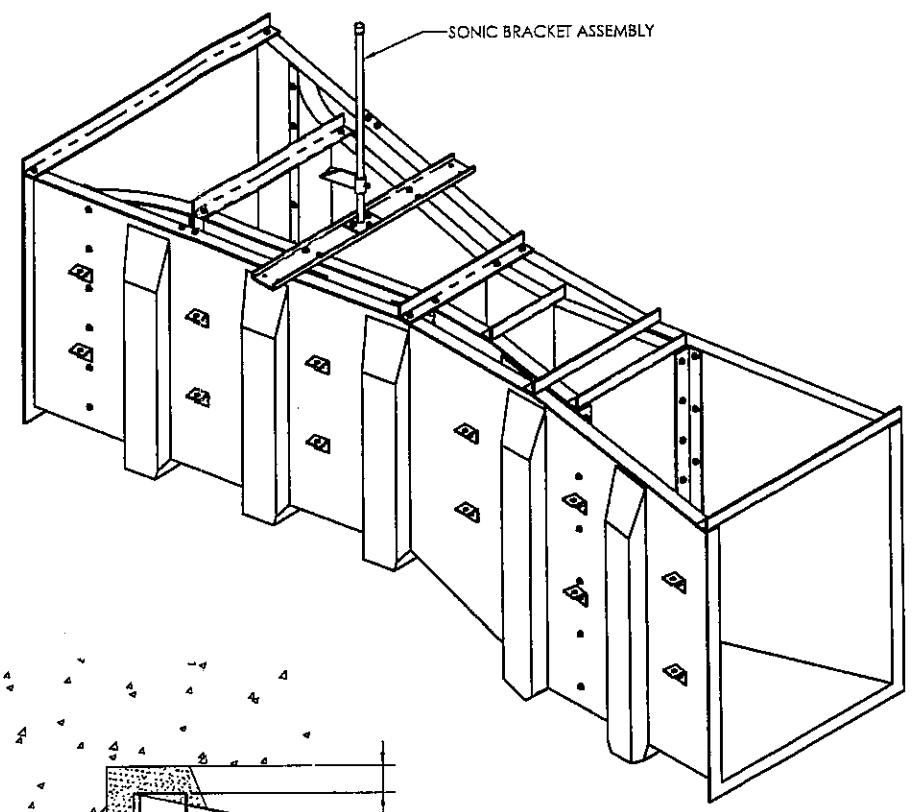
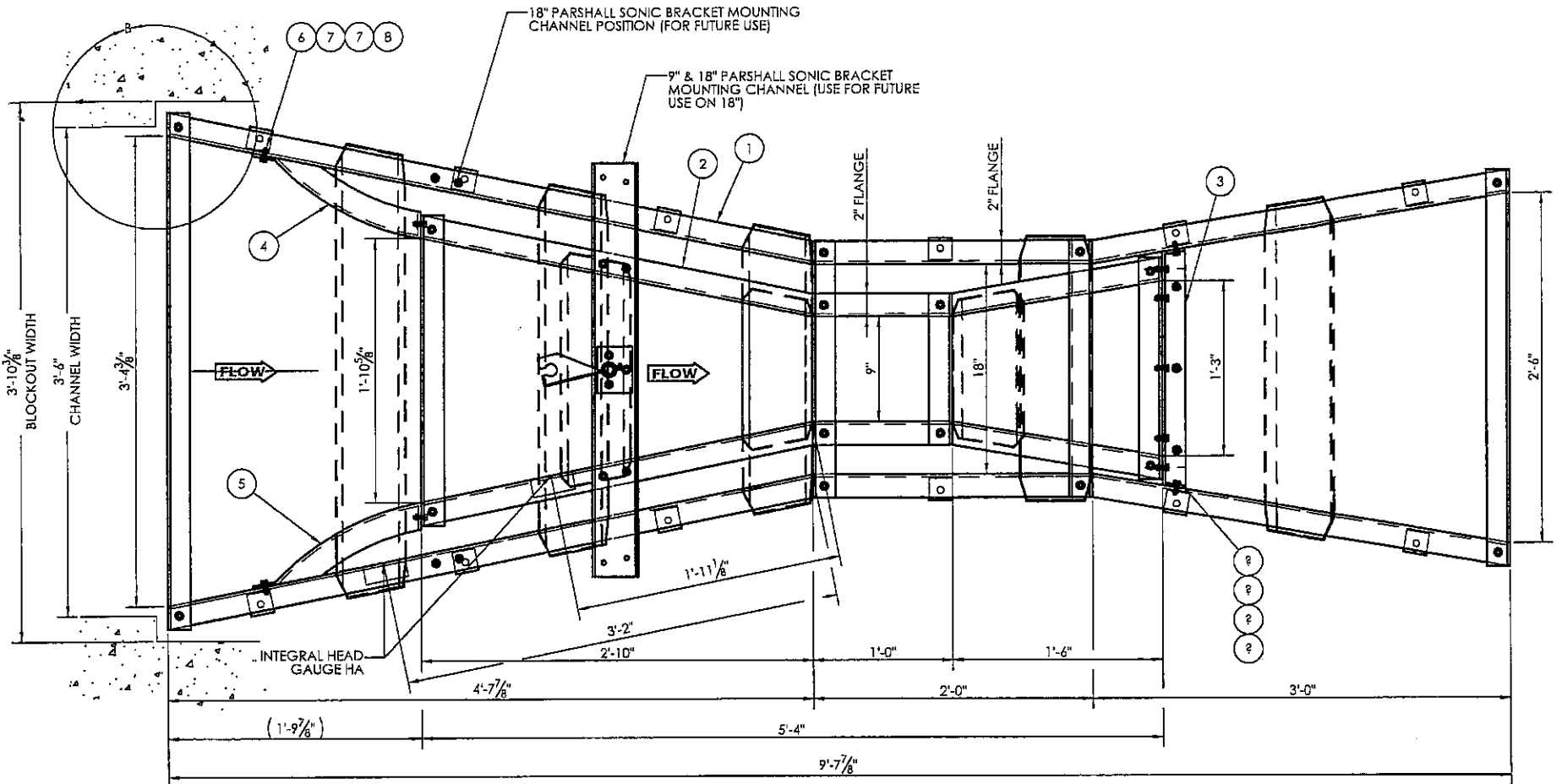


Flow Chart for 18" Parshall Flume

1.76	9.235	14.314	6,424.0
1.77	9.315	14.439	6,480.2
1.78	9.396	14.565	6,536.6
1.79	9.478	14.691	6,593.1
1.80	9.559	14.817	6,649.9
1.81	9.641	14.944	6,706.8
1.82	9.723	15.071	6,763.8
1.83	9.805	15.199	6,821.1
1.84	9.888	15.326	6,878.5
1.85	9.971	15.455	6,936.1
1.86	10.054	15.583	6,993.8
1.87	10.137	15.712	7,051.7
1.88	10.221	15.842	7,109.8
1.89	10.304	15.972	7,168.1
1.90	10.388	16.102	7,226.5
1.91	10.472	16.232	7,285.1
1.92	10.557	16.363	7,343.8
1.93	10.642	16.494	7,402.7
1.94	10.727	16.626	7,461.8
1.95	10.812	16.758	7,521.0
1.96	10.897	16.890	7,580.4
1.97	10.983	17.023	7,640.0
1.98	11.069	17.156	7,699.7
1.99	11.155	17.290	7,759.6
2.00	11.241	17.423	7,819.7
2.01	11.328	17.558	7,879.9
2.02	11.414	17.692	7,940.3
2.03	11.501	17.827	8,000.8
2.04	11.589	17.962	8,061.5
2.05	11.676	18.098	8,122.3
2.06	11.764	18.234	8,183.4
2.07	11.852	18.370	8,244.5
2.08	11.940	18.507	8,305.9
2.09	12.028	18.644	8,367.4
2.10	12.117	18.781	8,429.0
2.11	12.206	18.919	8,490.8
2.12	12.295	19.057	8,552.8
2.13	12.384	19.195	8,614.9
2.14	12.474	19.334	8,677.2
2.15	12.563	19.473	8,739.7

2.16	12.653	19.613	8,802.3
2.17	12.744	19.753	8,865.0
2.18	12.834	19.893	8,927.9
2.19	12.925	20.033	8,991.0
2.20	13.016	20.174	9,054.2
2.21	13.107	20.315	9,117.6
2.22	13.198	20.457	9,181.1
2.23	13.290	20.599	9,244.8
2.24	13.381	20.741	9,308.6
2.25	13.473	20.884	9,372.6
2.26	13.566	21.027	9,436.8
2.27	13.658	21.170	9,501.1
2.28	13.751	21.314	9,565.5
2.29	13.844	21.457	9,630.1
2.30	13.937	21.602	9,694.9
2.31	14.030	21.746	9,759.8
2.32	14.123	21.891	9,824.8
2.33	14.217	22.037	9,890.0
2.34	14.311	22.182	9,955.4
2.35	14.405	22.328	10,021
2.36	14.500	22.474	10,087
2.37	14.594	22.621	10,152
2.38	14.689	22.768	10,218
2.39	14.784	22.915	10,284
2.40	14.879	23.063	10,351
2.41	14.975	23.211	10,417
2.42	15.070	23.359	10,484
2.43	15.166	23.508	10,550
2.44	15.262	23.657	10,617
2.45	15.359	23.806	10,684
2.46	15.455	23.956	10,751
2.47	15.552	24.106	10,819
2.48	15.649	24.256	10,886
2.49	15.746	24.407	10,954
2.50	15.844	24.557	11,021

REV.	DESCRIPTION	NCR/ECCO NO.	REVISED BY	DATE
A	FOR APPROVAL		J.LAUGHUN	9/09/2011
B	ADDED MIL THICKNESS, CHANGED GAUGE TYPE, CLARIFIED TOTAL WEIGHT, ADDED ELEVATIONS		J.LAUGHUN	10/5/2011



BOM TABLE			
ITEM NO.	QTY.	DESCRIPTION	MATERIAL
1	1	18" PARSHALL FLUME	FRP (HLU, POLYESTER)
2	1	9" PARSHALL FLUME SET-UP TO NEST INTO 18" PARSHALL FLUME	FRP (HLU, POLYESTER)
3	1	OUTLET BULKHEAD, 9" PARSHALL FLUME NESTED IN 18" PARSHALL FLUME	FRP (HLU, POLYESTER)
4	1	INLET WING WALL, RIGHT SIDE, 18" PARSHALL FLUME X 3'-0" LG	FRP (HLU, POLYESTER)
5	1	INLET WING WALL, LEFT SIDE, 18" PARSHALL FLUME X 3'-0" LG	FRP (HLU, POLYESTER)
6	56	HHCS, 5/16-18UNC X 1"	T-316 S/S
7	112	FLAT WASHER, 5/16	T-316 S/S
8	56	HEX NUT, 5/16-18UNC	T-316 S/S

- NOTES:**
1. THE MINIMUM THICKNESS IS 1/4" FRP (FIBERGLASS REINFORCED PLASTIC).
 2. THE INSIDE SURFACE IS 10-20 MIL SMOOTH WHITE GEL COAT.
 3. THE OUTSIDE SURFACE IS WHITE GEL COAT.
 4. MINIMUM GLASS CONTENT IS 30%, EXCLUSIVE OF RESIN RICH SURFACES.
 5. THE HEAD GAGE (100THS OF A FOOT) IS MOLDED INTO THE SIDE OF THE FLUME.
 6. PLACE SMALL FLOW DIRECTION ARROW DECAL ON BOTTOM OF FLUME @ APPROXIMATELY 3" FROM INLET END.
 7. PLACE PLASTI-FAB LOGO LABEL ON TOP FLANGE AT APPROXIMATE CENTER-LINE OF MEASUREMENT POINT OR GAGE LOCATION.
 8. WEIGHT SHOWN ON DRAWING IS TOTAL WEIGHT FOR BOTH FLUMES.
 9. RESIN: CCP STYPOL C1-1200-22.

PROJECT: HAROLD D THOMPSON WATER RECLAMATION FOUNTAIN, COLORADO USA CUSTOMER: WEAVER CONSTRUCTION	TUALATIN, OR. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN FEET/INCHES	PLASTI-FAB PART NUMBER: MATERIAL INFORMATION: SPECIAL FINISH REQUIREMENT:	TITLE: 9" PARSHALL FLUME NESTED IN 18" PARSHALL FLUME QUANTITY (1) ONLY
REP: GOBLE SAMPSON P.O. NO: 9103-6610 PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF PLASTI-FAB. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF PLASTI-FAB IS PROHIBITED.	TOLERANCES UNLESS OTHERWISE SPECIFIED: ≤ 6'-0" ± 1/16" > 6'-0" AND ≤ 25'-0" ± 1/8" > 25'-0" ± 1/2"	NAME: J.LAUGHUN DATE: 9/9/2011 DRAWN BY: CHECKED BY:	SIZE: D DRAWING NO.: 111426-1A-01 WEIGHT: 360 SCALE: 1:8 SHEET: 1 OF 1