SECTION

APPENDIX K.

CREST PAD TESTING DOCUMENTATION

K.1

CONSTRUCTION FIELD DENSITY TESTING

FIELD DENSITY TEST (ASTM D-6938)

ENVIROTECH

2500 N. 11th Street | Enid, OK 73701
(580) 234-8780 | Fax (580) 237-4302

Client: Washington Closure Hanford

Submittal: 05-18B Earthwork Field Data

Soil Information

Project:	ERDF Cells 9-10 Expansion		
Project ID:	S013213A00		
Report No.	05-016-041 Date	4/7/2010	
Description:	Brown/Black Sand		
Troxler ID:	27881		
Moist Std:	647	Density Std:	2227
Moist offset:	-	Density offset:	-
Allowable Moisture Range:		N/A	
Necessary % Proctor:		95%	

Proctor:	SF-05
Max Dry Density (pcf)	124.4
Optimum Moisture (%):	12.5%
Proctor:	SF-06
Max Dry Density (pcf):	120.8
Optimum Moisture (%):	14.3%
Proctor:	SF-07
Max Dry Density (pcf):	117.3
Optimum Moisture (%):	12.5%

Test No	Location	Pr.	Lift	Time	Oper	Depth (in.)	Wet Density (pcf)	Moist Content (%)	% Proctor (calc)	Dry Density (calc)	Pass / Fail
Cell 9 Crest Pad											
CP9-01	Cell 9 Crest Pad Bldg.	SF-06	Sub	9:00	LH	12	128.6	9.3%	97.4%	117.7	PASS
CP9-02	Cell 9 Crest Pad Bldg.	SF-06	Sub	9:05	LH	12	129.6	10.1%	97.4%	117.7	PASS
CP9-03	Cell 9 Crest Pad Bldg.	SF-07	1	9:25	LH	6	127.4	13.5%	95.7%	112.2	PASS
CP9-04	Cell 9 Crest Pad Bldg.	SF-07	1	9:30	LH	6	126.6	12.3%	96.1%	112.7	PASS
CP9-05	Cell 9 Crest Pad Bldg.	SF-07	2	10:45	LH	6	128.7	14.8%	95.6%	112.1	PASS
CP9-06	Cell 9 Crest Pad Bldg.	SF-07	2	10:50	LH	6	132.8	15.0%	98.4%	115.5	PASS
CP9-07	Cell 9 Crest Pad Bldg.	SF-07	3	12:45	LH	6	125.5	9.9%	97.4%	114.2	PASS
CP9-08	Cell 9 Crest Pad Bldg.	SF-07	3	12:50	LH	6	131.1	15.1%	97.1%	113.9	PASS
CP9-09	Cell 9 Crest Pad Bldg.	SF-07	4	13:50	LH	6	127.4	12.8%	96.3%	112.9	PASS
CP9-10	Cell 9 Crest Pad Bldg.	SF-07	4	13:55	LH	6	130.0	15.4%	96.0%	112.7	PASS
Leachate Transmission Line											
MH34-01	MH-34 Subgrade	SF-05	Sub	9:40	LH	12	129.5	9.5%	95.1%	118.3	PASS
MH34-02	MH-34 Subgrade	SF-05	Sub	9:45	LH	12	130.2	8.1%	96.8%	120.4	PASS
MH35-01	MH-35 Subgrade	SF-05	Sub	9:50	LH	12	131.4	7.9%	97.9%	121.8	PASS
MH35-02	MH-35 Subgrade	SF-05	Sub	9:55	LH	12	130.5	8.6%	96.6%	120.2	PASS

Reviewed by: TW

Envirotech Engineering & Consulting, Inc

5/5/10
Date

UNIT WEIGHT OF COMPACTION
BY SAND CONE (ASTM 1556)

ENVIROTECH

2500 N. 11th Street | Enid, OK 73701
(580) 234-8780 | Fax (580) 237-4302

Client:	WCH
Submittal:	05-18B Earthwork Field Data

Sample Information

Contact Name:	Charlie Skiba			Sample ID:	CP9-07
Project:	S013213A00			Sample Description:	Brown Sand
Project Location:	ERDF Cells 9-10			Sampling Date:	4/7/2010
Tested By:	L. Hay	Date:	4/7/2010	Sampled By:	L.Hay
Reviewed By:	J. Voss	Date:	4/8/2010	Date Received:	4/7/2010
Comments				Report No.:	05-016-041

FIELD UNIT WEIGHT - SAND CONE METHOD

Calibration of Unit Weight of Ottawa Sand

1. Mass of Proctor mold, W_1	3955.80 g
2. Mass of Proctor mold + sand, W_2	5396.10 g
3. Volume of mold, V_1	0.03 ft
4. Dry unit weight, $Y_{d\,(sand)} = \frac{W_2 - W_1}{V_1}$	95.26 lb/ft^3

Calibration Cone

5. Mass of bottle + cone + sand (before use), W_3	6718.40 g
6. Mass of bottle + cone + sand (after use), W_4	5097.10 g
7. Weight of sand to fill the cone, $W_c = W_4 - W_3$	3.57 lb

Results from Field Tests

8. Mass of bottle + cone + sand (before use), W_6	6424.5 g
9. Mass of bottle + cone + sand (after use), W_8	3146.1 g
10. Volume of hole, $V_2 = \frac{W_6 - W_8 - W_c}{\gamma\, d\,(sand)}$	0.0384 ft^3
11. Mass of gallon can, W_5	0.00 g
12. Mass of gallon can + moist soil, W_7	2188.30 g
13. Mass of gallon can + dry soil, W_9	1993.90 g
14. Moist unit weight of soil in field, $\gamma = W_7 - W_5 / V_2$	125.80 lb/ft^3
15. Moisture content in the field, $w\,(\%) = \frac{W_7 - W_9}{W_9 - W_5} \times 100$	9.7%
16. Dry unit weight in the field, $_{d\,(sand)} = \gamma / (1+(w\,(\%)/100)$	114.62 lb/ft^3
17. Comparision moisture content =	9.9%
18. Dry unit weight comparison =	114.2 lb/ft^3

FIELD DENSITY TEST (ASTM D-6938)

ENVIROTECH

2500 N. 11th Street | Enid, OK 73701
(580) 234-8780 | Fax (580) 237-4302

Client: Washington Closure Hanford

Submittal: 05-18B Earthwork Field Data

Soil Information

Project:	ERDF Cells 9-10 Expansion	Proctor:	SF-05
Project ID:	S013213A00	Max Dry Density (pcf):	124.4
Report No	05-016-051 Date 4/21/2010	Optimum Moisture (%):	12.5%
Description:	Brown/Black Sand	Proctor:	SF-06
Troxler ID:	27881	Max Dry Density (pcf):	120.8
Moist Std.	637 Density Std: 2223	Optimum Moisture (%):	14.3%
Moist offset:	- Density offset: -	Proctor:	
Allowable Moisture Range.	N/A	Max Dry Density (pcf):	
Necessary % Proctor:	95%	Optimum Moisture (%):	

Test No	Location	Pr.	Lift	Time	Oper	Depth (in.)	Wet Density (pcf)	Moist Content (%)	% Proctor (calc)	Dry Density (calc)	Pass / Fail
	Manhole #36										
MH36-01	Manhole #36 Subgrade	SF-05	Sub	14:45	TW	12	132.9	5.2%	101.6%	126.3	PASS
MH36-02	Manhole #36 Subgrade	SF-05	Sub	14:50	TW	12	134.5	4.8%	103.2%	128.3	PASS
	Manhole #36										
MH37-01	Manhole #37 Subgrade	SF-05	Sub	15:00	TW	12	127.8	5.3%	97.6%	121.4	PASS
MH37-02	Manhole #37 Subgrade	SF-05	Sub	15:05	TW	12	132.0	4.6%	101.4%	126.2	PASS
	Crest Pad Cell 9										
CP9-11	Discharge line CP #9	SF-06	1	13:45	TW	6	121.6	17.0%	86.0%	103.9	FAIL
SCV-05	N. Berm West of CP #9	SF-06		15:30	TW	6	120.6	4.4%	95.6%	115.5	-

Reviewed by: TW

Envirotech Engineering & Consulting, Inc

5/5/10
Date

UNIT WEIGHT OF COMPACTION
BY SAND CONE (ASTM 1556)

ENVIROTECH

2500 N. 11th Street | Enid, OK 73701
(580) 234-8780 | Fax (580) 237-4302

Client: WCH
Submittal: 05-18B Earthwork Field Data

Sample Information

Contact Name:	Charlie Skiba			Sample ID:	SCV-05
Project:	S013213A00			Sample Description:	Brown/Black Sand
Project Location:	ERDF Cells 9-10			Sampling Date:	4/21/2010
Tested By:	T. Williams	Date:	4/21/2010	Sampled By:	T. Williams
Reviewed By:	J. Voss	Date:	4/22/2010	Date Received:	4/21/2010
Comments				Report No.:	05-016-051

FIELD UNIT WEIGHT - SAND CONE METHOD

Calibration of Unit Weight of Ottawa Sand

1. Mass of Proctor mold, W_1	3955.80 g
2. Mass of Proctor mold + sand, W_2	5396.10 g
3. Volume of mold, V_1	0.03 ft
4 Dry unit weight, $\gamma_{d\,(sand)} = \frac{W_2 - W_1}{V_1}$	95.26 lb/ft^3

Calibration Cone

5. Mass of bottle + cone + sand (before use), W_3	6718.40 g
6. Mass of bottle + cone + sand (after use), W_4	5097.10 g
7. Weight of sand to fill the cone, $W_c = W_4 - W_3$	3.57 lb

Results from Field Tests

8. Mass of bottle + cone + sand (before use), W_6	6399.0 g
9. Mass of bottle + cone + sand (after use), W_8	3218.8 g
10. Volume of hole, $V_2 = \frac{W_6 - W_8 - W_c}{\gamma\, d\,(sand)}$	0 0361 ft^3
11. Mass of gallon can, W_5	174.30 g
12. Mass of gallon can + moist soil, W_7	2182.80 g
13. Mass of gallon can + dry soil, W_9	2075.50 g
14. Moist unit weight of soil in field, $\gamma = W_7 - W_5 / V_2$	122.73 lb/ft^3
15. Moisture content in the field, $w\,(\%) = \frac{W_7 - W_9}{W_9 - W_5} \times 100$	5.6%
16. Dry unit weight in the field, $\gamma_{d\,(sand)} = \gamma / (1+(w\,(\%)/100)$	116.18 lb/ft^3
17. Comparision moisture content =	4.4%
18 Dry unit weight comparison =	115.5 lb/ft^3

FIELD DENSITY TEST (ASTM D-6938)

ENVIROTECH

2500 N. 11th Street | Enid, OK 73701
580) 234-8780 | Fax (580) 237-4302

Client: Washington Closure Hanford

Submittal: 05-18B Earthwork Field Data

Soil Information

Project:	ERDF Cells 9-10 Expansion			Proctor	SF-01
Project ID.	S013213A00			Max Dry Density (pcf)	113.6
Report No.	05-016-071	Date	5/19/2010	Optimum Moisture (%).	12.4%
Description:	Brown/Black Sand			Proctor	SF-06
Troxler ID	27881			Max Dry Density (pcf).	120.8
Moist Std.	650	Density Std	2245	Optimum Moisture (%)	14.3%
Moist offset.	-	Density offset.	-	Proctor	SF-07
Allowable Moisture Range.		N/A		Max Dry Density (pcf)	117.3
Necessary % Proctor.		90%		Optimum Moisture (%)	12.5%

Test No	Location	Pr.	Lift	Time	Oper	Depth (in.)	Wet Density (pcf)	Moist Content (%)	% Proctor (calc)	Dry Density (calc)	Pass / Fail
Leachate Transmission Trench Backfill											
LT-25	Backfill MH-32 to MH-33	SF-06	3	6:45	LH	6	125.5	9.1%	95.2%	115.0	PASS
LT-26	Backfill MH-32 to MH-33	SF-06	3	6:50	LH	6	127.4	9.7%	96.1%	116.1	PASS
LT-27	Backfill MH-32 to MH-33	SF-06	4	8:05	LH	6	126.3	7.1%	97.6%	117.9	PASS
LT-28	Backfill MH-32 to MH-33	SF-06	4	8:10	LH	6	125.9	6.5%	97.9%	118.2	PASS
Crest Pad 9 Foundation Backfill											
CP9-15	Crest Pad 9 Backfill	SF-06	1	9:00	LH	6	127.1	9.1%	96.4%	116.5	PASS
CP9-16	Crest Pad 9 Backfill	SF-06	2	10:00	LH	6	126.3	8.3%	96.5%	116.6	PASS
CP9-17	Crest Pad 9 Backfill	SF-06	3	12:30	LH	6	128.3	11.0%	95.7%	115.6	PASS
CP9-18	Crest Pad 9 Backfill	SF-06	4	14:00	LH	6	129.0	12.4%	95.0%	114.8	PASS

Reviewed by.

Envirotech Engineering & Consulting, Inc

5-24-2010
Date

K.2

PIPE PRESSURE TESTING

5-97-001

LEACHATE COLLECTION PIPE SYSTEM CQC REPORT

The contents of this CQC are presented to demonstrate TradeWind Services, LLC is in conformance with specification 0600X-SP-M0032, 3.5, PIPE, VALVES & SPECIALS. Itemized in this reports are segments showing verification of receipt of materials, conformance of materials to the requirements, equipment & device inspection upon installation, and field testing data for installed pipe. Pipe was placed in approximately 500 ft. lengths between newly installed manholes on the north side of the disposal facility. Testing was conducted for the inside and outside of the dual contained pipe using hydrostatic and pneumatic methods, respectively.

WASHINGTON CLOSURE HANFORD	JOB NO. 14655
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP	

1. ☑ Work may proceed.
2. ☐ ~~Revise and resubmit. Work may proceed prior to resubmission.~~ ~~SEE COMMENTS~~ CVS 12/8/10
3. ☐ Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments.
4. ☐ Revise and resubmit. Work may not proceed.
5. ☐ Permission to proceed not required.

CVS 12-8-10

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.

	CIVIL/ STRUCTURAL/ ARCHITECTURAL/ GEOTECHNICAL	ELECTRICAL	MECHANICAL	PROCESS/ NUCLEAR	CADD	PROJECT REP.	ENVIRONMENTAL	WASTE MANAGEMENT	SAFETY	INDUSTRIAL HYGIENE	FIRE PROTECTION	QA	CQA	FIELD ENGINEER	STR
CHECK REVIEW REQUIREMENT	✓											✓	✓		✓
REVIEWED BY	✓											✓	✓		✓

C.V. Project Engineer/STR — 11-29-10 Date

DOCUMENT ID NUMBER

5012308A00 - 05-097 - 001

SC/P.O. No. — SSRS ITEM — SUBMITTAL

WCH DE 032 (01/15/2007) — E0705051

RECEIVED
NOV 17 2010
MSP 11/17/10
WCH - DOCUMENT CONTROL

~~COMMENTS:~~
~~DATE MISSING~~
~~CORRECTION TAPE USED (NOT VIOLATION)~~
~~SOME REPORTS HAVE "BLOTCH OVER" USE "INITIAL + DATE~~
~~(e.g. 12/15/10 12/2/10 CVS)~~
CVS 12-8-10

+ PER SECOND COPY

~~PASS/FAIL ✓ ?~~

Cells 9 & 10

Material Receipts

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-17 PENETRATION Area: TANK #4 Test # 29

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 12 x 18 CARRIER For Test Pressures on which system:

Test Pressure: 30-40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 36 psi + 5% allowed Time: 2:10

Finish Test Pressure: 35.5 psi + 5% allowed Time: 3:10 Pass/~~Fail~~: ✓ Pass

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 29607

Gauge Serial# 438570-A Calibration Date: 8-12-10. Calibration Expiration Date: 8-12-11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James Hatton BMWC Representative	9/16/10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	9/16/10 Date
[illegible] WCH - CONTRACTOR	09.16.10 Date
[illegible] CQA - SUBCONTRACTOR	9/16/10 Date

Hydro Test Report Form.xls

Date: 3-22-10

ERDF CELLS 9 & 10 CONSTRUCTION
MATERIALS RECEIPT INSPECTION

ITEM	QUANITY	SPEC	ACCEPTED	STORED LOCATION
MANHOLE 21 MONOLITHIC BASE	1 EA	0600X-DD-M0059	JW 3-22-10	N/A
MH 39 MONO. BASE	1 EA	0600X-DD-M0059	JW 3-22-10	N/A
MH 32 MONO. BASE	1 EA	0600X-DD-M0057	JW 3-30-10	N/A
MH 33 MONO BASE	1 EA	0600X-DD-M0057	JW 3-30-10	N/A
MH 34 MONO BASE	1 EA	0600X-DD-M0058 DETAIL 2	JW 4-9-10	N/A
MH 35 MONO BASE	1 EA	↓	JW 4-9-10	N/A
MH 36 MONO	1 EA	↓	JW 4-22-10	N/A
MH 37 MONO BASE	1 EA	↓	JW 4-22-10	N/A
MH 38 MONO BASE	1 EA	0600X-DD-M0058 DETAIL 1	JW 6-3-10	N/A
2' RISERS	3 EA	0600X-DD-M0057 0600X-DD-M0058	JW 9-20-10	N/A
LIDS (21, 33, 39, 34)	4 EA	↓	JW 9-20-10	N/A
RISERS	2 EA	↓	JW 9-23-10	N/A
LIDS	5 EA	↓	JW 9-29-10	N/A
RISERS	2 EA	↓	JW 9-29-10	N/A
3' RISER	1 EA	↓	JW 10-12-10	N/A

Date: _____

ERDF CELLS 9 & 10 CONSTRUCTION
MATERIALS RECEIPT INSPECTION

ITEM	QUANITY	SPEC	ACCEPTED	STORED LOCATION
FUSION COUPLING	1 EA	CE00X-SP-M0032	[illegible] 9-28-10	BMWC
LEAK DETECTION RISER	1 EA		[illegible] 9-30-10	BMWC
FUSION COUPLING	2 EA		[illegible] 10-5-10	BMWC
4" ELBOW	1 EA		[illegible] 10-5-10	BMWC

Date 10-23-10

ERDF CELLS 9 & 10 CONSTRUCTION
MATERIALS RECEIPT INSPECTION

ITEM	QUANITY	SPEC	ACCEPTED	STORED LOCATION
1½" TEE	2 EA	0000X-SP-M0032	AW 8-23-10	BMWC
1½" REDUCER TEE	4 EA			
PRIMER	1 EA			
METAL CAN	6 EA			
1½" CAP	12 EA			
¾" BALL VALVE	3 EA			
¾" FLANGE	6 EA			
½" BALL VALVE	6 EA			
3" x ½" REDUCER TEE	2 EA			
4" PIPE PVC	20 FT			
3" PIPE PVC	40 FT			
1½" PIPE PVC	80 FT			
1" PIPE PVC	40 FT			
½" PIPE PVC	20 FT			
GAL. CEMENT	1 EA			
4" GATE VALVE	1 EA	CHANGE NOTICE 34	AW 9-14-10	N/A
12" GATE VALVE	1 EA			
4' x 36" VAULT	1 EA			
36" x 18" VAULT	1 EA			
12" x 18" 90°	1 EA			
4 x 8 TERMINATION	1 EA			
2 x 18 TERMINATION	1 EA			
4 x 8 PIPE	40 FT			
12 x 18 PIPE	20 FT			
2" PIPE	80 FT			

ERDF CELLS 9 & 10 CONSTRUCTION
MATERIALS RECEIPT INSPECTION

ITEM	QUANITY	SPEC	ACCEPTED	STORED LOCATION
4" BLIND FLANGE	2 EA	06COX-SP-M0032	GW 7-14-10	BMLC CONEX
3" 90° SCH. 80	17 EA		GW 8-23-10	
3" TEE SCH. 80	2 EA			
3"×2" BUSHING	2 EA			
2" PLUG	2 EA			
3" FLANGE RING	8 EA			
1½" BALL VALVE	10 EA			
1½" BALL CHECK VALVE	4 EA			
1½" TEE	4 EA			
4" FLANGE RING	2 EA			
4"×1½" TEE	4 EA			
4"×3" TEE	2 EA			
4"×3" BUSHING	2 EA			
3" PLUG	2 EA			
4" 90°	4 EA			
3" BALL VALVE	4 EA			
3" BALL CHECK	2 EA			
1½" PLUG	4 EA			
1½" 90°	44 EA			
1½"×1" BUSHING	8 EA			
1½" FLANGE	24 EA			
½" GASKET	12 EA			
BOLT PACKAGE	12 EA			

Date: 5-10-10

ERDF CELLS 9 & 10 CONSTRUCTION
MATERIALS RECEIPT INSPECTION

ITEM	QUANITY	SPEC	ACCEPTED	STORED LOCATION
18" DR 11	700 FT.	0600X-SP-M0032	JW 5-10-10	BMWC CONEX
~~1½" PIPE~~				
1 HP PUMP	4 EA	0600X-SP-M0032	JW 5-24-10	BMWC CONEX
7.5 HP PUMP	2 EA	↓	↓	↓
1½" DR 11 PIPE	1340 FT	↓	↓	↓
6" DR 11 PIPE	600 FT	0600X-SP-M0032	JW 6-1-10	BMWC CONEX
6" PERF. PIPE	40 FT.	↓	↓	↓
11 x ¾ FLANGE ADAPTER	12 EA	↓	↓	↓
¾ BALL VALVE	6 EA	↓	↓	↓
1½" POLY GROOVE	4 EA	↓	JW 6-10-10	↓
3" POLY GROOVE	2 EA	↓	↓	↓
STEEL THREAD FITTINGS	4 EA	↓	JW 6-10-10	BMWC CONEX
BOLT KITS	32 EA	↓	JW 6-22-10	BMWC CONEX
TERMINATION	3 EA	↓	JW 6-24-10	↓
6" CAP	1 EA	↓	JW 6-30-10	↓
ELECTRO FUSE COUPLINGS	6 EA	↓	JW 7-1-10	↓
4" FITTINGS	8 EA	↓	JW 7-6-10	↓
6" CAP	1 EA	↓	↓	↓
6" DR 11	60 FT	↓	↓	↓
10" CLAMP	9 EA	↓	JW 7-13-10	↓
¾" BALL VALVE	1 EA	↓	↓	↓
RISER CLAMP	1 EA	↓	↓	↓
10" GATE VALVE	1 EA	↓	↓	↓

Date: 4-27-10

ERDF CELLS 9 & 10 CONSTRUCTION
MATERIALS RECEIPT INSPECTION

ITEM	QUANITY	SPEC	ACCEPTED	STORED LOCATION
10" BLIND FLANGE	7 EA	06600-SP-M0032	JW 4-27-10	BMWC CONEX
3" DR 11	660 FT	↓	↓	↓
10"x4" DR 11 REDUCING TEE	2 EA	↓	↓	↓
10" SDR 11 FABBED TEE	5 EA	↓	↓	↓
8" DR 11	660 FT	↓	↓	↓
8" DR 17 x 4" END CENTRALIZER	6 EA	06600-SP-M0032	JW 4-28-10	BMWC CONEX
4" GATE VALVE	4 EA	↓	↓	↓
8" GATE VALVE	1 EA	↓	↓	↓
10" GATE VALVE	1 EA	↓	↓	↓
3/4" PVC FLANGE	34 EA	06600-SP-M0032	JW 5-3-10	BMWC CONEX
10 x 16 JOINTS	80 EA	06600-SP-M0032	JW 5-4-10	BMWC CONEX
10 x 16 JOINTS	1100 FT	↓	↓	↓
8 x 12 PIPE	20 FT	↓	↓	↓
12" PERF. PIPE	320 FT	↓	↓	↓
12" DR 11 PIPE	2240 FT	↓	↓	↓
1" FITTINGS	4 EA	↓	↓	↓
3" FITTINGS	2 EA	↓	↓	↓
FLOW MONITOR	2 EA	06600-SP-M0032	JW 5-5-10	BMWC CONEX
12" PERF. PIPE (LEACHATE)	1380 FT	06600-SP-M0032	JW 5-10-10	BMWC CONEX
12" PERF. PIPE (SUMP)	240 FT	↓	↓	↓
18" PERF. PIPE	50 FT	↓	↓	↓
8" PERF. PIPE	60 FT.	↓	↓	↓
12" DR 11	920 FT.	↓	↓	↓

Date: 4-20-10

ERDF CELLS 9 & 10 CONSTRUCTION
MATERIALS RECEIPT INSPECTION

ITEM	QUANITY	SPEC	ACCEPTED	STORED LOCATION
10"x16" TANK PENETRATIONS	1 EA	0600X-SP-M0032 2.4	JW 4-20-10	BMWC CONEX
8"x12" TANK PENETRATION	1 EA	0600X-SP-M0032 2.4	JW 4-20-10	BMWC CONEX
2" DR11 x 6" DR 17 TERMINATION	2 EA	0600X-SP-M0032 2.4	JW 4-20-10	BMWC CONEX
8" DR 17 x 4" CENTRALIZER	14 EA	0600X-SP-M0032	JW 4-20-10	BMWC CONEX
6" DR 17 x 2" CENTRALIZER	4 EA	0600X-SP-M0032	JW 4-20-10	BMWC CONEX
12" DR 17 x 8" CENTRALIZER	4 EA	0600X-SP-M0032	JW 4-20-10	BMWC CONEX
11 x 3/4 FLANGE ADAPTER	32 EA	0600X-SP-M0032	JW 4-22-10	BMWC CONEX
2" DR 11 IPS 90° ELBOW HDPE	2 EA	0600X-SP-M0032	JW 4-22-10	BMWC CONEX
10" DR 11 IPS BACKUP RING	4 EA	↓	JW 4-22-10	BMWC CONEX
8" DR 11 IPS TEE	1 EA	↓	JW 4-22-10	BMWC CONEX
2" DR 11 x 6" DR 17 TERMINATION	2 EA	0600X-SP-M0032	JW 4-23-10	BMWC CONEX
2" DR 11 IPS FLANGE ADAPTER	2 EA	↓	↓	↓
2" DR 11 IPS BACKUP RING	2 EA	↓	↓	↓
10" DR 11 x 16" DR 17 TERMINATION	14 EA	0600X-SP-M0032	JW 4-26-10	BMWC CONEX
10" DR 11 IPS FLANGE ADAPTER	6 EA	↓	↓	↓
10" DR 11 IPS FLANGE ADAPTER	8 EA	↓	↓	↓
10" DR 11 IPS BACKUP RING (IRON)	14 EA	↓	↓	↓
~~8" DR 11 IPS PERF PIPE~~		↓	↓	↓
8" DR 11 x 12" DR 17 TERMINATION	2 EA	↓	↓	↓
10" DR 11 x 16" DR17	1200 FT	↓	↓	↓
8" IPS BLIND FLANGE	1 EA	↓	↓	↓
8" LYSIMETER WYE	2 EA	0600X-SP-M0032	JW 4-27-10	BMWC CONEX
4" BLIND FLANGE	2 EA	↓	↓	↓

Date: 4-15-10

ERDF CELLS 9 & 10 CONSTRUCTION
MATERIALS RECEIPT INSPECTION

ITEM	QUANITY	SPEC	ACCEPTED	STORED LOCATION
8" DR 11 x 12" DR 17	20 FT	0600X-SP-M0032 2.9	JW 4-15-10	BMWC CONEX (EAST SIDE)
4" DR 11 x 8" DR 17	260 FT			
2" DR 11 x 6" DR 17	80 FT			
10" DR 11 x 16" DR 17	900 FT			
2" DR11 x 6" DR 17 90°	2 EA	0600X-SP-M0032 2.4		
10" DR11 x 16" DR 17 90°	1 EA			
8" DR 11 x 12" DR 17 90°	1 EA			
4" DR 11 x 8" DR 17 90°	3 EA			
4" DR 11 x 8" DR 17 22.5°	1 EA			
16" DR 17 x 10" END CENTRALIZER	14 EA			
12" DR 17 x 8" END CENTRALIZER	4 EA			
4" DR 11 x 8" DR 17 45°	4 EA	0600X-SP-M0032 2.4	JW 4-19-10	BMWC CONEX
2" DR 11 IPS FLANGE ADAPTER	2 EA	0600X-SP-M0032 2.3	JW 4-19-10	BMWC CONEX
2" LEAK DETECTION PENETRATION	1 EA	2.3		
2" DR 11 x 6" DR 17 END TERMINATION	1 EA	2.4		
4" DR11 IPS 90° HDPE 3408	4 EA	2.3		
4" DR 11 IPS PIPE HDPE 3408 ALWA F714	120 FT	2.3		
4" DR 11 IPS TEE	2 EA	2.3		
8" DR 11 IPS FLANGE ADAPTER 3408	2 EA	2.3		
10" DR 11 IPS FLANGE ADAPTER 3408	4 EA	2.3		
4" DR 11 IPS FLANGE ADAPTER	10 EA	2.3		
4" DR 11 IPS BACKUP RING DUCTILE IRON	10 EA	2.3		
4" x 8" TANK PENETRATION	1 EA	0600X-SP-M0032 2.4	JW 4-20-10	BMWC CONEX

Cells 9 & 10

Hydrostatic & Pneumatic Pressure Tests

Branom Instrument Co.

Since 1947

Service Dept.
5500 4th Ave. So.
Seattle, WA 98108

800-767-6051
FAX 206-763-4165
service@branom.com

Certificate of Calibration

Certification Number: 28750

Customer Name BMWC CONSTRUCTORS, INC

Address: 200 WEST AREA OF HANFORD
RICHLAND, WA 99354

Certification Date: 09-Apr-10

P O #: 402738-1016

Re-certification Due: 09-Apr-11

Branom Order #: 428736

Lab Temperature: 72.43° F

Technician: MIKE MCCARTY

Lab Humidity: 30.93%

Branom Instrument company certifies that the following instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology. The following certificate applies only to the instrument listed below.

Calibration Procedure: Calibrated to manufacturer's specifications.

Instrument

Description: MCDANIEL 4" 0-30PSI 1/2"LM

Serial Number: N/A

Customer ID#: 101121

Tolerance: ± 0.5% F.S.

Condition Found: IN TOLERANCE

Condition Left: IN TOLERANCE

Calibration Standard(s)

Standard Model	Standard Serial	Standard Due
WIKA 65-2000	0511292	05/08/2010

Calibration Readings

Calibration Standard Reading	Customer Instrument Reading	Acceptance Low	Acceptance High	Units of Measure
0.00	0.0	-0.15	0.15	PSI
15.00	15.0	14.85	15.15	PSI
30.00	30.0	29.85	30.15	PSI

Q.A. Manager

COREY PORTER

4/9/10

Date of Issue

This certificate shall not be reproduced except in full without written approval of Branom Instrument Company.

Certificate Revised 12/26/2006 Printed: 12-Apr-10 Page: 1

Branom Instrument Co.

Since 1947

Service Dept.
5500 4th Ave. So.
Seattle, WA 98108

800-767-6051
FAX 206-763-4165
service@branom.com

RECEIVED
MAY 13 2010
WCH - DOCUMENT CONTROL

Certificate of Calibration

S012308A-00 05.110 00

Certification Number: 28846

Customer Name BMWC CONSTRUCTORS, INC

Address: 20638 84TH AVE S
KENT, WA 98032

Certification Date: 28-Apr-10

P O #: 402738

Re-certification Due: 28-Apr-11

Branom Order #: 430371

Lab Temperature: 72.04° F

Technician: COREY PORTER

Lab Humidity: 36.90%

Branom Instrument company certifies that the following instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology. The following certificate applies only to the instrument listed below.

Calibration Procedure: Calibrated to manufacturer's specifications.

Instrument

Description: NOSHOK 40.901-60PSI/KPA

Serial Number: 430371

Customer ID#: N/A

Tolerance: ± 1% F.S.

Condition Found: IN TOLERANCE

Condition Left: IN TOLERANCE

Calibration Standard(s)

Standard Model	Standard Serial	Standard Due
WIKA 65-2000	0511292	05/08/2010

Calibration Readings

Calibration Standard Reading	Customer Instrument Reading	Acceptance Low	Acceptance High	Units of Measure
0.00	0.0	-0.6	0.6	PSI
30.00	30.0	29.4	30.6	PSI
60.00	59.8	59.4	60.6	PSI

Q.A. Manager

COREY PORTER

4/28/10
Date of Issue

This certificate shall not be reproduced except in full without written approval of Branom Instrument Company.

Submitted as 5-110-008

Branom Instrument Co.

Since 1947

Service Dept.
5500 4th Ave. So.
Seattle, WA 98108

800-767-6051
FAX 206-763-4165
service@branom.com

Certificate of Calibration

Copy

Certification Number: 29607

Customer Name	BMWC CONSTRUCTORS		
Address:	20638 84TH AVE S		
	KENT, WA 98032	Certification Date:	12-Aug-10
P O #:	CASH SALE	Re-certification Due:	12-Aug-11
Branom Order #:	438570	Lab Temperature:	73.1° F
Technician:	JESSE LABBE	Lab Humidity:	50.5%

Branom Instrument company certifies that the following instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology. The following certificate applies only to the instrument listed below.

Calibration Procedure: Calibrated to manufacturer's specifications.

Instrument

Description:	NOSHOK 40.901-60PSI/KPA		
Serial Number:	438570-A	Customer ID#:	N/A
Tolerance:	± 1% F.S.	Condition Found:	IN TOLERANCE
		Condition Left:	IN TOLERANCE

Calibration Standard(s)

Standard Model	Standard Serial	Standard Due
WIKA 65-2000	0511292	05/26/2011

Calibration Readings

Calibration Standard Reading	Customer Instrument Reading	Acceptance Low	Acceptance High	Units of Measure
0.00	0.0	-0.6	0.6	PSI
30.00	30.0	29.4	30.6	PSI
60.00	60.0	59.4	60.6	PSI

Q.A. Manager

COREY PORTER

8/12/10
Date of Issue

This certificate shall not be reproduced except in full without written approval of Branom Instrument Company.

Branom Instrument Co.

Since 1947

Service Dept.
5500 4th Ave. So.
Seattle, WA 98108

800-767-6051
FAX 206-763-4165
service@branom.com

Certificate of Calibration

Certification Number: 28531

Customer Name BMWC CONSTRUCTORS

Address: PO BOX 1316
KENT, WA 98035-1316

Certification Date: 09-Mar-10

P O #: 402738-1001

Re-certification Due: 09-Mar-11

Branom Order #: 424942

Lab Temperature: 72.58° F

Technician: JESSE LABBE

Lab Humidity: 30.79%

Branom Instrument company certifies that the following instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology. The following certificate applies only to the instrument listed below.

Calibration Procedure: Calibrated to manufacturer's specifications.

Instrument

Description: WIKA 332.54 SERIES P/N 4220081 0-300PSI

Serial Number: 369562

Customer ID#: N/A

Tolerance: ± 0.25% F.S.

Condition Found: OUT OF TOLERANCE

Condition Left: IN TOLERANCE

Calibration Standard(s)

Standard Model	Standard Serial	Standard Due
DM-T-150	11825	11/19/2011

Calibration Readings

Calibration Standard Reading	Customer Instrument Reading	Acceptance Low	Acceptance High	Units of Measure
0	0	-0.75	0.75	PSI
~~150~~	~~150~~	~~149.25~~	~~150.75~~	~~PSI~~
300	300	299.25	300.75	PSI

Q.A. Manager

COREY PORTER

3/9/10

Date of Issue

This certificate shall not be reproduced except in full without written approval of Branom Instrument Company.

Branom Instrument Co.

Since 1947

Service Dept.
5500 4th Ave. So.
Seattle, WA 98108

800-767-6051
FAX 206-763-4165
service@branom.com

Certificate of Calibration

Certification Number: 28532

Customer Name BMWC CONSTRUCTORS

Address: PO BOX 1316
KENT, WA 98035-1316

Certification Date: 09-Mar-10

P O #: 402738-1001

Re-certification Due: 09-Mar-11

Branom Order #: 424942

Lab Temperature: 72.58° F

Technician: JESSE LABBE

Lab Humidity: 30.79%

Branom Instrument company certifies that the following instrument meets or exceeds all published specifications and has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology. The following certificate applies only to the instrument listed below.

Calibration Procedure: Calibrated to manufacturer's specifications.

Instrument

Description: WIKA 332.54 SERIES P/N 4220081 0-300PSI

Serial Number: 400519-A

Customer ID#: N/A

Tolerance: ± 0.25% F.S.

Condition Found: OUT OF TOLERANCE

Condition Left: IN TOLERANCE

Calibration Standard(s)

Standard Model	Standard Serial	Standard Due
DM-T-150	11825	11/19/2011

Calibration Readings

Calibration Standard Reading	Customer Instrument Reading	Acceptance Low	Acceptance High	Units of Measure
0	0	-0.75	0.75	PSI
150	150	149.25	150.75	PSI
300	300	299.25	300.75	PSI

Q.A. Manager

COREY PORTER

3/9/10
Date of Issue

This certificate shall not be reproduced except in full without written approval of Branom Instrument Company.

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 40-2738 Unit: _____ Sequence # _____

Equipment/Line No.: 2"x6" FLOOR DRAIN (CARRIER PIPE) Area: _____ Test # 1

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 2"x6" CP 9 FLOOR DRAIN For Test Pressures on which system:

Test Pressure: 30 psi See Specification: 0600X-SP-M0032, 3.5

Reason For Test: New Piping Installation

Starting Test Pressure: 33 psi Time: 9:05 A.M.

Finish Test Pressure: 30 psi Time: 10:05 A.M. Pass/Fail: FAIL

Pass Criteria: (0) -Zero Leakage at specified test pressure.

Gauge Manufacturer: WIKA Calibration Certificate Number: 28532

Gauge Serial# 400519-A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump

Test Witnessed and Accepted By:

BMWC Representitive	Date
Delhur - SUBCONTRACTOR, QA/QC	Date
WCH - CONTRACTOR	Date
CQA	DATE

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 40-2738 Unit: _____ Sequence # _____

Equipment/Line No.: _____ Area: _____ Test # 1-A

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 2"×6" CP 9 FLOOR DRAIN For Test Pressures on which system:

Test Pressure: 30 psi See Specification: 0600X-SP-M0032, 3.5

Reason For Test: New Piping Installation

Starting Test Pressure: 34 psi Time: 10:25 A.M.

Finish Test Pressure: 34 psi Time: 11:25 A.M. Pass/Fail: PASS

Pass Criteria: (0) -Zero Leakage at specified test pressure.

Gauge Manufacturer: WIKA Calibration Certificate Number: 28532

Gauge Serial# 400519-A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump, CORRECTIVE ACTION: DRAIN PIPE WAS WATER COOLED TO MAINTAIN CONSISTENT TEMPERATURES ON THE LENGTH OF PIPE IN ORDER TO CONTROL EXPANSION DUE TO WARM WEATHER

Test Witnessed and Accepted By:

BMWC Representitive	4-22-10 Date
Delhur - SUBCONTRACTOR, QA/QC	4-22-10 Date
WCH - CONTRACTOR	4-22-10 Date
CQA	4-22-10 DATE

Hydro Test Report Form.xls

PNUEMATIC TEST REPORT FORM

MCF-10

BMW Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: Crest Pad #9 2"X6" Floor Drain Area: _____ Test # 1A-P

Service: 2"X6" Floor Drain 6" Containment Pipe Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: ~~10~~ 11 psi In Service Test ☐ (only checked, if in service test was performed)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 04/09/10 Calibration Expiration Date: 04/09/11

Date of Test: 4-22-10 12:30 Started time Duration of Test: 120 mins.

Final Test Pressure: 11 psi Pass ✓ Fail ☐

Comments: CQA observed BMWC "Snoop" The welds to Check for leaks. TW

Test Witnessed and Accepted By:

James A. Hatton — BMWC Representitive — Date: 4-22-10

Delhur - SUBCONTRACTOR, QA/QC — Date: 4-22-10

B Jack Howard, SIR — WCH - CONTRACTOR — Date: 4-22-10

CQA — Date: 4-22-10

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: 4"x8" CARRIER CPB#9 Area: _____ Test # 2

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 4"x8" CARRIER For Test Pressures on which system:

Test Pressure: 30 psi See Specification: 0600X-SP-M0032, 3.5

Reason For Test: New Piping Installation

Starting Test Pressure: 34 psi Time: 12:25

Finish Test Pressure: 33 psi Time: 2:25 Pass/Fail: Pass

Pass Criteria: ~~(0) Zero Leakage at specified test pressure.~~ 4-27-10

Gauge Manufacturer: WIKA Calibration Certificate Number: 28532

Gauge Serial# 400519-A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump

Test Witnessed and Accepted By:

BMWC Representitive	4-27-10 Date
Delhur - SUBCONTRACTOR, QA/QC	4-27-10 Date
WCH - CONTRACTOR	04.28.10 Date
CQA	4-27-10 DATE

Hydro Test Report Form.xls

PNUEMATIC TEST REPORT FORM

MCF-10

BMW Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CPB#9 4"x8" CONTAINMENT PIPE Area: _____ Test # 2-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi In Service Test ☐ (only checked, if in service test was performed)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 04/09/10 Calibration Expiration Date: 04/09/11

Date of Test: 4-27-10 2:40 P.M. Duration of Test: 120 mins.

Final Test Pressure: 11 psi Pass ☑ Fail ☐

Comments: CQA observed BMWC "Snoop" the Joints and observered no visible leaks. TW

Test Witnessed and Accepted By:

James A. Hatton BMWC Representitive	4/27/10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	4-27-10 Date
[illegible] WCH - CONTRACTOR	04-28-10 Date
[illegible] CQA	4-27-10

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CPB#10 4"x8" CARRIER PIPE Area: _____ Test # 3

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 4"x8" CARRIER

Test Pressure: 30 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, 3.5

Reason For Test: New Piping Installation

Starting Test Pressure: 36 psi Time: 1:05

Finish Test Pressure: 35 psi Time: 2:05 Pass/Fail: ✓ PASS

Pass Criteria: ~~(0) -Zero Leakage at specified test pressure.~~ 4-28-10

Gauge Manufacturer: WIKA Calibration Certificate Number: 28532

Gauge Serial# 400519-A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump

Test Witnessed and Accepted By:

BMWC Representitive	4-28-10 Date
Delhur - SUBCONTRACTOR QA/QC	4-28-10 Date
WCH - CONTRACTOR	4-29-10 Date
CQA	4-28-10 DATE

Hydro Test Report Form.xls

PNUEMATIC TEST REPORT FORM

MCF-10

BMW Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CPB #10 4"x8" CONTAINMENT PIPE Area: _____ Test # 3-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi In Service Test ☐ (only checked, if in service test was performed)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 04/09/10 Calibration Expiration Date: 04/09/11

Date of Test: 4-28-10 2:30 P.M. Duration of Test: 120 mins.

Final Test Pressure: 11 psi Pass ☑ Fail ☐

Comments:

Test Witnessed and Accepted By:

BMWC Representitive	4/28/10 Date
Delhur - SUBCONTRACTOR, QA/QC	4-28-10 Date
WCH - CONTRACTOR	4.29.10 Date
CQA	4-28-10

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CPB #10 2x6 CARRIER Area: _____ Test # 4

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 2"x6" CARRIER For Test Pressures on which system:

Test Pressure: 30-40 psi See Specification: 0600X-SP-M0032, 3.5

Reason For Test: New Piping Installation

Starting Test Pressure: 36 psi Time: 9:49 A.M.

Finish Test Pressure: 33 psi Time: 10:49 A.M. Pass/Fail: FAIL

Pass Criteria: (0) -Zero Leakage at specified test pressure.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump

Test Witnessed and Accepted By:

BMWC Representitive — Date

Delhur - SUBCONTRACTOR, QA/QC — Date

WCH - CONTRACTOR — Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CPB#10 2x6 CARRIER Area: _____ Test # 4A

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 2"x6" CARRIER For Test Pressures on which system:

Test Pressure: 30 - 40 psi See Specification: 0600X-SP-M0032, 3.5

Reason For Test: New Piping Installation

Starting Test Pressure: 36 psi Time: 11:45

Finish Test Pressure: 36 psi Time: 12:45 Pass/Fail: PASS

Pass Criteria: ~~(0) Zero Leakage at specified test pressure~~. 5 % LEAKAGE JW 5-5-10

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump

Test Witnessed and Accepted By:

James H. Hatton — 5-5-10
BMWC Representitive — Date

[signature] — 5-5-10
Delhur - SUBCONTRACTOR, QA/QC — Date

[signature] — 5-5-10
WCH - CONTRACTOR — Date

[signature] — 5-5-10
CQA.

Hydro Test Report Form.xls

PNUEMATIC TEST REPORT FORM

MCF-10

BMW Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CPB#10 2"x6" CONTAINMENT PIPE Area: _____ Test # 4A-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi In Service Test ☐ (only checked, if in service test was performed)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 04/09/10 Calibration Expiration Date: 04/09/11

Date of Test: 5-5-10 1:00 Duration of Test: ~~120~~ 15 mins. Thus 5-5-10

Final Test Pressure: 11 psi Pass ✓ Fail ☐

Comments: CQA Observed BMWC Soap Test all welds. TW

Test Witnessed and Accepted By:

James A. Hatton — BMWC Representitive — 5-5-10 Date

Delhur - SUBCONTRACTOR, QA/QC — 5-5-10 Date

WCH - CONTRACTOR — 5.5.10 Date

CQA — 5-5-10

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-33 TRANSMISSION LINE Area: _____ Test # 5

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10x16 CARRIER For Test Pressures on which system:

Test Pressure: 30 - 40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 37 psi + 5% allowed Time: 8:35 A.M.

Finish Test Pressure: 37 psi + 5% allowed Time: 9:35 Pass/Fail: ~~PASS~~ VOID

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Halton — 5-17-10
BMWC Representative — Date

Jeb Willi — 5-17-10
Delhur - SUBCONTRACTOR, QA/QC — Date

WCH - CONTRACTOR — Date

CQA - SUBCONTRACTOR — Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-33 TRANSMISSION LINE Area: _____ Test # 5A

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16 CARRIER

Test Pressure: 30-40 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 36 psi + 5% allowed Time: 8:05

Finish Test Pressure: 35 psi + 5% allowed Time: 9:05 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	5-19-10 Date
Delhur - SUBCONTRACTOR, QA/QC	5-19-10 Date
WCH - CONTRACTOR	05-19-10 Date
CQA - SUBCONTRACTOR	5-19-10 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-33 TRANSMISSION LINE Area: _____ Test # 5A-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

10x16 CONTAINMENT Piping ☑ Vessel ☐ Other _____

Test Pressure: 10.5 psi In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 5-19-10 9:55 A.M. Duration of Test: 10 mins.

Final Test Pressure: 10.5 psi Pass ☑ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H Hatton BMWC Representative	5-19-10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	5-19-10 Date
[illegible] WCH - CONTRACTOR	05-19-10 Date
[illegible] CQA - CONTRACTOR	5-19-10 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-21 TANK PENETRATION Area: _____ Test # 6

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 8 x 12 CARRIER

Test Pressure: 30-40 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 39 psi + 5% allowed Time: 6:55 A.M.

Finish Test Pressure: 38 psi + 5% allowed Time: 7:55 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton — 5-21-10
BMWC Representative — Date

[illegible] — 5-21-10
Delhur - SUBCONTRACTOR, QA/QC — Date

[illegible] — 05.21.10
WCH - CONTRACTOR — Date

[illegible] — 5-21-10
CQA - SUBCONTRACTOR — Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-21 TANK PENETRATION Area: _____ Test # 6-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

8 x 12 CONTAINMENT Piping ☑ Vessel ☐ Other _____

Test Pressure: 10 psi In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 5-21-10 8:40 AM Duration of Test: 10 mins.

Final Test Pressure: 10 psi Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Halton — BMWC Representative — 5-21-10 Date

Delhur - SUBCONTRACTOR, QA/QC — 5-21-10 Date

WCH - CONTRACTOR — 05.21.10 Date

CQA - CONTRACTOR — 5-21-10 Date

Pnuematic Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-21 TANK PENETRATION Area: _____ Test # 6-P-1

Service: VALVE TEST Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

8×12 CONTAINMENT Piping ☑ Vessel ☐ Other _____

Test Pressure: 10.5 psi In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation, VERIFY VALVE TIGHTNESS IN MH-21. TEST 6-P VERIFIED WELDS.

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 5-21-10 2:20 P.M. Duration of Test: 10 mins.

Final Test Pressure: 10.5 psi Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton BMWC Representative	5-21-10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	5-21-10 Date
[illegible] WCH - CONTRACTOR	05.21.10 Date
[illegible] CQA - CONTRACTOR	5-21-10 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH - 39 TANK PENETRATION Area: _____ Test # 7

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16 CARRIER

Test Pressure: 30-40 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 38 psi + 5% allowed Time: 9:24 A.M.

Finish Test Pressure: 37 psi + 5% allowed Time: 10:24 Pass/Fail: PASS

If Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	5-21-10 Date
Dethur - SUBCONTRACTOR, QA/QC	5-21-10 Date
WCH - CONTRACTOR	05.21.10 Date
CQA - SUBCONTRACTOR	5-21-10 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-39 TANK PENETRATION Area: _____ Test # 7-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

10 x 16 CONTAINMENT Piping ☑ Vessel ☐ Other _____

Test Pressure: 10 psi In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 5-21-10 10:45 A.M. Duration of Test: 10 mins.

Final Test Pressure: 10 psi Pass ☑ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton BMWC Representative	5-21-10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	5-21-10 Date
[illegible] WCH - CONTRACTOR	05-21-10 Date
[illegible] CQA - CONTRACTOR	5-21-10 Date

Pnuematic Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-39 TANK PENETRATION Area: _____ Test # 7-P-1

Service: VALVE TEST Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 10.5 psi In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation, VERIFY VALVE TIGHTNESS IN MH-39. TEST 7-P VERIFIED WELDS.

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 5-21-10 2:00 P.M. Duration of Test: 10 mins.

Final Test Pressure: 10.5 psi Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton — BMWC Representative — 5-21-10 Date

[illegible] — Delhur - SUBCONTRACTOR, QA/QC — 5-21-10 Date

[illegible] — WCH - CONTRACTOR — 05.21.10 Date

[illegible] — CQA - CONTRACTOR — 5-21-10 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: 2" LEAK DETECTION Area: _____ Test # 8

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 2" SINGLE WALL For Test Pressures on which system:

Test Pressure: 30-40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 35 psi + 5% allowed Time: 1:00

Finish Test Pressure: 34 psi + 5% allowed Time: 2:00 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	5-24-10 Date
Delhur - SUBCONTRACTOR, QA/QC	5-24-10 Date
WCH - CONTRACTOR	05.24.10 Date
CQA - SUBCONTRACTOR	5-24-2010 Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-22 TANK PENETRATION Area: _____ Test # 9

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 4 x 8 CARRIER

Test Pressure: 30-40 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 36 psi + 5% allowed Time: 7:15 A.M.

Finish Test Pressure: 36 psi + 5% allowed Time: 8:15 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton BMWC Representative	5-25-10 Date
Delhur - SUBCONTRACTOR, QA/QC	5-25-10 Date
WCH - CONTRACTOR	05-25-10 Date
CQA - SUBCONTRACTOR	5-25-2010 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-22 TANK PENETRATION Area: _____ Test # 9-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

4x8 CONTAINMENT Piping ☑ Vessel ☐ Other _____

Test Pressure: 10.5 psi In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☒ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 5-25-10 2:28 P.M. Duration of Test: 10 mins.

Final Test Pressure: 10.5 psi Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James Hatton BMWC Representative	5-25-10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	5-25-10 Date
[illegible] WCH - CONTRACTOR	05.25-10 Date
[illegible] CQA - CONTRACTOR	5-25-2010 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-32 TRANSMISSION LINE Area: _____ Test # 10

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16 CARRIER

Test Pressure: 30-40 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 34 psi + 5% allowed Time: 7:50 A.M.

Finish Test Pressure: 35 psi + 5% allowed Time: 8:50 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton — BMWC Representative — Date: 5-27-10

[illegible] — Delhur - SUBCONTRACTOR, QA/QC — Date: 5-27-10

B Howard — WCH - CONTRACTOR — Date: 5/27/10

[illegible] — CQA - SUBCONTRACTOR — Date: 5-27-2010

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-32 TRANSMISSION LINE Area: _____ Test # 10-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: 10 x 16 CONTAINMENT

Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi

In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☒ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 5-27-10 11:45 AM Duration of Test: 10 mins.

Final Test Pressure: 11 psi

Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton BMWC Representative	5-27-10 Date
Delhur - SUBCONTRACTOR, QA/QC	5-27-10 Date
WCH - CONTRACTOR	5/27/10 Date
CQA - CONTRACTOR	5-27-2010 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-35 TRANSMISSION LINE Area: _____ Test # 11

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16 CARRIER For Test Pressures on which system:

Test Pressure: 30-40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 38.5 psi + 5% allowed Time: 12:45

Finish Test Pressure: 37.5 psi + 5% allowed Time: 1:45 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton BMWC Representative	6-7-10 Date
Delhur - SUBCONTRACTOR, QA/QC	6-7-10 Date
WCH - CONTRACTOR	06.08.10 Date
CQA - SUBCONTRACTOR	6-8-10 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-35 TRANSMISSION LINE Area: _____ Test # 11-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: 10 x 16 CONTAINMENT

Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi

In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 6-8-10 8:45 A.M. Duration of Test: 10 mins.

Final Test Pressure: 11 psi Pass ☑ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	6-8-10 Date
Delhur - SUBCONTRACTOR, QA/QC	6-8-10 Date
WCH - CONTRACTOR	06.08.10 Date
CQA - CONTRACTOR	6-8-10 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH 37-38 CARRIER Area: _____ Test # 12

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16 For Test Pressures on which system:

Test Pressure: psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 36 psi + 5% allowed Time: 10:55

Finish Test Pressure: 35.5 psi + 5% allowed Time: 11:55 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton BMWC Representative	6-17-10 Date
Jack Willi Delhur - SUBCONTRACTOR, QA/QC	6-17-10 Date
Bruce D. Michel WCH - CONTRACTOR	06-17-10 Date
[illegible] CQA - SUBCONTRACTOR	6-17-10 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH 37-38 CONTAINMENT Area: _____ Test # 12-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: 10 x 16 Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 6-17-10 1:37 Duration of Test: 10 mins.

Final Test Pressure: 11 psi Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton BMWC Representative	6-17-10 Date
Delhur - SUBCONTRACTOR, QA/QC	6-17-10 Date
WCH - CONTRACTOR	06-17-10 Date
CQA - CONTRACTOR	6-17-10 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # 13

Equipment/Line No.: MH - 20 Area: _____ Test # 13

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: CONTAINMENT For Test Pressures on which system:

Test Pressure: 30-40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 39 psi + 5% allowed Time: 10:34

Finish Test Pressure: 38 psi + 5% allowed Time: 11:34 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton BMWC Representative	7-15-10 Date
Delhur - SUBCONTRACTOR, QA/QC	7-15-10 Date
WCH - CONTRACTOR	7·15·10 Date
CQA - SUBCONTRACTOR	7/15/10 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-20 CARRIER Area: _____ Test # 13-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi In Service Test ☑ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 7-15-10 Duration of Test: 10 mins.

Final Test Pressure: 11 psi Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton BMWC Representative	7-15-10 Date
Delhur - SUBCONTRACTOR, QA/QC	7-15-10 Date
WCH - CONTRACTOR	7.15.10 Date
CQA - CONTRACTOR	7/15/10 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-32 DAYLIGHT Area: _____ Test # 14

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 4" DAYLIGHT

Test Pressure: psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 39 psi + 5% allowed Time: 7:38

Finish Test Pressure: 38 psi + 5% allowed Time: 8:38 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Fatton BMWC Representative	07-19-10 Date
Jub Will Delhur - SUBCONTRACTOR, QA/QC	7-19-10 Date
Bryan A. Thalal WCH - CONTRACTOR	7-19-10 Date
[illegible] CQA - SUBCONTRACTOR	07-19-2010 Date

Hydro Test Report Form .xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH - 33 DAYLIGHT Area: _____ Test # 15

Service: 4" HDPE Clean discharge Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☒ Vessel ☐ Other _____

Piping System: 4" DAYLIGHT For Test Pressures on which system:

Test Pressure: psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 37 ½ psi + 5% allowed Time: 6:40 A.m.

Finish Test Pressure: 37 psi + 5% allowed Time: 7:40 Pass/Fail: Pass

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	7-20-10 Date
Delhur - SUBCONTRACTOR, QA/QC	7-20-10 Date
WCH - CONTRACTOR	7.20.10 Date
CQA - SUBCONTRACTOR	07-20-10 Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-38 TO 39 CARRIER Area: _____ Test # 16

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16

Test Pressure: 30 - 40 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 38 psi + 5% allowed Time: 11:52

Finish Test Pressure: 38 psi + 5% allowed Time: 12:52 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	8-3-10 Date
Delhur - SUBCONTRACTOR, QA/QC	8-3-10 Date
WCH - CONTRACTOR	08-03-10 Date
CQA - SUBCONTRACTOR	8.3.10 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-38 TO 39 CONTAINMENT Area: _____ Test # 16-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: CONTAINMENT

Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi

In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 8-3-10 2:05 P.M. Duration of Test: 10 mins.

Final Test Pressure: 11 psi

Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	8-3-10 Date
Delhur - SUBCONTRACTOR, QA/QC	8-3-10 Date
WCH - CONTRACTOR	08-03-10 Date
CQA - CONTRACTOR	8-3-10 Date

Pneumatic Test Report Form.ds

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-34 TO 35 CARRIER Area: _____ Test # 17

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16

Test Pressure: 30-40 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 35.5 psi + 5% allowed Time: 6:30

Finish Test Pressure: 35 psi + 5% allowed Time: 7:30 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 28846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	8-5-10 Date
Delhur - SUBCONTRACTOR, QA/QC	8-5-10 Date
WCH - CONTRACTOR	08-05-10 Date
* 36-35.5 PSI -2.9% DROP IN 1 HOUR	
CQA - SUBCONTRACTOR	8-5-10 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-34 TO 35 CONTAINMENT 10" x 16" DC Pipe Area: _____ Test # 17-10

Service: _____ Test Medium: Compressed AIR

System Being Tested: CONTAINMENT (pneumatic test)

Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi

In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☒ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

All joints observed (snooped) for visible signs of leaks - None Observed.

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 8-5-10 Duration of Test: 10 mins.

Start 12:55 p.m. end 1:05 pm

Final Test Pressure: 11 psi Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	8-5-10 Date
Delhur - SUBCONTRACTOR, QA/QC	8-5-10 Date
WCH - CONTRACTOR	08.05.10 Date
CQA - CONTRACTOR	8/5/10 Date

Pneumatic Test Report Form.ds

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-38 TO 9 CARRIER Area: _____ Test # 18

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16 CARRIER For Test Pressures on which system:

Test Pressure: 30 - 40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 31 psi + 5% allowed Time: 7:00

Finish Test Pressure: 31 psi + 5% allowed Time: 8:00 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 29846

Gauge Serial# 430371 Calibration Date: 4/10 Calibration Expiration Date: 4/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Patton BMWC Representative	8-9-10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	8-9-10 Date
[illegible] WCH - CONTRACTOR	08.09.10 Date
[illegible] CQA - SUBCONTRACTOR	8-9-10 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MHS 38-9 CONTAINMENT Area: _____ Test # 18-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: 10x16 CONTAINMENT

Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi

In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☐ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 8-12-10 12:50 Duration of Test: 10 mins.

Final Test Pressure: 11 psi

Pass ☑ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	8-12-10 Date
Delhur - SUBCONTRACTOR, QA/QC	8-12-10 Date
WCH - CONTRACTOR	08.12.10 Date
CQA - CONTRACTOR	8/12/10 Date

Pneumatic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CELL 9 - 18 PRIMARY Area: _____ Test # 19

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 3" DISCHARGE For Test Pressures on which system:

Test Pressure: 70 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 85 psi + 5% allowed Time: 6:29

Finish Test Pressure: 84 psi + 5% allowed Time: 7:29 Pass/Fail: PASS

If Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: WIKA Calibration Certificate Number: 28531

Gauge Serial# 364562 Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton BMWC Representative	8-16-10 Date
Jack Lilli Delhur - SUBCONTRACTOR, QA/QC	8-16-10 Date
Barry D. Kimball WCH - CONTRACTOR	08.16.10 Date
[illegible] CQA - SUBCONTRACTOR	8/16/10 Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CELL 4-12" PRIMARY Area: _____ Test # 20

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 1½" DISCHARGE For Test Pressures on which system:

Test Pressure: 70 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 85 psi + 5% allowed Time: 6:29

Finish Test Pressure: 84 psi + 5% allowed Time: 7:29 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: WIKA Calibration Certificate Number: 28532

Gauge Serial# 400619-A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	8-16-10 Date
Delhur - SUBCONTRACTOR, QA/QC	8-16-10 Date
WCH - CONTRACTOR	08.16.10 Date
CQA - SUBCONTRACTOR	8/16/10 Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CELL 10- 18" PRIMARY Area: _____ Test # 21

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 3" DISCHARGE

Test Pressure: 70 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 89 psi + 5% allowed Time: 6:30 A.M.

Finish Test Pressure: 88 psi + 5% allowed Time: 7:30 A.M. Pass/Fail: Pass

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: UIKA Calibration Certificate Number: 28531

Gauge Serial# 369562 Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	8/17/10 Date
Delhur - SUBCONTRACTOR, QA/QC	8/17/10 Date
WCH - CONTRACTOR	08-23-10 Date
CQA - SUBCONTRACTOR	8/17/10 Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: Cell 10 12" Primary Area: _____ Test # 22

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 1½" discharge

Test Pressure: 70 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 86 psi + 5% allowed Time: 6:13 Am.

Finish Test Pressure: 86 psi + 5% allowed Time: 7:15 Am. Pass/Fail: Pass

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: Wika Calibration Certificate Number: 28532

Gauge Serial# 10519A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton — BMWC Representative — 8-18-10 Date

Delhur - SUBCONTRACTOR, QA/QC — 8-18-10 Date

WCH - CONTRACTOR — 08-23-10 Date

CQA - SUBCONTRACTOR — 8/18/10 Date

Hydro Test Report Form .xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CELL 9 - 12" SECONDARY Area: _____ Test # 24

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 1½" DISCHARGE

Test Pressure: 70 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 89 psi + 5% allowed Time: 6:10 A.M.

Finish Test Pressure: 87 psi + 5% allowed Time: 7:10 A.M Pass/Fail: Pass

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: WIKA Calibration Certificate Number: 28532

Gauge Serial# 400519-A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	8-19-10 Date
Delhur - SUBCONTRACTOR, QA/QC	8-19-10 Date
WCH - CONTRACTOR	08-23-10 Date
CQA - SUBCONTRACTOR	8/19/10 Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CELL 10 - 12" SECONDARY Area: _____ Test # 23

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 1½" DISCHARGE For Test Pressures on which system:

Test Pressure: 70 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 88 psi + 5% allowed Time: 6:10 A.M.

Finish Test Pressure: 84 psi + 5% allowed Time: 7:10 AM Pass/Fail: Pass

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: WIKA Calibration Certificate Number: ~~28532~~ 28531 GW 8-23-10

Gauge Serial# ~~46659-A~~ Calibration Date: 3/10 Calibration Expiration Date: 3/11

369562 GW 8-23-10

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton — BMWC Representative — 8-19-10 Date

Doug M. [illegible] — Delhur - SUBCONTRACTOR, QA/QC — 8-19-10 Date

Bruce W. [illegible] — WCH - CONTRACTOR — 08·23·10 Date

[illegible] — CQA - SUBCONTRACTOR — 8/19/10 Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH 36-37 Area: _____ Test # 25

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16 CARRIER For Test Pressures on which system:

Test Pressure: 30-40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 38.5 psi + 5% allowed Time: 6:30

Finish Test Pressure: 38 psi + 5% allowed Time: 7:30 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 29607

Gauge Serial# 438570-A Calibration Date: 8-12-10 Calibration Expiration Date: 8-12-11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton BMWC Representative	8-25-10 Date
Jack Willi Delhur - SUBCONTRACTOR, QA/QC	8-25-10 Date
Bryan A. [illegible] WCH - CONTRACTOR	08-25-10 Date
[illegible] CQA - SUBCONTRACTOR	08-25-2010 Date

Hydro Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH 36 - 37 Area: _____ Test # 25-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

10 x 16 CONTAINMENT Piping ☑ Vessel ☐ Other _____

Test Pressure: 11 psi In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☑ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 8-25-10 8:28 Duration of Test: 10 mins.

Final Test Pressure: 11 psi Pass ✓ Fail ☐

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatter BMWC Representative	8-25-10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	8-25-10 Date
[illegible] WCH - CONTRACTOR	08.25.10 Date
[illegible] CQA - CONTRACTOR	8-25-10 Date

Pneumatic Test Report Form.ds

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH's 32 - 39 FULL Area: _____ Test # 26

Service: TRANSMISSION LINE Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 10 x 16 CARRIER For Test Pressures on which system:

Test Pressure: 30 - 40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 36 psi + 5% allowed Time: 6:48

Finish Test Pressure: 35 psi + 5% allowed Time: 7:48 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NESHOK Calibration Certificate Number: 29607

Gauge Serial# 438570-A Calibration Date: 8-12-10 Calibration Expiration Date: 8-12-11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

Doug Dixon BMWC Representative	8-31-10 Date
Delhur - SUBCONTRACTOR, QA/QC	8-31-10 Date
WCH - CONTRACTOR	08-31-10 Date
CQA - SUBCONTRACTOR	08-31-10 Date

Hydro Test Report Form 4ts

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: ~~[illegible]~~ Leak Detection Tank 4 Area: _____ Test # 27

Service: _____ Test Medium: Compressed AIR

System Being Tested: 2 in. leak Detection line

Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 34 psi

In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☐ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

~~DMS~~ 9-16-10

Gauge Serial# ~~438570-A~~ 438570-A Calibration Date: 8-12-10 Calibration Expiration Date: 8-12-11

Date of Test: 9-16-10 Duration of Test: 60 mins.

Final Test Pressure: 33 psi Pass [X] Fail [ ]

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James A. Hatton BMWC Representative	9/16/10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	9/16/10 Date
Benjamin S. [illegible] WCH - CONTRACTOR	09-16-10 Date
[illegible] CQA - CONTRACTOR	9/16/10 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-18 PENETRATION Area: TANK #4 Test # 28

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: 4×8 CARRIER For Test Pressures on which system:

Test Pressure: 30-40 psi See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 34.5 psi + 5% allowed Time: 7:17

Finish Test Pressure: 33.5 psi + 5% allowed Time: 8:17 Pass/Fail: Pass

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: NOSHOK Calibration Certificate Number: 29607

Gauge Serial# 438570-A Calibration Date: 8-12-10 Calibration Expiration Date: 8-12-11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton — BMWC Representative — Date: 9-16-10

Delhur - SUBCONTRACTOR, QA/QC — Date: 9-16-10

~~WCH - CONTRACTOR~~ CQA — Date: 9/16/10

~~CQA - SUBCONTRACTOR~~ — Date: 09.16.10

WCH - CONTRACTOR

BAK

Hydro Test Report Form rts

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-18 PENETRATION Tank 4 Area: _____ Test # 28-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: CONTAINMENT 4x8

Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: ~~[illegible]~~ 11 psi TWS 9-16-10

In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☐ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 9-16-10 Duration of Test: ~~[illegible]~~ 10 mins. TWS 9-16-10

Final Test Pressure: 11 psi Pass [X] Fail [ ]

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Hatton BMWC Representative	9-16-10 Date
[signature] Delhur - SUBCONTRACTOR, QA/QC	9.16.10 Date
[signature] WCH - CONTRACTOR	09.16.10 Date
[signature] CQA - CONTRACTOR	9/16/10 Date

Pnuematic Test Report Form.xls

PNEUMATIC TEST REPORT FORM

MCF-10

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: MH-17 PENETRATION Tank 4 Area: _____ Test # 29-P

Service: _____ Test Medium: Compressed AIR

System Being Tested: CONTAINMENT 12 x 18

Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Test Pressure: 10.5 psi

In Service Test ☐ (only checked, if Joints Snooped (Soap Tested)

Joints Snoop Tested ☐ (only checked, if Joints (Soap Tested)

Reason For Test: New Piping Installation

Gauge Serial# 511292 Calibration Date: 4-9-10 Calibration Expiration Date: 4-9-11

Date of Test: 9-16-10 Duration of Test: 10 mins.

Final Test Pressure: 10 psi Pass [X] Fail [ ]

Comments: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.
Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Sutton BMWC Representative	5/16/10 Date
[illegible] Delhur - SUBCONTRACTOR, QA/QC	9/16/10 Date
[illegible] WCH - CONTRACTOR	09-16-10 Date
[illegible] CQA - CONTRACTOR	9-16-10 Date

Pnuematic Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CREST PAD 9 PVC Area: CP 9 Test # 30

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: PVC

Test Pressure: 70 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 74 psi + 5% allowed Time: 1:50

Finish Test Pressure: 73 psi + 5% allowed Time: 2:50 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: LUKA Calibration Certificate Number: 28532

Gauge Serial# 400519-A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

BMWC Representative	11-2-10 Date
Delhur - SUBCONTRACTOR, QA/QC	11-2-10 Date
WCH - CONTRACTOR	11·02·10 Date
CQA - SUBCONTRACTOR	11-2-10 Date

Hydro Test Report Form.xls

HYDRO TEST REPORT FORM

MCF-9

BMWC Constructors Inc.

Gauge Tested in accordance to ASME B31.3

Job Number: 402738 Unit: _____ Sequence # _____

Equipment/Line No.: CREST PAD 10 PVC Area: CP 10 Test # 31

Service: _____ Test Medium: Water

Equipment/System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Piping ☑ Vessel ☐ Other _____

Piping System: PVC

Test Pressure: 70 psi

For Test Pressures on which system:

See Specification: 0600X-SP-M0032, Rev 1, 3.5.1

Reason For Test: New Piping Installation

Starting Test Pressure: 76 psi + 5% allowed Time: 7:30

Finish Test Pressure: 74 psi + 5% allowed Time: 8:30 Pass/Fail: PASS

Pass Criteria: The test is acceptable if the measured loss is not greater than 5 % of the test beginning pressure thoughout the specified test duration.

Gauge Manufacturer: WIKA Calibration Certificate Number: 28532

Gauge Serial# 400519-A Calibration Date: 3/10 Calibration Expiration Date: 3/11

Comments: Pressure Relief Valve is installed on test pump and set at no more than 5% of the maxium test pressure

Test Witnessed and Accepted By:

James H. Walton BMWC Representative	11-9-10 Date
Chris Willi Delhur - SUBCONTRACTOR, QA/QC	11-9-10 Date
Bryan A. Kleinhans WCH - CONTRACTOR	11.09.10 Date
[illegible] CQA - SUBCONTRACTOR	11/9/10 Date

Hydro Test Report Form .xls

Cells 9 & 10

Torque Reports

TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 38

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☑
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: September 2nd, 2010

Comments: (3) 10" Flange to Flange
(2) 10" Flange to Valve

Test Witnessed and Accepted By: James H. Halton 9-2-10

BMWC Representative Date

Torque Witness Report Form.xls

GLOBAL
CALIBRATION SERVICES

502 S LUCILE ST
SEATTLE, WA 98108-2507

CERTIFICATE OF CALIBRATION #128566

Issued To:

BMWC CONSTRUCTORS, INC
20638 84TH AVE S
KENT, WA 98032

ISO 9001 Registered | ANAB | AS9100 Registered

Quality Management System
Certificate No. 11495

Item ID: 5981138958

Item Description: TORQUE WRENCH

Item Size: 250 ft-lb CW

Manufacturer: ARMSTRONG

Model Number: 64-086

Serial Number: 5981138958

Assigned Department: N/A

Item Location: N/A

Calibration Location: INHOUSE LAB

Purchase Order Number: 4027360105

Calibration Date: 03/30/2010

Calibration Due: 03/30/2011

Temperature (Deg F): 67

Humidity (%): 37

Procedure: GCS-8002

Ian Torres, Technical Specialist

Date Certificate Issued: 03/30/2010

Global Calibration Services' quality management system conforms to ISO 9001:2000, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003, and the technical requirements of the customer's order. All calibrations are performed using internationally recognized standards traceable to the SI Units. Traceability is achieved through the National Institute of Standards and Technology (NIST), other National Measurement Institutes (NMIs), or by using natural physical constraints, intrinsic standards or ratio calibration techniques. Unless otherwise indicated, the combined estimated uncertainty of the measurement has a coverage factor of k-2 at a confidence level of 95%. Any number of factors may cause the instrument to drift out of specification before the recommended recalibration date contained in this certificate. The information shown on this certificate applies only to the instrument identified above and may not be reproduced, except in full, without prior written consent from Global Calibration Services.

TABLE 2

EXAMPLES OF ESTIMATED BOLT TORQUE TO "SEAT" HDPE FLANGE FACES:

The **engineer of record** is usually responsible for establishing each flange joint criteria, and performing the required calculations to determine the initial and residual torque values.

These estimated values are based on non-plated bolts and studs, using a nut factor of K=**0.16** for lightly greased bolts and nuts. The calculations uses a HDPE flange face seating stress of **1200-psi** as a minimum and **1800-psi** as a maximum, and assumes the flanged joint is between two HDPE flange adapters (in which the contact area is largest), without a rubber gasket.

NOTE: For bolting to ductile-iron pipe, steel flanges or butterfly valves, the flange face contact area is about half, so bolt torque for that flange pair will be measurably less (refer to Table #3).

IPS Nominal Pipe Size	LJF Bolt Diameter	Initial Number of Bolts	Minimum Lubed Torque (Ft-Lbs)	Initial Maximum Lubed Torque (Ft-Lbs)	Flange OD/ ID (Inches)
2"	0.625	4	23	35	3.9 / 1.94
3"	0.625	4	33	50	5.0 / 2.86
4"	0.625	8	33	50	6.6 / 3.68
5"	0.75	8	44	66	7.5 / 4.40
6"	0.75	8	50	75	8.5 / 5.42
8"	0.75	8	80	120	10.63 / 6.76
10"	0.875	12	80	120	12.75 / 8.79
12"	0.875	12	105	160	15.00/ 10.43
14"	1.000	12	180	270	17.50 / 11.46
16"	1.000	16	180	270	20.00 / 13.09
18"	1.125	16	200	300	21.12 / 14.73
20"	1.125	20	200	300	23.50 / 16.36
22"	1.25	20	260	390	25.60 / 18.00
24"	1.25	20	290	435	28.00 / 19.64
26"	1.25	24	290-	435	30.00 / 21.27
28"	1.25	28	290	435	32.30 / 22.91
30"	1.25	28	325	488	34.30 / 24.54
32"	1.50	28	425	640	36.50 / 26.18
34"	1.50	32	425	640	38.50 / 27.82
36"	1.50	32	460	690	40.80 / 29.45
40"	1.50	36	460	690	46.00 / 35.29
42"	1.50	36	460	690	47.50 / 37.06
48"	1.50	44	460	690	54.00 / 43.43
54"	1.75	44	560	840	60.00 / 48.86

NOTE: Uniform bolt pre-load (torque), without large "scatter", is as useful as the target pre-load. Within the limits of the HDPE flange adapter, gasket, or metal LJF, higher pre-load is desirable. The higher the pre-load safely achievable, the more closely the assembly will behave like the theoretical model and seal well. Higher pre-load means that a given internal pressure will result in the least possible change in contact sealing pressure. Be consistent (avoid changes) with materials and tools when following written assembly procedures.

Train and supervise the bolting personnel. Tell the crew what is to be accomplished, why, and explain that good results are not automatically achieved. Skill and care are essential. Bolted Joint assembly is a technical skill that is not common in the construction and maintenance profession, being considered more like a specialty. There is no universally accepted testing, nor certification, of bolted-joint assembly mechanics. With no common training, certification, nor standards, it is no surprise there is +/- 25% variability in assembly torque. Specifications and instructions by the engineer, followed by trained mechanics, help to solve the dilemma.

TABLE 3

Examples of Estimated Bolt Torque to "Seat" the HDPE Flange Face To A Butterfly-Valve, Steel Pipe Flange, or Ductile Iron Flange.

The engineer of record is usually responsible for establishing each flange joint criteria, and performing the required calculations to determine the initial and residual torque values.

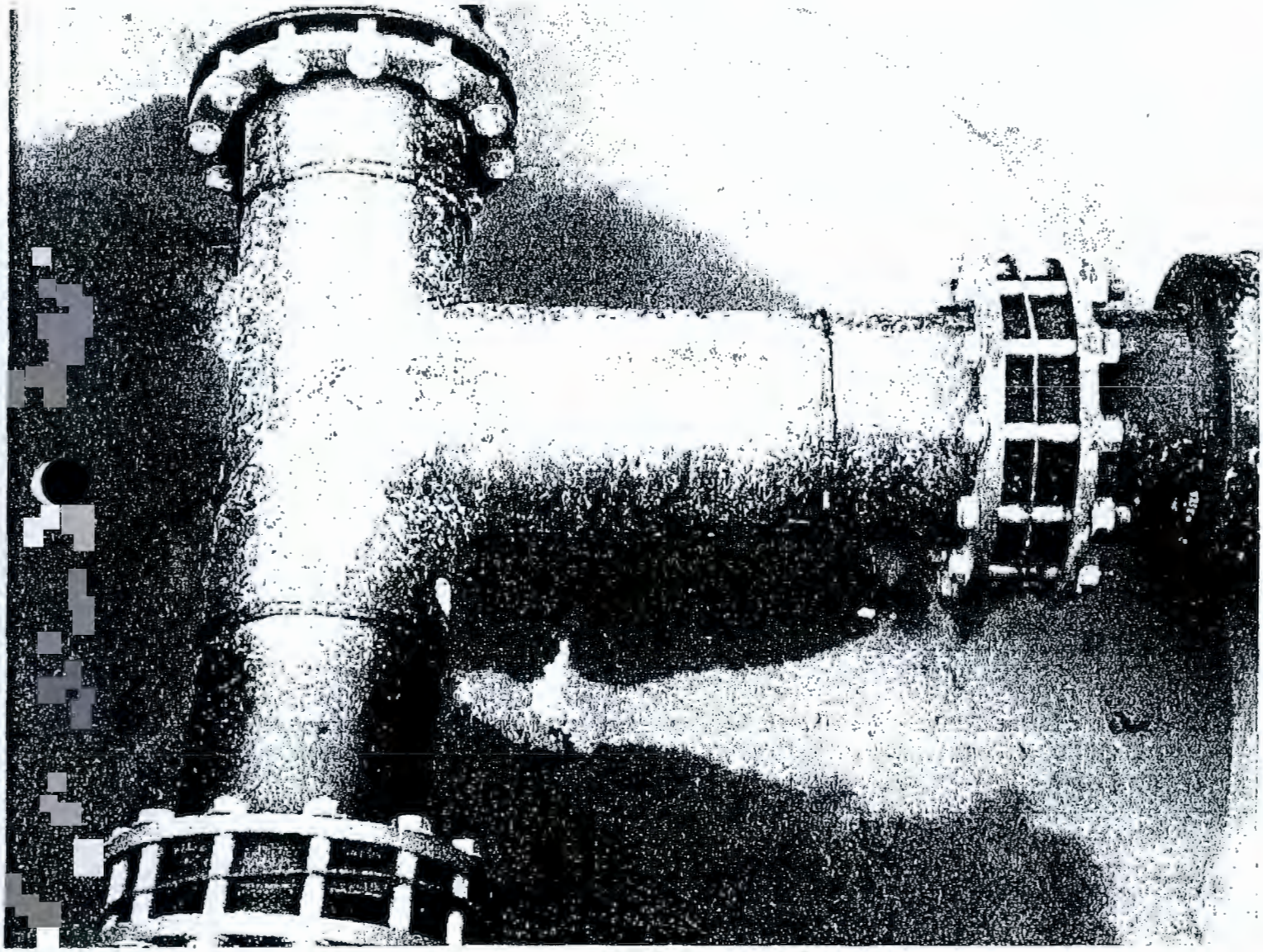
These estimated lightly lubricated torque values assume the flanged joint connects one HDPE flange-adapter to a Butterfly-Valve or Steel Pipe flange of Schedule 40 ID, or a Ductile-iron flange. For bolting to steel flanges or butterfly valves, the flange face contact area is just over half that of HDPE to HDPE flanges, so calculated bolt torque for this flange pair will be measurably less than the values listed in Table #2.

Dimensional flange data should be obtained for each case from the pipe flange suppliers, so as to be able to calculate the face contact area.

These estimated values are based on non-plated bolts and studs, using a K=0.16 for lightly greased bolts and nuts. These calculations use an HDPE material minimum and maximum compressive seating stress of **1200-psi to 1800-psi.**

IPS Nominal Pipe Size	LJF Bolt Dia. (Inches)	Initial Number of Bolts	Initial Minimum Lubed Torque (Ft-Lbs)	Initial Maximum Lubed Torque (Ft-Lbs)	HDPE Flange OD / Steel Pipe ID (Inches)
2"	0.625	4	22	32	3.90 / 2.067
3"	0.625	4	30	45	5.00 / 3.068
4"	0.625	8	30	45	6.60 / 4.026
5"	0.75	8	44	66	7.50 / 4.40
6"	0.75	8	44	66	8.50 / 6.06
8"	0.75	8	58	88	10.63 / 7.98
10"	0.875	12	58	88	12.75 / 10.02
12"	0.875	12	75	114	15.00 / 11.94
14"	1.000	12	140	210	17.50 / 13.13
16"	1.000	16	140	210	20.00 / 15.00
18"	1.125	16	140	210	21.12 / 16.88
20"	1.125	20	140	210	23.50 / 18.81
22"	1.25	20	160	240	25.60 / 21.25
24"	1.25	20	180	270	28.00 / 23.25
26"	1.25	24	180	270	30.00 / 25.25
28"	1.25	28	180	270	32.30 / 27.25
30"	1.25	28	180	270	34.30 / 29.25
32"	1.50	28	240	360	36.50 / 31.00
34"	1.50	32	240	360	38.50 / 33.00
36"	1.50	32	260	390	40.80 / 35.00
40"	1.50	36	310	465	46.00 / 39.00
42"	1.50	36	310	465	47.50 / 41.00
48"	1.50	44	310	465	54.00 / 47.00
54"	1.75	44	365	550	60.00 / 53.00

Train and supervise the bolting personnel. Tell the crew what is to be accomplished, why, and explain that good results are not automatically achieved. Skill and care are essential. Bolted Joint assembly is a technical skill that is not common in the construction and maintenance profession, being considered more like a specialty. There is no universally accepted testing, nor certification, of bolted-joint assembly mechanics. With no common training, certification, nor standards, it is no surprise there is +/- 25% variability in assembly torque. Specifications and instructions by the engineer, followed by trained mechanics, help to solve the dilemma.



TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: Man-Hole # 39

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☑
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: Tuesday, ~~8~~ August 10th, 2010
Thursday ~~8~~ September 2nd, 2010

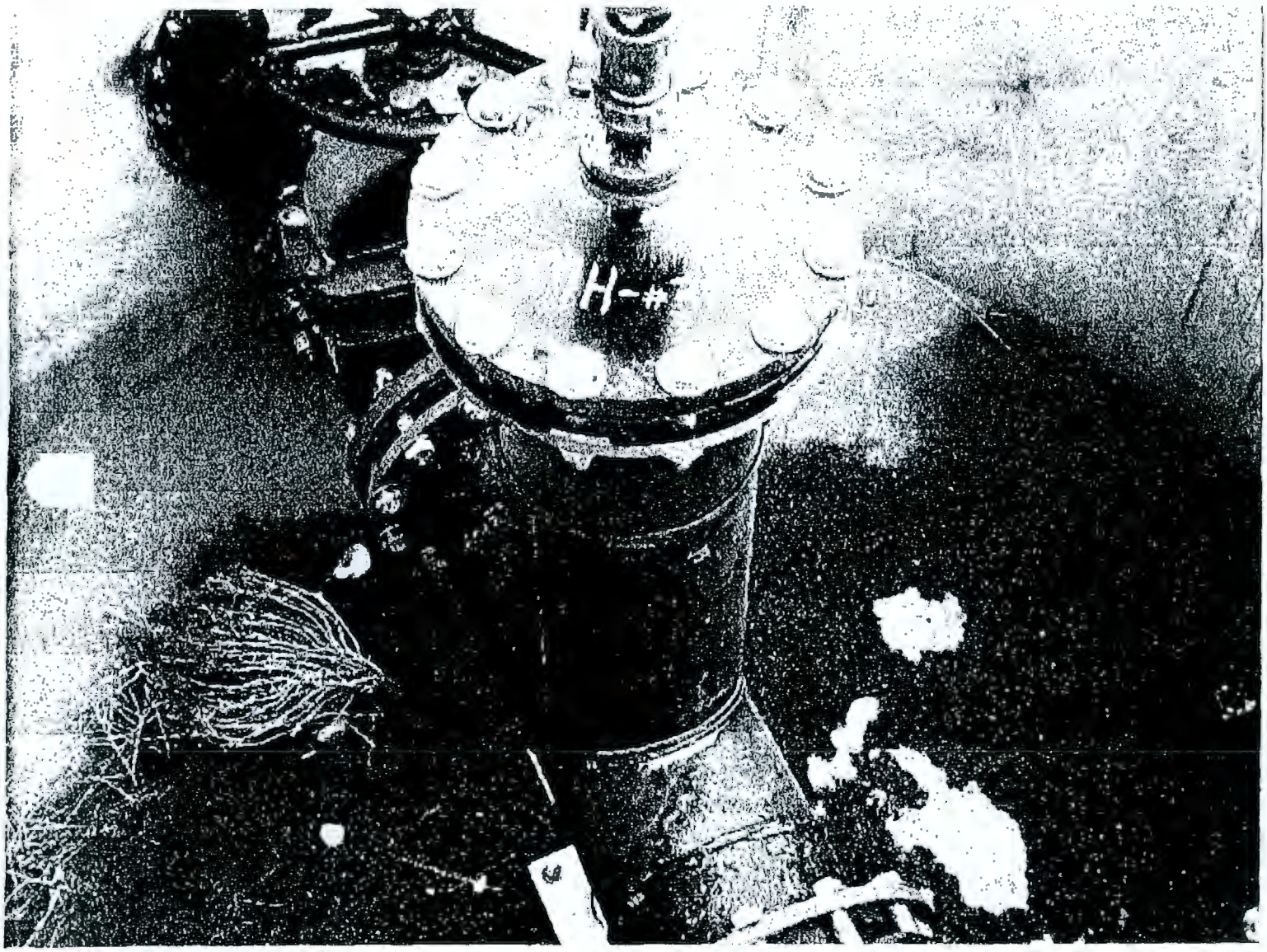
Comments: 2 (10") Flange to Flange, 2 (10") Flange to Valve
1 (10" Flange to Blind Flange)

Test Witnessed and Accepted By:

James H. Hatton
BMWC Representative

9-2-10
Date

Torque Witness Report Form.xls


H-#

TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 35

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: Monday August 16, 2010

Comments: 3(10") Flange to Flange
1(10") Flange to 10" Blind Flange

Test Witnessed and Accepted By: James H. Fitton

BMWC Representative

9-2-10
Date

Torque Witness Report Form.xls

GLOBAL
CALIBRATION SERVICES

502 S LUCILE ST
SEATTLE, WA 98108-2507

CERTIFICATE OF CALIBRATION #128566

Issued To:

BMWC CONSTRUCTORS, INC
20638 84TH AVE S
KENT, WA 98032

Quality Management System
Certificate No. 11495

Item ID: 5981138958

Item Description: TORQUE WRENCH

Item Size: 250 ft-lb CW

Manufacturer: ARMSTRONG

Model Number: 64-086

Serial Number: 5981138958

Assigned Department: N/A

Item Location: N/A

Calibration Location: INHOUSE LAB

Purchase Order Number: 4027380105

Calibration Date: 03/30/2010

Calibration Due: 03/30/2011

Temperature (Deg F): 67

Humidity (%): 37

Procedure: GCS-8002

Ian Torres, Technical Specialist

Date Certificate Issued: 03/30/2010

Global Calibration Services' quality management system conforms to ISO 9001:2000, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003, and the technical requirements of the customer's order. All calibrations are performed using internationally recognized standards traceable to the SI Units. Traceability is achieved through the National Institute of Standards and Technology (NIST), other National Measurement Institutes (NMIs), or by using natural physical constraints, intrinsic standards or ratio calibration techniques. Unless otherwise indicated, the combined estimated uncertainty of the measurement has a coverage factor of k-2 at a confidence level of 95%. Any number of factors may cause the instrument to drift out of specification before the recommended recalibration date contained in this certificate. The information shown on this certificate applies only to the instrument identified above and may not be reproduced, except in full, without prior written consent from Global Calibration Services.

TABLE 2

EXAMPLES OF ESTIMATED BOLT TORQUE TO "SEAT" HDPE FLANGE FACES:

The **engineer of record** is usually responsible for establishing each flange joint criteria, and performing the required calculations to determine the initial and residual torque values.

These estimated values are based on non-plated bolts and studs, using a nut factor of **K=0.16** for lightly greased bolts and nuts. The calculations uses a HDPE flange face seating stress of **1200-psi** as a minimum and **1800-psi** as a maximum, and assumes the flanged joint is between two HDPE flange adapters (in which the contact area is largest), without a rubber gasket.

NOTE: For bolting to ductile-iron pipe, steel flanges or butterfly valves, the flange face contact area is about half, so bolt torque for that flange pair will be measurably less (refer to Table #3).

IPS Nominal Pipe Size	LJF Bolt Diameter	Initial Number of Bolts	Minimum Lubed Torque (Ft-Lbs)	Initial Maximum Lubed Torque (Ft-Lbs)	Flange OD/ ID (Inches)
2"	0.625	4	23	35	3.9 / 1.94
3"	0.625	4	33	50	5.0 / 2.86
4"	0.625	8	33	50	6.6 / 3.88
5"	0.75	8	44	66	7.5 / 4.40
6"	0.75	8	50	75	8.5 / 5.42
8"	0.75	8	80	120	10.63 / 6.76
10"	0.875	12	80	120	12.75 / 8.79
12"	0.875	12	105	160	15.00/ 10.43
14"	1.000	12	180	270	17.50 / 11.45
16"	1.000	16	180	270	20.00 / 13.09
18"	1.125	16	200	300	21.12 / 14.73
20"	1.125	20	200	300	23.50 / 16.36
22"	1.25	20	260	390	25.60 / 18.00
24"	1.25	20	290	435	28.00 / 19.64
26"	1.25	24	290-	435	30.00 / 21.27
28"	1.25	28	290	435	32.30 / 22.91
30"	1.25	28	325	488	34.30 / 24.54
32"	1.50	28	425	640	36.50 / 26.18
34"	1.50	32	425	640	38.50 / 27.82
36"	1.50	32	460	690	40.80 / 29.45
40"	1.50	36	460	690	46.00 / 35.29
42"	1.50	36	460	690	47.50 / 37.06
48"	1.50	44	460	690	54.00 / 43.43
54"	1.75	44	560	840	60.00 / 48.86

NOTE: Uniform bolt pre-load (torque), without large "scatter", is as useful as the target pre-load. Within the limits of the HDPE flange adapter, gasket, or metal LJF, higher pre-load is desirable. The higher the pre-load safely achievable, the more closely the assembly will behave like the theoretical model and seal well. Higher pre-load means that a given internal pressure will result in the least possible change in contact sealing pressure. Be consistent (avoid changes) with materials and tools when following written assembly procedures.

Train and supervise the bolting personnel. Tell the crew what is to be accomplished, why, and explain that good results are not automatically achieved. Skill and care are essential. Bolted Joint assembly is a technical skill that is not common in the construction and maintenance profession, being considered more like a specialty. There is no universally accepted testing, nor certification, of bolted-joint assembly mechanics. With no common training, certification, nor standards, it is no surprise there is +/- 25% variability in assembly torque. Specifications and instructions by the engineer, followed by trained mechanics, help to solve the dilemma.

TABLE 3

Examples of Estimated Bolt Torque to "Seat" the HDPE Flange Face To A Butterfly-Valve, Steel Pipe Flange, or Ductile Iron Flange.

The engineer of record is usually responsible for establishing each flange joint criteria, and performing the required calculations to determine the initial and residual torque values.

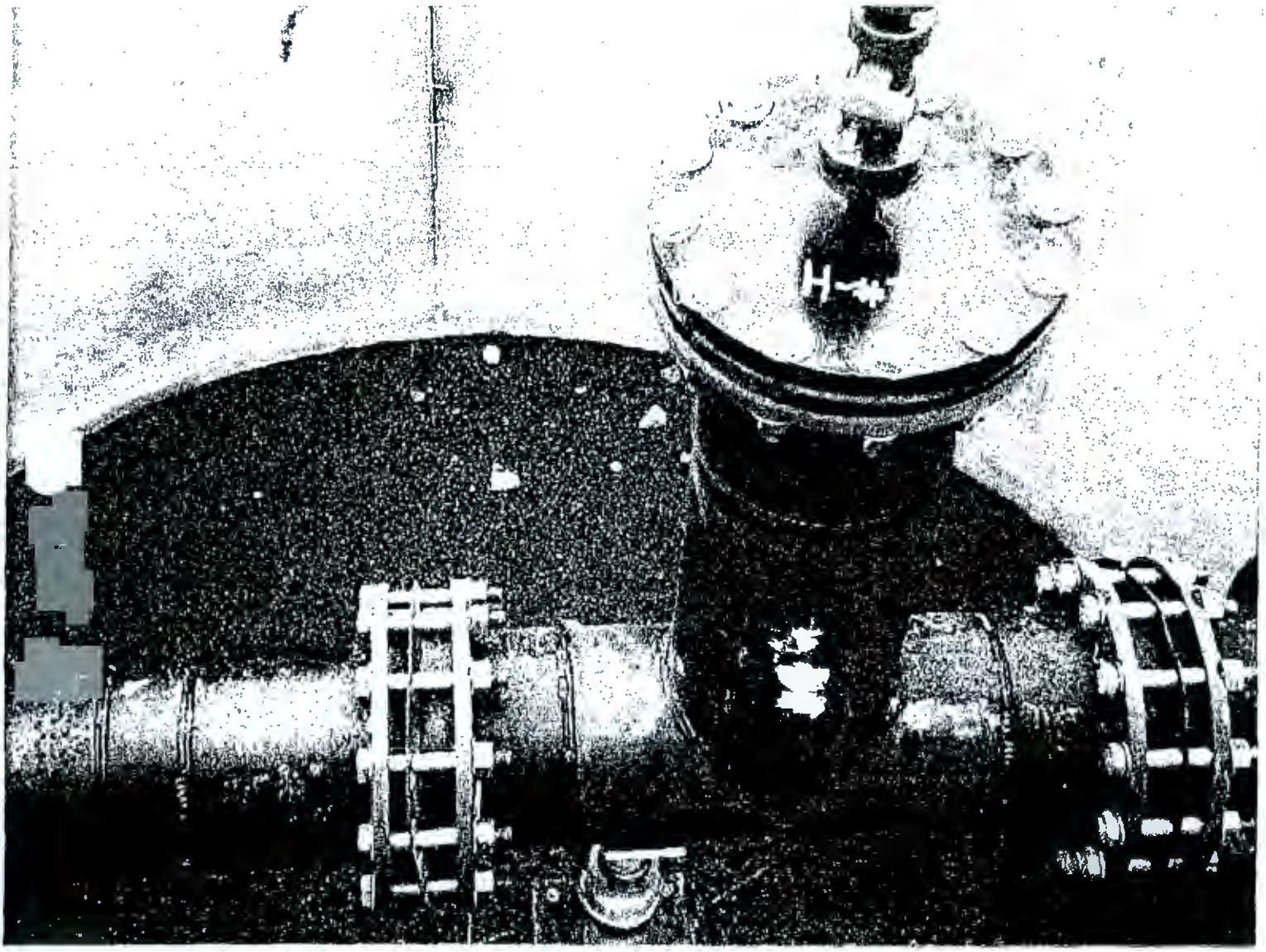
These estimated lightly lubricated torque values assume the flanged joint connects one HDPE flange-adapter to a Butterfly-Valve or Steel Pipe flange of Schedule 40 ID, or a Ductile-Iron flange. For bolting to steel flanges or butterfly valves, the flange face contact area is just over half that of HDPE to HDPE flanges, so calculated bolt torque for this flange pair will be measurably less than the values listed in Table #2.

Dimensional flange data should be obtained for each case from the pipe flange suppliers, so as to be able to calculate the face contact area.

These estimated values are based on non-plated bolts and studs, using a K=0.16 for lightly greased bolts and nuts. These calculations use an HDPE material minimum and maximum compressive seating stress of **1200-psi to 1800-psi.**

IPS Nominal Pipe Size	LJF Bolt Dia. (Inches)	Initial Number of Bolts	Initial Minimum Lubed Torque (Ft-Lbs)	Initial Maximum Lubed Torque (Ft-Lbs)	HDPE Flange OD Steel Pipe ID (Inches)
2"	0.625	4	22	32	3.90 / 2.067
3"	0.625	4	30	45	5.00 / 3.068
4"	0.625	8	30	45	6.60 / 4.026
5"	0.75	8	44	66	7.50 / 4.40
6"	0.75	8	44	66	8.50 / 6.06
8"	0.75	8	58	88	10.63 / 7.98
10"	0.875	12	58	88	12.75 / 10.02
12"	0.875	12	75	114	15.00 / 11.94
14"	1.000	12	140	210	17.50 / 13.13
16"	1.000	16	140	210	20.00 / 15.00
18"	1.125	16	140	210	21.12 / 16.88
20"	1.125	20	140	210	23.50 / 18.81
22"	1.25	20	160	240	25.60 / 21.25
24"	1.25	20	180	270	28.00 / 23.25
26"	1.25	24	180	270	30.00 / 25.25
28"	1.25	28	180	270	32.30 / 27.25
30"	1.25	28	180	270	34.30 / 29.25
32"	1.50	28	240	360	36.50 / 31.00
34"	1.50	32	240	360	38.50 / 33.00
36"	1.50	32	260	390	40.80 / 35.00
40"	1.50	36	310	465	46.00 / 39.00
42"	1.50	36	310	465	47.50 / 41.00
48"	1.50	44	310	465	54.00 / 47.00
54"	1.75	44	365	550	60.00 / 53.00

Train and supervise the bolting personnel. Tell the crew what is to be accomplished, why, and explain that good results are not automatically achieved. Skill and care are essential. Bolted Joint assembly is a technical skill that is not common in the construction and maintenance profession, being considered more like a specialty. There is no universally accepted testing, nor certification, of bolted-joint assembly mechanics. With no common training, certification, nor standards, it is no surprise there is +/- 25% variability in assembly torque. Specifications and instructions by the engineer, followed by trained mechanics, help to solve the dilemma.



TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 36

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: September 2nd, 2010

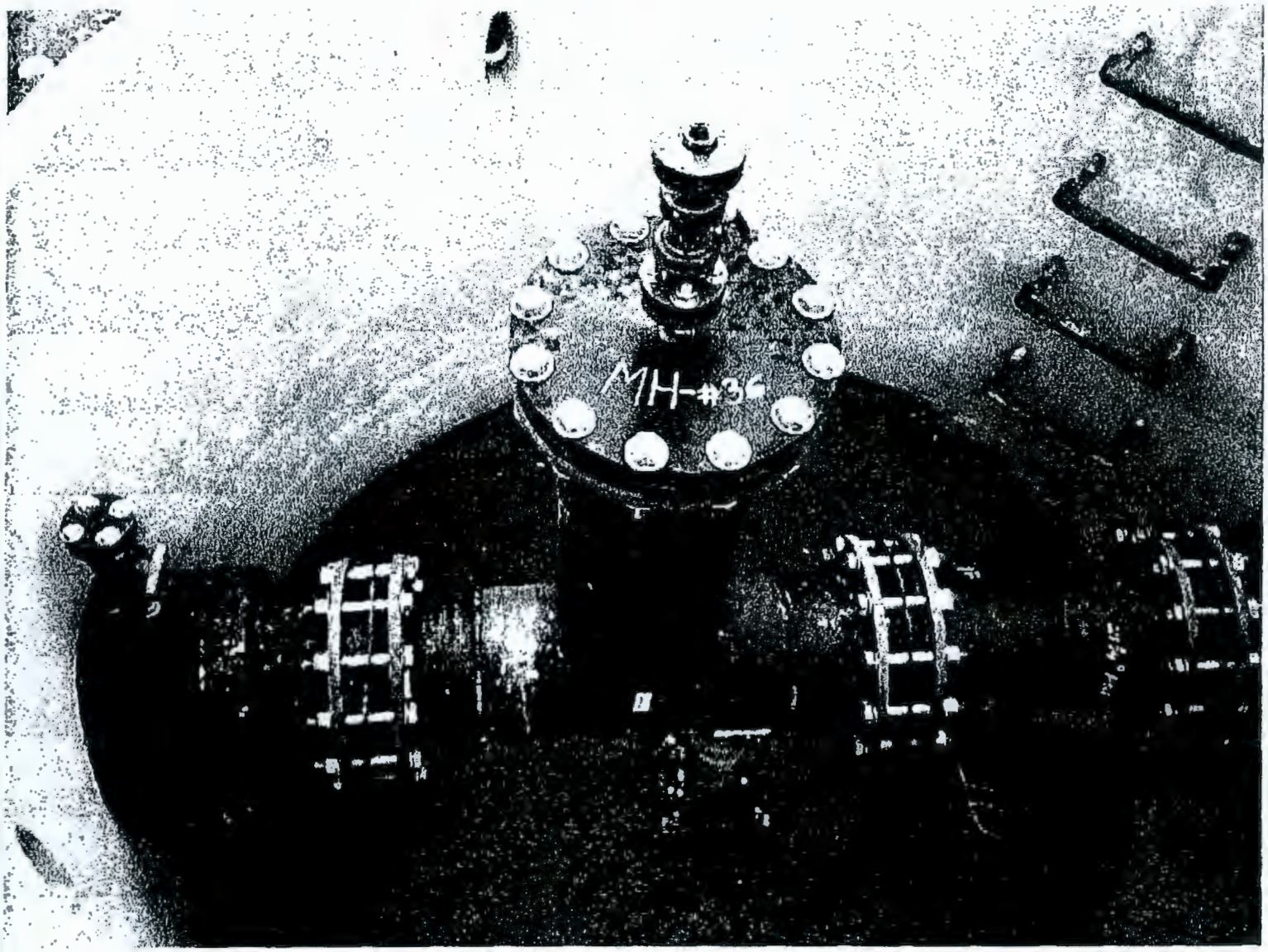
Comments: (3) 10" Flange to Flange
(1) 10" Flange to Blind

Test Witnessed and Accepted By

James G. Hatton
BMWC Representative

9-2-10
Date

Torque Witness Report Form.xls


MH-#36

TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 37

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: September 2nd, 2010

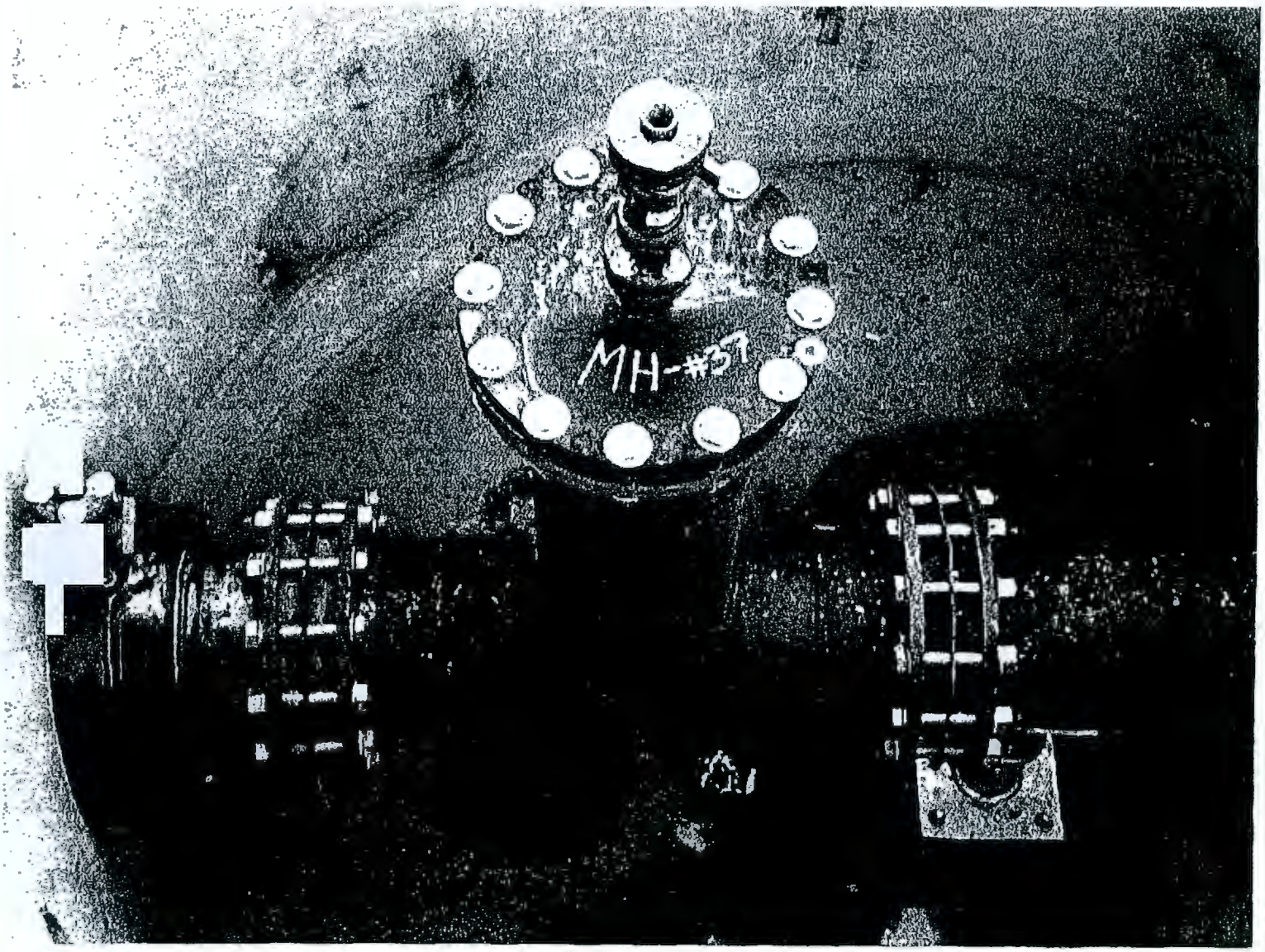
Comments: (3) 10" Flange to Flange
(1) 10" Flange to blind

Test Witnessed and Accepted By:

James H Hatton
BMWC Representative

9-2-10
Date

Torque Witness Report Form.xls


MH-#37

TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 32

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☑	4" Flange x Valve	30	ft-lbs	☑

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: Monday Aug. 9th, 2010

Comments: 2 (10") Flange to Flange, 3 (4") Flange to flange, 4 (4") Flange to Valves (2 valves)

Test Witnessed and Accepted By:

James A. Hatton
BMWC Representative

8-9-10
Date

Torque Witness Report Form.xls

GLOBAL
CALIBRATION SERVICES

502 S LUCILE ST
SEATTLE, WA 98108-2507

CERTIFICATE OF CALIBRATION #128566

Issued To:

BMWC CONSTRUCTORS, INC
20638 84TH AVE S
KENT, WA 98032

ISO 9001 Registered | ANAB Accredited | AS9100 Registered

Quality Management System
Certificate No. 11495

Item ID: 5981138958

Item Description: TORQUE WRENCH

Item Size: 250 ft-lb CW

Manufacturer: ARMSTRONG

Model Number: 64-086

Serial Number: 5981138958

Assigned Department: N/A

Item Location: N/A

Calibration Location: INHOUSE LAB

Purchase Order Number: 4027380105

Calibration Date: 03/30/2010

Calibration Due: 03/30/2011

Temperature (Deg F): 67

Humidity (%): 37

Procedure: GCS-8002

Ian Torres

Ian Torres, Technical Specialist

Date Certificate Issued: 03/30/2010

Global Calibration Services' quality management system conforms to ISO 9001:2000, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003, and the technical requirements of the customer's order. All calibrations are performed using internationally recognized standards traceable to the SI Units. Traceability is achieved through the National Institute of Standards and Technology (NIST), other National Measurement Institutes (NMIs), or by using natural physical constraints, intrinsic standards or ratio calibration techniques. Unless otherwise indicated, the combined estimated uncertainty of the measurement has a coverage factor of k-2 at a confidence level of 95%. Any number of factors may cause the instrument to drift out of specification before the recommended recalibration date contained in this certificate. The information shown on this certificate applies only to the instrument identified above and may not be reproduced, except in full, without prior written consent from Global Calibration Services.

TABLE 2

EXAMPLES OF ESTIMATED BOLT TORQUE TO "SEAT" HDPE FLANGE FACES:

The **engineer of record** is usually responsible for establishing each ~~flange joint~~ criteria, and performing the required calculations to determine the initial and residual torque values.

These estimated values are based on non-plated bolts and studs, using a nut factor of K=**0.16** for lightly greased bolts and nuts. The calculations uses a HDPE flange face seating stress of **1200-psi** as a minimum and **1800-psi** as a maximum, and assumes the flanged joint is between two HDPE flange adapters (in which the contact area is largest), without a rubber gasket.

NOTE: For bolting to ductile-iron pipe, steel flanges or butterfly valves, the flange face contact area is about half, so bolt torque for that flange pair will be measurably less (refer to Table #3).

IPS Nominal Pipe Size	LJF Bolt Diameter	Initial Number of Bolts	Minimum Lubed Torque (Ft-Lbs)	Initial Maximum Lubed Torque (Ft-Lbs)	Flange OD/ ID (Inches)
2"	0.625	4	23	35	3.9 / 1.94
3"	0.625	4	33	50	5.0 / 2.86
4"	0.625	8	33	50	6.8 / 3.68
5"	0.75	8	44	66	7.5 / 4.40
6"	0.75	8	50	75	8.5 / 5.42
8"	0.75	8	80	120	10.63 / 6.76
10"	0.875	12	80	120	12.75 / 8.79
12"	0.875	12	105	160	15.00/ 10.43
14"	1.000	12	180	270	17.50 / 11.45
16"	1.000	16	180	270	20.00 / 13.09
18"	1.125	16	200	300	21.12 / 14.73
20"	1.125	20	200	300	23.50 / 16.36
22"	1.25	20	260	390	25.60 / 18.00
24"	1.25	20	290	435	28.00 / 19.64
26"	1.25	24	290-	435	30.00 / 21.27
28"	1.25	28	290	435	32.30 / 22.91
30"	1.25	28	325	488	34.30 / 24.54
32"	1.50	28	425	640	36.50 / 26.18
34"	1.50	32	425	640	38.50 / 27.82
36"	1.50	32	460	690	40.80 / 29.45
40"	1.50	36	460	690	46.00 / 35.29
42"	1.50	36	460	690	47.50 / 37.06
48"	1.50	44	460	690	54.00 / 43.43
54"	1.75	44	560	840	60.00 / 48.86

NOTE: Uniform bolt pre-load (torque), without large "scatter", is as useful as the target pre-load. Within the limits of the HDPE flange adapter, gasket, or metal LJF, higher pre-load is desirable. The higher the pre-load safely achievable, the more closely the assembly will behave like the theoretical model and seal well. Higher pre-load means that a given internal pressure will result in the least possible change in contact sealing pressure. Be consistent (avoid changes) with materials and tools when following written assembly procedures.

Train and supervise the bolting personnel. Tell the crew what is to be accomplished, why, and explain that good results are not automatically achieved. Skill and care are essential. Bolted Joint assembly is a technical skill that is not common in the construction and maintenance profession, being considered more like a specialty. There is no universally accepted testing, nor certification, of bolted-joint assembly mechanics. With no common training, certification, nor standards, it is no surprise there is +/- 25% variability in assembly torque. Specifications and instructions by the engineer, followed by trained mechanics, help to solve the dilemma.

TABLE 3

Examples of Estimated Bolt Torque to "Seat" the HDPE Flange Face To A Butterfly-Valve, Steel Pipe Flange, or Ductile Iron Flange.

The engineer of record is usually responsible for establishing each flange joint criteria, and performing the required calculations to determine the initial and residual torque values.

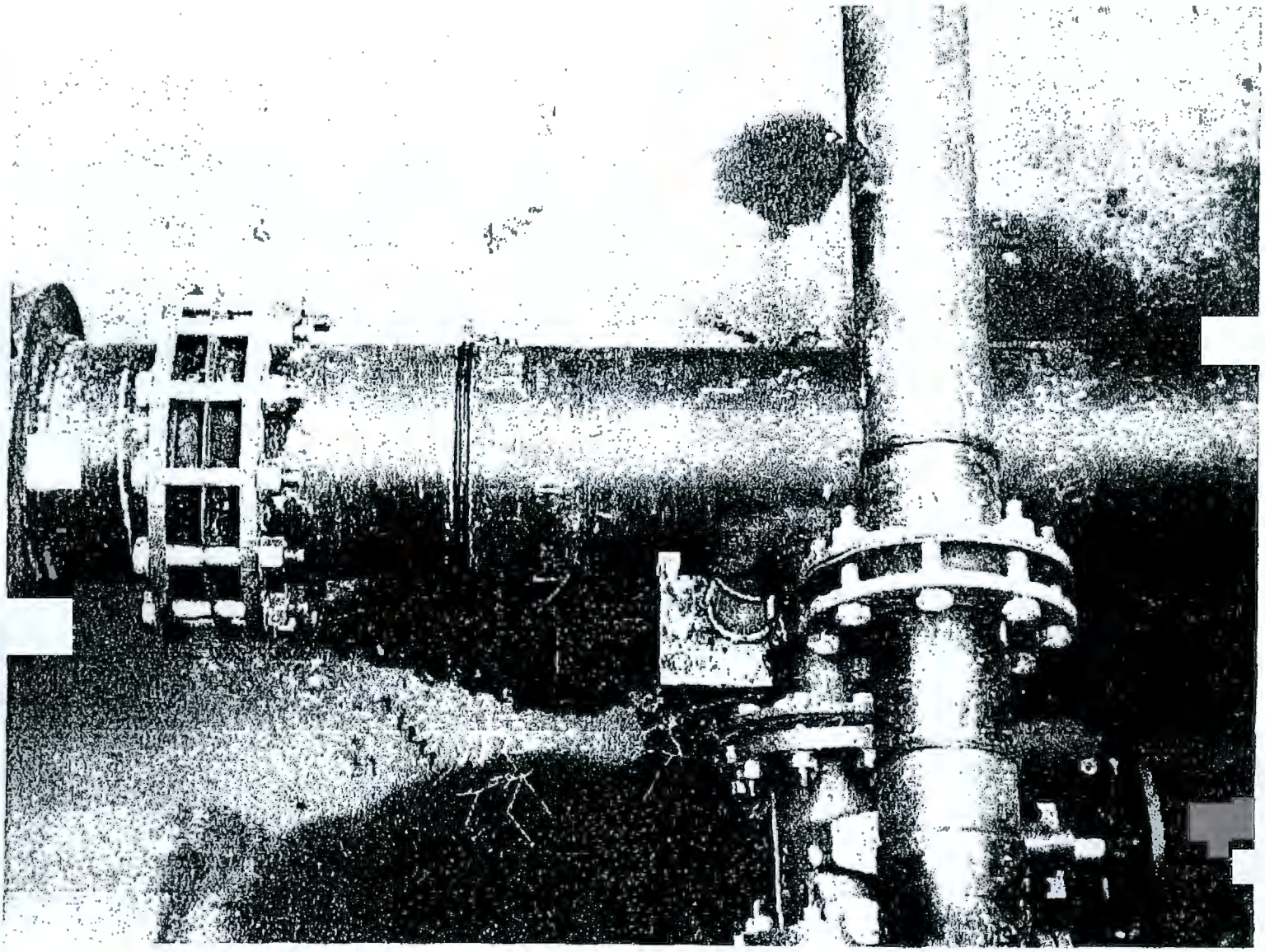
These estimated lightly lubricated torque values assume the flanged joint connects one HDPE flange-adapter to a Butterfly-Valve or Steel Pipe flange of Schedule 40 ID, or a Ductile-Iron flange. For bolting to steel flanges or butterfly valves, the flange face contact area is just over half that of HDPE to HDPE flanges, so calculated bolt torque for this flange pair will be measurably less than the values listed in Table #2.

Dimensional flange data should be obtained for each case from the pipe flange suppliers, so as to be able to calculate the face contact area.

These estimated values are based on non-plated bolts and studs, using a K=0.16 for lightly greased bolts and nuts. These calculations use an HDPE material minimum and maximum compressive seating stress of **1200-psi to 1800-psi.**

IPS Nominal Pipe Size	LJF Bolt Dia. (Inches)	Initial Number of Bolts	Minimum Lubed Torque (Ft-Lbs)	Initial Maximum Lubed Torque (Ft-Lbs)	HDPE Flange OD Steel Pipe ID (Inches)
2"	0.625	4	22	32	3.90 / 2.067
3"	0.625	4	30	45	5.00 / 3.068
4"	0.625	8	30	45	6.60 / 4.026
5"	0.75	8	44	66	7.50 / 4.40
6"	0.75	8	44	66	8.50 / 6.06
8"	0.75	8	58	88	10.63 / 7.98
10"	0.875	12	58	88	12.75 / 10.02
12"	0.875	12	75	114	15.00 / 11.94
14"	1.000	12	140	210	17.50 / 13.13
16"	1.000	16	140	210	20.00 / 15.00
18"	1.125	16	140	210	21.12 / 16.88
20"	1.125	20	140	210	23.50 / 18.81
22"	1.25	20	160	240	25.60 / 21.25
24"	1.25	20	180	270	28.00 / 23.25
26"	1.25	24	180	270	30.00 / 25.25
28"	1.25	28	180	270	32.30 / 27.25
30"	1.25	28	180	270	34.30 / 29.25
32"	1.50	28	240	360	36.50 / 31.00
34"	1.50	32	240	360	38.50 / 33.00
36"	1.50	32	260	390	40.80 / 35.00
40"	1.50	36	310	465	46.00 / 39.00
42"	1.50	36	310	465	47.50 / 41.00
48"	1.50	44	310	465	54.00 / 47.00
54"	1.75	44	365	550	60.00 / 53.00

Train and supervise the bolting personnel. Tell the crew what is to be accomplished, why, and explain that good results are not automatically achieved. Skill and care are essential. Bolted Joint assembly is a technical skill that is not common in the construction and maintenance profession, being considered more like a specialty. There is no universally accepted testing, nor certification, of bolted-joint assembly mechanics. With no common training, certification, nor standards, it is no surprise there is +/- 25% variability in assembly torque. Specifications and instructions by the engineer, followed by trained mechanics, help to solve the dilemma.



TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: Man-Hole # 33

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☑	4" Flange x Valve	30	ft-lbs	☑

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: Monday, August 9th 2010

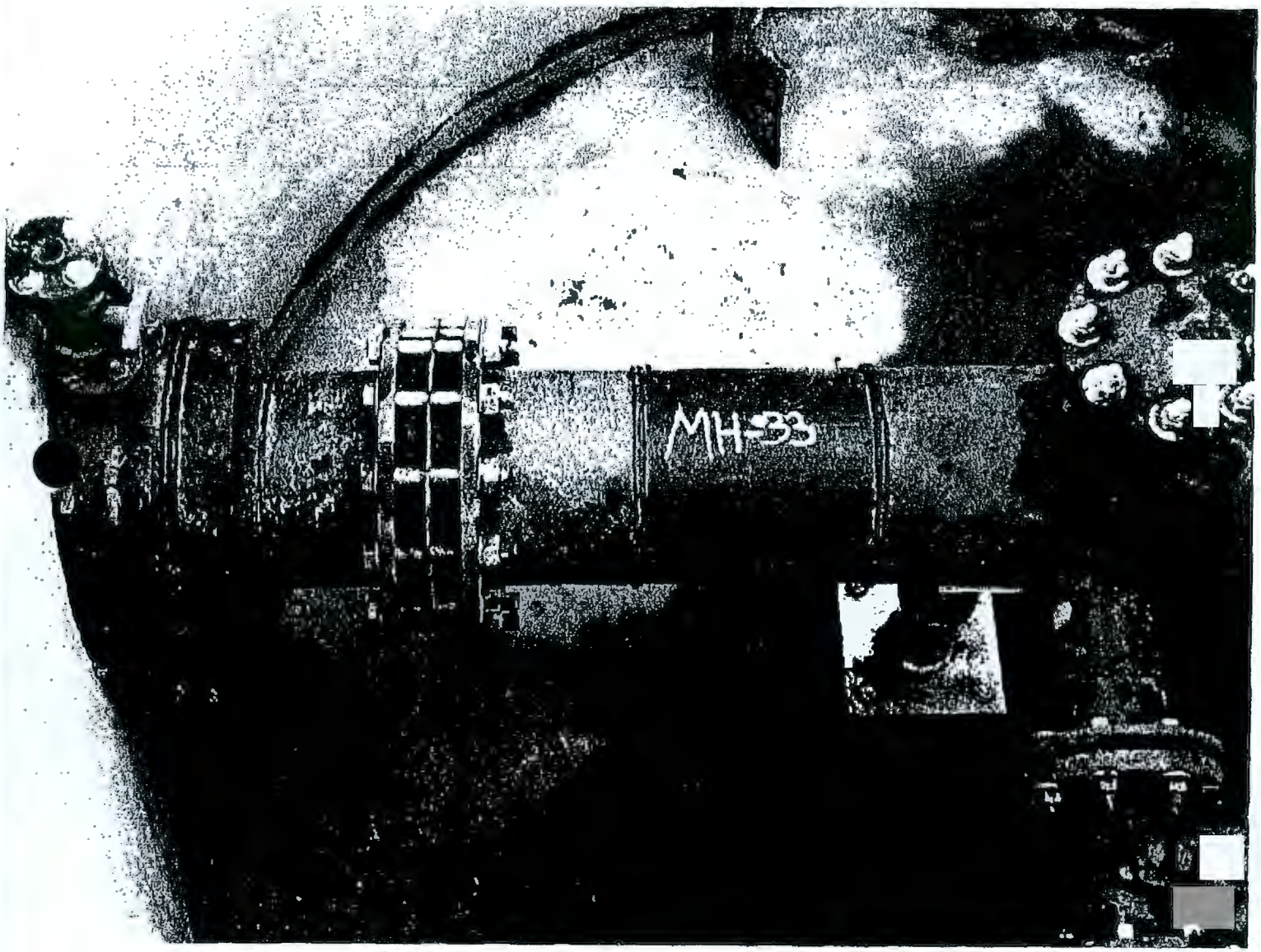
Comments: 3(4") Flange to flange, 4 (4") Flange to Valve, 1(16") Flange to flange 1 (10" Flange to 10" Blind Flange)

Test Witnessed and Accepted By:

James H. Hatton — BMWC Representative

8-9-10 — Date

Torque Witness Report Form.xls


MH-33

TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 34

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: Monday August 16, 2010

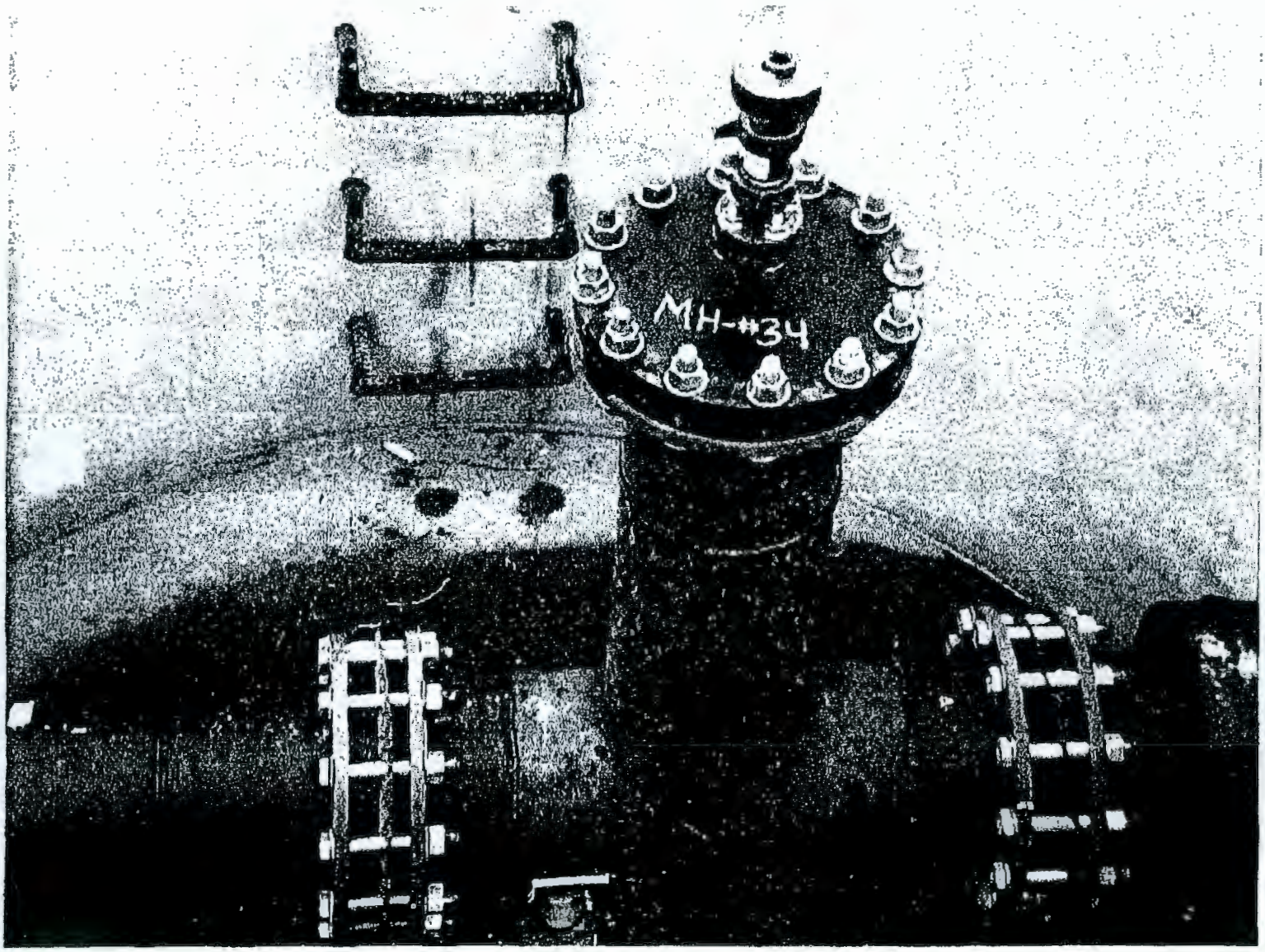
Comments: 3(10") Flange to Flange
1(10") Flange to Blind Flange

Test Witnessed and Accepted By:

James A. Hatton
BMWC Representative

9-2-10
Date

Torque Witness Report Form.xls


MH-#34

TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 9

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☑	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: Thursday august 12th, 2010

Comments: 2 (10") Flange, 2 (12") Flange

Test Witnessed and Accepted By:

James H. Hatton
BMWC Representative

8-16-10
Date

Torque Witness Report Form.xls

GLOBAL
CALIBRATION SERVICES

502 S LUCILE ST
SEATTLE, WA 98108-2507

CERTIFICATE OF CALIBRATION #128566

Issued To:

BMWC CONSTRUCTORS, INC
20638 84TH AVE S
KENT, WA 98032

Quality Management System
Certificate No. 11495

Item ID: 5981138958

Item Description: TORQUE WRENCH

Item Size: 250 ft-lb CW

Manufacturer: ARMSTRONG

Model Number: 64-086

Serial Number: 5981138958

Assigned Department: N/A

Item Location: N/A

Calibration Location: INHOUSE LAB

Purchase Order Number: 4027380105

Calibration Date: 03/30/2010

Calibration Due: 03/30/2011

Temperature (Deg F): 67

Humidity (%): 37

Procedure: GCS-8002

Ian Torres, Technical Specialist

Date Certificate Issued: 03/30/2010

Global Calibration Services' quality management system conforms to ISO 9001:2000, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003, and the technical requirements of the customer's order. All calibrations are performed using internationally recognized standards traceable to the SI Units. Traceability is achieved through the National Institute of Standards and Technology (NIST), other National Measurement Institutes (NMIs), or by using natural physical constraints, intrinsic standards or ratio calibration techniques. Unless otherwise indicated, the combined estimated uncertainty of the measurement has a coverage factor of k-2 at a confidence level of 95%. Any number of factors may cause the instrument to drift out of specification before the recommended recalibration date contained in this certificate. The information shown on this certificate applies only to the instrument identified above and may not be reproduced, except in full, without prior written consent from Global Calibration Services.

TABLE 2

EXAMPLES OF ESTIMATED BOLT TORQUE TO "SEAT" HDPE FLANGE FACES:

The **engineer of record** is usually responsible for establishing each flange-joint criteria, and performing the required calculations to determine the initial and residual torque values.

These estimated values are based on non-plated bolts and studs, using a nut factor of K=**0.16** for lightly greased bolts and nuts. The calculations uses a HDPE flange face seating stress of **1200-psi** as a minimum and **1800-psi** as a maximum, and assumes the flanged joint is between two HDPE flange adapters (in which the contact area is largest), without a rubber gasket.

NOTE: For bolting to ductile-iron pipe, steel flanges or butterfly valves, the flange face contact area is about half, so bolt torque for that flange pair will be measurably less (refer to Table #3).

IPS Nominal Pipe Size	LJF Bolt Diameter	Initial Number of Bolts	Initial Minimum Lubed Torque (Ft-Lbs)	Initial Maximum Lubed Torque (Ft-Lbs)	Flange OD/ ID (Inches)
2"	0.625	4	23	35	3.9 / 1.94
3"	0.625	4	33	50	5.0 / 2.86
4"	0.625	8	33	50	6.5 / 3.68
5"	0.75	8	44	66	7.5 / 4.40
6"	0.75	8	50	75	8.5 / 5.42
8"	0.75	8	80	120	10.63 / 6.76
10"	0.875	12	80	120	12.75 / 8.79
12"	0.875	12	105	160	15.00/ 10.43
14"	1.000	12	180	270	17.50 / 11.45
16"	1.000	16	180	270	20.00 / 13.09
18"	1.125	16	200	300	21.12 / 14.73
20"	1.125	20	200	300	23.50 / 16.36
22"	1.25	20	260	390	25.60 / 18.00
24"	1.25	20	290	435	28.00 / 19.64
26"	1.25	24	290-	435	30.00 / 21.27
28"	1.25	28	290	435	32.30 / 22.91
30"	1.25	28	325	488	34.30 / 24.54
32"	1.50	28	425	640	36.50 / 26.18
34"	1.50	32	425	640	38.50 / 27.82
36"	1.50	32	460	690	40.80 / 29.45
40"	1.50	36	460	690	46.00 / 35.29
42"	1.50	36	460	690	47.50 / 37.06
48"	1.50	44	460	690	54.00 / 43.43
54"	1.75	44	560	840	60.00 / 48.86

NOTE: Uniform bolt pre-load (torque), without large "scatter", is as useful as the target pre-load. Within the limits of the HDPE flange adapter, gasket, or metal LJF, higher pre-load is desirable. The higher the pre-load safely achievable, the more closely the assembly will behave like the theoretical model and seal well. Higher pre-load means that a given internal pressure will result in the least possible change in contact sealing pressure. Be consistent (avoid changes) with materials and tools when following written assembly procedures.

Train and supervise the bolting personnel. Tell the crew what is to be accomplished, why, and explain that good results are not automatically achieved. Skill and care are essential. Bolted Joint assembly is a technical skill that is not common in the construction and maintenance profession, being considered more like a specialty. There is no universally accepted testing, nor certification, of bolted-joint assembly mechanics. With no common training, certification, nor standards, it is no surprise there is +/- 25% variability in assembly torque. Specifications and instructions by the engineer, followed by trained mechanics, help to solve the dilemma.

TABLE 3

Examples of Estimated Bolt Torque to "Seat" the HDPE Flange Face To A Butterfly-Valve, Steel Pipe Flange, or Ductile Iron Flange.

The engineer of record is usually responsible for establishing each flange joint criteria, and performing the required calculations to determine the initial and residual torque values.

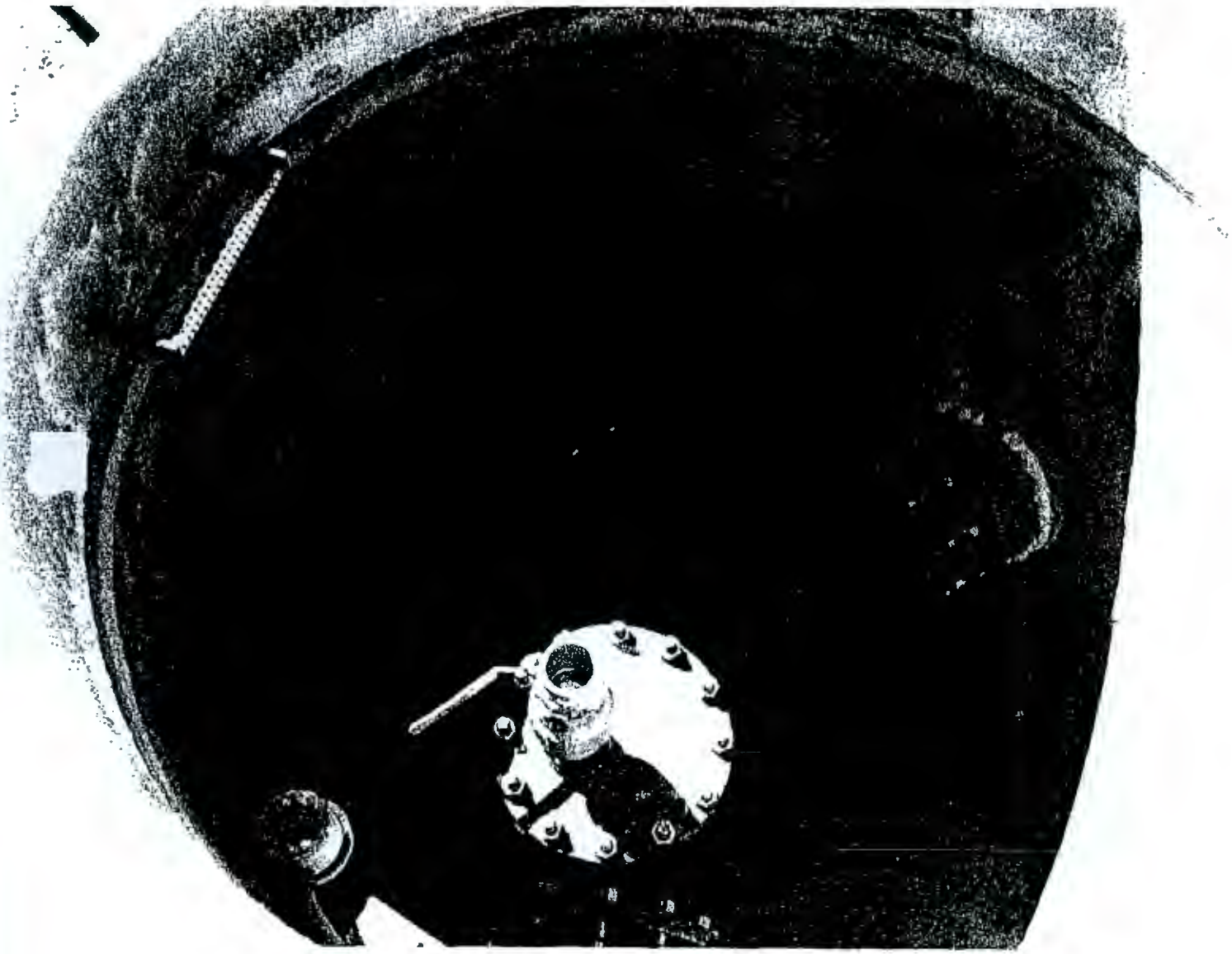
These estimated lightly lubricated torque values assume the flanged joint connects one HDPE flange-adapter to a Butterfly-Valve or Steel Pipe flange of Schedule 40 ID, or a Ductile-Iron flange. For bolting to steel flanges or butterfly valves, the flange face contact area is just over half that of HDPE to HDPE flanges, so calculated bolt torque for this flange pair will be measurably less than the values listed in Table #2.

Dimensional flange data should be obtained for each case from the pipe flange suppliers, so as to be able to calculate the face contact area.

These estimated values are based on non-plated bolts and studs, using a K=0.16 for lightly greased bolts and nuts. These calculations use an HDPE material minimum and maximum compressive seating stress of **1200-psi to 1800-psi.**

IPS Nominal Pipe Size	LJF Bolt Dia. (Inches)	Initial Number of Bolts	Minimum Lubed Torque (Ft-Lbs)	Initial Maximum Lubed Torque (Ft-Lbs)	HDPE Flange OD Steel Pipe ID (Inches)
2"	0.625	4	22	32	3.90 / 2.067
3"	0.625	4	30	45	5.00 / 3.068
4"	0.625	8	30	45	6.60 / 4.026
6"	0.75	8	44	66	7.50 / 4.40
6"	0.75	8	44	66	8.50 / 6.06
8"	0.75	8	58	88	10.63 / 7.98
10"	0.875	12	58	88	12.75 / 10.02
12"	0.875	12	75	114	15.00 / 11.94
14"	1.000	12	140	210	17.50 / 13.13
16"	1.000	16	140	210	20.00 / 15.00
18"	1.125	16	140	210	21.12 / 16.88
20"	1.125	20	140	210	23.50 / 18.81
22"	1.25	20	180	240	25.60 / 21.25
24"	1.25	20	180	270	28.00 / 23.25
26"	1.25	24	180	270	30.00 / 25.25
28"	1.25	28	180	270	32.30 / 27.25
30"	1.25	28	180	270	34.30 / 29.25
32"	1.50	28	240	360	36.50 / 31.00
34"	1.50	32	240	360	38.50 / 33.00
36"	1.50	32	260	390	40.80 / 35.00
40"	1.50	36	310	465	46.00 / 39.00
42"	1.50	36	310	465	47.50 / 41.00
48"	1.50	44	310	465	54.00 / 47.00
54"	1.75	44	365	550	60.00 / 53.00

Train and supervise the bolting personnel. Tell the crew what is to be accomplished, why, and explain that good results are not automatically achieved. Skill and care are essential. Bolted joint assembly is a technical skill that is not common in the construction and maintenance profession, being considered more like a specialty. There is no universally accepted testing, nor certification, of bolted-joint assembly mechanics. With no common training, certification, nor standards, it is no surprise there is +/- 25% variability in assembly torque. Specifications and instructions by the engineer, followed by trained mechanics, help to solve the dilemma.



New MH-#9
w/ Tee TO MH-#38

TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 20

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☑	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☐	8" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: Monday August 23rd, 2010

Comments: 4 (10") Flange to Flange

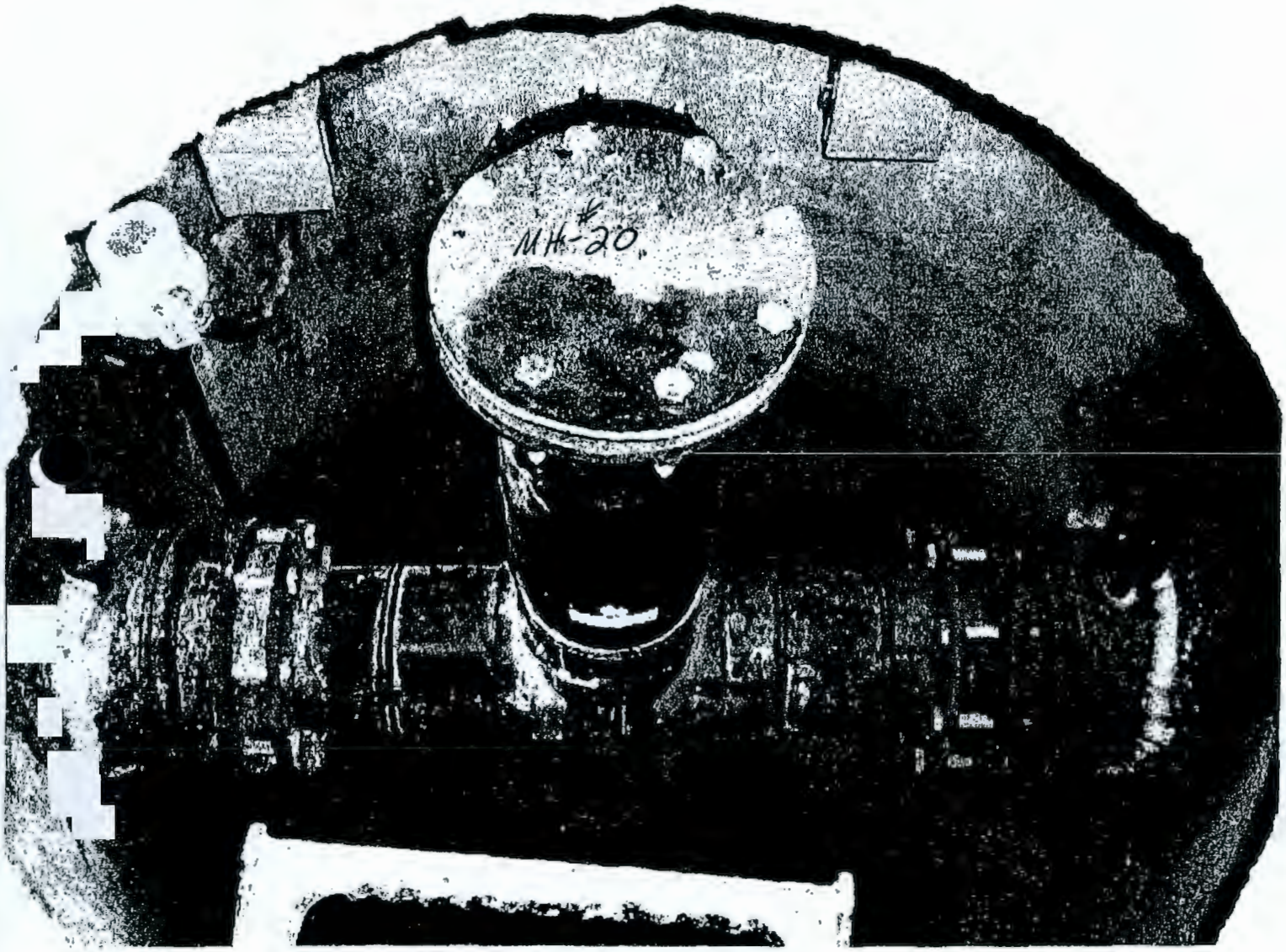
Test Witnessed and Accepted By: James A. Hatten

BMWC Representative

8-23-2010

Date

Torque Witness Report Form.xls


MH-20

TORQUE WITNESS REPORT FORM MCF-12

BMWC Constructors Inc.

Job Number: 402738 Area: SC#9 & SC#10

Equipment/Line No.: _____ Man-Hole # 21

Service: Leachate Test : Torque

System Being Tested: Boiler ☐ Exchanger ☐ Furnace ☐

Flanged Connections ☑ Vessel ☐ Other _____

Torque Requirements:	105	ft-lbs	12" Flanges ☐	12" Flange x Valve	75	ft-lbs	☐
Torque Requirements:	80	ft-lbs	10" Flanges ☐	10" Flange x Valve	58	ft-lbs	☐
Torque Requirements:	80	ft-lbs	8" Flanges ☑	8" Flange x Valve	58	ft-lbs	☑
Torque Requirements:	50	ft-lbs	6" Flanges ☐	6" Flange x Valve	44	ft-lbs	☐
Torque Requirements:	33	ft-lbs	4" Flanges ☐	4" Flange x Valve	30	ft-lbs	☐

Reason For Test: New Leachate Transmission Line Installation

Wrench Serial#	Calibration Date:	Calibration Due:
5981138958	3/30/2010	3/30/2011

Date of Torque: 8/19/2010

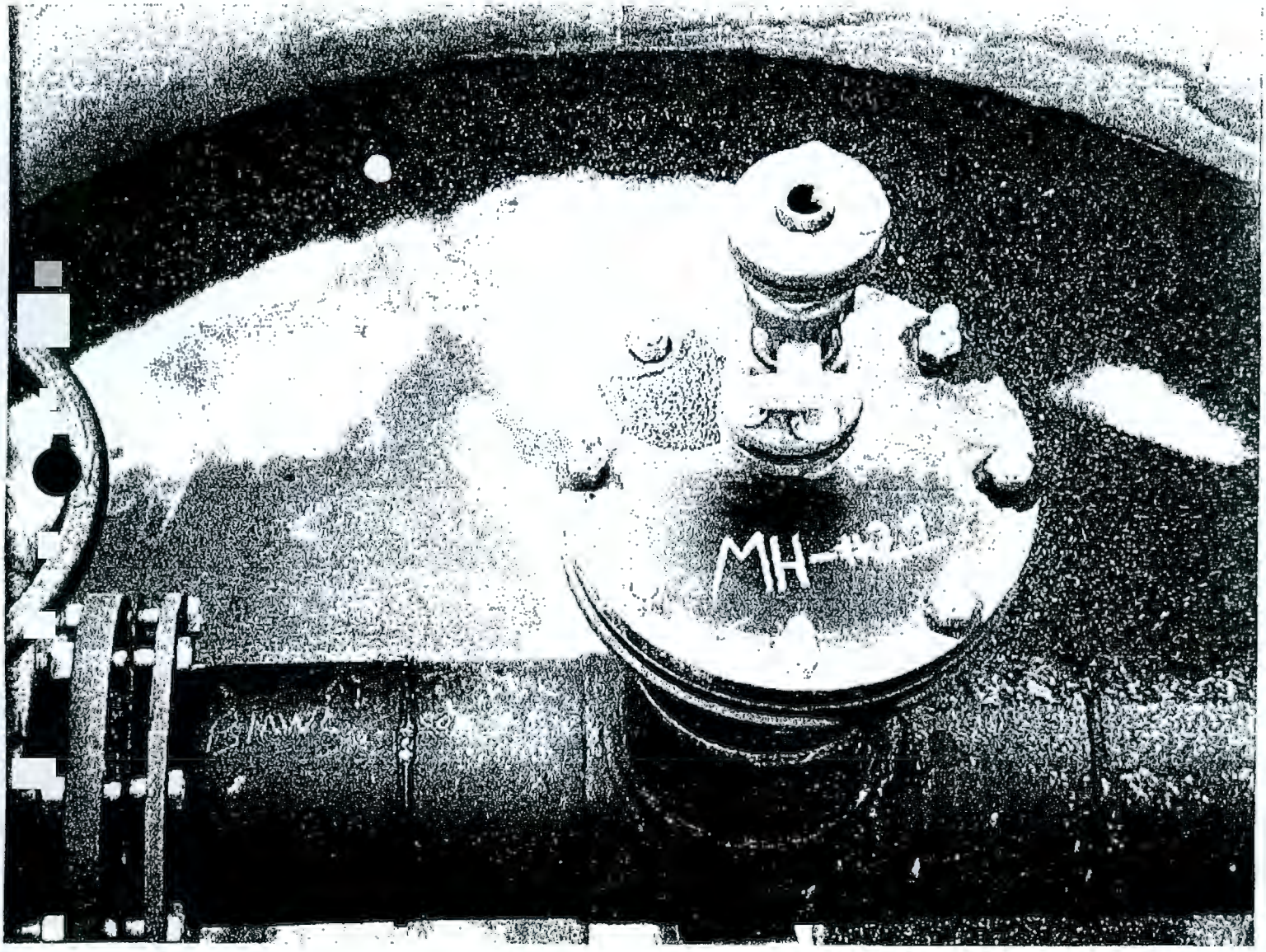
Comments: 2 (8") Flange to Flange, 2 (8") Valve to Flange

Test Witnessed and Accepted By:

BMWC Representative

8-19-10
Date

Torque Witness Report Form.xls


MH

K.3

CONCRETE TESTING

CONCRETE POUR SLIP/INSPECTION REPORT

Placement No.: Pour # 2

PART A - REQUIREMENTS

Project/W.O. No.	PCP No.	PCI No.	Area	Bldg.	Plan Placement Date
14 9 & 10	N/A	N/A	N/A	CPR 9	4-28-10

Description of Pour: Crest Pad Bldg 9 footing & slab

Estimated Yards	Mix Design No.	PSI Required	Aggregate Size
50 yd³	# 50550	4000 PSI	3/4"

Quality Control Required	Acceptance Inspection Required	Prepared By/Date
☑ Yes ☐ No	☒ Yes ☐ No	Stanley 4/27/10

PART B - PREPLACEMENT

Description	Craft Release (Sign/Date)	QC Inspection (Sign/Date)
Layout	4-27-10	4/27/10
Excavation/Compaction	4-27-10	" " "
Formwork (Material, Location, Alignment)	4-27-10	" " " "
Embeds (Material, Location, Alignment, Stability)	4-27-10	" " " "
Reinforcement (Size, Quality, Bends, Lap, Length, Spacing, Cover, Stability, Cleanliness)	4-27-10	" " " "
Joints (Material, Location, Prep, Dowel/Tie)	4-27-10	N/A
Piping	4-27-10	4/27/10
Electrical	4-27-10	" " " "
Cleanup		N/A
and Curing Equipment	4-27-10	4/27/10
Other	N/A	N/A
Preplacement Approved - Acc. Insp.	4-27-10	4/27/10

PART C - PLACEMENT

Actual Placement Date	Time	Trip Ticket No.	Placement Approved - Supt.	Date
4/28/10	7:00 AM	119991, 119992, 119995, 119999, 120001		4-28-10

Description	QC Inspection Acpt	Hold	N/A	Date	Description	QC Inspection Acpt	Hold	N/A	Date
Delivery	✓			4/28/10	Consolidating	✓			4/28/10
Mix Design	✓			4/28/10	Joint Forming/Tooling	✓			4/28/10
Conveying	✓			4/28/10	Curing	✓			4/28/10
Depositing	✓			4/28/10	Repair			✓	4/28/10

WAIVER FOR EXTENSION OF DISCHARGE TIME/DRUM REVOLUTIONS:

Time/Revolutions	Slump	Air	Superintendent (Sign/Date)
NO WATER ADDED			

Comments:

	Employee No.	Date
	2187609	4-27-10

American Rock Products, Inc.
2090 Robertson Drive
Richland WA 99354
Richland Office
(509) 375-1021
(509) 375-5194 Fax

AR 119991

SOLD TO:

DELHUR INDUSTRIES, INC 555 7

SHIP TO:

ERDF, Hanford Site at the stoller site

DATE	TIME	FORMULA #	YARDS ORD.	TRUCK #	DRIVER	BATCH #	LOAD #	YARDS DEL.	P.O. #
04/28/10	6:05	505500	50	0102	DUSTIN	122303	1	10	0

WARNING

IRRITATING TO THE SKIN AND EYES

Contains Portland Cement. Wear Rubber Boots and Gloves. PROLONGED CONTACT MAY CAUSE BURNS. Avoid Contact With Eyes and Prolonged Contact With Skin. In Case of Contact With Skin or Eyes, Flush Thoroughly With Water. If Irritation Persists, Get Medical Attention. KEEP CHILDREN AWAY.

CONCRETE is a PERISHABLE COMMODITY and BECOMES the PROPERTY of the PURCHASER UPON LEAVING the PLANT. ANY CHANGES or CANCELLATION of ORIGINAL INSTRUCTIONS MUST be TELEPHONED to the OFFICE BEFORE LOADING STARTS.

- The undersigned promises to pay all costs, including reasonable attorney's fees, incurred in collecting any sums owed.
- All accounts not paid within 30 days of delivery will bear interest at the rate of 18% per annum.
- Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered.
- A $25.00 Service Charge and Loss of the Cash Discount will be Collected on all Returned Checks.

PROPERTY DAMAGE RELEASE

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE)

Dear Customer - The driver of this truck is presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this load where you desire it. It is our wish to help you in every way that we can, but in order to do this the driver is requesting that you sign this RELEASE relieving him and this supplier from any responsibility from any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, driveways, curbs, etc., by the delivery of this material, and that you also agree to help him remove mud from the wheels of his vehicle so that he will not litter the public street. Further, as an additional consideration, the undersigned agrees to indemnify and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order.

EXCESSIVE WATER IS DETRIMENTAL TO CONCRETE PERFORMANCE H_2O ADDED BY REQUEST / AUTHORIZED BY:

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

ARRIVED AT _____ BEGIN

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

TOTAL WATER ADDED _____

QUANTITY		DESCRIPTION		UNIT PRICE	EXTENDED
10.00	yd	505500	4000PSI INTERIOR		
150.00	yd	ON3030	GLENIUM 3030		
10.00	cy	ON9949	ENVIRONMENTAL FEE		

3.99in

LEFT PLANT	ARRIVED JOB	START UNLOADING	DELAY EXPLANATION/CYLINDER TEST TAKEN	TIME ALLOWED
6:15	6:56	7:15	1 JOB NOT READY 2 SLOW POUR OR PUMP 3 TRUCK AHEAD ON JOB 4 CONTRACTOR BROKE DOWN 5 ADDED WATER 6 TRUCK BROKE DOWN 7 ACCIDENT 8 CITATION 9 LOCATION 10 OTHER	
RETURNED TO PLANT	LEFT JOB	FINISH UNLOADING		DELAY TIME
8:14	7:39	7:35		
TOTAL ROUND TRIP	TOTAL AT JOB	UNLOADING TIME		ADDITIONAL CHARGE

SUBTOTAL

TAX CODE

TAX

ADDITIONAL CHARGE

GRAND TOTAL

Truck	Driver	User	Disp Ticket Num	Ticket ID	Time	Date
0102		user	122303	37560	6:05	4/28/10

Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
10.00 CYDS	505500				W	40408

Material	Design Qty	Required	Batched	% Var	Moisture	Actual Wat
500WN1	1480 lb	14948 lb	14800 lb	-0.99%	1.00% M	18 gl
460WRR	390 lb	3959 lb	3920 lb	-0.97%	1.50% M	7 gl
560WN1	1582 lb	16562 lb	16440 lb	-0.74%	4.69% A	88 gl
RCTI/II	520.0 lb	5200.0 lb	5170.0 lb	-0.58%		
WATER	29.80 gl	154.00 gl	154.00 gl	0.00%	154.00 gl	
ON9941	31.00 oz	310.00 oz	308.00 oz	-0.65%		

Actual Num Batches: 1 Manual 6:05:26

Load Total: 41634 lb Design W/C: 0.461 Water/Cement: 0.464 T Design Water: 288.0 gl Actual Water: 267.0 gl To Add: 21.0 gl

Slump: 3.99 in # Water in Truck: 0.0 gl Adjust Water: 0.0 gl/ Load Trim Water: -1.0 gl/ CYDS Note: Manual feed occured

WEIGHMASTER SIGNATURE X _____

GALLONS OF WATER AVAILABLE PER CUBIC YARD _____

LOAD RECEIVED BY X _____

American Rock Products, Inc.

2090 Robertson Drive
Richland, WA 99354

Richland Office
(509) 375-1021
(509) 375-5194 Fax

AR 119932

S O:

SHIP TO:

DATE	TIME	FORMULA #	YARDS ORD.	TRUCK #	DRIVER	BATCH #	LOAD #	YARDS DEL.	P.O. #
[illegible]	[illegible]	[illegible]	9	[illegible]	[illegible]	[illegible]	2	2	

WARNING
IRRITATING TO THE SKIN AND EYES

Contains Portland Cement. Wear Rubber Boots and Gloves. PROLONGED CONTACT MAY CAUSE BURNS. Avoid Contact With Eyes and Prolonged Contact With Skin. In Case of Contact With Skin or Eyes, Flush Thoroughly With Water. If Irritation Persists Get Medical Attention. KEEP CHILDREN AWAY.

CONCRETE is a PERISHABLE COMMODITY and BECOMES the PROPERTY of the PURCHASER UPON LEAVING the PLANT. ANY CHANGES or CANCELLATION of ORIGINAL INSTRUCTIONS MUST be TELEPHONED to the OFFICE BEFORE LOADING STARTS.

- The undersigned promises to pay all costs, including reasonable attorney's fees, incurred in collecting any sums owed.
- All accounts not paid within 30 days of delivery will bear interest at the rate of 18% per annum.
- Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered.
- A $25.00 Service Charge and Loss of the Cash Discount will be Collected on all returned Checks.

PROPERTY DAMAGE RELEASE
(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE)

Dear Customer: The driver of this truck is presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this load where you desire it. It is our wish to help you in every way that we can, but in order to do this the driver is requesting that you sign this RELEASE relieving him and this supplier from any responsibility from any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, driveways, curbs, etc., by the delivery of this material, and that you also agree to help him remove mud from the wheels of his vehicle so that he will not litter the public street. Further, as an additional consideration, the undersigned agrees to indemnify and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order.

EXCESSIVE WATER IS DETRIMENTAL TO CONCRETE PERFORMANCE H_2O ADDED BY REQUEST / AUTHORIZED BY:

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

ARRIVED AT 6 SLUMP

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

TOTAL WATER ADDED ____

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED
[illegible]	[illegible]		

LEFT PLANT	ARRIVED JOB	START UNLOADING	DELAY EXPLANATION/CYLINDER TEST TAKEN	TIME ALLOWED
635	715	725	1 JOB NOT READY 2 SLOW POUR OR PUMP 3 TRUCK AHEAD ON JOB 4 CONTRACTOR BROKE DOWN 5 ADDED WATER 6 TRUCK BROKE DOWN 7 ACCIDENT 8 CITATION 9 LOCATION 10 OTHER	
RETURNED TO PLANT	LEFT JOB	FINISH UNLOADING		DELAY TIME
TOTAL ROUND TRIP	TOTAL AT JOB	UNLOADING TIME		ADDITIONAL CHARGE

SUBTOTAL

TAX CODE

TAX

ADDITIONAL CHARGE

GRAND TOTAL

[illegible]

Load Date [illegible] Mix Code [illegible] Mix Age [illegible] Load ID [illegible]
Yd CYDS [illegible]

Material	Design Qty	Required	Batched	% Var	Moisture	Actual Adj
[illegible]	1480 lb	14748 lb	14340 lb	-0.72%	1.30% M	13 gl
[illegible]	390 lb	3957 lb	3920 lb	-0.93%	1.50% M	7 gl
[illegible]	1582 lb	15331 lb	15440 lb	-0.55%	4.63% A	85 gl
[illegible]	520.0 lb	5200.0 lb	5183.0 lb	-0.27%		
[illegible]	28.80 gl	157.41 gl	158.00 gl	0.12%		158.00 gl
[illegible]	31.00 oz	310.00 oz	312.00 oz	0.65%		

Actual Mix Batches: 1 Manual Seq: [illegible]
Load Total: 41721 lb Design W/C: 0.40 Water/Cement: 0.40 Design Water: 288.0 gl Actual Water: 257.4 gl To Add: 20.0 gl
Time: [illegible] Water in Truck: 0.0 gl Adjust Water: [illegible] gl Load Total Water: [illegible] gl CYDS Notes: Manual feed occurred

WEIGHMASTER SIGNATURE X _____

GALLONS OF WATER AVAILABLE PER CUBIC YARD _____

LOAD RECEIVED BY X _____

American Rock Products, Inc.

2090 Robertson Drive
Richland, WA 99354

Richland Office
(509) 375-1021
(509) 375-5194 Fax

AR 119395

TO:

SHIP TO:

DATE	TIME	FORMULA #	YARDS ORD.	TRUCK #	DRIVER	BATCH #	LOAD #	YARDS DEL.	P.O. #

WARNING

IRRITATING TO THE SKIN AND EYES

Contains Portland Cement. Wear Rubber Boots and Gloves. PROLONGED CONTACT MAY CAUSE BURNS. Avoid Contact With Eyes and Prolonged Contact With Skin. In Case of Contact With Skin or Eyes, Flush Thoroughly With Water. If Irritation Persists, Get Medical Attention. KEEP CHILDREN AWAY.

CONCRETE is a PERISHABLE COMMODITY and BECOMES the PROPERTY of the PURCHASER UPON LEAVING the PLANT. ANY CHANGES or CANCELLATION of ORIGINAL INSTRUCTIONS MUST be TELEPHONED to the OFFICE BEFORE LOADING STARTS.

- The undersigned promises to pay all costs, including reasonable attorney's fees, incurred in collecting any sums owed.
- All accounts not paid within 10 days of delivery will bear interest at the rate of 18% per annum.
- Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered.
- A $25.00 Service Charge and Loss of the Cash Discount will be Collected on all returned Checks.

PROPERTY DAMAGE RELEASE

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE)

Dear Customer: The driver of this truck in presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this load where you desire it. It is our wish to help you in every way that we can, but in order to do this the driver is requesting that you sign this RELEASE relieving him and this supplier from any responsibility from any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, driveways, curbs, etc., by the delivery of this material, and that you also agree to help him remove mud from the wheels of his vehicle so that he will not litter the public street. Further, as an additional consideration, the undersigned agrees to indemnify and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order.

EXCESSIVE WATER IS DETRIMENTAL TO CONCRETE PERFORMANCE H_2O ADDED BY REQUEST / AUTHORIZED BY:

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

ARRIVED AT _____ SLUMP

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

TOTAL WATER ADDED _____

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED

LEFT PLANT	ARRIVED JOB	START UNLOADING	DELAY EXPLANATION/CYLINDER TEST TAKEN	TIME ALLOWED
			1 JOB NOT READY 2 SLOW POUR OR PUMP 3 TRUCK AHEAD ON JOB 4 CONTRACTOR BROKE DOWN 5 ADDED WATER 6 TRUCK BROKE DOWN 7 ACCIDENT 8 CITATION 9 LOCATION 10 OTHER	
RETURNED TO PLANT	LEFT JOB	FINISH UNLOADING		DELAY TIME
TOTAL ROUND TRIP	TOTAL AT JOB	UNLOADING TIME		ADDITIONAL CHARGE

SUBTOTAL

TAX CODE

TAX

ADDITIONAL CHARGE

GRAND TOTAL

Mix	Driver	Load	Also Ticket from	Ticket ID	Time	Date
			122303			

Mix Size	Mix Code	Returned	Qty	Mix	Age	Load ID

Item	Design Qty	Required	Dispatched	% Var Moisture	Actual Wt	
00PM1	1440 lb	1440 lb	1450 lb	0.08%	1.00% M	13 gl
40489	390 lb	390 lb	390 lb	-0.92%	1.50% M	4 gl
00NN1	1582 lb	1582 lb	1580 lb	-0.42%	4.74% A	20 gl
[illegible]	5200.0 lb	5200.0 lb	5180.0 lb	-0.38%		
[illegible]	29.00 gl	150.00 gl	151.00 gl	-0.05%	150.00 gl	
N7941	31.00 oz	310.00 oz	308.00 oz	-0.65%		

Total Mix Batches: 1 Manual 6:56:28

Load Total: 6850 lb Design W/C: [illegible] Water Cement: 0.563 Design Water: 330.0 gl Actual Water: [illegible] gl To Add: 20.0 gl

Drop [illegible] lb # Water to Tank: [illegible] gl Adjust Water: 0.0 gl Total Trim Water: [illegible] gl [illegible] Water Times Load occurred

WEIGHMASTER SIGNATURE X _____

GALLONS OF WATER AVAILABLE PER CUBIC YARD _____

LOAD RECEIVED BY X _____

American Rock Products, Inc.
2090 Robertson Drive
Richland, WA 99354

Richland Office
(509) 375-1021
(509) 375-5194 Fax

AR 119999

TO:

SHIP TO:

DATE	TIME	FORMULA #	YARDS ORD.	TRUCK #	DRIVER	BATCH #	LOAD #	YARDS DEL.	P.O. #

WARNING

IRRITATING TO THE SKIN AND EYES

Contains Portland Cement. Wear Rubber Boots and Gloves. PROLONGED CONTACT MAY CAUSE BURNS. Avoid Contact With Eyes and Prolonged Contact With Skin. In Case of Contact With Skin or Eyes, Flush Thoroughly With Water. If Irritation Persists, Get Medical Attention. KEEP CHILDREN AWAY.

CONCRETE is a PERISHABLE COMMODITY and BECOMES the PROPERTY of the PURCHASER UPON LEAVING the PLANT. ANY CHANGES or CANCELLATION or ORIGINAL INSTRUCTIONS MUST be RESIGNED to the OFFICE BEFORE LOADING STARTS.

- The undersigned promises to pay all costs, including reasonable attorney's fees, incurred in collecting any sums owed.
- All accounts not paid within 30 days of delivery will bear interest at the rate of 18% per annum.
- Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered.
- A $25.00 Service Charge and Loss of the Cash Discount will be Collected on all Returned Checks.

PROPERTY DAMAGE RELEASE

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE)

Dear Customer: The driver of this truck in presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this load where you desire it. It is our wish to help you in every way that we can, but in order to do this the driver is requesting that you sign this RELEASE, relieving him and this supplier from any responsibility from any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, driveways, curbs, etc., by the delivery of this material, and that you also agree to help him remove mud from the wheels of his vehicle so that he will not litter the public street. Further, as an additional consideration, the undersigned agrees to indemnify and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order.

EXCESSIVE WATER IS DETRIMENTAL TO CONCRETE PERFORMANCE. H_2O ADDED BY REQUEST / AUTHORIZED BY:

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

ARRIVED AT _____ SLUMP

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

TOTAL WATER ADDED _____

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED

LEFT PLANT	ARRIVED JOB	START UNLOADING	DELAY EXPLANATION/CYLINDER TEST TAKEN	TIME ALLOWED
			1 JOB NOT READY; 2 SLOW POUR OR PUMP; 3 TRUCK AHEAD ON JOB; 4 CONTRACTOR BROKE DOWN; 5 ADDED WATER; 6 TRUCK BROKE DOWN; 7 ACCIDENT; 8 CITATION; 9 LOCATION; 10 OTHER	
RETURNED TO PLANT	LEFT JOB	FINISH UNLOADING		DELAY TIME
TOTAL ROUND TRIP	TOTAL AT JOB	UNLOADING TIME		ADDITIONAL CHARGE

SUBTOTAL

TAX CODE

TAX

ADDITIONAL CHARGE

GRAND TOTAL

WEIGHMASTER SIGNATURE X _____

GALLONS OF WATER AVAILABLE PER CUBIC YARD _____

LOAD RECEIVED BY X _____

American Rock Products, Inc.

2090 Robertson Drive
Richland, WA 99354

Richland Office
(509) 375-1021
(509) 375-5194 Fax

AR 120001

TO:

SHIP TO:

DATE	TIME	FORMULA #	YARDS ORD.	TRUCK #	DRIVER	BATCH #	LOAD #	YARDS DEL.	P.O. #
						122314	5		

WARNING
IRRITATING TO THE SKIN AND EYES

Contains Portland Cement. Wear Rubber Boots and Gloves. PROLONGED CONTACT MAY CAUSE BURNS. Avoid Contact With Eyes and Prolonged Contact With Skin. In Case of Contact With Skin or Eyes, Flush Thoroughly With Water. If Irritation Persists, Get Medical Attention. KEEP CHILDREN AWAY

CONCRETE is a PERISHABLE COMMODITY and BECOMES the PROPERTY of the PURCHASER UPON LEAVING the PLANT. ANY CHANGES or CANCELLATION of ORIGINAL INSTRUCTIONS MUST be TELEPHONED to the OFFICE BEFORE LOADING STARTS.

- The undersigned promises to pay all costs, including reasonable attorney's fees, incurred in collecting any sums owed.
- All accounts not paid within 30 days of delivery will bear interest at the rate of 18% per annum.
- Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered.
- A $25.00 Service Charge and Loss of the Cash Discount will be Collected on all returned Checks.

PROPERTY DAMAGE RELEASE
(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE)

Dear Customer: The driver of this truck in presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this load where you desire it. It is our wish to help you in every way that we can, but in order to do this the driver is requesting that you sign this RELEASE relieving him and this supplier from any responsibility from any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, driveways, curbs, etc., by the delivery of this material, and that you also agree to help him remove mud from the wheels of his vehicle so that he will not litter the public street. Further, as an additional consideration, the undersigned agrees to indemnify and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order.

EXCESSIVE WATER IS DETRIMENTAL TO CONCRETE PERFORMANCE H_2O ADDED BY REQUEST / AUTHORIZED BY:

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

ARRIVED AT _____ SLUMP
GALLONS ADDED ____ TO ____ YDS
GALLONS ADDED ____ TO ____ YDS
GALLONS ADDED ____ TO ____ YDS
GALLONS ADDED ____ TO ____ YDS
TOTAL WATER ADDED _____

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED

SUBTOTAL

LEFT PLANT	ARRIVED JOB	START UNLOADING	DELAY EXPLANATION/CYLINDER TEST TAKEN	TIME ALLOWED
			1 JOB NOT READY 2 SLOW POUR OR PUMP 3 TRUCK AHEAD ON JOB 4 CONTRACTOR BROKE DOWN 5 ADDED WATER 6 TRUCK BROKE DOWN 7 ACCIDENT 8 CITATION 9 LOCATION 10 OTHER	
RETURNED TO PLANT	LEFT JOB	FINISH UNLOADING		DELAY TIME
TOTAL ROUND TRIP	TOTAL AT JOB	UNLOADING TIME		ADDITIONAL CHARGE

TAX CODE

TAX

ADDITIONAL CHARGE

GRAND TOTAL

Operator	User	Disp. Ticket Num	Ticket ID	Time	Date

Mix Code	Mix Name	Batched	Qty	Mix Age	Pan	Load ID
					W	

	Design	Requested	Batched	% Var Moisture	Actual Wt
	1490 lb	1498 lb	1490 lb	-0.73% 1.00% M	12 gl
	330 lb	3959 lb	3900 lb	-1.48% 1.50% M	7 gl
	1582 lb	1583 lb	1500 lb	0.09% 4.20% M	80 gl
	5200.0 lb	5200.0 lb	5215.0 lb	0.29%	
	39.99 gl	153.2 gl	153.00 gl	-0.15%	153.00 gl
	1.00 oz	310.00 oz	308.00 oz	-0.65%	

Total Batches: 1 Manual: 7:45:42

Design W/C: 0.44 Water/Cement: 0.45 Design Water: 258.0 gl Actual Water: 267.5 gl To Add: 20.5 gl
Total Water to Add: 0.0 gl Added Water: 0.0 gl Total Free Water: 0.0 gl CDS Water Manual feed occurred

WEIGHMASTER SIGNATURE X _____

GALLONS OF WATER AVAILABLE PER CUBIC YARD _____

LOAD RECEIVED BY X _____

INTERMOUNTAIN MATERIALS TESTING & GEOTECHNICAL
PO Box 2801
Pasco, WA 99302
(509) 545-9217 (509) 545-9243 FAX

REC'D MAY 07 2010

Compressive Strength Report

Concrete
ASTM C-39,05

Client: Del Hur Industries
Address: P.O. Box 883
Hermiston, OR 97838

Set #: 10709

Project: ERDF Cells 9 & 10
Project #: M10014
Contractor: Del Hur, Inc.
Sampled By: IMT
Sample Location: West side of building 9, Slab/footings
Sample Date: 4/28/2010
Date Received: 4/29/2010
Supplier: ARP
Mix #: 505500
Ticket #: 37568
Specified Strength: 4000 psi

EQUIPMENT ID
Slump Cone/Tamping Rod: 081
Air Entrainment Meter: 039
Thermometer: 331

Slump (\"): 7 (ASTM C-143, AASHTO T-119)
Entrained Air (%): 2.5 (ASTM C-231, AASHTO T-152)
Temperature: 65.3 * (ASTM C-1064)

Unit Wieght (pcf): n/r (ASTM C-138, AASHTO T-121)
Yield (%): n/r (ASTM C-138, AASHTO T-121)

Sample I.D.	Test Date	Age (days)	Fracture Type	Diameter (.01 inch)	Load (lbs.)	Area (.01 inch^2)	Strength (p.s.i.)	% of Spec.
10709-1	5/3/2010	5	5	4.02	48120	12.69	3790	95
-2	5/5/2010	7						
-3	5/26/2010	28						
-4	5/26/2010	28						

Remarks:

Report By:
Scott Walters
Construction Services Manager

Report Copy To: Addressee - 2

INTERMOUNTAIN MATERIALS TESTING & GEOTECHNICAL
PO Box 2801
Pasco, WA 99302
(509) 545-9217 (509) 545-9243 FAX

REC'D MAY 07 2010

Compressive Strength Report

Concrete
ASTM C-39,05

Client: Del Hur Industries
Address: P.O. Box 883
Hermiston, OR 97838

Set #: 10710

Project: ERDF Cells 9 & 10
Project #: M10014
Contractor: Del Hur, Inc.
Sampled By: IMT
Sample Location: East side of crest pad building 9, Slab/footings
Sample Date: 4/28/2010
Date Received: 4/29/2010
Supplier: ARP
Mix #: 505500
Ticket #: 37560
Specified Strength: 4000 psi

EQUIPMENT ID
Slump Cone/Tamping Rod: 081
Air Entrainment Meter: 039
Thermometer: 331

Slump (")): 6 3/4 (ASTM C-143, AASHTO T-119)
Entrained Air (%): 1.8 (ASTM C-231, AASHTO T-152)
Temperature: 64.9 * (ASTM C-1064)

Unit Wieght (pcf): n/r (ASTM C-138, AASHTO T-121)
Yield (%): n/r (ASTM C-138, AASHTO T-121)

Sample I.D.	Test Date	Age (days)	Fracture Type	Diameter (.01 inch)	Load (lbs.)	Area (.01 inch^2)	Strength (p.s.i.)	% of Spec.
10710-1	5/3/2010	5	1	4.01	49760	12.63	3940	99
-2	5/5/2010	7						
-3	5/26/2010	28						
-4	5/26/2010	28						

Remarks:

Report By:
Scott Walters
Construction Services Manager

Report Copy To: Addressee - 2

INTERMOUNTAIN MATERIALS TESTING & GEOTECHNICAL
PO Box 2801
Pasco, WA 99302
(509) 545-9217 (509) 545-9243 FAX

REC'D MAY 10 2010

Compressive Strength Report

Concrete
ASTM C-39,05

Client: Del Hur Industries
Address: P.O. Box 883
Hermiston, OR 97838

Set #: 10709

Project: ERDF Cells 9 & 10
Project #: M10014
Contractor: Del Hur, Inc.
Sampled By: IMT
Sample Location: West side of building 9, Slab/footings
Sample Date: 4/28/2010
Date Received: 4/29/2010
Supplier: ARP
Mix #: 505500
Ticket #: 37568
Specified Strength: 4000 psi

EQUIPMENT ID
Slump Cone/Tamping Rod: 081
Air Entrainment Meter: 039
Thermometer: 331

Slump (\"): 7 (ASTM C-143, AASHTO T-119)
Entrained Air (%): 2.5 (ASTM C-231, AASHTO T-152)
Temperature: 65.3 * (ASTM C-1064)

Unit Wieght (pcf): n/r (ASTM C-138, AASHTO T-121)
Yield (%): n/r (ASTM C-138, AASHTO T-121)

Sample I.D.	Test Date	Age (days)	Fracture Type	Diameter (.01 inch)	Load (lbs.)	Area (.01 inch^2)	Strength (p.s.i.)	% of Spec.
10709-1	5/3/2010	5	5	4.02	48120	12.69	3790	95
-2	5/5/2010	7	1	4.02	58320	12.69	4590	115
-3	5/26/2010	28						
-4	5/26/2010	28						

Remarks:

Report By:
Scott Walters
Construction Services Manager

Report Copy To: Addressee - 2

CONCRETE PLACEMENT

Project: ERDF Cells 9 and 10

Job #: m1004 Date: 4/28/10 Slump Cone/Tamping Rod: 081

Air Entrainment Meter: 039

Thermometer: 331

Item(s) Placed: Slab/Footings

Sample Location: Crest Pad Bldg Pad Slab, (1) East side & (2) west side of slab/Footings

Reinforcing Steel Examined? ☐yes ☒no Total Cubic Yards Placed: 50 cy

Supplier: ARP Mix #: 505500 Admixtures: Super P

High Early: ☐yes ☐no Ticket#: (1) 37560, (2) 37568

Project Specifications: Slump Air Entrainment Strength W/C Rat.

Time Batched	Time Done	Age	Water Added	W/C Ratio	Load #	Quantity (c.y.)	Slump (1/4 inch)	Temp. (F)	Air %	Unit Wt. (pcf)	Cyl. Cast (#)
5:05	7:29	84 mins	/	.464	1	10.0	6 3/4"	64.9	1.8	/	4
7:32	8:10	98 mins	/	.461	4	10.0	7"	65.3	2.5	/	4

*Estimated

ASTM C-143, C-172, C-1064, C-231 C-173 C-138 C-31

Intermountain Materials Testing & Geotechnical
P.O. Box 2801, Pasco, WA 99302-2801
2301 N. Commercial Avenue 99302 (509) 545-9217 fax (509) 545-9243

CONCRETE POUR SLIP/INSPECTION REPORT

Placement No.: POUR # 3

PART A - REQUIREMENTS

ct/W.O. No.	PCP No.	PCI No.	Area	Bldg.	Plan Placement Date
EKDF 9-10	N/A	N/A	N/A	CPB #9	5-12-10

Description of Pour: CREST PAD BUILDING 9 WALLS

Estimated Yards	Mix Design No	PSI Required	Aggregate Size
13 CY	51550	4000	3/4"

Quality Control Required	Acceptance Inspection Required	Prepared By/Date
☑ Yes ☐ No	☑ Yes ☐ No	JAKE WILLIAMS 5-12-10

PART B - PREPLACEMENT

Description	Craft Release (Sign/Date)	QC Inspection (Sign/Date)
Layout	[illegible] 5-12-10	[illegible] 5-12-10
Excavation/Compaction	N/A	N/A
Formwork (Material, Location, Alignment)	[illegible]	[illegible] 5-12-10
Embeds (Material, Location, Alignment, Stability)	[illegible]	[illegible] 5-12-10
Reinforcement (Size, Quality, Bends, Lap, Length, Spacing, Cover, Stability, Cleanliness)	[illegible]	[illegible] 5-12-10
Joints (Material, Location, Prep, Dowel/Tie)	[illegible]	[illegible] 5-12-10
Piping	[illegible]	[illegible] 5-12-10
Electrical	N/A	N/A
	[illegible]	[illegible] 5-12-10
Placing and Curing Equipment	[illegible]	[illegible] 5-12-10
Other	N/A	N/A
Preplacement Approved - Acc. Insp.	[illegible]	[illegible] 5-12-10

PART C - PLACEMENT

Actual Placement Date	Time	Trip Ticket No.	Placement Approved - Supt.	Date
5-12-10	2:00	120755, 120758		

Description	QC Inspection Acpt	Hold	N/A	Date	Description	QC Inspection Acpt	Hold	N/A	Date
Delivery	✓			5-12-10	Consolidating	✓			5-12-10
Mix Design	✓			5-12-10	Joint Forming/Tooling	✓			5-12-10
Conveying	✓			5-12-10	Curing	✓			5-12-10
Depositing	✓			5-12-10	Repair			✓	5-12-10

WAIVER FOR EXTENSION OF DISCHARGE TIME/DRUM REVOLUTIONS:

Time/Revolutions	Slump	Air	Superintendent (Sign/Date)
2:25	8.5"	6.2%	

Comments:

Inspector	Employee No	Date
JAKE WILLIAMS	04374223	5-12-10

American Rock Products, Inc.

2090 Robertson Drive
Richland, WA 99354

Richland Office
(509) 375-1021
(509) 375-5194 Fax

AR 120735

TO:

SHIP TO:

DATE	TIME	FORMULA #	YARDS ORD.	TRUCK #	DRIVER	BATCH #	LOAD #	YARDS DEL.	P.O. #
[illegible]	13:09	515504	13	[illegible]	DAN FA	123041	[illegible]	7	CRAIG

WARNING
IRRITATING TO THE SKIN AND EYES

Contains Portland Cement. Wear Rubber Boots and Gloves. PROLONGED CONTACT MAY CAUSE BURNS. Avoid Contact With Eyes and Prolonged Contact With Skin. In Case of Contact With Skin or Eyes, Flush Thoroughly With Water. If Irritation Persists, Get Medical Attention. KEEP CHILDREN AWAY.

CONCRETE is a PERISHABLE COMMODITY and BECOMES the PROPERTY of the PURCHASER UPON LEAVING the PLANT. ANY CHANGES or CANCELLATION of ORIGINAL INSTRUCTIONS MUST be TELEPHONED to the OFFICE BEFORE LOADING STARTS.

- The undersigned promises to pay all costs, including reasonable attorney's fees, incurred in collecting any sums owed.
- All accounts not paid within 30 days of delivery will bear interest at the rate of 18% per annum.
- Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered.
- A $25.00 Service Charge and Loss of the Cash Discount will be Collected on all returned Checks.

PROPERTY DAMAGE RELEASE
(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE)

Dear Customer - The driver of this truck in presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this load where you desire it. It is our wish to help you in every way that we can, but in order to do this the driver is requesting that you sign this RELEASE relieving him and this supplier from any responsibility from any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, driveways, curbs, etc., by the delivery of this material, and that you also agree to help him remove mud from the wheels of his vehicle so that he will not litter the public street. Further, as an additional consideration, the undersigned agrees to indemnify and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order.

EXCESSIVE WATER IS DETRIMENTAL TO CONCRETE PERFORMANCE H_2O ADDED BY REQUEST / AUTHORIZED BY:

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

ARRIVED AT _____ SLUMP
GALLONS ADDED ____ TO ____ YDS
GALLONS ADDED ____ TO ____ YDS
GALLONS ADDED ____ TO ____ YDS
GALLONS ADDED ____ TO ____ YDS
TOTAL WATER ADDED _____

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED
[illegible]	[illegible]	[illegible]	
105.[illegible]	SUPER	[illegible]	
[illegible]	[illegible]	ENVIRONMENTAL FEE	

TRUCK 1 78°/62/8½/4/2:25 / 1364

LEFT PLANT	ARRIVED JOB	START UNLOADING	DELAY EXPLANATION/CYLINDER TEST TAKEN	TIME ALLOWED
			1 JOB NOT READY 2 SLOW POUR OR PUMP 3 TRUCK AHEAD ON JOB 4 CONTRACTOR BROKE DOWN 5 ADDED WATER 6 TRUCK BROKE DOWN 7 ACCIDENT 8 CITATION 9 LOCATION 10 OTHER	
RETURNED TO PLANT	LEFT JOB	FINISH UNLOADING		DELAY TIME
TOTAL ROUND TRIP	TOTAL AT JOB	UNLOADING TIME		ADDITIONAL CHARGE

SUBTOTAL
TAX CODE
TAX
ADDITIONAL CHARGE
GRAND TOTAL

Truck	Driver	User	Disp Ticket Num	Ticket ID	Time Date
107		user	123041	38277	13:09 5/12/10

Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
10.	CY05 515504				W	41166

Material	Design Qty	Required	Batched	% Var	Moisture	Actual Wt
[illegible]	1420 lb	10037 lb	10000 lb	-0.37%	1.00% M	12 gl
[illegible]	440 lb	3126 lb	3100 lb	-0.84%	1.50% M	6 gl
[illegible]	1450 lb	10542 lb	10580 lb	-0.36%	4.85% A	52 gl
[illegible]	517.0 lb	3619.0 lb	3640.0 lb	0.58%		
[illegible]	29.50 gl	108.70 gl	108.00 gl	-0.65%		108.00 gl
[illegible]	3.00 oz	21.00 oz	21.00 oz	0.00%		
[illegible]	25.90 oz	181.30 oz	180.00 oz	-0.72%		

Actual: Mix Batches: 1 Manual 13:09:55
Grid Total: 25234 lb Design W/C: 0 +3% Water/Cement: 0.457 Design Water: 177.5 g Actual Water: 184.1 gl To Add: 15.4 gl
Load: 00 to Water in Trucks: 0.0 gl Adjust Water: 0.0 gl/ Load Trim Water: -2.0 gl/ CY05 Note: Manual feed occured

WEIGHMASTER SIGNATURE X _____
GALLONS OF WATER AVAILABLE PER CUBIC YARD _____
LOAD RECEIVED BY X _____

American Rock Products, Inc.

2090 Robertson Drive
Richland WA 99354

Richland Office
(509) 375-1021
(509) 375-5194 Fax

AR 120738

SOLD TO:

SHIP TO:

DATE	TIME	FORMULA #	YARDS ORD	TRUCK #	DRIVER	BATCH #	LOAD #	YARDS DEL.	P.O #
[illegible]	13:25	[illegible]	13	0109	JEFF	[illegible]	3	[illegible]	CRAIG

WARNING

IRRITATING TO THE SKIN AND EYES

Contains Portland Cement. Wear Rubber Boots and Gloves. PROLONGED CONTACT MAY CAUSE BURNS. Avoid Contact With Eyes and Prolonged Contact With Skin. In Case of Contact With Skin or Eyes, Flush Thoroughly With Water. If Irritation Persists, Get Medical Attention. KEEP CHILDREN AWAY.

CONCRETE is a PERISHABLE COMMODITY and BECOMES the PROPERTY of the PURCHASER UPON LEAVING the PLANT. ANY CHANGES or CANCELLATION of ORIGINAL INSTRUCTIONS MUST be TELEPHONED to the OFFICE BEFORE LOADING STARTS.

- The undersigned promises to pay all costs, including reasonable attorney's fees, incurred in collecting any sums owed.
- All accounts not paid within 10 days of delivery will bear interest at the rate of 18% per annum.
- Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered.
- A $25.00 Service Charge and Loss of the Cash Discount will be Collected on all returned Checks.

PROPERTY DAMAGE RELEASE

(TO BE SIGNED IF DELIVERY TO BE MADE INSIDE CURB LINE)

Dear Customer: The driver of this truck in presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this load where you desire it. It is our wish to help you in every way that we can, but in order to do this the driver is requesting that you sign this RELEASE relieving him and this supplier from any responsibility from any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, driveways, curbs, etc., by the delivery of this material, and that you also agree to help him remove mud from the wheels of his vehicle so that he will not litter the public street. Further, as an additional consideration, the undersigned agrees to indemnify and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order.

EXCESSIVE WATER IS DETRIMENTAL TO CONCRETE PERFORMANCE. H_2O ADDED BY REQUEST / AUTHORIZED BY:

NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE

ARRIVED AT 4 SLUMP

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

GALLONS ADDED ____ TO ____ YDS

TOTAL WATER ADDED 7

Luis P

QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED
	TRUCK 1 [illegible] EXTERIOR [illegible] BLENDED [illegible]		
	TRUCK 2		

LEFT PLANT	ARRIVED JOB	START UNLOADING	DELAY EXPLANATION/CYLINDER TEST TAKEN	TIME ALLOWED
1:40	2:15		1 JOB NOT READY 2 SLOW POUR OR PUMP 3 TRUCK AHEAD ON JOB 4 CONTRACTOR BROKE DOWN 5 ADDED WATER 6 TRUCK BROKE DOWN 7 ACCIDENT 8 CITATION 9 LOCATION 10 OTHER	
RETURNED TO PLANT	**LEFT JOB**	**FINISH UNLOADING**		**DELAY TIME**
TOTAL ROUND TRIP	**TOTAL AT JOB**	**UNLOADING TIME**		**ADDITIONAL CHARGE**

SUBTOTAL

TAX CODE

TAX

ADDITIONAL CHARGE

GRAND TOTAL

Plant	Drive	Use	Disp Ticket Num	Ticket ID	Time Date
110		Load	1230	[illegible]	13:25 5/18/10

Load Size	Mix Code	Mixed	Qty	Mix Age	Seq	Load ID
10	L/Da 5150				3	4116

Material	Design Qty	Required	Batched	% Variance	Actual Mix
0CWM1	1429 lb	3505 lb	3520 lb	-0.39%	1.00% M 10 gl
3GRAR	440 lb	2580 lb	2590 lb	0.01%	1.50% M 5 gl
5DWM1	1450 lb	9121 lb	9060 lb	-0.67%	4.66% D 50 gl
CTL/II	317.0 lb	3102.0 lb	3090.7 lb	-0.71%	
AFER	33.50 gl	75.45 gl	75.09 gl	-0.47%	95.00 gl
BAE90	3.00 oz	13.00 oz	13.00 oz	0.00%	
MRT41	25.90 oz	155.40 oz	155.00 oz	0.03%	

Total Batches: 1 Manual 13:25:42

24152 lb Design W/C: 0.457 Water/Cement: 0.462 Design Water: 171.1 gl Actual Water: 161.1 gl To Add: 3.8 gl

00 lb Water in Truck: 0.0 gl Adjust Water: 0.0 gl Load Form Water: [illegible] gl C/D: Notes: Manual feed occured

Ralph's Pump

WEIGHMASTER SIGNATURE X _____

GALLONS OF WATER AVAILABLE PER CUBIC YARD

LOAD RECEIVED BY X

CONCRETE PLACEMENT

Project: ERDF CELLS 9 and 10

Job #: M10014 Date: 5/12/10 Slump Cone/Tamping Rod: 081

Air Entrainment Meter: 039

Thermometer: 331

Item(s) Placed: Walls

Sample Location: ERDF CELL 9 Crest PAD Bldg. Walls

Reinforcing Steel Examined? ☐yes ☐no Total Cubic Yards Placed: 13 cy

Supplier: ARP Mix #: 51550A Admixtures: Super P

High Early: ☐yes ☐no Ticket#: 38277

Project Specifications: Slump Air Entrainment Strength W/C Rat.

Time Batched	Time Done	Age	Water Added	W/C Ratio	Load #	Quantity (c.y.)	Slump (1/4 inch)	Temp (F)	Air %	Unit Wt. (pcf)	Cyl Cast (#)
1:09	2:25	76 mins	N/A	0.457	1	7.0	8 1/2"	78°	6.2	/	4

*Estimated

ASTM C-143, C-172 C-1064, C-231, C-173 C-138 C-31

Intermountain Materials Testing & Geotechnical
P.O Box 2801, Pasco, WA 99302-2801
2301 N Commercial Avenue, 99302 (509) 545-9217 fax (509) 545-9243

INTERMOUNTAIN MATERIALS TESTING & GEOTECHNICAL
PO Box 2801
Pasco, WA 99302
(509) 545-9217 (509) 545-9243 FAX

RECD MAY 26 2010

Compressive Strength Report

Concrete
ASTM C-39,05

Client: Del Hur Industries
Address: P.O. Box 883
Hermiston, OR 97838

Set #: 10734

Project: ERDF Cells 9 & 10
Project #: M10014
Contractor: Del Hur. Inc.
Sampled By: IMT
Sample Location: ERDF CELL 9 crest pad building walls
Sample Date: 5/12/2010
Date Received: 5/13/2010
Supplier: ARP
Mix #: 51550A
Ticket #: 38277
Specified Strength: 4000 psi

EQUIPMENT ID
Slump Cone/Tamping Rod: 081
Air Entrainment Meter: 039
Thermometer: 331

Slump (\"): 8 1/2 (ASTM C-143, AASHTO T-119)
Entrained Air (%): 6.2 (ASTM C-231, AASHTO T-152)
Temperature: 78 * (ASTM C-1064)

Unit Wieght (pcf): n/r (ASTM C-138, AASHTO T-121)
Yield (%): n/r (ASTM C-138, AASHTO T-121)

Sample I.D.	Test Date	Age (days)	Fracture Type	Diameter (.01 inch)	Load (lbs.)	Area (.01 inch^2)	Strength (p.s.i.)	% of Spec.
10734-1	5/19/2010	7	5	4.01	40620	12.63	3220	81
-2	6/9/2010	28						
-3	6/9/2010	28						
-4	6/9/2010	H						

Remarks:

Report By:
Scott Walters
Construction Services Manager

Report Copy To: Addressee - 2