

BUCKMAN DIRECT DIVERSION  
RAW WATER PUMPS

CITY OF SANTA FE BID NO. '16/38/B

ADDENDUM NO. 1  
June 14, 2016

Make the following changes to the Request for Bid documents for the Buckman Direct Diversion Raw Water Pumps, City of Santa Fe Bid No. '16/38/B:

**Item No. 1**

To prevent the ingress of solids and product water to the grease in the stuffing box housing, please provide 2 downward facing lip seals below the bottom stuffing box bushing on each pump. An equal or better configuration may be proposed by the pump supplier subject to approval by the ENGINEER.

**Item No. 2**

Included in the Attachments to this addendum, Appendix A & B, are documents providing drawings and information on the existing equipment and conditions at Booster Station 1A and Booster Station 2A, where the pumps are to be replaced.

**Item No. 3**

The bid due date will be extended to **July 7, 2016** with the same conditions stated in the bid documents. An additional pre-bid conference will be offered to address questions and inspect the facilities at the following time and location:

Pre-Bid Conference:

June 23, 2016  
10:00 a.m. (local time)  
Buckman Regional Water Treatment Plant,  
341 Caja Del Rio Rd.  
Santa Fe, NM 87506

The pre-bid conference will be followed by a site visit to the facilities where the work will be performed. Attendance is not mandatory for bidders that attended the first pre-bid conference on June 2, 2016.

**Item No. 4**

Questions from bidders at June 2, 2016 Pre-Bid Conference:

Q1: "Is it possible to utilize BDD's electricians to disconnect and reconnect the motors or whatever electrical requirements needed on site?"

A1: Yes.

Q2: "Is it possible to utilize BDD's crane for motor and pump removal?"

A2: Yes. This is subject to the availability of BDD's crane and operators.

Q3: Is testing the motor only at full speed, with no VFD, acceptable? If not, is there a specific contact or contractor with that capability to test the motors under variable speeds or can we do it on site with the project VFDs?

A3: It is acceptable to test the motors at full speed during refurbishments. The motors will be field tested under no-load conditions at varying speeds in the field.

Q4: "We see that Public Works Minimum Wage Rates per 7.0 of the Instructions to Bidders are required for this project per decision SF-15-1373-B. We are requesting that a copy of the applicable poster showing the wage decision rates be provided?"

A4: Use the January 1, 2016 schedule for the statewide wage classification. The classification for this work will be Type H: Heavy Engineering.

Q5: "4.10 Factory Testing A.1.a.4 NPSH Required Test Curve; Clarification; Is a factory NPSH test desired/required? This is typically a separate or distinct test from a factory performance test and is typically quoted separately by pump manufacturers from a factory performance test. Also if an NPSH test is desired does it also need to be a witnessed test?"

A5: Section 4.10 Factory Testing A.1.a.4) NPSH required test curve. The test is listed in the required test results and must follow the same requirements listed in Section 4.10 Factory Testing.

Q6: "Summary of Work 1.1 Summary B 1. and 2. – Will the contractor be allowed to remove all four pumps and motors at the same time?"

A6: Yes.

Q7: "4.4 Pump Requirements D. Pump Construction – Impeller - 304 stainless steel impellers are specified. Are 316 stainless steel impellers acceptable?"

A7: Yes.

Q8: "If it is stated in the bid documents I missed it. Is there a cut-off date to submit questions, if there is what is it?"

A8: Section 3.2.1 in the Instructions to Bidders states: "Questions received less than ten (10) days prior to the date for opening of Bids will not be answered."

# Appendix

## Table of Contents:

### Appendix A:Booster Station 1A

Section 1: Existing Pump Station Drawings

Section 2: Existing Pump Data

Section 3: Existing Motor Data

### Appendix B:Booster Station 2A

Section 1: Existing Pump Station Drawings

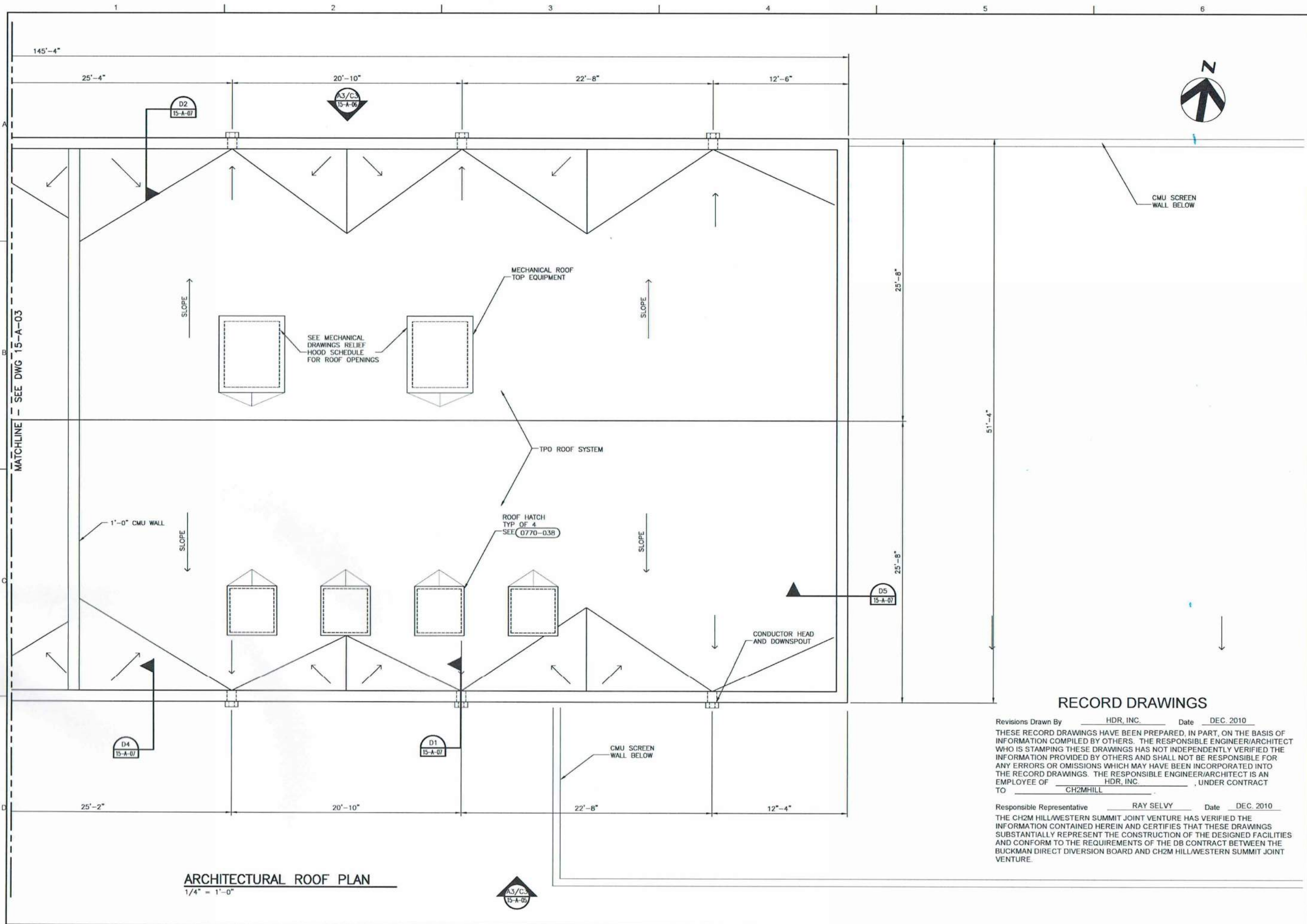
Section 2: Existing Pump Data

Section 3: Existing Motor Data

# Appendix A:

## Booster Station 1A

# Section 1: Booster Station 1A Existing Pump Station Drawings



MATCHLINE - SEE DWG 15-A-03

**ARCHITECTURAL ROOF PLAN**  
1/4" = 1'-0"

**RECORD DRAWINGS**

Revisions Drawn By HDR, INC. Date DEC. 2010  
THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THE RESPONSIBLE ENGINEER/ARCHITECT WHO IS STAMPING THESE DRAWINGS HAS NOT INDEPENDENTLY VERIFIED THE INFORMATION PROVIDED BY OTHERS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS. THE RESPONSIBLE ENGINEER/ARCHITECT IS AN EMPLOYEE OF HDR, INC., UNDER CONTRACT TO CH2MHILL.  
Responsible Representative RAY SELVY Date DEC. 2010  
THE CH2M HILL/WESTERN SUMMIT JOINT VENTURE HAS VERIFIED THE INFORMATION CONTAINED HEREIN AND CERTIFIES THAT THESE DRAWINGS SUBSTANTIALLY REPRESENT THE CONSTRUCTION OF THE DESIGNED FACILITIES AND CONFORM TO THE REQUIREMENTS OF THE DB CONTRACT BETWEEN THE BUCKMAN DIRECT DIVERSION BOARD AND CH2M HILL/WESTERN SUMMIT JOINT VENTURE.

|                 |           |
|-----------------|-----------|
| RECORD DRAWINGS |           |
| HDR             | X         |
| BY              | APVD      |
| NO. 1           | DATE      |
| DSGN            | CHK       |
| DR              | APVD      |
| CHK             | APVD      |
| LKW             | DW        |
| CH2M HILL       | CH2M HILL |

**WESTERN SUMMIT**

**ARCHITECTURAL**

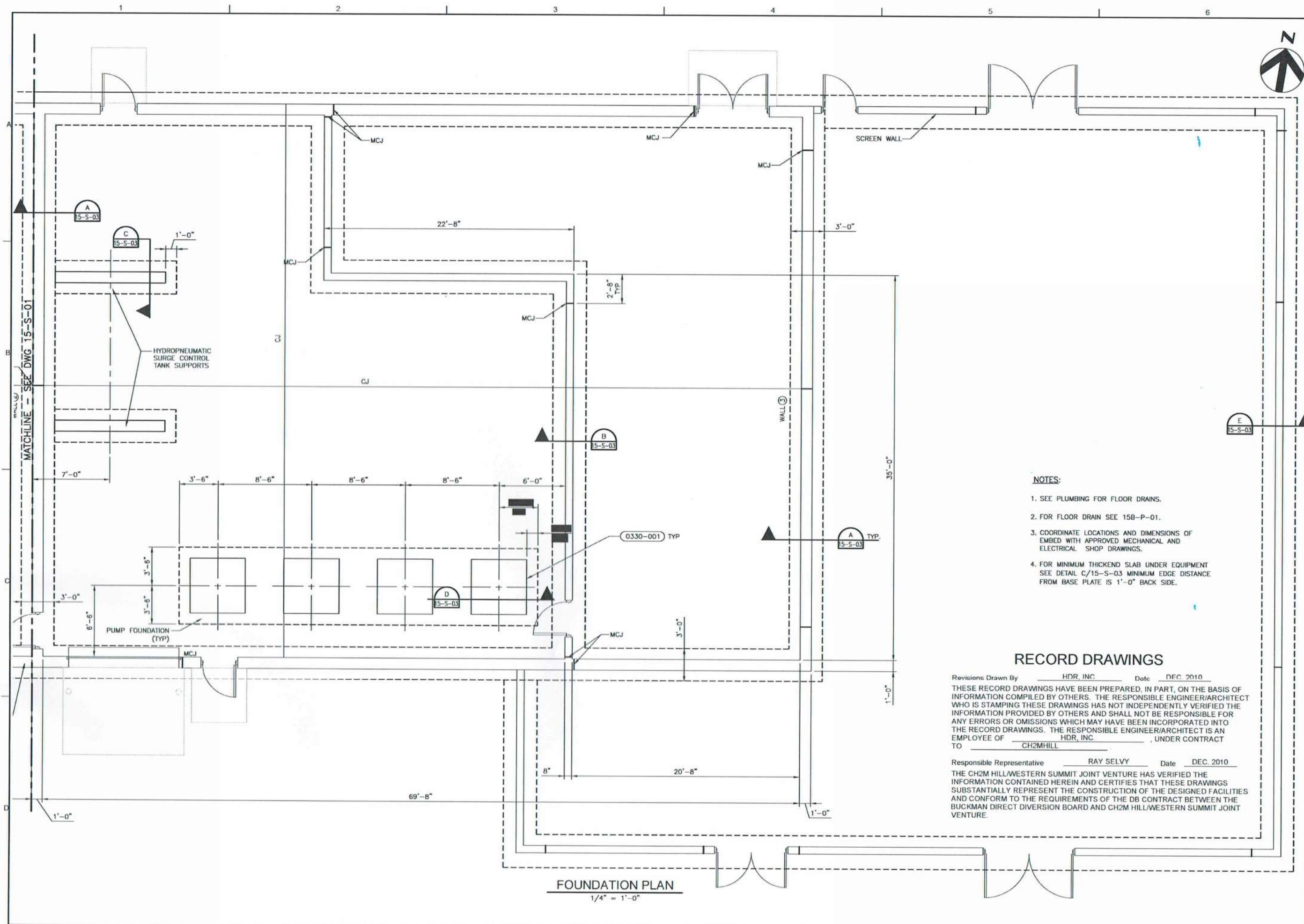
**BUCKMAN DIRECT DIVERSION PROJECT**  
**RAW WATER FACILITIES**  
**SANTA FE, NEW MEXICO**

**SEDIMENT REMOVAL FACILITY**  
**AND BOOSTER STATION 1A**  
**ROOF PLAN**

VERIFY SCALE  
BAR IS ONE INCH ON ORIGINAL DRAWING.  
0" = 1"

|       |              |
|-------|--------------|
| DATE  | OCTOBER 2008 |
| PROJ  | 82384        |
| DWG   | 15-A-04      |
| SHEET | 111          |





FOUNDATION PLAN  
1/4" = 1'-0"

NOTES:

1. SEE PLUMBING FOR FLOOR DRAINS.
2. FOR FLOOR DRAIN SEE 15B-P-01.
3. COORDINATE LOCATIONS AND DIMENSIONS OF EMBED WITH APPROVED MECHANICAL AND ELECTRICAL SHOP DRAWINGS.
4. FOR MINIMUM THICKEND SLAB UNDER EQUIPMENT SEE DETAIL C/15-S-03 MINIMUM EDGE DISTANCE FROM BASE PLATE IS 1'-0" BACK SIDE.

RECORD DRAWINGS

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CH2MHILL

WESTERN SUMMIT

HDR

STRUCTURAL  
SEDIMENT REMOVAL FACILITY  
AND BOOSTER STATION 1A  
FOUNDATION PLAN

BUCKMAN DIRECT DIVERSION PROJECT  
RAW WATER FACILITIES  
SANTA FE, NEW MEXICO

|     |   |      |         |          |  |    |      |     |    |     |     |    |          |
|-----|---|------|---------|----------|--|----|------|-----|----|-----|-----|----|----------|
| NO. | 1 | DATE | 12/2010 | REVISION |  | BY | APVD | CHK | DR | ZHS | SRE | LF | CH2MHILL |
| DGN |   |      |         |          |  |    |      |     |    |     |     |    |          |

VERIFY SCALE  
BAR IS ONE INCH ON  
ORIGINAL DRAWING  
0 1'

DATE OCTOBER 2008  
PROJ 82384  
DWG 15-S-02  
SHEET 119

RAY SELVY  
12250  
NEW MEXICO  
12-14-11

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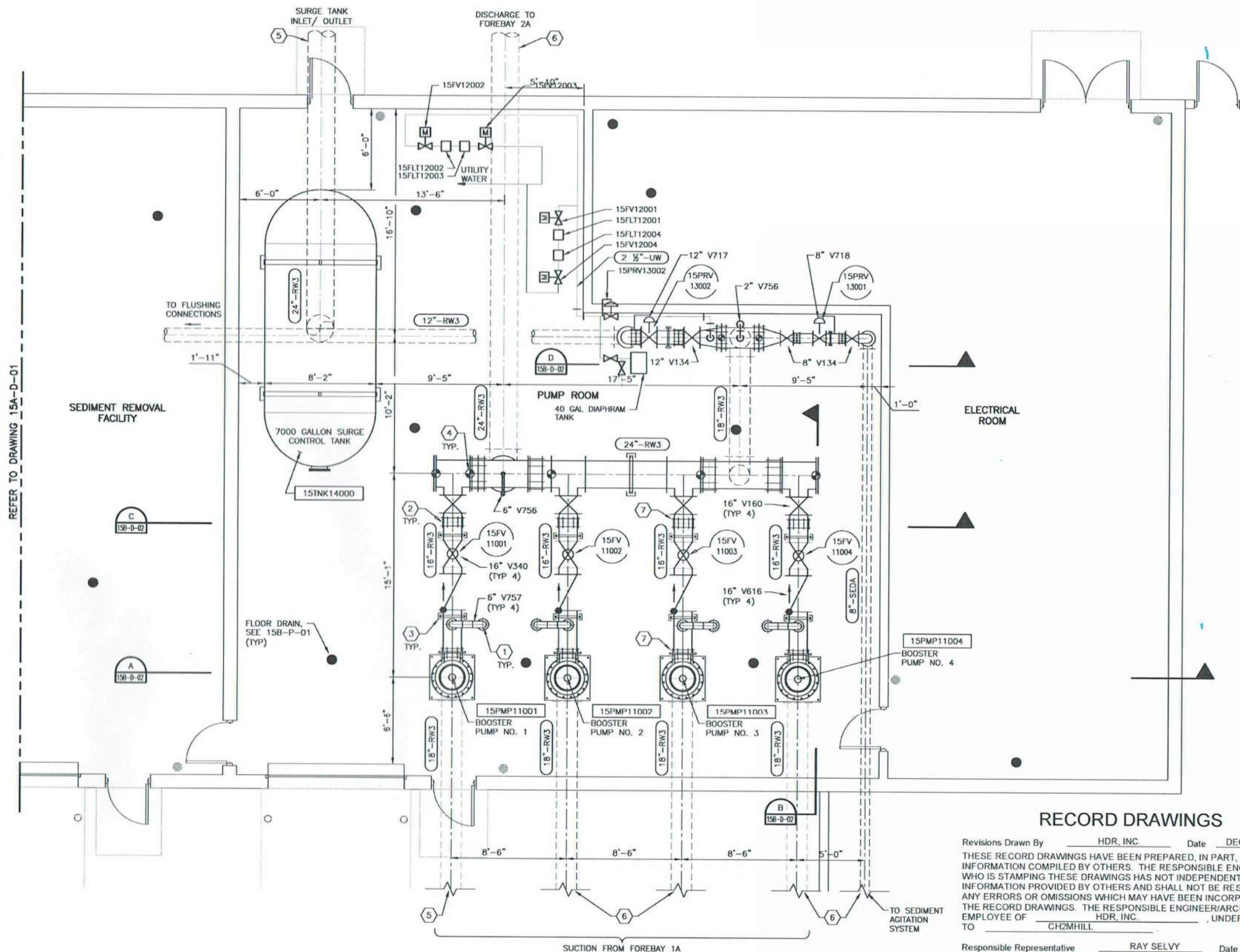






1. PUMP CANS SHALL BE CONCRETE ENCASED PER STRUCTURAL DRAWINGS.
2. ALL BELOW SLAB PIPING SHALL BE CONCRETE ENCASED PER DETAIL 0330-017.
3. PROVIDE DIELECTRIC COUPLINGS ON ALL STEEL AND DUCTILE IRON CONNECTIONS TO BOOSTER STATION 1A.

- 1 ROUTE AIR VALVE DRAIN TO 6" OFF FLOOR.
- 2 RESTRAINED COUPLING
- 3 CONCRETE SADDLE PIPE SUPPORT PER DETAIL 0330-061, PROVIDE PIPE STRAP PER DETAIL 1 SHEET 15B-D-02.
- 4 PIPE SUPPORT PER DETAIL 400S-501
- 5 EXTEND PIPE ENCASEMENT 5'-0" BEYOND OUTSIDE FACE OF BUILDING. PROVIDE FLEXIBLE COUPLINGS AS SHOWN ON SITE PLANS.
- 6 EXTEND PIPE ENCASEMENT 1'-0" BEYOND OUTSIDE FACE OF SCREEN WALL. PROVIDE FLEXIBLE COUPLINGS AS SHOWN ON SITE PLANS.
- 7 TEST PRESSURE FOR PIPING BETWEEN PUMP DISCHARGE AND DISCHARGE HEADER SHALL BE EQUAL TO PUMP SHUTOFF HEAD (TYP 4).

Revisions Drawn By HDR, INC. Date DEC. 2010

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Responsible Representative RAY SELVY Date DEC. 2010

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FILENAME: 15B-D-01.dwg

PLOT DATE: Feb 14, 2011

PLOT TIME: 12:52 am



HILL  
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| REUSE OF DOCUMENTS                                                                                                                                                                                                                                    | SB | RN | GF |
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[illegible]**FOR**

WESTERN  
SUMMIT

CH2MHILL

BUCKMAN DIRECT DIVERSION PROJECT  
RAW WATER FACILITIES  
SANTA FE, NEW MEXICO

PROCESS  
BOOSTER STATION 1A  
PROCESS PLAN

VERIFY SCALE

BAR IS ONE INCH OF  
ORIGINAL DRAWING

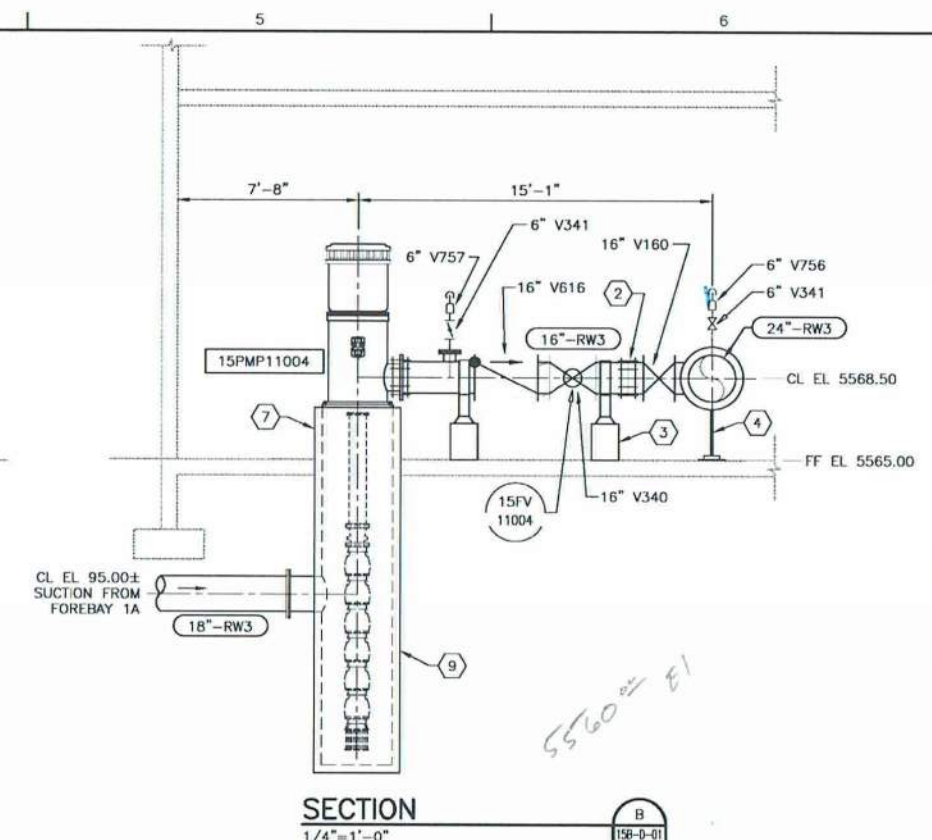
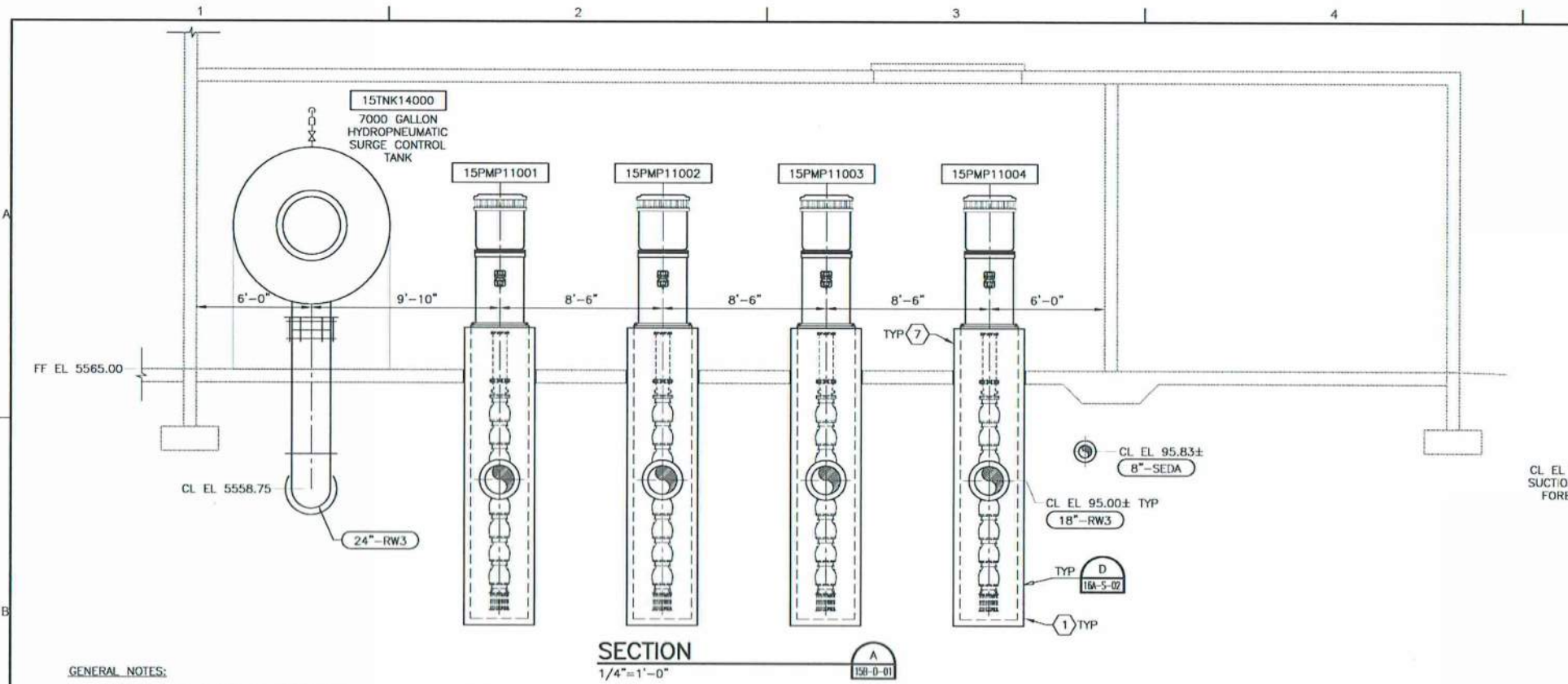
DATE OCTOBER 2008

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| DWG | 15B-D-01 |
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|-------|-----|
| SHEET | 131 |
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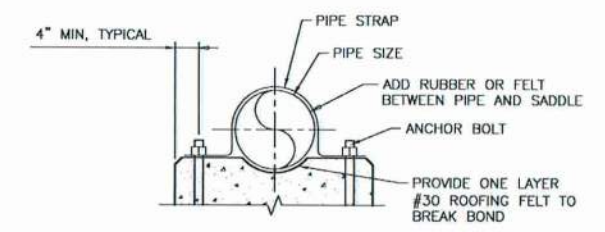
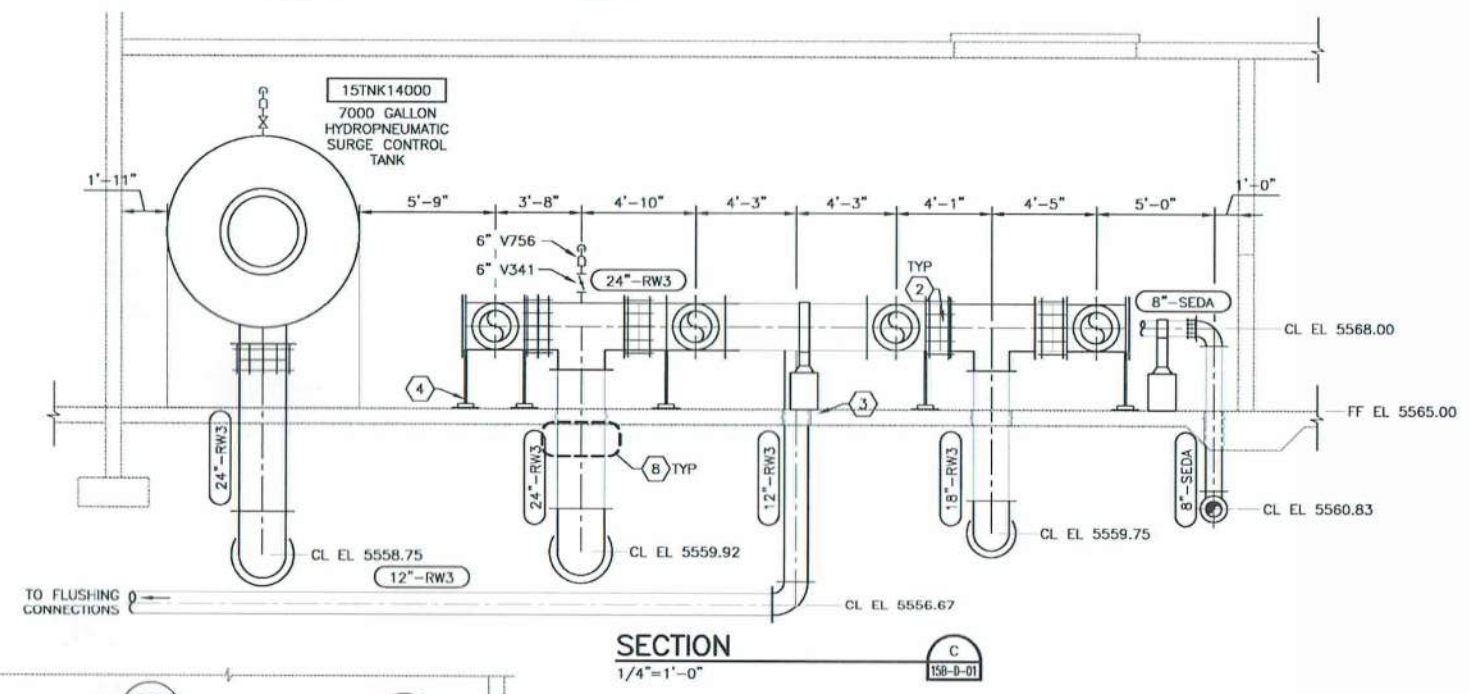


**GENERAL NOTES:**

1. PUMP CANS SHALL BE CONCRETE ENCASED PER STRUCTURAL DRAWINGS
2. ALL BELOW SLAB PIPING SHALL BE CONCRETE ENCASED PER DETAIL 0330-017
3. PROVIDE DIELECTRIC COUPLINGS ON ALL STEEL AND DUCTILE IRON CONNECTIONS TO BOOSTER STATION 1A

**KEY NOTES:**

- 1 PUMP CAN. SEE SHEET 15-S-03, SECTION D FOR DETAILS
- 2 RESTRAINED COUPLING
- 3 CONCRETE SADDLE PIPE SUPPORT PER DETAIL 0330-061, PROVIDE PIPE STRAP PER DETAIL 2 THIS SHEET
- 4 PIPE SUPPORT PER DETAIL 4005-501
- 5 EXTEND PIPE ENCASEMENT 5'-0" BEYOND OUTSIDE FACE OF BUILDING. PROVIDE FLEXIBLE COUPLINGS AS SHOWN ON SITE PLANS.
- 6 EXTEND PIPE ENCASEMENT 1'-0" BEYOND OUTSIDE FACE OF SCREEN WALL. PROVIDE FLEXIBLE COUPLINGS AS SHOWN ON SITE PLANS.
- 7 CONCRETE EQUIPMENT PAD, SEE 15-S-03 SECTIONS D AND G.
- 8 SIAR PENETRATION PER DETAIL 4027-620



| PIPE SIZE, DIA | PIPE STRAP  | ANCHOR BOLTS, DIA | PEDESTAL THICKNESS |
|----------------|-------------|-------------------|--------------------|
| 6"-12"         | 1/4"x2"     | 1/2"              | 12"                |
| 14"-24"        | 3/8"x2 1/2" | 5/8"              | 16"                |
| 30"-48"        | 1/2"x3"     | 3/4"              | 24"                |

**DETAIL**

NO SCALE

**RECORD DRAWINGS**

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Responsible Representative RAY SELVY Date DEC. 2010

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| NO. | DATE    | DSGN | CHK | APVD | BY | APVD |
|-----|---------|------|-----|------|----|------|
| 1   | 12/2010 |      |     |      |    |      |

BUCKMAN DIRECT DIVERSION PROJECT  
RAW WATER FACILITIES  
SANTA FE, NEW MEXICO

PROCESS  
BOOSTER STATION 1A  
PROCESS SECTIONS

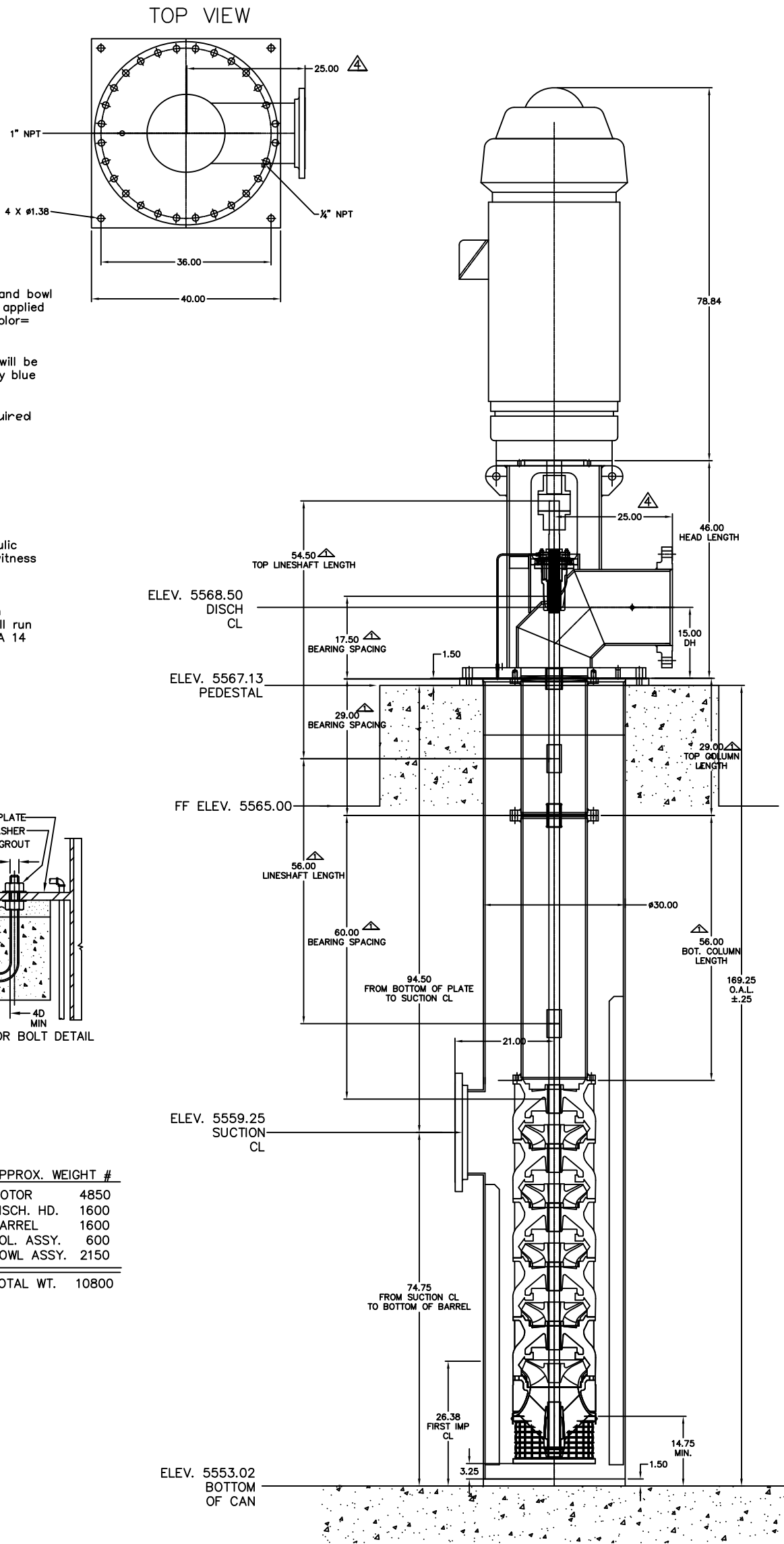
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| VERIFY SCALE                        | DATE  | OCTOBER 2008 |
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|                                     | DWG   | 15B-D-02     |
|                                     | SHEET | 132          |

# Section 2: Booster Station 1A

## Existing Pump Data



VERTICAL TURBINE PUMP  
TYPE "VFR"



THIS DRAWING IS  
CERTIFIED

☐ FOR APPROVAL  
NO PRODUCTION WILL START  
UNTIL APPROVED IN WRITING.

☒ FOR CONSTRUCTION  
PRODUCTION HAS STARTED.  
ANY CHANGES MAY AFFECT  
PRICE AND DELIVERY.

OUR ORDER No.: 65838

CUST. ORDER No.:670017

BY:MO DATE:02/10/09

SPECIAL FEATURES:

1. TOP TWO STAGES O-RING BOWL CONSTRUCTION
2. 316 SS, DYNAMIC BALANCE IMPELLERS
3. O-RING FLANGE COLUMN
4. HARD CHROME JOURNALS ON TOP SHAFT
5. 3125 FSC NON-SPACER COUPLING

COATING:

Discharge head interior, wetted surfaces of the packing box, column pipe ID and OD, and bowl assembly exterior will be cleaned per SSPC-SP-10. Carboline Carboguard 891 will be applied in 2 coats of 5-7 mils DFT. Final dry film thickness will be 12 mils. NSF approved. Color= Safety white (color# S800) unless other color is noted in returned submittal.

The Discharge Head exterior will cleaned per SSPC-SP-6. Carboline Carboguard 890 will be applied in 2 coats of 5 mils DFT. Final dry film thickness will be 10 mils. Color=Safety blue (color# S150) unless other color is noted in the returned submittal.

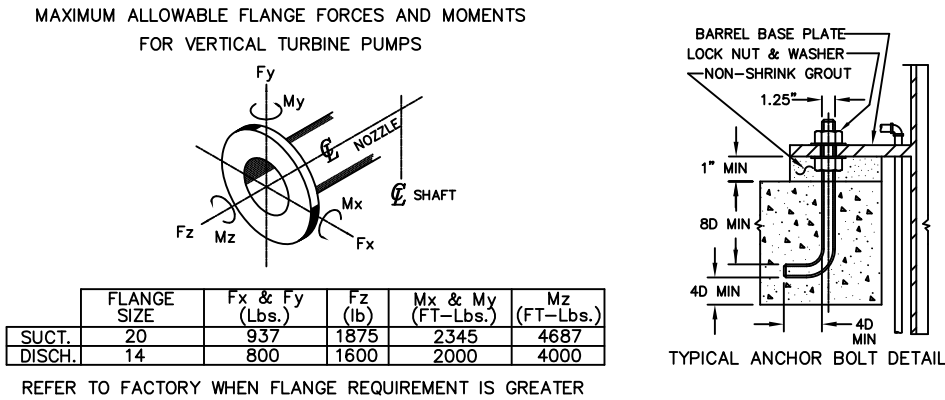
Customer Witness of coating process required, a 7 day notification is required prior to witness of coating.

Holiday and DFT testing are required on coated surfaces.

TESTING:

**Hydrostatic testing:**  
The bowls and discharge head will be hydrostatically tested in accordance with Hydraulic Institute Standards.Hydrotest reports are to be submitted to the customer prior to witness performance testing.

**Performance testing:**  
Pumps will be witnessed tested as bowl assemblies with job driver in accordance with Hydraulic Institute standards and test procedure 65838PTP. A mechanical run test will run concurrently with the performance test for a three hour period without malfunction. A 14 day notification is required to the customer prior to testing. Submit Test results for approval. Calibration records for test instruments are required at time of test.



SUCTION FLANGE

20" 150# -R.F.ANSI. FLG.  
(20) 1.250 DIA. HOLES \*  
25.00 DIA. BOLT CIRCLE  
27.50 DIA. FLANGE  
\* BOLT HOLES STRADDLE VERTICAL C

DISCH. FLANGE

16" 300# -R.F.ANSI. FLG.  
(20) 1.250 DIA. HOLES \*  
20.25 DIA. BOLT CIRCLE  
23.00 DIA. FLANGE  
\* BOLT HOLES STRADDLE VERTICAL C

PUMPAGE

FLUID WATER  
SPEC. GRAVITY .998  
VISCOSITY 1.0 cSt  
TEMPERATURE AMBIENT  
PH ----

PUMP

16X24.5X30"VFR" DISCH HEAD.  
2.25 LINE SHAFT 14" COL  
n/a SHAFT TUBE  
PROD.LUBE YES OIL LUBE NO  
TYPE 18MM/N STAGES 5  
4225 GPM 575" BOWL HD  
IMPELLER ENCLOSED  
STRAINER YES

MOTOR

MAKE US MOTORS  
ENCLOSURE WPI  
TYPE VSS NRR YES  
HP 800 RPM 1775  
PHASE 3 HERTZ 60  
VOLTAGE 460  
FRAME NO. 5012VP  
TYPE COUPLING FASC 3125

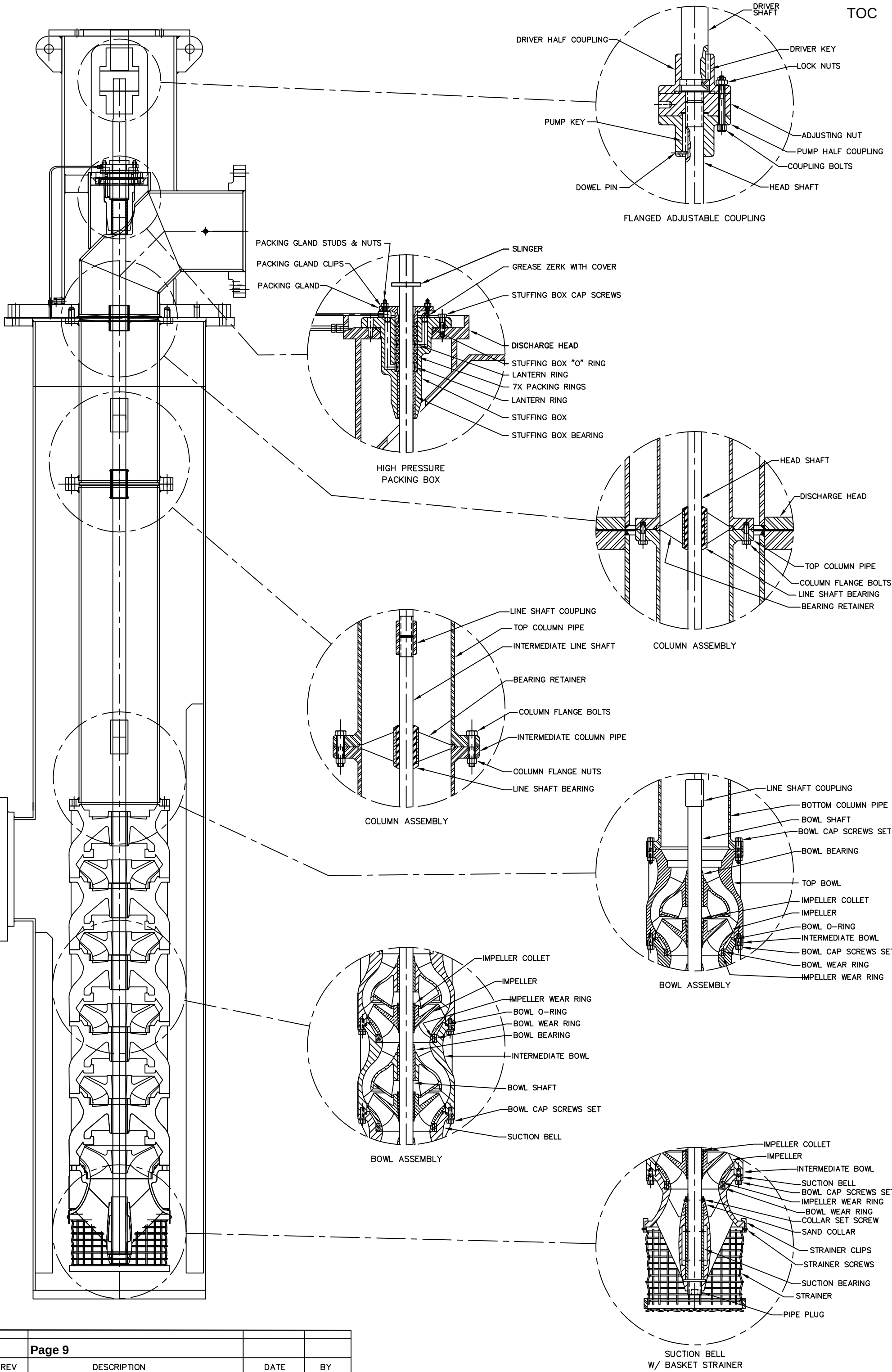
MATERIALS

COL PIPE A53-GR B STEEL  
LINE SHAFT A582-416 SS  
DISCH. HEAD FAB. STL  
BARREL FAB. STL  
BOWL SHAFT A582-416 SS  
PACKING JC 100M  
BRG.RETAINER A536 GR.60 DI  
PUMP BOWL A48-CL 30 CIE  
IMPELLER 316 SS  
BEARINGS (BOWL) B505-937 BRZ  
BEARINGS (LINESHAFT) STYRENE BUTADIENE RUBBER  
STRAINER 316 SS  
BOWL W/R 440 SS  
IMPELLER W/R 410 SS

| APPROX. WEIGHT # |      |
|------------------|------|
| MOTOR            | 4850 |
| DISCH. HD.       | 1600 |
| BARREL           | 1600 |
| COL. ASSY.       | 600  |
| BOWL ASSY.       | 2150 |
| TOTAL WT. 10800  |      |

|                                                                                                                                                                           |                                                                                                                                                               |    |         |                                                                       |                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| LOCATION: SANTE FE, NM<br><br>CUSTOMER: CH2M HILL CONSTRUCTION<br><br><br>FLOWAY CO: 65838-1<br>SERIAL #: 65838-1-1,2,3,4<br><br>TAG NUMBER: BS1A - 15PMP1101, 02, 03, 04 | NOTES:<br>1. ALL DIMENSIONS IN INCHES<br>2. DRAWING SCALE = 1:28<br>3. DO NOT SCALE UNKNOWN DIMENSIONS<br>4. NOT TO BE USED FOR CONSTRUCTION UNLESS CERTIFIED |    |         |                                                                       | OUTLINE<br>DRAWING<br><br><br><br>DRAWN BY: MO<br><br>DATE: 2/10/09<br><br>DRAWING NUMBER<br>6583801COD |
|                                                                                                                                                                           | REV                                                                                                                                                           | BY | DATE    | DESCRIPTION                                                           |                                                                                                         |
|                                                                                                                                                                           | 1                                                                                                                                                             | MO | 5/5/09  | ADDED DIMENSIONS SHOWN PER CUSTOMER REQUEST                           |                                                                                                         |
|                                                                                                                                                                           | 2                                                                                                                                                             | MO | 7/13/09 | Released to production.                                               |                                                                                                         |
|                                                                                                                                                                           | 3                                                                                                                                                             | MO | 7/28/09 | PER CUSTOMER REQUEST CHANGED DISCH FLANGE SIZE FROM 14" TO 16"        |                                                                                                         |
|                                                                                                                                                                           | 4                                                                                                                                                             | AC | 8/19/09 | Changed distance of 16" flange to centerline of pump from 22" to 25". |                                                                                                         |



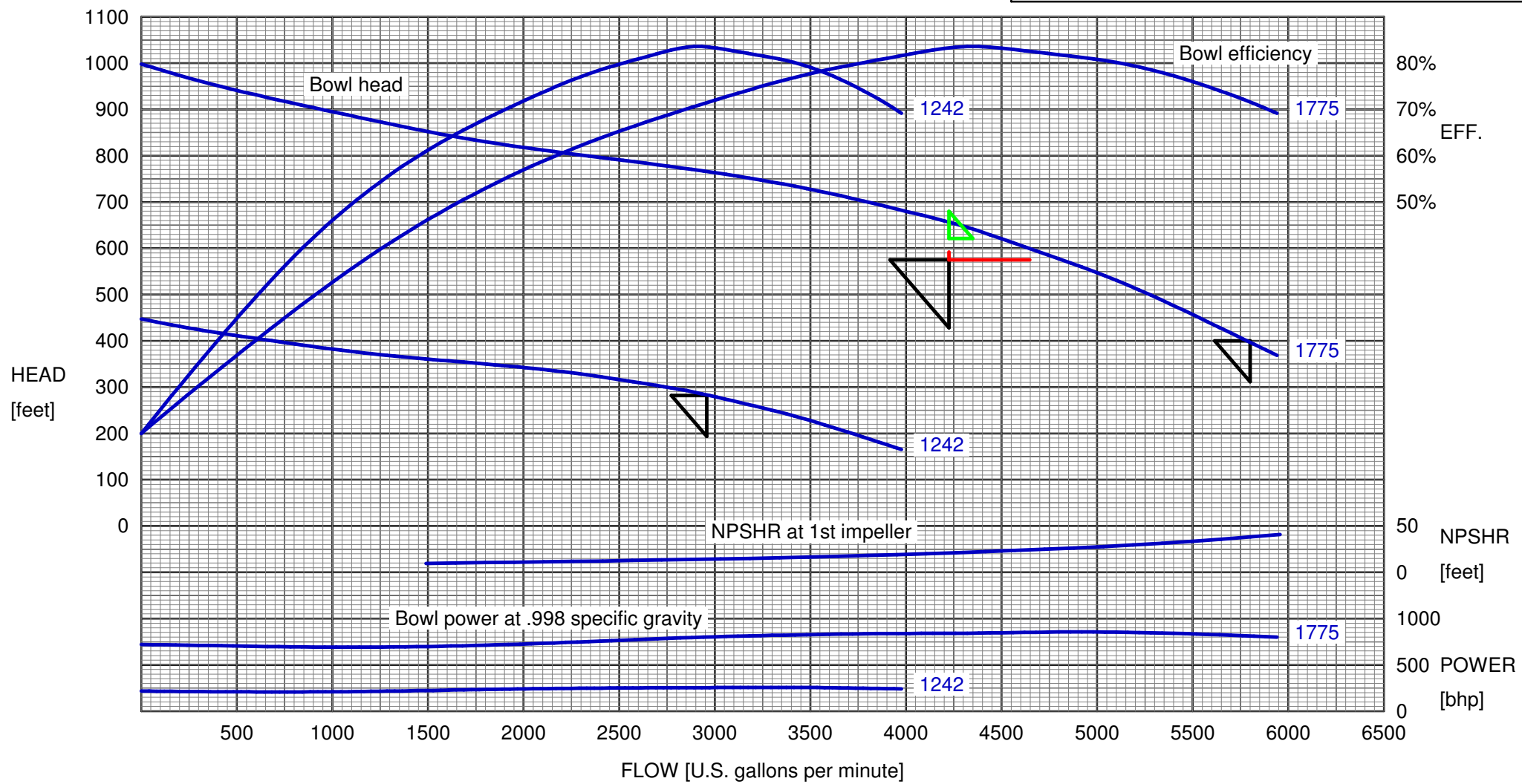


|        |             |      |    |
|--------|-------------|------|----|
| Page 9 |             |      |    |
| REV    | DESCRIPTION | DATE | BY |

The head and power may be different than shown in accordance with Hydraulic Institute standards.

4225 GPM @ 575 RPM  
SECONDARY:  
5800 GPM @ 400 FT TDH (MAX) 1775 GPM  
2958 GPM @ 282 FT TDH (MIN) 1242 GPM

CJ2M HILL  
PROJECT: BUCKMAN 1A  
ITEM: 15PMP1101,02,03,04



CH2M HILL  
SANTE FE, NEW MEXICO



A WEIR COMPANY

TYPE: 18MKM/N  
NO. OF STAGES: 5  
R.P.M.: 1775  
PUMP SERIAL NO.: 65838-1-1/4

**PARTS LIST WITH RECOMMENDED SPARES****CUSTOMER: BUCKMAN DIRECT DIVERSION PROJECT****SUPPLIER: CH2M HILL CONSTRUCTORS****PURCHASE ORDER NO.: 670017****FACTORY CUSTOMER ORDER NO.: 65838****4225 GPM, 800 HP, 5 STAGE, 18MKM/N, P.L. BARREL PUMP****QUANTITY: 4****SERIAL NO.: 65838-1-1, -2, -3, -4****DATE: 03/11/10**

| QTY. | PART #               | DESCRIPTION                                 | MATERIAL                 | RECOM SPARE |
|------|----------------------|---------------------------------------------|--------------------------|-------------|
| 1    | 793182-700           | HEAD,VFR-16-300#x24x30xTRB-14               | FAB STL                  |             |
| 1    | 101465-2005          | PLUG PIPE 0.250 NPT SQ HD                   | STEEL                    |             |
| 1    | 101465-6051          | PLUG PIPE 1.000 NPT SQ HD                   | CL 30 CI                 |             |
| 1    | 550598-006           | NAMEPLATE,HEAD-WEIR FLOWAY                  | 316 SS                   |             |
| 1    | 551597-006           | NAMEPLATE,SMALL FLOWAY LOGO                 | 316 SS                   |             |
| 1    | 546016-2006          | NAMEPLATE,BLANK                             | 1.250 x 4.500 x<br>24 GA |             |
| 10   | 101217-3006          | SCREW DRIVE TYPE U #2 x 0.250 LG            | 316 SS                   |             |
| 4    | 100496-107-14        | SCREW,CAP,HX-0.63-11NCx4.50                 | F593-316 SS              |             |
| 4    | 100889-222           | NUT,HX-0.63-11NC                            | F594-316 SS              |             |
| 28   | 100506-107-07        | SCREW,CAP,HX-1.25-7NCx3.50                  | F593-316 SS              |             |
| 1    | 305482-014           | O-RING-33.00IDx.25RD                        | BUNA-N                   | X           |
| 1    | 547689-1051          | BOX HIGH PRESS STF 2.25 LOW<br>PROFILE      | CL 30 CI                 |             |
| 1    | 549372-1039          | BEARING BRONZE 2.250 x 2.750 x<br>6.000     | 932 BRZ                  | X           |
| 2    | 545874-1008          | RING LANTERN 2.250                          | PTFE                     |             |
| 6    | 549142-1137          | RING PACKING 0.500 SQ x 8.625 LG<br>HI      | JC 100-M                 | X           |
| 1    | 545871-102           | GLAND,PACKING-2.25                          | A743-CF-8M               |             |
| 2    | 102506-107-07        | STUD-0.44-14NCx2.75                         | F593-316 SS              |             |
| 2    | 100886-222           | NUT,HX-0.44-14NC                            | F594-316 SS              |             |
| 1    | 549935-1017          | SLINGER 2.250 SHFT x 4.500 OD               | NEOPRENE                 |             |
| 1    | 305432-1014          | O-RING-05.38IDx.25RD                        | BUNA N                   | X           |
| 8    | 100492-107-05        | SCREW,CAP,HX-0.50-13NCx1.50                 | F593-316 SS              |             |
| 2    | 548021-2145          | PLUG PIPE 0.250 PUSH-IN TYPE                | PLASTIC<br>#4491K42      |             |
| 2    | 544823-1001          | FITTING STRAIGHT 0.375 OD x 0.250           | BRASS                    |             |
| 4    | 544752-3046          | TUBING,RD-0.38x0.032W                       | COPPER                   |             |
| 1    | 544723-6005          | FITTING GRSE ZERK 1/8" NPT X 67 1/2<br>DEG  | STEEL                    |             |
| 1    | 544723-7007          | LUBRICAP #1087K11                           | RUBBER                   |             |
| 1    | 550877-010           | COUPLING,FAC-CPAT-<br>3125x2.25 FLEXIBOX    | VENDOR STD               |             |
| 1    | 281424-1093          | KEY SQUARE 0.750 x 3.000 LG                 | 316 SS                   |             |
| 1    | 281030-093           | KEY,SQ-0.50x3.75LG                          | A276 316SS               |             |
| 1    | 549281-1005          | PIN ROLL 0.125 x 0.500 LG                   | STEEL                    |             |
| 1    | 789840-700-<br>02900 | COLUMN,FxF-14-T300#R-T300#R-<br>0.375x02900 | FAB STL                  |             |
| 12   | 100502-107-08        | SCREW,CAP,HX-1.00-8NCx3.25                  | F593-316 SS              |             |
| 2    | 540210-1057          | RETAINER,BEARING-14x3.00ID                  | GR 60 DI                 |             |
| 2    | 551039-256           | BEARING,TYPE-H-2.25x3.00x4.50LG             | SBR                      | X           |

J:/65000/65838/FINAL DATA/6583801PL, REV. 0

X = RECOMMENDED SPARES

DH

DRAWING NO.: 6583801PL, REV. 0

PAGE 1 OF 3



**PARTS LIST WITH RECOMMENDED SPARES****CUSTOMER: BUCKMAN DIRECT DIVERSION PROJECT****SUPPLIER: CH2M HILL CONSTRUCTORS****PURCHASE ORDER NO.: 670017****FACTORY CUSTOMER ORDER NO.: 65838****4225 GPM, 800 HP, 5 STAGE, 18MKM/N, P.L. BARREL PUMP****QUANTITY: 4****SERIAL NO.: 65838-1-1, -2, -3, -4****DATE: 03/11/10**

| QTY. | PART #                | DESCRIPTION                                    | MATERIAL          | RECOM SPARE |
|------|-----------------------|------------------------------------------------|-------------------|-------------|
| 1    | 793183-700-05600      | COLUMN,FxF-14-T300#R-18MK-.375x056.00          | FAB STL           |             |
| 12   | 100502-107-15         | SCREW,CAP,HX-1.00-8NCx6.00                     | 316 SS            |             |
| 12   | 100892-222            | NUT,HX-1.00-8NC                                | F594-316 SS       |             |
| 1    | 793184-097-05450-2400 | SHAFT,TOPO-3125T-S0-225x054.50_HF              | 416 SS            |             |
| 2    | 542676-097            | COUPLING,SHAFT-THRD-2.25                       | 416 SS            |             |
| 1    | 542675-097-05600      | SHAFT,LINE0-T-S0-225x056.00                    | 416 SS            |             |
| 2    | 303280-1014           | RING O 14.000 x 14.250 x 0.125                 | BUNA N            | X           |
| 1    | 303279-1014           | RING O 13.000 x 13.250 x 0.125                 | BUNA N            | X           |
| 12   | 100498-107-05         | SCREW,CAP,HX - 3/4-10 X 2.00 HX HD             | 316 SS            |             |
| 1    | 542121-097-09000      | SHAFT,BOWL0-T-C-225x090.00                     | 416 SS            |             |
| 1    | 546896-3057           | BOWL 18MK INTER W/ O-RING                      | DI                |             |
| 1    | 546896-1057           | BOWL 18MK INTER W/ O-RING NO W/R               | DI                |             |
| 2    | 545600-2052           | BOWL,18MK-BW-INT-2.75-NO-SL                    | CL 30 CIE         |             |
| 1    | 548174-2052           | BOWL,18MK-BW-BTW-2.75-NO-SL_18MKN-IMP          | CL 30 CIE         |             |
| 2    | 303279-1014           | RING O 13.000 x 13.250 x 0.125                 | BUNA N            | X           |
| 4    | 6583801BWWR           | RING,WEAR,BOWL-10.50x11.00x1.13                | 440 SS            | X           |
| 5    | 549372-1026           | BEARING BRONZE 2.250 x 2.750 x 6.000           | 937 BRZ           | X           |
| 60   | 100498-107-04         | SCREW,CAP,HX-0.75-10NCx1.75                    | F593-316 SS       |             |
| 4    | 545602-2102M          | IMPELLER,18MKM-C-WR                            | A296-77 GR. CF-8M |             |
| 1    | 548177-2102M          | IMPELLER 18MKN W/ WR                           | A743-CF8M 316SS   |             |
| 4    | 6583801IMPWRM         | RING,WEAR,IMP - 10.00x10.50x1.13               | 440 SS            | X           |
| 1    | 6583801IMPWRN         | RING,WEAR,IMP "N" STAGE - 11.00 X 11.36 X 1.13 | 440 SS            | X           |
| 5    | 541277-093            | COLLET,IMP-2.25-STD_15DK,16DK,MK,18MK          | A276-316SS        |             |
| 1    | 6583801BLWR           | RING,WEAR,BOWL-11.40x11.79x1.13                | 440 SS            | X           |
| 1    | 548176-2051           | BELL SUCT 18MKN W/WR                           | CL 30 CI          |             |
| 1    | 541279-097            | COLLAR,SAND-2.25-3.00-1.38                     | A582-416SS        |             |
| 2    | 100611-107-02         | SCREW,SET-HX-0.25-20NCx0.25-CUP POINT          | F593-316 SS       |             |
| 1    | 542239-1039           | BEARING SUCTION 2.250 X 2.750 X 10.000         | 932 BRZ           | X           |
| 1    | 101472-3051           | PLUG PIPE 2.500 NPT C'SUNK                     | CL 30 CI          |             |
| 1    | 544740-1006           | NAMEPLATE PUMP BOWL S.S.                       | 304 SS            |             |

J:/65000/65838/FINAL DATA/6583801PL, REV. 0

X = RECOMMENDED SPARES

DH

DRAWING NO.: 6583801PL, REV. 0

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**PARTS LIST WITH RECOMMENDED SPARES****CUSTOMER: BUCKMAN DIRECT DIVERSION PROJECT****SUPPLIER: CH2M HILL CONSTRUCTORS****PURCHASE ORDER NO.: 670017****FACTORY CUSTOMER ORDER NO.: 65838****4225 GPM, 800 HP, 5 STAGE, 18MKM/N, P.L. BARREL PUMP****QUANTITY: 4****SERIAL NO.: 65838-1-1, -2, -3, -4****DATE: 03/11/10**

| <b>QTY.</b> | <b>PART #</b> | <b>DESCRIPTION</b>               | <b>MATERIAL</b> | <b>RECOM<br/>SPARE</b> |
|-------------|---------------|----------------------------------|-----------------|------------------------|
| 2           | 101217-3006   | SCREW DRIVE TYPE U #2 x 0.250 LG | 304 SS          |                        |
| 1           | 545610-093    | STRAINER CLIP ON 18MK-16DK       | 316 SS          |                        |
| 4           | 547957-1093   | CLIP BSKT STRNR 1/8 X 1 X 2-3/8  | 316 SS          |                        |
| 4           | 100484-107-04 | SCREW,CAP,HX-0.25-20NCx0.75      | F593 - 316 SS   |                        |
| 4           | 101225-144-06 | WASHER,LOCK,EXT-TOOTH-0.25       | 410 S.S.        |                        |

**SPARE PARTS LIST****CUSTOMER: BUCKMAN DIRECT DIVERSION PROJECT****SUPPLIER: CH2M HILL CONSTRUCTORS****PURCHASE ORDER NO.: 670017****FACTORY CUSTOMER ORDER NO.: 65838****4,225 GPM, 800 HP, 5 STAGE, 18MKM/N, P.L. BARREL PUMP****QUANTITY: 1****SERIAL NO.: 65838-4-1****DATE: 03/11/10**

| <b>QTY.</b> | <b>PART #</b>    | <b>DESCRIPTION</b>                    | <b>MATERIAL</b>  |
|-------------|------------------|---------------------------------------|------------------|
| 2           | 305482-014       | O-RING-33.00IDx.25RD                  | BUNA-N           |
| 2           | 549372-1039      | BEARING BRONZE 2.250 x 2.750 x 6.000  | 932 BRZ          |
| 4           | 545874-1008      | RING LANTERN 2.250                    | PTFE             |
| 12          | 549142-1137      | RING PACKING 0.500 SQ x 8.625 LG HI   | JC 100-M         |
| 2           | 545871-102       | GLAND,PACKING-2.25                    | A743-CF-8M       |
| 2           | 305432-1014      | O-RING-05.38IDx.25RD                  | BUNA N           |
| 4           | 542676-097       | COUPLING,SHAFT-THRD-2.25              | 416 SS           |
| 4           | 303280-1014      | RING O 14.000 x 14.250 x 0.125        | BUNA N           |
| 2           | 303279-1014      | RING O 13.000 x 13.250 x 0.125        | BUNA N           |
| 2           | 542121-097-09000 | SHAFT,BOWL0-T-C-225x090.00            | 416 SS           |
| 4           | 303279-1014      | RING O 13.000 x 13.250 x 0.125        | BUNA N           |
| 8           | 6583801BWWR      | RING,WEAR,BOWL-10.50x11.00x1.13       | 440 SS           |
| 10          | 549372-1026      | BEARING BRONZE 2.250 x 2.750 x 6.000  | 937 BRZ          |
| 2           | 545602-2102M     | IMPELLER,18MKM-C-WR                   | 316 SS           |
| 2           | 548177-2102M     | IMPELLER 18MKN W/ WR                  | A743-CF8M 316 SS |
| 8           | 6583801IMPWRM    | RING,WEAR,IMP-9.99x10.47x1.13         | 440 SS           |
| 2           | 6583801IMPWRN    | RING,WEAR,IMP11.00x11.36x1.13         | 440 SS           |
| 10          | 541277-093       | COLLET,IMP-2.25-STD_15DK,16DK,MK,18MK | A276-316SS       |
| 2           | 6583801BLWR      | RING,WEAR,BOWL-11.40x11.79x1.13       | 440 SS           |
| 1           | 544837-1071      | DRIVER COLLET 2.250 x 10.00 LG        | 4130 STL         |

# Section 3: Booster Station 1A

## Existing Motor Data



**EMERSON MOTOR COMPANY**

8100 WEST FLORISSANT AVE.  
ST. LOUIS, MO 63136

**DATE:** 9/10/2009**P.O. NO.:** P228148**Order/Line NO.:** 20082696 SO 100

**TO:** Floway Pumps  
2494 Railroad Avenue  
PO Box 164  
Fresno, CA, 93706

PO P228148 CO 65838-2 AE:MD  
BOYER & SEELEY INC  
BUCKMAN WTP ITEM # CH2M BS5A

**ATTN:**DOCTECH2

**Model Number:** NA  
**Catalog Number:** NA  
Submittals  
CONF,LLC,SUBMITTALS

**REVISIONS:**  
(A)GUAR EFF 95.0  
15593 THRUST

**ALL DOCUMENTS HEREIN ARE CONSIDERED CERTIFIED BY US ELECTRICAL MOTORS.****THANK YOU FOR YOUR ORDER AND THE OPPORTUNITY TO SERVE YOU.****Features:**

Horsepower ..... 00800.00~00000.00 ~ KW: 596.8  
Enclosure ..... WPI  
Poles ..... 04~00 ~ RPM: 1800~0  
Frame Size ..... 5012~VP  
Phase/Frequency/Voltage.. 3~060~460 ~ Form Wound  
Service Factor ..... 1.15  
Insulation Class ..... Class "F" ~ Insulife 5000  
Altitude In Feet (Max) .. 6600 Ft.(2000 M)  
Ambient In Degree C (Max) +40 C  
Efficiency Class ..... Premium Efficiency  
Application ..... Vertical Centrifugal Pump  
Customer Part Number .... CO 65838-2  
Base Diameter (Inches) ..... 24.5  
Non-Reverse Ratchet  
Pricebook Thrust Value (lbs).. 10300  
Customer Down Thrust (lbs) ... 15593  
Customer Shutoff Thrust (lbs).  
Up Thrust (lbs) .....  
Inverter Duty Rating:  
Load Type (Base Hz & Below) .. Variable Torque  
Speed Range (Base Hz & Below). 10:1  
"AK" Dimension (Inches).. NA  
Shaft Dimensions:~U=3.125 ~ AH/V=7.000  
KEYWAY=0.750 ~ ES=5.00  
Temperature Rise (Sine Wave): "B" Rise @ 1.0 SF (Resist)  
Starting Method ..... Direct-On-Line Start  
Duty Cycle ..... Continuous Duty  
Efficiency Value ..... 95.0 % ~ Guaranteed  
Load Inertia (lb-ft<sup>2</sup>): NEMA ~ NEMA Inertia: 2815.00 ~ 1.00  
Number Of Starts Per Hour: NEMA  
Motor Type Code ..... RVEI4  
Rotor Inertia (LB-FT<sup>2</sup>) ..... 180. LB-FT<sup>2</sup>  
Qty. of Bearings PE (Shaft) 1  
Qty. of Bearings SE (OPP) 1  
Bearing Number PE (Shaft) 95BC02J3  
Bearing Number SE (OPP) 140TS94J





## EMERSON MOTOR COMPANY

8100 WEST FLORISSANT AVE.  
ST. LOUIS, MO 63136

**DATE:** 9/10/2009

**P.O. NO.:** P228148

**Order/Line NO.:** 20082696 SO 100

**TO:** Floway Pumps  
2494 Railroad Avenue  
PO Box 164  
Fresno, CA, 93706  
**ATTN:**DOCTECH2

PO P228148 CO 65838-2 AE:MD  
BOYER & SEELEY INC  
BUCKMAN WTP ITEM # CH2M BS5A

**Model Number:** NA  
**Catalog Number:** NA  
Submittals  
CONF,LLC,SUBMITTALS

**REVISIONS:**  
(A)GUAR EFF 95.0  
15593 THRUST

**ALL DOCUMENTS HEREIN ARE CONSIDERED CERTIFIED BY US ELECTRICAL MOTORS.  
THANK YOU FOR YOUR ORDER AND THE OPPORTUNITY TO SERVE YOU.**

### Accessories:

Direct Connected To Load  
Corro-Duty Paint Job  
Counter CW Rotation FODE  
300 %EHT-See Min.Thrust Requiremt.  
Ground Lug In Conduit Box  
Insul. Bearings- Both Brackets  
Screens - Standard Material  
115 Volt Space Heaters  
Synthetic Lubrication  
Bearing RTD-100 Ohm,3 Lead  
Both Bearings  
Winding RTD's-100 Ohm,3 Lead  
VFD Duty  
Conduit Box Information: ~ Size 3.5 Conduit Box-Fab Steel  
Conduit Opening Size (AA) .. 3.5" NPT  
3 Conduit Openings ~ Bottom Of Conduit Box  
Q-2 Accessory Outlet Boxes ~ Same & Opposite Side Of Main  
Ground Lug In Conduit Box  
1" NPT Both Boxes  
Two Boxes with Terminal Board  
Shipping Tag Information:  
MOTOR 1: P-030  
MOTOR 2: P-031  
MOTOR 3: P-032  
MOTOR 4: P-033  
ATA Vib. Detect/Prox Probe:  
Vib Det/Prox Probe Type .... ST6900 COMPACT TRANS  
Manufacturer ..... METRIX INSTRUMENTS  
Manufacturer's Part Number.. ST6917-123-0-0  
Test Requirements:  
Short Commer. Test - Unwit  
Complete Initial Test-Unwit.  
Sound Test - Unwitnessed  
Vibration Test-Unwit. (IPS)  
Polarization Index - Unwit

**USE THE DATA PROVIDED BELOW TO SELECT THE APPROPRIATE DIMENSION PRINT**

**Horsepower**  
**Pole(s)**

800  
04

2 of 16

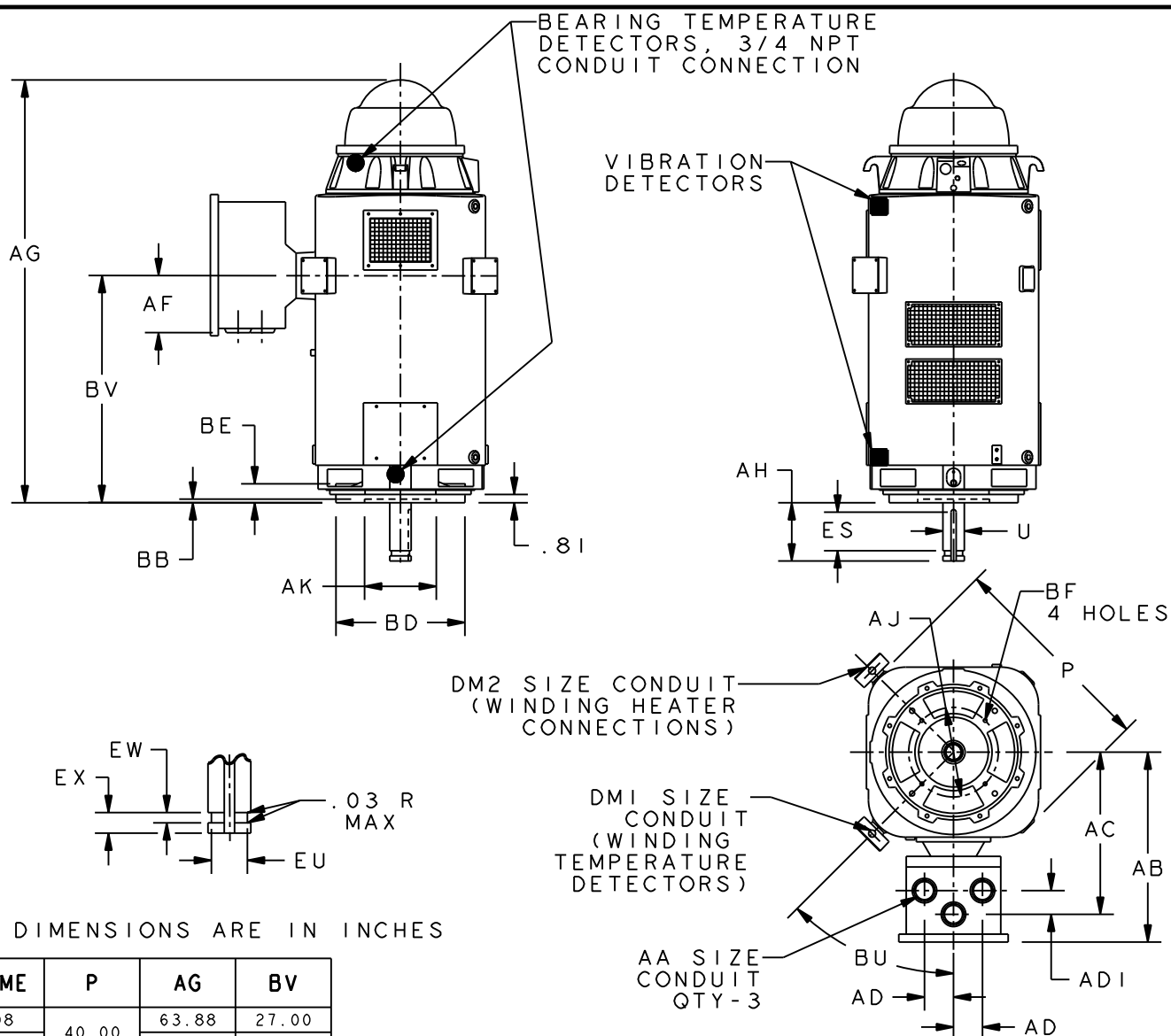
|                                |        |
|--------------------------------|--------|
| <b>Voltage(s)</b>              | 460    |
| <b>Frame Size</b>              | 5012VP |
| <b>Shaft U Diameter</b>        | 3.125  |
| <b>Outlet Box AF</b>           | 10.81  |
| <b>Outlet Box AA</b>           | 3.5    |
| <b>Accessory Outlet Box DM</b> | 1-1    |



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EFFECTIVE:  
02-SEP-09SUPERSEDES:  
31-AUG-09

## VERTICAL MOTORS

WEATHER PROTECTED TYPE I  
FRAME: 5000VPH, VP, VPA  
TYPE: RV4PRINT:  
09-2659-76SHEET:  
1 OF 2

| FRAME | P     | AG    | BV    |
|-------|-------|-------|-------|
| 5008  | 40.00 | 63.88 | 27.00 |
| 5012  |       | 78.88 | 42.00 |

| POLE       | U     | AH    | ES   | EU    | EW   | EX    | SO KEY |
|------------|-------|-------|------|-------|------|-------|--------|
| 2          | 2.375 | 5.000 | 3.50 | 2.000 | .375 | .750  | .625   |
| 4 & SLOWER | 3.125 | 7.000 | 5.00 | 2.625 | .500 | 1.000 | .750   |

| C/BOX VOLUME (CU. IN.) | AB    | AC    | AD   | ADI  | AF    | BU  |
|------------------------|-------|-------|------|------|-------|-----|
| 5600                   | 36.13 | 30.13 | 5.50 | 4.50 | 10.81 | 45° |

|  | FRAME               | AJ     | AK<br>+.005 | BB<br>min | BD<br>max | BE   | BF  |
|--|---------------------|--------|-------------|-----------|-----------|------|-----|
|  | 5000VPH             | 14.750 | 13.500      | .25       | 20.00     | 2.19 | .69 |
|  | 5000VP <sup>3</sup> | 14.750 | 13.500      |           | 24.50     |      | .69 |
|  |                     | 22.000 |             |           |           |      | .94 |
|  | 5000VPA             | 26.000 | 22.000      |           | 30.50     |      | .81 |

| AA        | DM1       | DM2       |
|-----------|-----------|-----------|
| 2 NPT     | 1/2 NPT   | 1/2 NPT   |
| 2 1/2 NPT | 3/4 NPT   | 3/4 NPT   |
| 3 NPT     | 1 NPT     | 1 NPT     |
| 3 1/2 NPT | 1 1/4 NPT | 1 1/4 NPT |
| 4 NPT     | 1 1/2 NPT | 1 1/2 NPT |

| TOLERANCES                                  |             |
|---------------------------------------------|-------------|
| FACE RUNOUT                                 | .007 T.I.R. |
| PERMISSIBLE ECCENTRICITY OF MOUNTING RABBET | .007 T.I.R. |
| PERMISSIBLE SHAFT RUNOUT                    | .003 T.I.R. |
| MAXIMUM SHAFT END PLAY                      | .010        |

- 1: DIMENSIONS MAY VARY .25" DUE TO CASTING AND/OR FABRICATION VARIATIONS.  
 2: TOLERANCES ARE SHOWN IN INCHES.  
 3: 5000VP HAS TWO BOLT CIRCLES.  
 4: MAIN OUTLET BOX DIMENSIONS: 24h x 18w x 14d.

|                                 |                                                                                            |                             |
|---------------------------------|--------------------------------------------------------------------------------------------|-----------------------------|
| EFFECTIVE:<br><b>02-SEP-09</b>  | <b>VERTICAL MOTORS</b><br>WEATHER PROTECTED TYPE I<br>FRAME: 5000VPH, VP, VPA<br>TYPE: RV4 | PRINT:<br><b>09-2659-76</b> |
| SUPERSEDES:<br><b>31-AUG-09</b> |                                                                                            | SHEET:<br><b>2 OF 2</b>     |

ALL DIMENSIONS ARE IN MILLIMETERS

|  | FRAME | P    | AG   | BV   |
|--|-------|------|------|------|
|  | 5008  | 1016 | 1623 | 686  |
|  | 5012  |      | 2004 | 1067 |

|  | POLE       | U<br>-.001 | AH<br>±.062 | ES<br>min | EU<br>-.005 | EW<br>+.002 | EX<br>-.005 | SO<br>KEY |
|--|------------|------------|-------------|-----------|-------------|-------------|-------------|-----------|
|  | 2          | 60.33      | 127.00      | 89        | 50.80       | 9.53        | 19.05       | 15.88     |
|  | 4 & SLOWER | 79.38      | 177.80      | 127       | 66.68       | 12.70       | 25.40       | 19.05     |

|  | C/BOX<br>VOLUME<br>(CU. IN.) | AB  | AC  | AD  | ADI | AF  | BU  |
|--|------------------------------|-----|-----|-----|-----|-----|-----|
|  | 5600                         | 918 | 765 | 140 | 114 | 275 | 45° |

|  | FRAME               | AJ     | AK<br>+.005 | BB<br>min | BD<br>max | BE | BF |
|--|---------------------|--------|-------------|-----------|-----------|----|----|
|  | 5000VPH             | 374.65 | 342.90      | 6         | 508       | 56 | 18 |
|  | 5000VP <sup>3</sup> | 374.65 | 342.90      |           | 622       |    | 18 |
|  |                     | 558.80 |             |           |           |    | 24 |
|  | 5000VPA             | 660.40 | 558.80      |           | 775       |    | 21 |



# NAMEPLATE DATA

|                          |        |                  |        |                   |                                               |                  |     |
|--------------------------|--------|------------------|--------|-------------------|-----------------------------------------------|------------------|-----|
| CATALOG NUMBER:          |        |                  |        | NAMEPLATE PART #: |                                               | 422707-006       |     |
| MODEL                    |        | FR               | 5012VP | TYPE              | RVEI4                                         | ENCL             | WPI |
| SHAFT<br>END BRG         |        | 95BC02J3 - QTY 1 |        | OPP<br>END BRG    |                                               | 140TS94J - QTY 1 |     |
| PH                       | 3      | MAX<br>AMB       | 40 C   | ID#               | (ref: Order#: 20082696, Type: SO, Line#: 100) |                  |     |
| INSUL<br>CLASS           | F      | Asm.<br>Pos.     |        | DUTY              | CONT                                          |                  |     |
| HP                       | 800    | RPM              | 1775   | HP                |                                               | RPM              |     |
| VOLTS                    | 460    |                  |        | VOLTS             |                                               |                  |     |
| FL<br>AMPS               | 875.0  |                  |        | FL<br>AMPS        |                                               |                  |     |
| SF<br>AMPS               | 1013.0 |                  |        | SF<br>AMPS        |                                               |                  |     |
| SF                       | 1.15   | DESIGN           | #      | CODE              | G                                             |                  |     |
| NEMA NOM<br>EFFICIENCY   | 95.4   | NOM<br>PF        | 89.7   | KiloWatt          | 596.8                                         |                  |     |
| GUARANTEED<br>EFFICIENCY | 95.0   | MAX<br>KVAR      |        | HZ                | 60                                            |                  |     |

## UL DATA (IF APPLICABLE):

|           |  |          |  |          |  |
|-----------|--|----------|--|----------|--|
| DIVISION  |  | CLASS I  |  | GROUP I  |  |
| TEMP CODE |  | CLASS II |  | GROUP II |  |

## VFD DATA (IF APPLICABLE):

|                   |             |  |  |
|-------------------|-------------|--|--|
| VOLTS             | 460         |  |  |
| AMPS              | 918.8       |  |  |
| TORQUE 1          | 2368.7LB-FT |  |  |
| VFD LOAD TYPE 1   | VT/PWM      |  |  |
| VFD HERTZ RANGE 1 | 6-60        |  |  |
| VFD SPEED RANGE 1 | 180-1800    |  |  |
| SERVICE FACTOR    | 1.00        |  |  |
| NO. POLES         |             |  |  |
| VECTOR MAX RPM    |             |  |  |
| Radians / Seconds |             |  |  |
| TORQUE 2          |             |  |  |
| VFD LOAD TYPE 2   |             |  |  |
| VFD HERTZ RANGE 2 |             |  |  |
| VFD SPEED RANGE 2 |             |  |  |
| FL SLIP           |             |  |  |
| MAGNETIZING AMPS  |             |  |  |
| Encoder PPR       |             |  |  |
| Encoder Volts     |             |  |  |

## TEAO DATA (IF APPLICABLE):

|                     |  |                         |  |                         |  |                       |  |
|---------------------|--|-------------------------|--|-------------------------|--|-----------------------|--|
| HP (AIR OVER)       |  | HP (AIR OVER<br>M/S)    |  | RPM (AIR OVER)          |  | RPM (AIR OVER<br>M/S) |  |
| FPM AIR<br>VELOCITY |  | FPM AIR<br>VELOCITY M/S |  | FPM AIR<br>VELOCITY SEC |  |                       |  |

**ADDITIONAL NAMEPLATE DATA:**

|                           |                     |                           |                  |
|---------------------------|---------------------|---------------------------|------------------|
| Decal / Plate             | WD=499495           | Customer PN               | CO 65838-2       |
| Notes                     |                     | Non Rev Ratchet           | NRR              |
| Max Temp Rise             | 80C RISE/RES@1.00SF | OPP/Upper Oil Cap         | 30 QT/28.4 L     |
| Thermal (WDG)             | OVER TEMP PROT 2    | SHAFT/Lower Oil Cap       | GREASE           |
| Altitude                  | 6600 FASL           |                           |                  |
| EPACT Note                |                     | EPACT Compliance          |                  |
| COS                       |                     | Marine Duty               |                  |
| Balance                   | 0.08 IN/SEC         | Arctic Duty               |                  |
| 3/4 Load Eff.             | 96.0                | Inrush Limit              |                  |
| Motor Weight              | 4850                | Direction of Rotation     |                  |
| Sound Level               |                     | Special Note 1            |                  |
| Vertical Thrust           | 15593               | Special Note 2            |                  |
| Thrust Percentage         | 300% EHT            | Special Note 3            |                  |
| Bearing Life              |                     | Special Note 4            |                  |
| Starting Method           |                     | Special Note 5            |                  |
| Number of Starts          |                     | Special Note 6            |                  |
| 200/208V 60Hz Max Amps    |                     | SH Max. Temp.             |                  |
| 190V 50 hz Max Amps       |                     | SH Voltage                | SH VOLTS=115V    |
| 380V 50 Hz Max Amps       |                     | SH Watts                  | SH WATTS=384W    |
| NEMA Inertia              |                     | Load Inertia              |                  |
| Sumpheater Voltage        |                     | Sumpheater Wattage        |                  |
| Special Accessory Note 1  | BEARING SET POINTS  | Special Accessory Note 16 |                  |
| Special Accessory Note 2  | ALARM= 120C         | Special Accessory Note 17 | AFFIX N/P 915592 |
| Special Accessory Note 3  | SHUTDOWN= 130C      | Special Accessory Note 18 |                  |
| Special Accessory Note 4  |                     | Special Accessory Note 19 |                  |
| Special Accessory Note 5  |                     | Special Accessory Note 20 |                  |
| Special Accessory Note 6  |                     | Special Accessory Note 21 |                  |
| Special Accessory Note 7  |                     | Special Accessory Note 22 |                  |
| Special Accessory Note 8  |                     | Special Accessory Note 23 |                  |
| Special Accessory Note 9  |                     | Special Accessory Note 24 |                  |
| Special Accessory Note 10 |                     | Special Accessory Note 25 |                  |
| Special Accessory Note 11 |                     | Special Accessory Note 26 |                  |
| Special Accessory Note 12 |                     | Special Accessory Note 27 |                  |
| Special Accessory Note 13 |                     | Special Accessory Note 28 |                  |
| Special Accessory Note 14 |                     | Special Accessory Note 29 |                  |
| Special Accessory Note 15 |                     | Special Accessory Note 30 |                  |



**EMERSON MOTOR COMPANY**  
ST. LOUIS, MO



TYPICAL NAMEPLATE DATA  
ACTUAL MOTOR NAMEPLATE LAYOUT MAY VARY  
SOME FIELDS MAY BE OMITTED

# MOTOR PERFORMANCE

| MODEL NO. | CATALOG NO. | PHASE | TYPE  | FRAME  |
|-----------|-------------|-------|-------|--------|
| NA        | NA          | 3     | RVEI4 | 5012VP |

| ORDER NO. | 20082696 | LINE NO. | 100 |
|-----------|----------|----------|-----|
|-----------|----------|----------|-----|

|                             |        |
|-----------------------------|--------|
| MPI:                        | 114541 |
| HP:                         | 800    |
| POLES:                      | 4      |
| VOLTS:                      | 460    |
| HZ:                         | 60     |
| SERVICE FACTOR:             | 1.15   |
| EFFICIENCY (%):             |        |
| S.F.                        | 94.9   |
| FULL                        | 95.4   |
| 3/4                         | 96     |
| 1/2                         | 95.9   |
| 1/4                         | 94.1   |
| POWER FACTOR (%):           |        |
| S.F.                        | 89.7   |
| FULL                        | 89.7   |
| 3/4                         | 88.7   |
| 1/2                         | 84.5   |
| 1/4                         | 68.9   |
| NO LOAD                     | 4.9    |
| LOCKED ROTOR                | 21.1   |
| AMPS:                       |        |
| S.F.                        | 1013   |
| FULL                        | 875    |
| 3/4                         | 660    |
| 1/2                         | 462    |
| 1/4                         | 289    |
| NO LOAD                     | 194.4  |
| LOCKED ROTOR                | 6311   |
| NEMA CODE LETTER            | G      |
| NEMA DESIGN LETTER          | #      |
| FULL LOAD RPM               | 1775   |
| NEMA NOMINAL EFFICIENCY (%) | 95.4   |
| GUARANTEED EFFICIENCY (%)   | 95     |
| MAX KVAR                    | 131.7  |
| AMBIENT (°C)                | 40     |
| ALTITUDE (FASL)             | 7000   |
| SAFE STALL TIME-HOT (SEC)   | 15     |
| SOUND PRESSURE (DBA @ 1M)   | 86     |
| TORQUES:                    |        |
| BREAKDOWN{% F.L.}           | 175    |
| LOCKED ROTOR{% F.L.}        | 60     |
| FULL LOAD{LB-FT}            | 2368.7 |

The Above Data Is Typical. Sinewave Power Unless Noted Otherwise



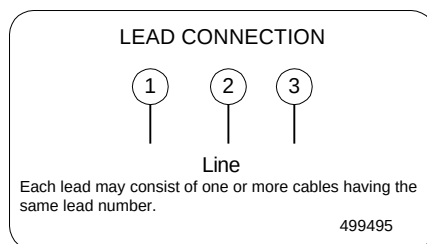
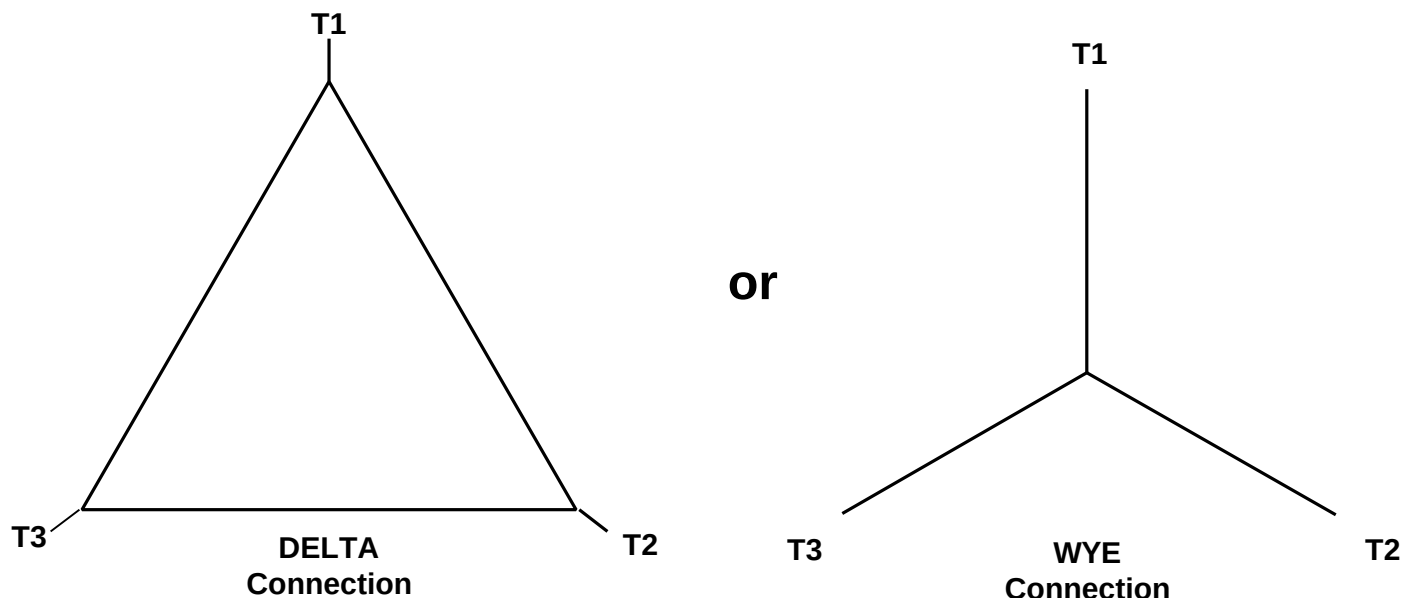
EMERSON MOTOR COMPANY  
ST. LOUIS, MO





499495

## Motor Wiring Diagram



To reverse direction of rotation interchange connections L1 and L2.

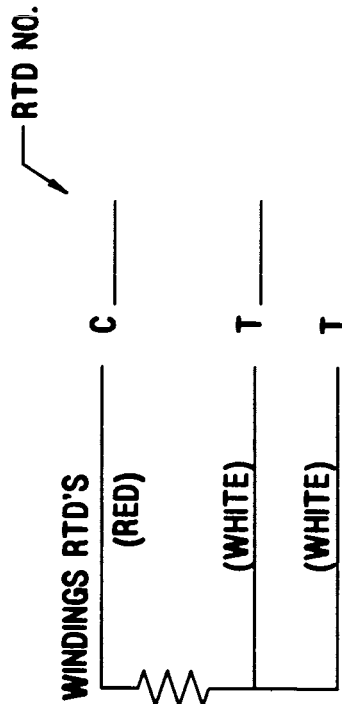
Each lead may be comprised of one or more cables.  
Each cable will be marked with the appropriate lead number.

# WINDING RTD'S

1. THERE ARE QTY-6 RESISTANCE TYPE TEMPERATURE DETECTORS (RTD) INSTALLED IN THE STATOR WINDING, 2 PER PHASE. REFER TO NAMEPLATE ATTACHED TO THE MOTOR ADJACENT TO ACCESSORY OUTLET BOX FOR RATING THE RTD'S.

2. DETECTORS ARE INSTALLED IN PHASES AS SHOWN.

| PHASE   | A     | B     | C     |
|---------|-------|-------|-------|
| RTD NO. | 1, 11 | 2, 22 | 3, 33 |



## ACCESSORY LISTING

QTY-6 3 LEAD RTD'S

|                            |                        |                                                                                   |          |                                |
|----------------------------|------------------------|-----------------------------------------------------------------------------------|----------|--------------------------------|
| ALT. CHANGE LET NOTICE NO. | DESCRIPTION OF CHANGE  | U.S. ELECTRICAL MOTORS<br>DIVISION OF EMERSON ELECTRIC CO.<br>ST. LOUIS, MISSOURI | TITLE    | CUSTOMER<br>CONNECTION DIAGRAM |
| -                          | REDRAWN ON CAD 8-10-89 | DRWN 9-MAY-79, HEB                                                                | ---      | ---                            |
| A MOD                      | 6-JUN-00 UPDATED       | RVSD 6-JUN-00, RWK                                                                | ---      | ---                            |
|                            |                        | APPD 8-JUN-00, REP                                                                | ---      | ---                            |
|                            |                        |                                                                                   | ---      | ---                            |
|                            |                        |                                                                                   | ---      | ---                            |
|                            |                        |                                                                                   | ---      | ---                            |
| ALT. LET                   | CDG                    | 1, 1                                                                              | ALT. LET | 833989 A                       |

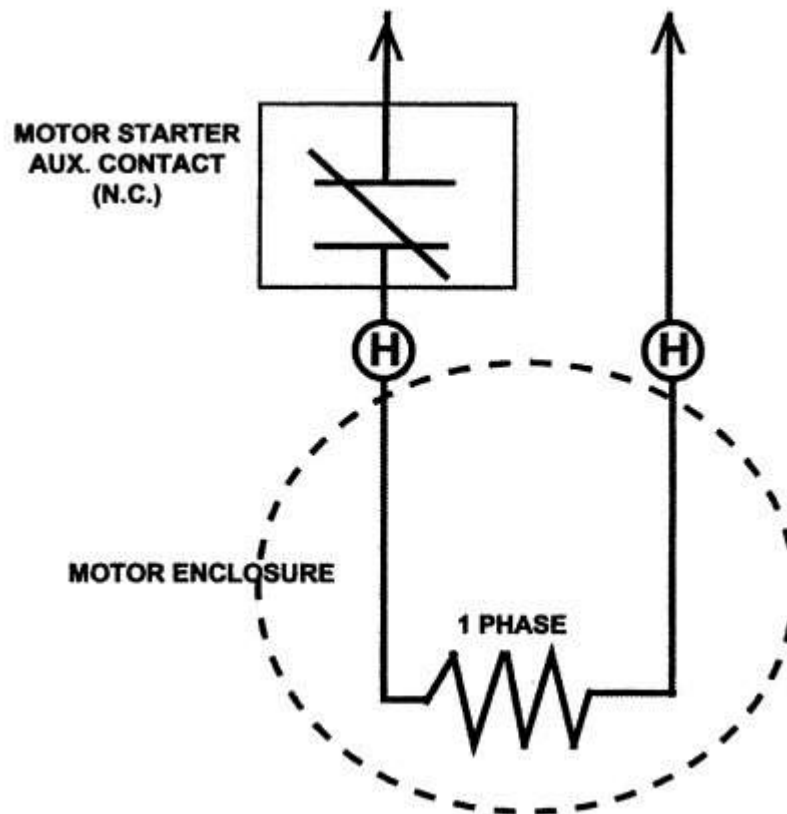




970798

# SPACE HEATER CONNECTION DIAGRAM

SPACE HEATER LEADS MAY BE LOCATED IN EITHER THE MAIN OUTLET BOX  
OR IF SO EQUIPPED, AN AUXILIARY BOX



THIS EQUIPMENT IS SUPPLIED WITH ANTI-  
CONDENSATION HEATERS. HEATERS  
SHOULD BE ENERGIZED WHEN EQUIPMENT  
IS NOT OPERATING TO PROTECT UNIT BY  
PREVENTING INTERNAL CONDENSATION.  
CONNECT THE "H" OR HEATER  
LEADS TO

|                   |                          |
|-------------------|--------------------------|
| <b>115V</b> VOLTS | <b>384W</b> WATTS RATING |
|-------------------|--------------------------|

**SPACE HEATER NAMEPLATE (ON MOTOR)**

Revision: 7/30/2008  
Mike Cullen

|      |   |        |   |
|------|---|--------|---|
| ALT. | A | 338312 | A |
|------|---|--------|---|

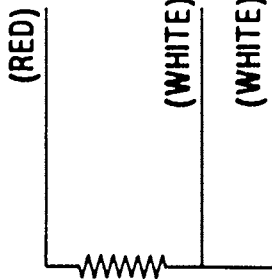
**BEARING RTD'S**

1. THERE ARE QTY-1 OR 2 (3 LEAD) BEARING RTD'S INSTALLED, ONE PER BEARING.

A = UPPER/ODE (OPPOSITE DRIVE END)  
B = LOWER/DE (DRIVE END)

**BEARING RTD'S**

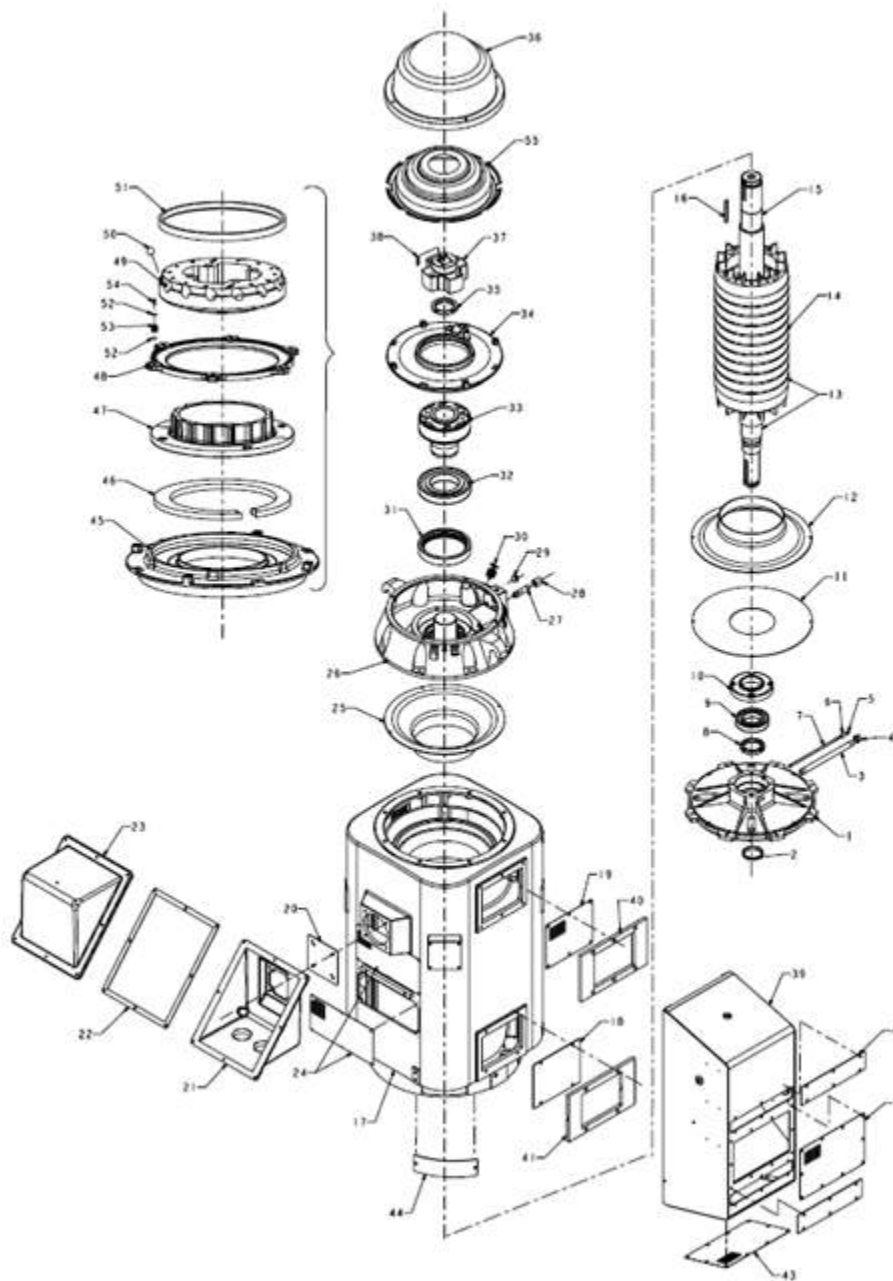
| UPPER/ODE | LOWER/DE |
|-----------|----------|
| A1        | B1       |
| A2        | B2       |
| A2        | B2       |



|                                                                                                                                                      |                                |        |     |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------|-----|-----|----------|-----|---|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----|--------|---------------------|-----|-----|---------------------|-----|-----|
| ACCESSORY LISTING                                                                                                                                    |                                |        |     |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| QTY 1 OR 2 BEARING RTD'S (3 LEAD)                                                                                                                    |                                |        |     |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| U.S. ELECTRICAL MOTORS<br>DIVISION OF EMERSON ELECTRIC CO.<br>ST. LOUIS, MISSOURI                                                                    | CUSTOMER CONNECTION<br>DIAGRAM |        |     |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| <table border="1"> <tr> <td>SCALE</td> <td>NONE</td> <td>IN</td> <td>5</td> </tr> <tr> <td>MATERIAL</td> <td colspan="3">---</td> </tr> </table>     | SCALE                          | NONE   | IN  | 5   | MATERIAL | --- |   |     | <table border="1"> <tr> <td>DRWN 12-APR-00, RAW</td> <td>---</td> <td>---</td> </tr> <tr> <td>RVSD 11-JUL-00, RWK</td> <td>---</td> <td>---</td> </tr> <tr> <td>APPD 11-JUL-00, REP</td> <td>---</td> <td>---</td> </tr> </table> | DRWN 12-APR-00, RAW | --- | ---    | RVSD 11-JUL-00, RWK | --- | --- | APPD 11-JUL-00, REP | --- | --- |
| SCALE                                                                                                                                                | NONE                           | IN     | 5   |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| MATERIAL                                                                                                                                             | ---                            |        |     |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| DRWN 12-APR-00, RAW                                                                                                                                  | ---                            | ---    |     |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| RVSD 11-JUL-00, RWK                                                                                                                                  | ---                            | ---    |     |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| APPD 11-JUL-00, REP                                                                                                                                  | ---                            | ---    |     |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| <table border="1"> <tr> <td>ALT.</td> <td>1</td> <td>1</td> <td>CDG</td> </tr> <tr> <td>SHEET</td> <td>1</td> <td>1</td> <td>CDG</td> </tr> </table> | ALT.                           | 1      | 1   | CDG | SHEET    | 1   | 1 | CDG | <table border="1"> <tr> <td>ALT.</td> <td>A</td> <td>338312</td> <td>A</td> </tr> </table>                                                                                                                                        | ALT.                | A   | 338312 | A                   |     |     |                     |     |     |
| ALT.                                                                                                                                                 | 1                              | 1      | CDG |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| SHEET                                                                                                                                                | 1                              | 1      | CDG |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |
| ALT.                                                                                                                                                 | A                              | 338312 | A   |     |          |     |   |     |                                                                                                                                                                                                                                   |                     |     |        |                     |     |     |                     |     |     |

## RENEWAL PARTS

FRAMES 5008 AND 5012  
TYPES: RU, RUE, RUEI, RV4, RVE4, RVEI4



### WARNING:

Any disassembly or repair work on explosionproof motors will void the Underwriters Laboratories, Inc. label unless done by the manufacturer, or a facility approved by the Underwriters Laboratories, Inc. Refer to your nearest U.S. Electrical Motors office for assistance.

### BEARINGS:

Refer to motor nameplate for the bearing numbers.

### PRICES:

Parts stocking distributors: refer to USEM renewal parts numerical index. All Others: refer to your nearest USEM parts distributor.

reference: Renewal Parts Section 700 - 200

# RENEWAL PARTS

FRAMES 5008 AND 5012  
TYPES: RU, RUE, RUEI, RV4, RVE4, RVEI4

| ITEM NO. | QTY                          | NAME OF PART                           |
|----------|------------------------------|----------------------------------------|
| 1        | 1                            | Lower Bracket                          |
| 2        | 1                            | Shaft Water Slinger                    |
| 3        | 1                            | Pipe Nipple (Lower Grease Drain)       |
| 4        | 1                            | Pipe Cap (Lower Grease Drain)          |
| 5        | 1                            | Grease Zerk Fitting                    |
| 6        | 1                            | Pipe Coupling (Lower Grease Fill)      |
| 7        | 1                            | Pipe Nipple (Lower Grease Fill)        |
| 8        | 1                            | Locknut and Lockwasher (Lower Bearing) |
| 9        | 1                            | Lower Bearing                          |
| 10       | 1                            | Lower Bearing Cap                      |
| 11       | 1                            | Lower Intake Screen (Only on WP-1)     |
| 12       | 1                            | Lower Air Deflector                    |
| 13       | 1                            | Rotor Assembly                         |
| 14       | 1                            | Rotor Core                             |
| 15       | 1                            | Rotor Shaft                            |
| 16       | 1                            | Square Key (Bearing Mounting to Shaft) |
| 17       | 1                            | Stator Assembly                        |
| 18       | 2                            | Lower Air Intake Cover (Only on WP-1)  |
| 19       | 2                            | Upper Air Intake Screen (Only on WP-1) |
| 20       | 1                            | Gasket (Outlet Box Base to Stator)     |
| 21       | 1                            | Outlet Box Base                        |
| 22       | 1                            | Gasket (Outlet Box Cover to Base)      |
| 23       | 1                            | Outlet Box Cover                       |
| 24       | 2-<br>(5008)<br>4-<br>(5012) | Exhaust Screen                         |
| 25       | 1                            | Upper Air Deflector                    |
| 26       | 1                            | Upper Bracket                          |
| 27       | 1                            | Pipe Nipple (Oil Drain)                |
| 28       | 1                            | Pipe Cap (Oil Drain)                   |
| 29       | 1                            | Oil Sight Gauge Window                 |

## WARNING:

Any disassembly or repair work on explosionproof motors will void the Underwriters Laboratories, Inc. label unless done by the manufacturer, or a facility approved by the Underwriters Laboratories, Inc. Refer to your nearest U.S. Electrical Motors office for assistance.

## BEARINGS:

Refer to motor nameplate for the bearing numbers.

## PRICES:

Parts stocking distributors: refer to USEM renewal parts numerical index. All Others: refer to your nearest USEM parts distributor.

reference: Renewal Parts Section 700 - 200

| ITEM NO. | QTY                            | NAME OF PART                                     |
|----------|--------------------------------|--------------------------------------------------|
| 30       | 1                              | Oil Fill Plug (Expanding)                        |
| 31       | 1                              | Bearing Spacer (or Tandem Thrust Bearing)        |
| 32       | 1                              | Upper Thrust Bearing                             |
| 33       | 1                              | Bearing Mounting                                 |
| 34       | 1                              | Dust Cover (Only on Units Without Ratchet)       |
| 35       | 1                              | Locknut and Lockwasher (Brg Mtg to Shaft)        |
| 36       | 1                              | Canopy Cap                                       |
| 37       | 1                              | Thrust Coupling (Only on Hollowshaft)            |
| 38       | 1                              | Gib Key (Only on Hollowshaft)                    |
| 39       | 2                              | WP2 Intake Box (Only on WP-2)                    |
| 40       | 2                              | Upper Adapter Flange (Only on WP-2)              |
| 41       | 2                              | Lower Adapter Flange (Only on WP-2)              |
| 42       | 4                              | Filter Access Cover (Only on WP-2)               |
| 43       | 4                              | Intake Screen (Only on WP-2)                     |
| 44       | 4                              | Cover (Flange Access) (Only on WP-2)             |
| 45       | 1                              | Ratchet Adaptor (Only on Units With Ratchet)     |
| 46       | 1                              | Connection Spring (Only on Units With Ratchet)   |
| 47       | 1                              | Stationary Ratchet (Only on Units With Ratchet)  |
| 48       | 1                              | Pressure Plate (Only on Units With Ratchet)      |
| 49       | 1                              | Rotating Ratchet (Only on Units With Ratchet)    |
| 50       | 12-<br>(5008)<br>14-<br>(5012) | Ratchet Ball (Only on Units with Ratchet)        |
| 51       | 1                              | Ball Retaining Ring (Only on Units With Ratchet) |
| 52       | 4-<br>(5008)<br>12-<br>(5012)  | Plain Washer (Only on Units With Ratchet)        |
| 53       | 4-<br>(5008)<br>6-<br>(5012)   | Die Spring (Only on Units With Ratchet)          |
| 54       | 4-<br>(5008)<br>6-<br>(5012)   | Screw (Only on Units With Ratchet)               |
| 55       | 1                              | Pressurization Baffle                            |

# TYPICAL REED CRITICAL FREQUENCY DATA

USEM MODEL NO: NA  
USEM CATALOG NO: NA

Frame: 5012VP Type: RVEI4

|                                 |           |      |
|---------------------------------|-----------|------|
| REED CRITICAL FREQUENCY:        | 20        | HZ   |
| CENTER OF GRAVITY:              | 34.0      | IN   |
| DEFLECTION @ CENTER OF GRAVITY: | 0.0245    | IN   |
| UNIT WEIGHT:                    | 4850      | LBS. |
| BASE DIAMETER:                  | 24.5      | IN.  |
| MAXIMUM MOTOR DIAMETER:         | 40        | IN.  |
| DATE:                           | 9/10/2009 |      |



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## MINIMUM DOWN-THRUST REQUIREMENT

The motor contains an Extra-High-Thrust bearing arrangement that utilizes preload springs to prevent bearing skidding. In order to properly seat the thrust bearing and unload the guide bearing, the motor must be subjected to at least **4500 lbs** of external down-thrust during all operation, with exception of momentary excursions of reduced down-thrust or up-thrust at startup and/or shutdown. Failure to provide adequate down-thrust may result in premature damage to the motor bearings that would not be covered under warranty.

The pump thrust should be compared to the required motor down-thrust value to ensure that sufficient thrust will be present under all steady-state running conditions (at all anticipated speeds and flow rates). If there are any questions, please contact your US Motors Sales Representative.

The motor will be provided with a caution nameplate indicating the same minimum down-thrust noted above.

Thrust Bearing: **29428**



# Appendix B:

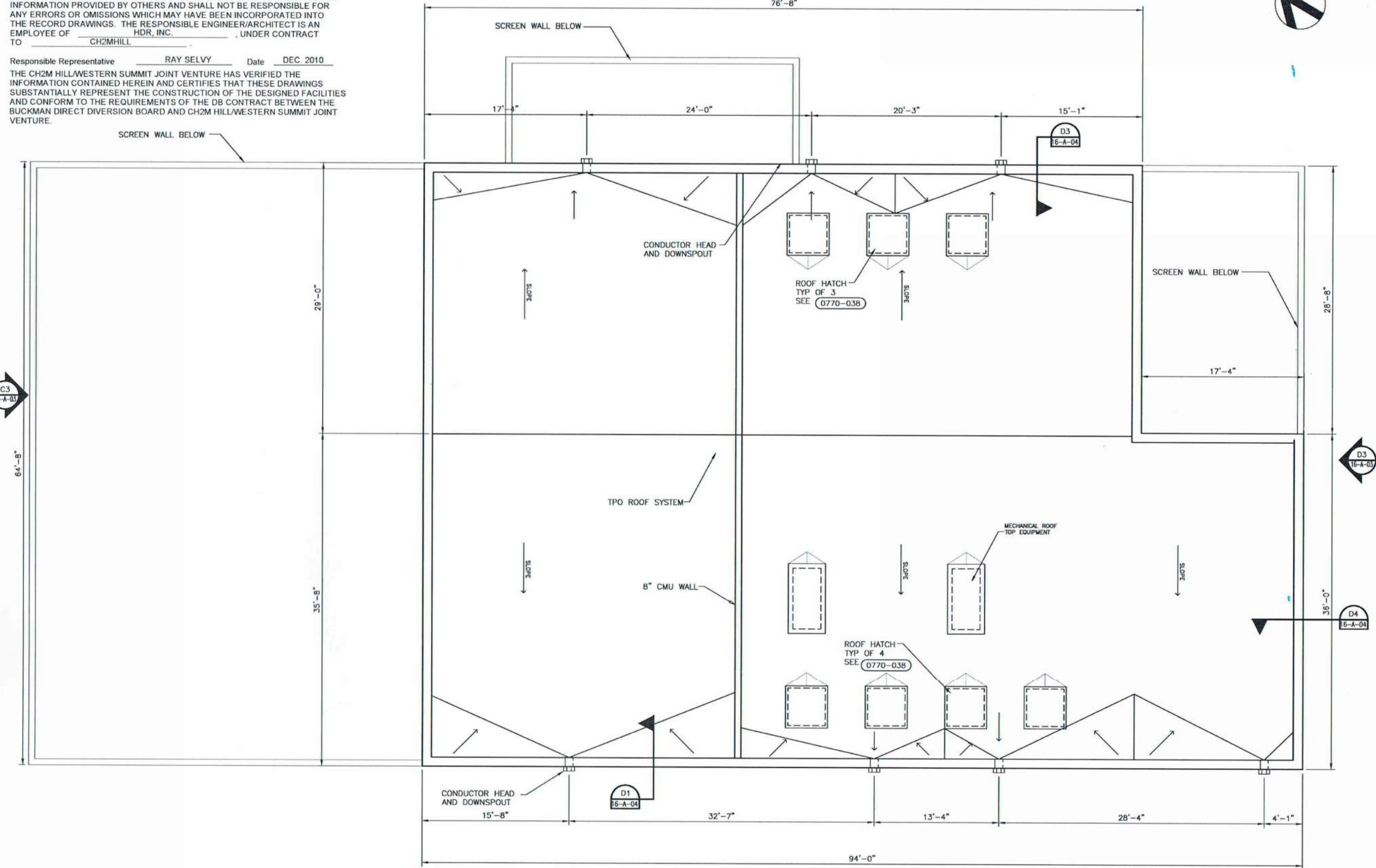
## Booster Station 2A

# Section 1: Booster Station 2A, Existing Pump Station Drawings

# RECORD DRAWINGS

Revisions Drawn By HDR, INC. Date DEC. 2010  
 THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THE RESPONSIBLE ENGINEER/ARCHITECT WHO IS STAMPING THESE DRAWINGS HAS NOT INDEPENDENTLY VERIFIED THE INFORMATION PROVIDED BY OTHERS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS. THE RESPONSIBLE ENGINEER/ARCHITECT IS AN EMPLOYEE OF HDR, INC. UNDER CONTRACT TO CH2MHILL.

Responsible Representative RAY SELVY Date DEC. 2010  
 THE CH2M HILL/WESTERN SUMMIT JOINT VENTURE HAS VERIFIED THE INFORMATION CONTAINED HEREIN AND CERTIFIES THAT THESE DRAWINGS SUBSTANTIALLY REPRESENT THE CONSTRUCTION OF THE DESIGNED FACILITIES AND CONFORM TO THE REQUIREMENTS OF THE DB CONTRACT BETWEEN THE BUCKMAN DIRECT DIVERSION BOARD AND CH2M HILL/WESTERN SUMMIT JOINT VENTURE.



**ARCHITECTURAL ROOF PLAN**  
 3/16" = 1'-0"



| NO.             | DATE    | DSGN | CHK | APVD | BY  | APVD |
|-----------------|---------|------|-----|------|-----|------|
| 1               | 12/2010 |      |     |      | HDR | X    |
| RECORD DRAWINGS |         |      |     |      |     |      |
| REVISION        |         |      |     |      |     |      |
| A.J.T.          |         |      |     |      |     |      |
| L.K.W.          |         |      |     |      |     |      |
| D.W.            |         |      |     |      |     |      |
| CH2M HILL       |         |      |     |      |     |      |

**HDR**  
 WESTERN SUMMIT

**CH2MHILL**  
 ARCHITECTURAL

BUCKMAN DIRECT DIVERSION PROJECT  
 RAW WATER FACILITIES  
 SANTA FE, NEW MEXICO

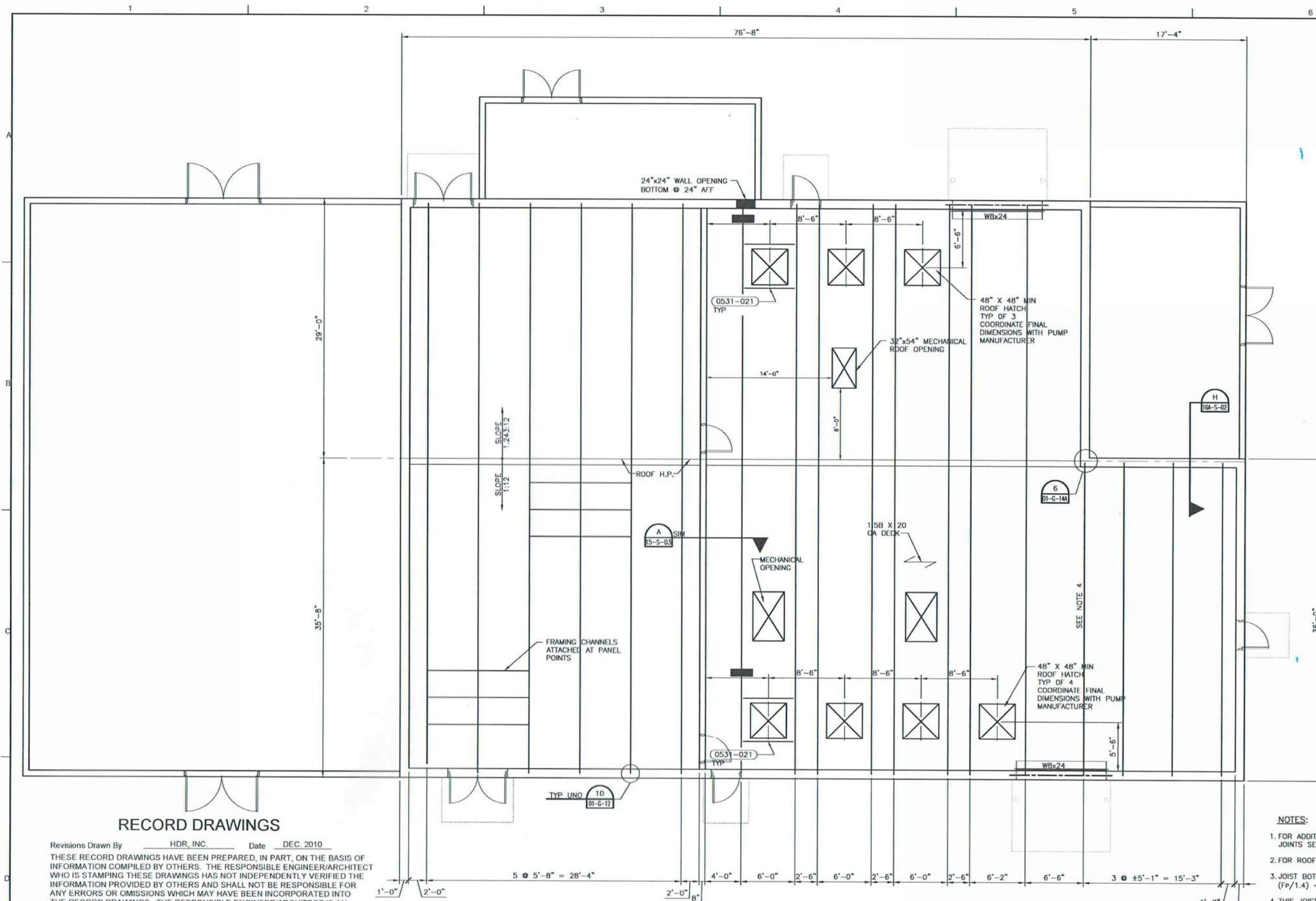
BOOSTER STATION 2A  
 ROOF PLAN

|                                     |              |
|-------------------------------------|--------------|
| VERIFY SCALE                        |              |
| BAR IS ONE INCH ON ORIGINAL DRAWING |              |
| DATE                                | OCTOBER 2008 |
| PROJ                                | 82364        |
| DWG                                 | 16A-A-02     |
| SHEET                               | 161          |









## RECORD DRAWINGS

Revisions Drawn By HDR, INC. Date DEC. 2010

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THE RESPONSIBLE ENGINEER/ARCHITECT WHO IS STAMPING THESE DRAWINGS HAS NOT INDEPENDENTLY VERIFIED THE INFORMATION PROVIDED BY OTHERS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS. THE RESPONSIBLE ENGINEER/ARCHITECT IS AN EMPLOYEE OF HDR, INC., UNDER CONTRACT TO CH2MHILL.

Responsible Representative RAY SELVY Date DEC. 2010

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## ROOF PLAN

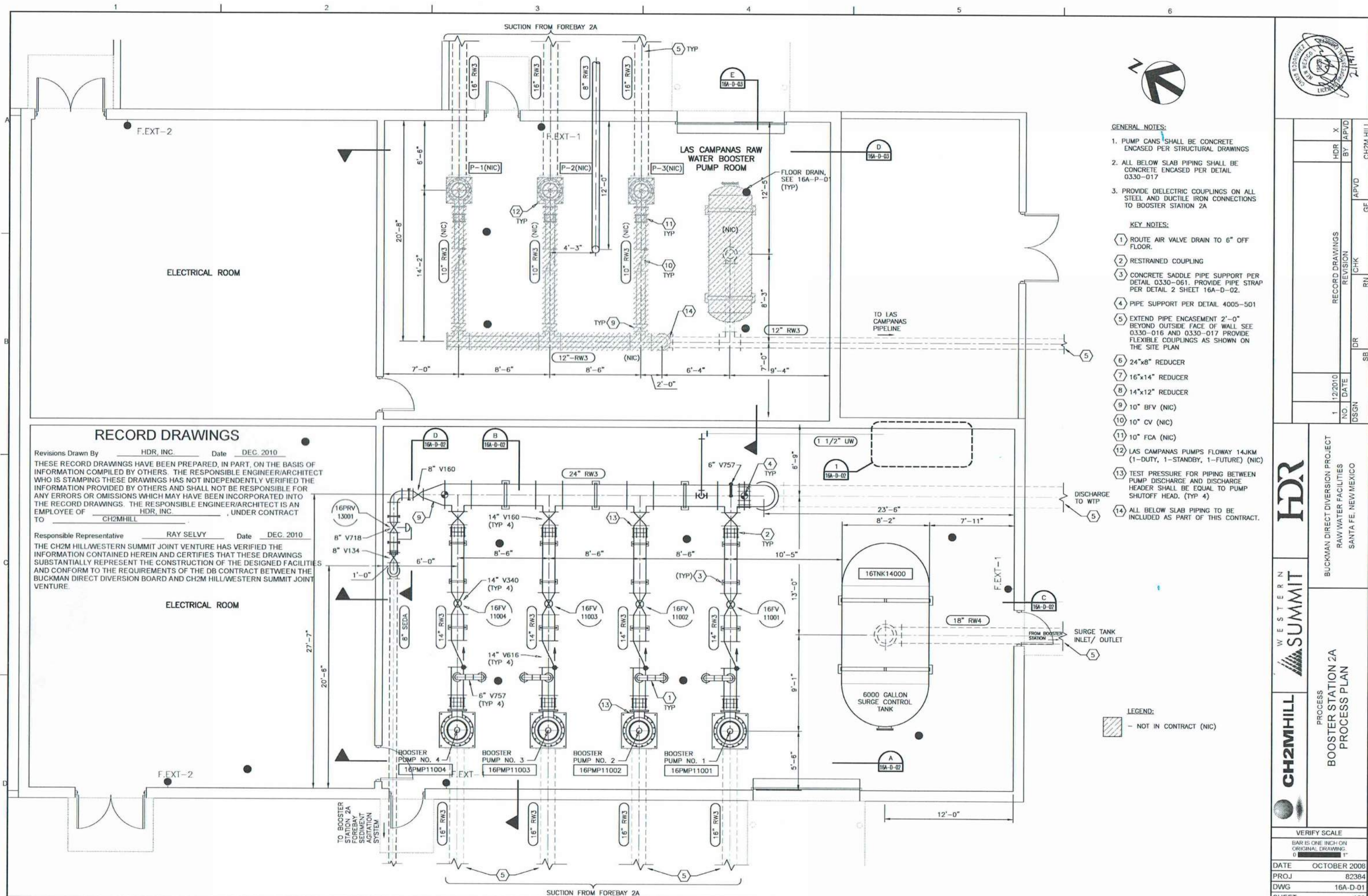
3/16" = 1'-0"

### NOTES:

1. FOR ADDITIONAL CMU CONTROL JOINTS SEE SPECIFICATIONS.
2. FOR ROOF JOISTS SEE 01-G-13A.
3. JOIST BOTTOM CHORD TENSION (F<sub>p</sub>/1.4) = 3.5K.
4. THIS JOIST HAS A DRAG FORCE OF F/1.4 = 20.5.
5. ROOF DECK ATTACHMENT TYPE A, SEE 01-G-13A.
6. FOR SCREEN WALLS, SEE E/15-S-03.

|                                                                                  |  |                              |  |                                                 |  |
|----------------------------------------------------------------------------------|--|------------------------------|--|-------------------------------------------------|--|
|                                                                                  |  |                              |  |                                                 |  |
| BUCKMAN DIRECT DIVERSION PROJECT<br>RAW WATER FACILITIES<br>SANTA FE, NEW MEXICO |  |                              |  |                                                 |  |
| BOOSTER STATION 2A<br>ROOF PLAN                                                  |  |                              |  |                                                 |  |
| NO. 1<br>DATE 12/20/10<br>DSGN                                                   |  | REVISION<br>BY APVD<br>HDR X |  | RECORD DRAWINGS<br>REVISION<br>BY APVD<br>HDR X |  |
| ZHS<br>IDR                                                                       |  | SRF<br>CHK                   |  | LF<br>APVD<br>CH2MHILL                          |  |
| VERIFY SCALE<br>BAR IS ONE INCH ON ORIGINAL DRAWING.                             |  |                              |  |                                                 |  |
| DATE OCTOBER 2008<br>PROJ 82364<br>DWG 16A-S-03<br>SHEET 168                     |  |                              |  |                                                 |  |





- GENERAL NOTES:**
1. PUMP CANS SHALL BE CONCRETE ENCASED PER STRUCTURAL DRAWINGS
  2. ALL BELOW SLAB PIPING SHALL BE CONCRETE ENCASED PER DETAIL 0330-017
  3. PROVIDE DIELECTRIC COUPLINGS ON ALL STEEL AND DUCTILE IRON CONNECTIONS TO BOOSTER STATION 2A
- KEY NOTES:**
- 1 ROUTE AIR VALVE DRAIN TO 6" OFF FLOOR.
  - 2 RESTRAINED COUPLING
  - 3 CONCRETE SADDLE PIPE SUPPORT PER DETAIL 0330-061. PROVIDE PIPE STRAP PER DETAIL 2 SHEET 16A-D-02.
  - 4 PIPE SUPPORT PER DETAIL 4005-501
  - 5 EXTEND PIPE ENCASEMENT 2'-0" BEYOND OUTSIDE FACE OF WALL. SEE 0330-016 AND 0330-017 PROVIDE FLEXIBLE COUPLINGS AS SHOWN ON THE SITE PLAN
  - 6 24"x8" REDUCER
  - 7 16"x14" REDUCER
  - 8 14"x12" REDUCER
  - 9 10" BFV (NIC)
  - 10 10" CV (NIC)
  - 11 10" FCA (NIC)
  - 12 LAS CAMPANAS PUMPS FLOWAY 14JKM (1-DUTY, 1-STANDBY, 1-FUTURE) (NIC)
  - 13 TEST PRESSURE FOR PIPING BETWEEN PUMP DISCHARGE AND DISCHARGE HEADER SHALL BE EQUAL TO PUMP SHUTOFF HEAD. (TYP 4)
  - 14 ALL BELOW SLAB PIPING TO BE INCLUDED AS PART OF THIS CONTRACT.

**RECORD DRAWINGS**

Revisions Drawn By HDR, INC. Date DEC. 2010

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THE RESPONSIBLE ENGINEER/ARCHITECT WHO IS STAMPING THESE DRAWINGS HAS NOT INDEPENDENTLY VERIFIED THE INFORMATION PROVIDED BY OTHERS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS. THE RESPONSIBLE ENGINEER/ARCHITECT IS AN EMPLOYEE OF HDR, INC., UNDER CONTRACT TO CH2MHILL.

Responsible Representative RAY SELVY Date DEC. 2010

THE CH2M HILL/WESTERN SUMMIT JOINT VENTURE HAS VERIFIED THE INFORMATION CONTAINED HEREIN AND CERTIFIES THAT THESE DRAWINGS SUBSTANTIALLY REPRESENT THE CONSTRUCTION OF THE DESIGNED FACILITIES AND CONFORM TO THE REQUIREMENTS OF THE DB CONTRACT BETWEEN THE BUCKMAN DIRECT DIVERSION BOARD AND CH2M HILL/WESTERN SUMMIT JOINT VENTURE.

BUCKMAN DIRECT DIVERSION PROJECT  
RAW WATER FACILITIES  
SANTA FE, NEW MEXICO

PROCESS  
BOOSTER STATION 2A  
PROCESS PLAN

|       |              |
|-------|--------------|
| DATE  | OCTOBER 2008 |
| PROJ  | 82384        |
| DWG   | 16A-D-01     |
| SHEET | 169          |

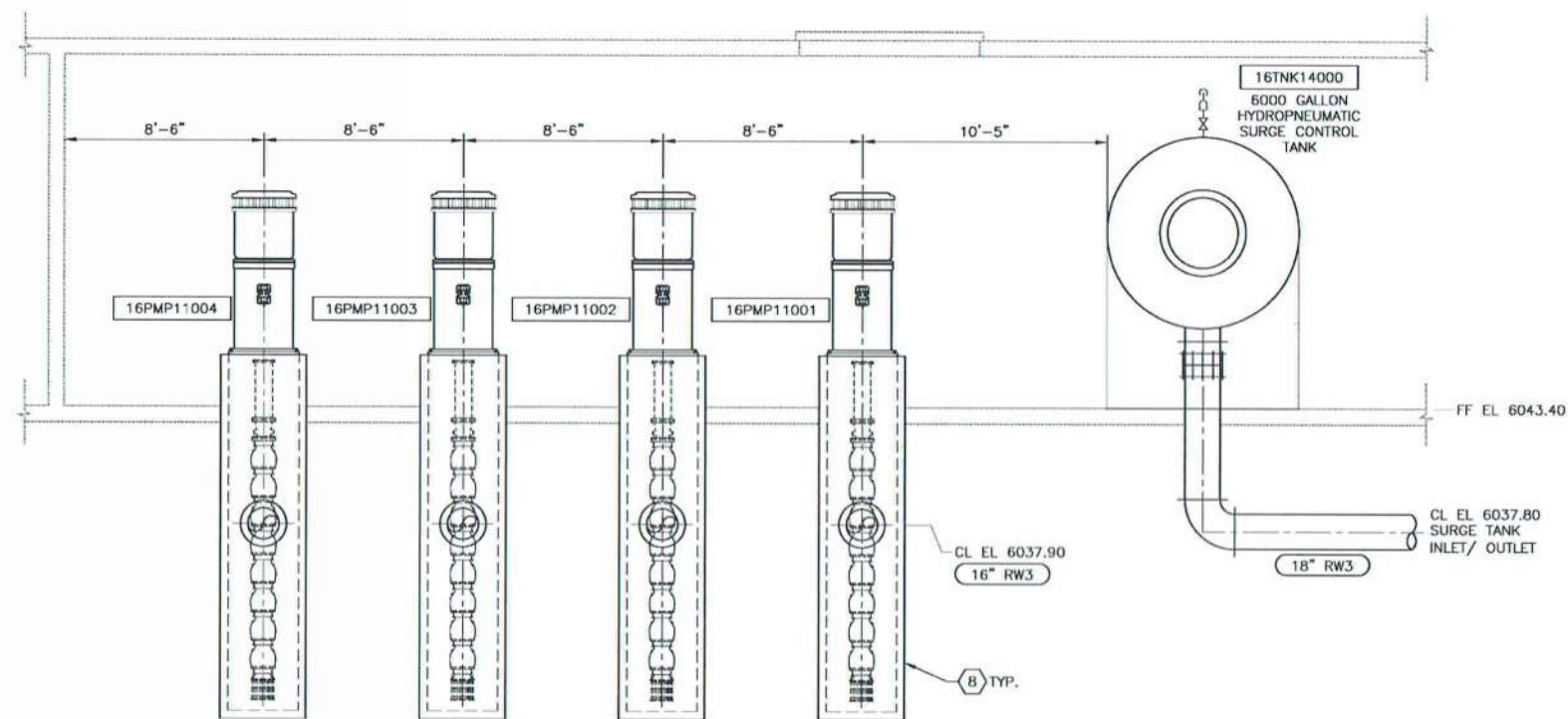
VERIFY SCALE  
BAR IS ONE INCH ON ORIGINAL DRAWING.  
0 1"

FILENAME: 16A-D-01.dwg PLOT DATE: Feb 14, 2011 PLOT TIME: 10:52 am

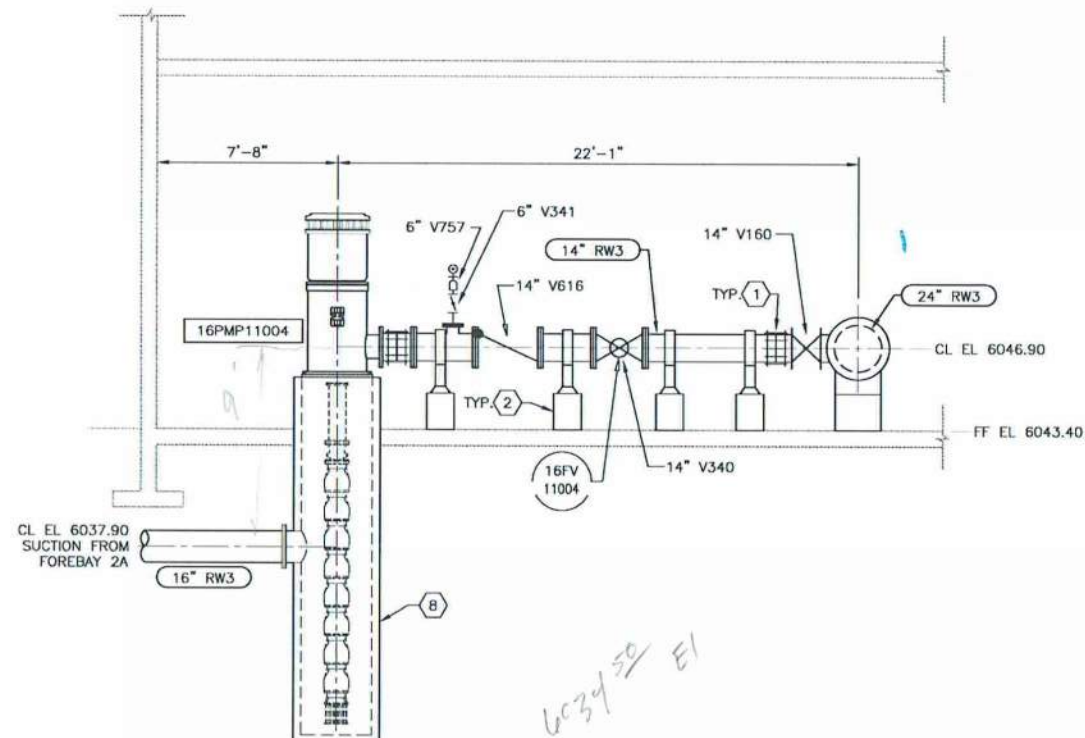
REUSE OF DOCUMENTS: THIS DOCUMENT AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, ARE THE PROPERTY OF CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL.

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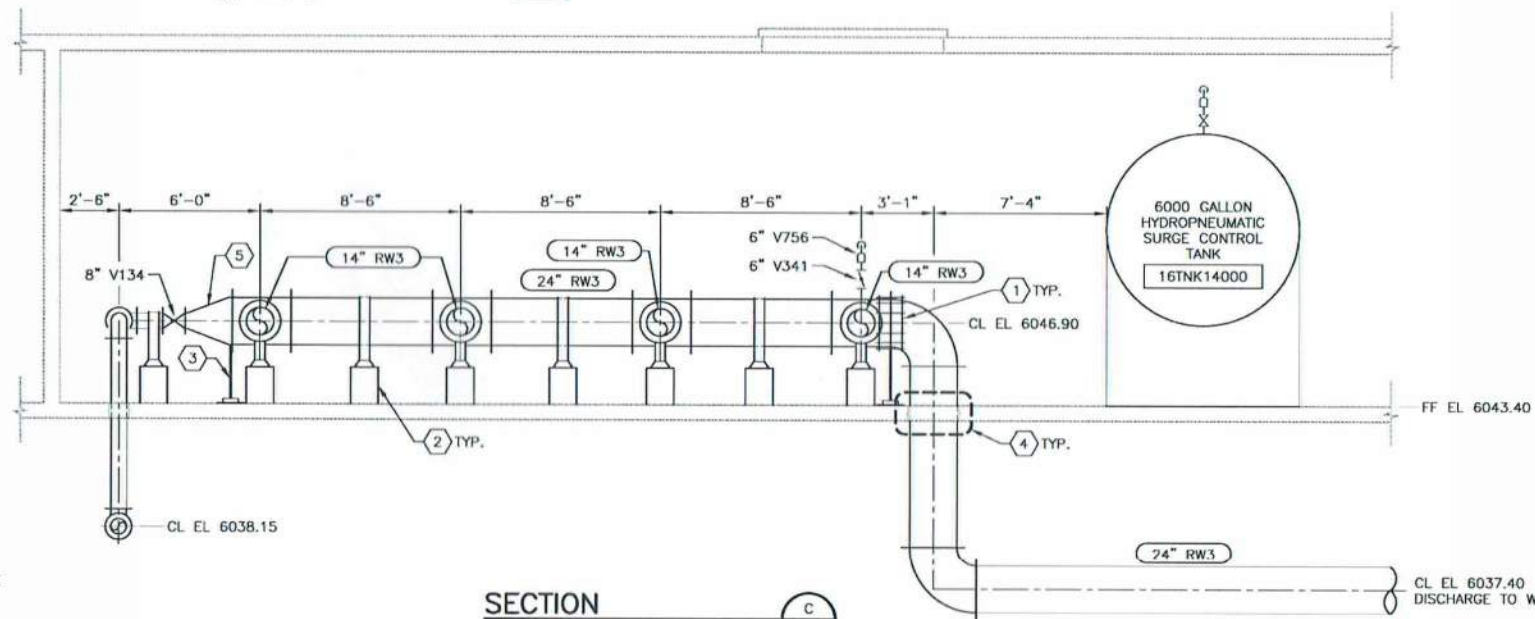




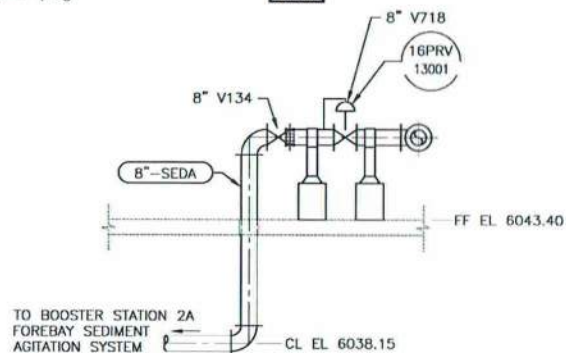
SECTION  
1/4" = 1'-0"



SECTION  
1/4" = 1'-0"



SECTION  
1/4" = 1'-0"



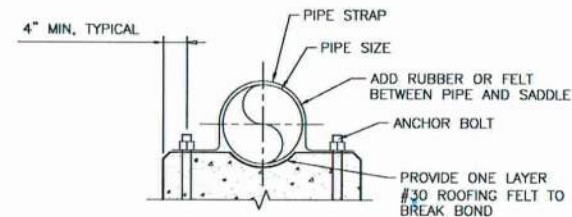
SECTION  
1/4" = 1'-0"

GENERAL NOTES:

1. PUMP CANS SHALL BE CONCRETE ENCASED PER STRUCTURAL DRAWINGS.
2. ALL BELOW SLAB PIPING SHALL BE CONCRETE ENCASED PER DETAIL 0330-017
3. PROVIDE DIELECTRIC COUPLING ON ALL STEEL AND DUCTILE IRON CONNECTIONS TO BOOSTER STATION 2A.

KEY NOTES:

- (1) RESTRAINED COUPLING (TYP.)
- (2) CONCRETE SADDLE PIPE SUPPORT PER DETAIL 0330-061, PROVIDE PIPE STRAP PER DETAIL 2 THIS SHEET
- (3) PIPE SUPPORT PER DETAIL 4005-501
- (4) SLAB PENETRATION PER DETAIL 4027-620
- (5) 24"x8" REDUCER
- (6) 16"x14" REDUCER
- (7) 14"x12" REDUCER
- (8) PUMP CAN. SEE SHEET 16A-S-02, SECTION D FOR DETAILS



| PIPE SIZE, DIA | PIPE STRAP  | ANCHOR BOLTS, DIA | PEDESTAL THICKNESS |
|----------------|-------------|-------------------|--------------------|
| 6"-12"         | 1/4"x2"     | 1/2"              | 12"                |
| 14"-24"        | 3/8"x2 1/2" | 5/8"              | 16"                |
| 30"-48"        | 1/2"x3"     | 3/4"              | 24"                |

DETAIL  
NO SCALE

RECORD DRAWINGS

Revisions Drawn By HDR, INC. Date DEC. 2010

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THE RESPONSIBLE ENGINEER/ARCHITECT WHO IS STAMPING THESE DRAWINGS HAS NOT INDEPENDENTLY VERIFIED THE INFORMATION PROVIDED BY OTHERS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS. THE RESPONSIBLE ENGINEER/ARCHITECT IS AN EMPLOYEE OF HDR, INC. UNDER CONTRACT TO CH2MHILL

Responsible Representative RAY SELVY Date DEC. 2010

THE CH2M HILL/WESTERN SUMMIT JOINT VENTURE HAS VERIFIED THE INFORMATION CONTAINED HEREIN AND CERTIFIES THAT THESE DRAWINGS SUBSTANTIALLY REPRESENT THE CONSTRUCTION OF THE DESIGNED FACILITIES AND CONFORM TO THE REQUIREMENTS OF THE DB CONTRACT BETWEEN THE BUCKMAN DIRECT DIVERSION BOARD AND CH2M HILL/WESTERN SUMMIT JOINT VENTURE.

HDR

WESTERN SUMMIT

CH2MHILL

BUCKMAN DIRECT DIVERSION PROJECT  
RAW WATER FACILITIES  
SANTA FE, NEW MEXICO

PROCESS  
BOOSTER STATION 2A  
PROCESS SECTIONS

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING

DATE OCTOBER 2008

PROJ 82384

DWG 16A-D-02

SHEET 170



## Section 2: Booster Station 2A, Existing Pump Data



THIS DRAWING IS CERTIFIED

☐ FOR APPROVAL  
NO PRODUCTION WILL START UNTIL APPROVED IN WRITING.

☒ FOR CONSTRUCTION  
PRODUCTION HAS STARTED. ANY CHANGES MAY AFFECT PRICE AND DELIVERY.

OUR ORDER No.: 65838

CUST. ORDER No.:670017

BY:MO      DATE: 02/13/09

VERTICAL TURBINE PUMP  
TYPE "VFR"

SPECIAL FEATURES:

1. TOP TWO STAGES O-RING BOWL CONSTRUCTION
2. 316 SS, DYNAMIC BALANCE IMPELLERS
3. O-RING FLANGE COLUMN
4. HARD CHROME JOURNALS ON TOP SHAFT
5. 3125 FSC NON-SPACER COUPLING

COATING:

Discharge head interior, wetted surfaces of the packing box, column pipe ID and OD, and bowl assembly exterior will be cleaned per SSPC-SP-10. Carboline Carboguard 891 will be applied in 2 coats of 5-7 mils DFT. Final dry film thickness will be 12 mils. NSF approved. Color=Safety white (color# S800) unless other color is noted in returned submittal.

The Discharge Head exterior will cleaned per SSPC-SP-6. Carboline Carboguard 890 will be applied in 2 coats of 5 mils DFT. Final dry film thickness will be 10 mils. Color=Safety blue (color# S150) unless other color is noted in the returned submittal.

Customer Witness of coating process required, a 7 day notification is required prior to witness of coating.

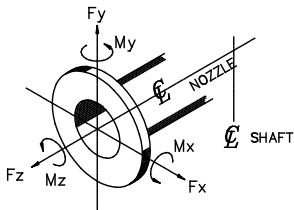
Holiday and DFT testing are required on coated surfaces.

TESTING:

**Hydrostatic testing:**  
The bowls and discharge head will be hydrostatically tested in accordance with Hydraulic Institute Standards.Hydrotest reports are to be submitted to the customer prior to witness performance testing.

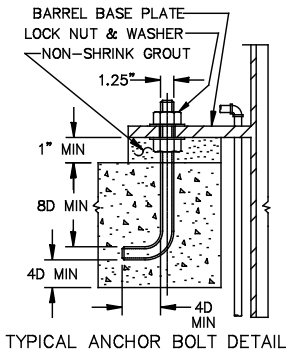
**Performance testing:**  
Pumps will be witnessed tested as bowl assemblies with job driver in accordance with Hydraulic Institute standards and test procedure 65838PTP. A mechanical run test will run concurrently with the performance test for a three hour period without malfunction. A 14 day notification is required to the customer prior to testing. Submit Test results for approval. Calibration records for test instruments are required at time of test.

MAXIMUM ALLOWABLE FLANGE FORCES AND MOMENTS  
FOR VERTICAL TURBINE PUMPS



|        | FLANGE SIZE | Fx & Fy (Lbs.) | Fz (lb) | Mx & My (FT-Lbs.) | Mz (FT-Lbs.) |
|--------|-------------|----------------|---------|-------------------|--------------|
| SUCT.  | 20          | 937            | 1875    | 2345              | 4687         |
| DISCH. | 14          | 800            | 1600    | 2000              | 4000         |

REFER TO FACTORY WHEN FLANGE REQUIREMENT IS GREATER



TYPICAL ANCHOR BOLT DETAIL

SUCTION FLANGE

20" 150# -R.F.ANSI. FLG.  
(20) 1.250 DIA. HOLES \*  
25.00 DIA. BOLT CIRCLE  
27.50 DIA. FLANGE  
\* BOLT HOLES STRADDLE VERTICAL C

DISCH. FLANGE

14" 300# -R.F.ANSI. FLG.  
(20) 1.250 DIA. HOLES \*  
20.25 DIA. BOLT CIRCLE  
23.00 DIA. FLANGE  
\* BOLT HOLES STRADDLE VERTICAL C

PUMPAGE

FLUID WATER  
SPEC. GRAVITY .998  
VISCOSITY 1.0 cSt  
TEMPERATURE AMBIENT  
PH ----

PUMP

14X24.5X30"VFR" DISCH HEAD.  
2.25 LINE SHAFT 14" COL  
n/a SHAFT TUBE  
PROD.LUBE YES OIL LUBE NO  
TYPE 16DKH/N STAGES 6  
3560 GPM 590' BOWL HD  
IMPELLER ENCLOSED  
STRAINER YES

MOTOR

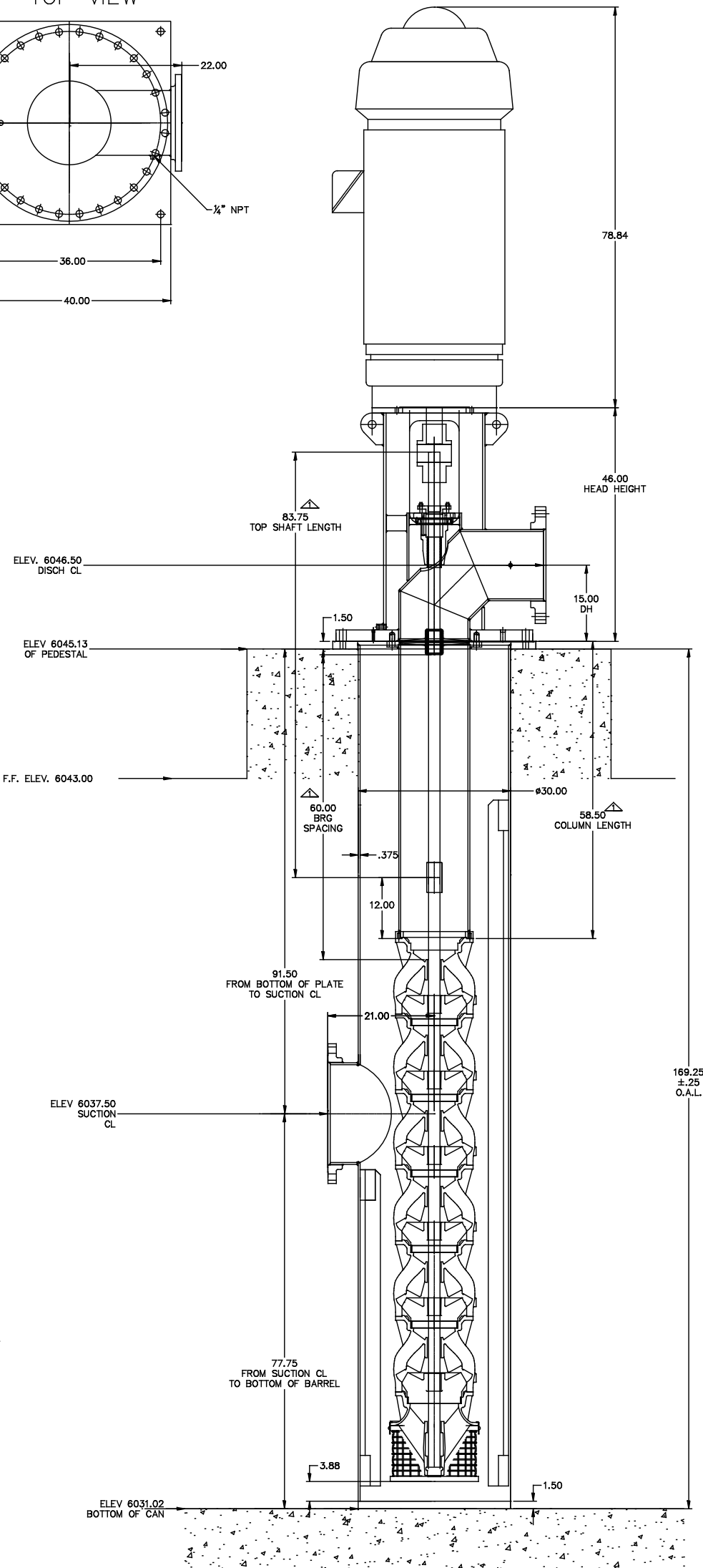
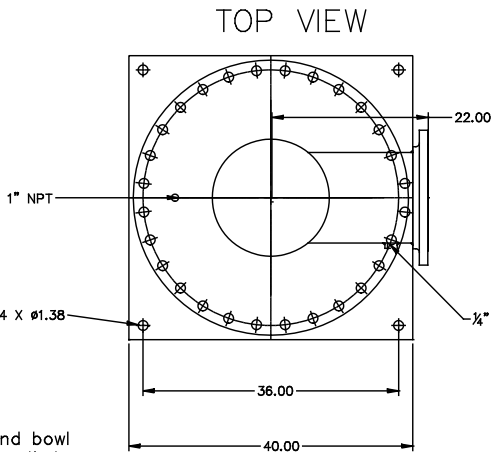
MAKE US MOTORS  
ENCLOSURE WPI  
TYPE VSS NRR YES  
HP 700 RPM 1780  
PHASE 3 HERTZ 60  
VOLTAGE 460  
FRAME NO. 5012VP  
TYPE COUPLING FASC 3125

MATERIALS

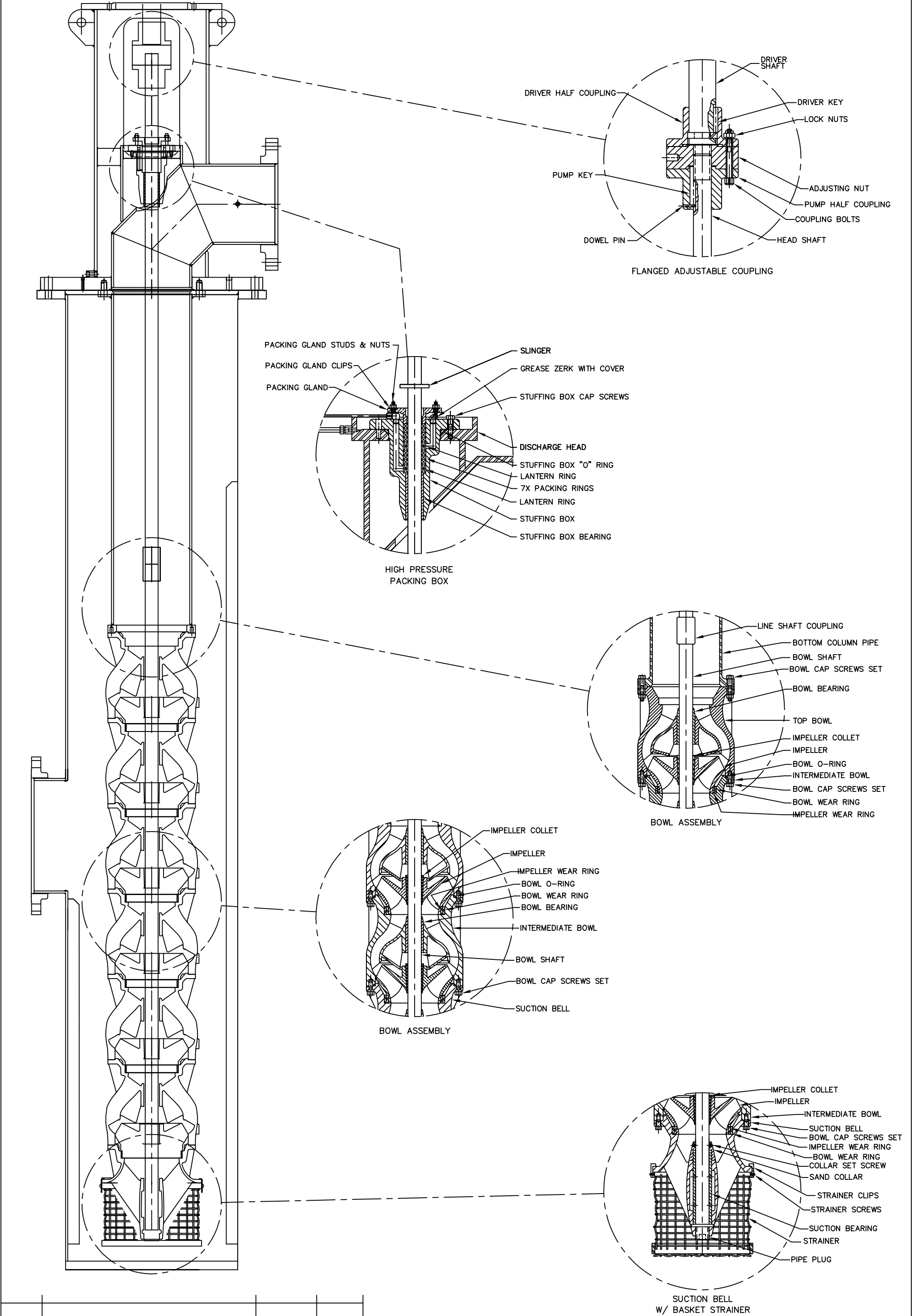
COL PIPE A53-GR B STEEL  
LINE SHAFT A582-416 SS  
DISCH. HEAD FAB. STL.  
BARREL FAB. STL.  
BOWL SHAFT A582-416 SS  
PACKING JC 100M  
BRG.RETAINER A536 GR.60 DI  
PUMP BOWL A48-CL 30 CIE  
IMPELLER 316 SS  
BEARINGS(BOWL) B505-937 BRZ  
BEARINGS(LINESHAFT) STYRENE BUTADIENE RUBBER  
STRAINER 316 SS  
BOWL W/R 440 SS  
IMPELLER W/R 440 SS

APPROX. WEIGHT #

MOTOR 4850  
DISCH. HD. 1600  
BARREL 1600  
COL. ASSY. 560  
BOWL ASSY. 1270  
TOTAL WT. 9880



|                                                                                                                                                                           |                                                                                                                                                               |    |         |                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------|---------------------------------------------|
| LOCATION: SANTE FE, NM<br><br>CUSTOMER: CH2M HILL CONSTRUCTION<br><br><br>FLOWAY CO: 65838-5<br>SERIAL #: 65838-5-1,2,3,4<br><br>TAG NUMBER: BS2A - 16PMP1101, 02, 03, 04 | NOTES:<br>1. ALL DIMENSIONS IN INCHES<br>2. DRAWING SCALE = 1:28<br>3. DO NOT SCALE UNKNOWN DIMENSIONS<br>4. NOT TO BE USED FOR CONSTRUCTION UNLESS CERTIFIED |    |         | OUTLINE<br>DRAWING                          |
|                                                                                                                                                                           | REV                                                                                                                                                           | BY | DATE    | DESCRIPTION                                 |
|                                                                                                                                                                           | 1                                                                                                                                                             | MO | 5/5/09  | ADDED DIMENSIONS SHOWN PER CUSTOMER REQUEST |
|                                                                                                                                                                           | 2                                                                                                                                                             | MO | 7/14/09 | RELEASE TO PRODUCTION                       |
|                                                                                                                                                                           |                                                                                                                                                               |    |         |                                             |
|                                                                                                                                                                           |                                                                                                                                                               |    |         | DRAWN BY: MO                                |
|                                                                                                                                                                           |                                                                                                                                                               |    |         | DATE: 2/10/09                               |
|                                                                                                                                                                           |                                                                                                                                                               |    |         | DRAWING NUMBER                              |
|                                                                                                                                                                           |                                                                                                                                                               |    |         | 6583805COD                                  |

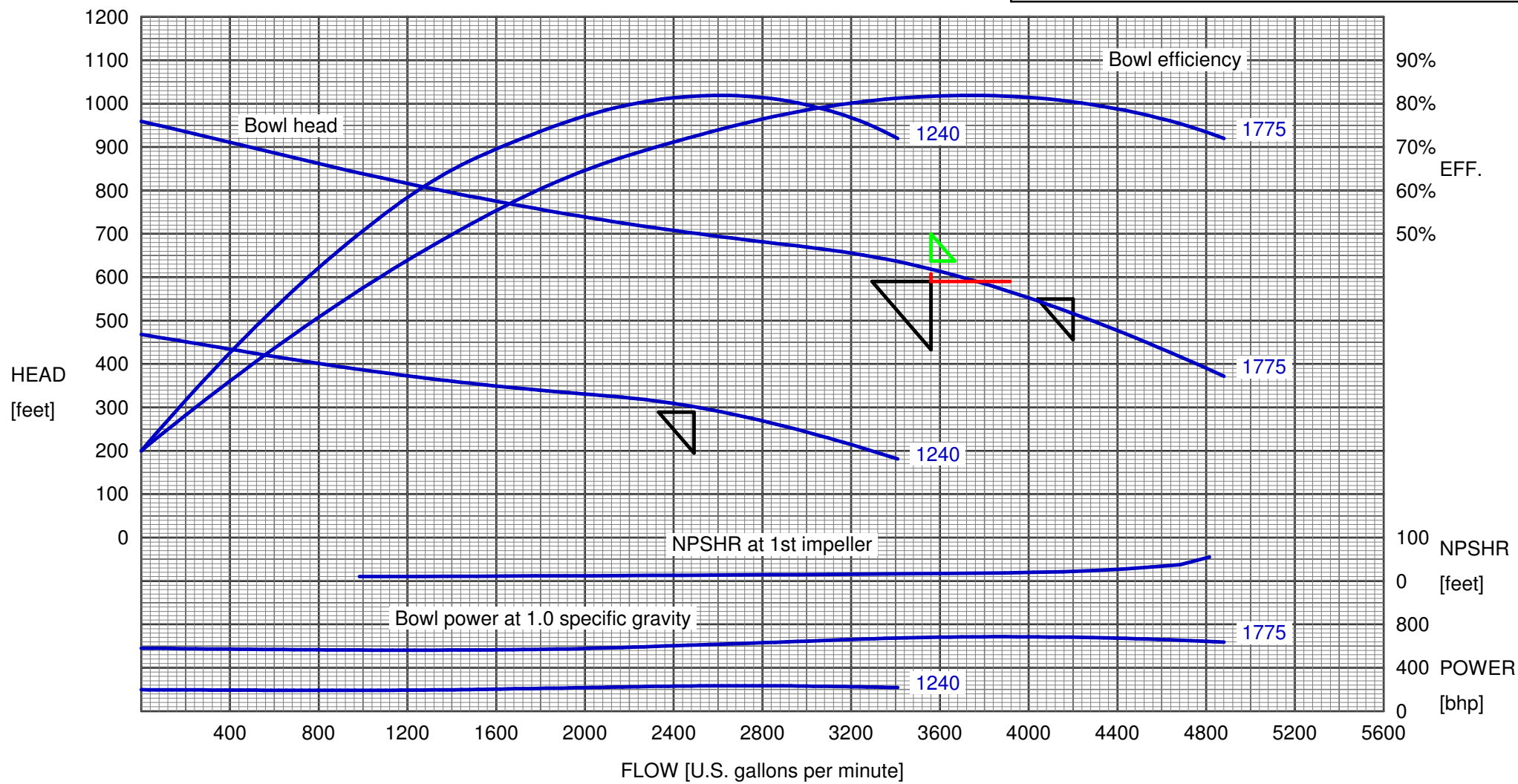


| REV | DESCRIPTION | DATE | BY |
|-----|-------------|------|----|
|     |             |      |    |

The head and power may be different than shown in accordance with Hydraulic Institute standards.

3560 GPM @ 590 FT TDH  
SECONDARY  
4000 GPM @ 550 FT TDH (MAX) 1775 GPM  
2492 GPM @ 289 FT TDH (MIN) 1242 GPM

CJ2M HILL  
PROJECT: BUCKMAN 2A  
ITEM: 16PMP1101,02,03,04



CH2M HILL  
SANTE FE, NEW MEXICO



TYPE: 16DKH/N  
NO. OF STAGES: 6  
R.P.M.: 1775  
PUMP SERIAL NO.: 65838-5-1/4

**PARTS LIST WITH RECOMMENDED SPARES****CUSTOMER: BUCKMAN DIRECT DIVERSION PROJECT****SUPPLIER: CH2M HILL CONSTRUCTORS****PURCHASE ORDER NO.: 670017****FACTORY CUSTOMER ORDER NO.: 65838****3560 GPM, 700 HP, 6 STAGE, 16DKH/N, P.L. BARREL PUMP****QUANTITY: 4****SERIAL NO.: 65838-5-1, -2, -3, -4****DATE: 03/11/10**

| QTY. | PART #           | DESCRIPTION                             | MATERIAL              | RECOM. SPARES |
|------|------------------|-----------------------------------------|-----------------------|---------------|
| 1    | 793434-700       | HEAD,VFR-14-150#x24x30-150#xTRB-14      | FAB STL               |               |
| 1    | 101465-2005      | PLUG PIPE 0.250 NPT SQ HD               | STEEL                 |               |
| 1    | 101465-6051      | PLUG PIPE 1.000 NPT SQ HD               | CL 30 CI              |               |
| 1    | 550598-006       | NAMEPLATE,HEAD-WEIR_FLOWAY              | 316 SS                |               |
| 1    | 551597-006       | NAMEPLATE,SMALL FLOWAY LOGO             | 316 SS                |               |
| 1    | 546016-2006      | NAMEPLATE,BLANK                         | 1.250 x 4.500 x 24 GA |               |
| 10   | 101217-3006      | SCREW DRIVE TYPE U #2 x 0.250 LG        | 316 SS                |               |
| 4    | 100496-107-14    | SCREW,CAP,HX-0.63-11NCx4.50             | F593-316 SS           |               |
| 4    | 100889-222       | NUT,HX-0.63-11NC                        | F594-316 SS           |               |
| 28   | 100506-107-07    | SCREW,CAP,HX-1.25-7NCx3.50              | F593-316 SS           |               |
| 1    | 305482-014       | O-RING-33.00IDx.25RD                    | BUNA-N                | X             |
| 1    | 547689-1051      | BOX HIGH PRESS STF 2.25 LOW PROFILE     | CL 30 CI              |               |
| 1    | 549372-1039      | BEARING BRONZE 2.250 x 2.750 x 6.000    | 932 BRZ               | X             |
| 2    | 545874-1008      | RING LANTERN 2.250                      | PTFE                  |               |
| 6    | 549142-1137      | RING PACKING 0.500 SQ x 8.625 LG HI     | JC 100-M              | X             |
| 1    | 545871-102       | GLAND,PACKING-2.25                      | A743-CF-8M            |               |
| 2    | 102506-107-07    | STUD-0.44-14NCx2.75                     | F593-316 SS           |               |
| 2    | 100886-222       | NUT,HX-0.44-14NC                        | F594-316 SS           |               |
| 1    | 549935-1017      | SLINGER 2.250 SHFT x 4.500 OD           | NEOPRENE              |               |
| 1    | 305432-1014      | O-RING-05.38IDx.25RD                    | BUNA N                | X             |
| 8    | 100492-106-05    | SCREW,CAP,HX-0.50-13NCx1.50             | 304 SS                |               |
| 2    | 548021-2145      | PLUG PIPE 0.250 PUSH-IN TYPE            | PLASTIC #4491K42      |               |
| 1    | 544821-9001      | FITTING 90 DEG ELL 0.375 OD x 0.250     | BRASS                 |               |
| 1    | 544823-1001      | FITTING STRAIGHT 0.375 OD x 0.250       | BRASS                 |               |
| 4    | 544752-3046      | TUBING,RD-0.38x0.032W                   | COPPER                |               |
| 1    | 544723-6005      | FITTING GRSE ZERK 1/8" NPT X 67 1/2 DEG | STEEL                 |               |
| 1    | 544723-7007      | LUBRICAP #1087K11                       | RUBBER                |               |
| 1    | 550877-010       | COUPLING,FAC-CPAT-3125x2.25 FLEXIBOX    | VENDOR STD            |               |
| 1    | 281424-1093      | KEY SQUARE 0.750 x 3.000 LG             | A276 316SS            |               |
| 1    | 281030-093       | KEY,SQ-0.50x3.75LG                      | A276 316SS            |               |
| 1    | 549281-1005      | PIN ROLL 0.125 x 0.500 LG               | STEEL                 |               |
| 1    | 789839-700-05850 | COLUMN,FxF-14-T300#R-16DK-.375X058.50   | FAB STL               |               |
| 1    | 540210-1057      | RETAINER,BEARING-14x3.00ID              | GR 60 DI              |               |
| 1    | 551039-256       | BEARING,TYPE-H-2.25x3.00x4.50LG         | SBR                   | X             |

J:/65000/65838/FINAL DATA/6583805PL, REV. 0

X = RECOMMENDED SPARES

DH

DRAWING NO.: 6583805PL, REV. 0

PAGE 1 OF 2



**PARTS LIST WITH RECOMMENDED SPARES****CUSTOMER: BUCKMAN DIRECT DIVERSION PROJECT****SUPPLIER: CH2M HILL CONSTRUCTORS****PURCHASE ORDER NO.: 670017****FACTORY CUSTOMER ORDER NO.: 65838****3560 GPM, 700 HP, 6 STAGE, 16DKH/N, P.L. BARREL PUMP****QUANTITY: 4****SERIAL NO.: 65838-5-1, -2, -3, -4****DATE: 03/11/10**

| QTY. | PART #                | DESCRIPTION                               | MATERIAL       | RECOM. SPARES |
|------|-----------------------|-------------------------------------------|----------------|---------------|
| 12   | 100502-107-08         | SCREW,CAP,HX-1.00-8NCx3.25                | F593-316 SS    |               |
| 1    | 793184-097-08375-2400 | SHAFT, TOP0-3125T-S0-225x083.75 HF        | 416 SS         |               |
| 1    | 542676-097            | COUPLING, SHAFT-THRD-2.25                 | 416 SS         |               |
| 1    | 303280-1014           | RING O 14.000 x 14.250 x 0.125            | BUNA N         | X             |
| 1    | 302186-1014           | O-RING-12.50IDx.09RD                      | BUNA-N         | X             |
| 12   | 102512-107-05         | STUD-0.63-11NCx2.50                       | F593-316 SS    |               |
| 12   | 100889-222            | NUT, HX-0.63-11NC                         | F594-316 SS    |               |
| 1    | 542121-097-11606      | SHAFT, BOWL0-T-C-225x116.06               | 416 SS         |               |
| 1    | 754764-1057           | BOWL 16DK TOP BOWL W/"O" RING FOR 2-1/4   | DUCT IRON A536 |               |
| 1    | 754764-2057           | BOWL 16DK INTER BOWL W/"O" RING & W.R.    | DUCT IRON A536 |               |
| 4    | 548300-2052           | BOWL 16DK INTER W/WR                      | CL 30CIE       |               |
| 2    | 302186-1014           | O-RING-12.50IDx.09RD                      | BUNA-N         | X             |
| 5    | 6583805BWWR           | RING, WEAR, BOWL-9.27x9.65x1.38           | 440 SS         | X             |
| 6    | 547593-1026           | BEARING BRONZE 2.250 x 2.750 x 4.000      | 937 BRZ        | X             |
| 72   | 100496-107-04         | SCREW, CAP, HX-0.63-11NCx1.75             | F593-316 SS    |               |
| 5    | 548303-2102M          | IMPELLER 16DKH W W/R                      | 316 SS         |               |
| 1    | 550213-2102M          | IMPELLER 16DKN W/WR                       | 316 SS         |               |
| 5    | 6583805IMWRH          | RING, WEAR, IMP-8.87x9.24x1.38            | 440 SS         | X             |
| 1    | 6583805IMWRN          | RING, WEAR, IMP-10.24x10.62x1.25          | 440 SS         | X             |
| 6    | 541277-093            | COLLET, IMP-2.25-STD 15DK, 16DK, MK, 18MK | A276-316SS     |               |
| 1    | 550215-051-2          | BELL, 16DKN-BT-FLG-STD-2.75-STD W/WR      | CL 30 CI       |               |
| 1    | 6583805BLWR           | RING, WEAR, BELL-10.64x11.00x1.25         | 440 SS         | X             |
| 1    | 541279-097            | COLLAR, SAND-2.25-3.00-1.38               | A582-416SS     |               |
| 2    | 100611-107-02         | SCREW, SET-HX-0.25-20NCx0.25-CUP POINT    | F593-316 SS    |               |
| 1    | 542239-1039           | BEARING SUCTION 2.250 X 2.750 X 10.000    | 932 BRZ        | X             |
| 1    | 101472-3051           | PLUG PIPE 2.500 NPT C'SUNK                | CL 30 CI       |               |
| 1    | 544740-1006           | NAMEPLATE PUMP BOWL S.S.                  | 316 SS         |               |
| 2    | 101217-3006           | SCREW DRIVE TYPE U #2 x 0.250 LG          | 316 SS         |               |
| 1    | 789103-093            | STRAINER CLIP 16DKN                       | 316 SS         |               |
| 4    | 547957-1093           | CLIP BSKT STRNR 1/8 X 1 X 2-3/8           | 316 SS         |               |
| 4    | 100484-107-04         | SCREW, CAP, HX-0.25-20NCx0.75             | 303 SS         |               |
| 4    | 101225-144-06         | WASHER, LOCK, EXT-TOOTH-0.25              | 410 S.S.       |               |

J:/65000/65838/FINAL DATA/6583805PL, REV. 0

X = RECOMMENDED SPARES

DH

DRAWING NO.: 6583805PL, REV. 0

PAGE 2 OF 2

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**SPARE PARTS LIST****CUSTOMER: BUCKMAN DIRECT DIVERSION PROJECT****SUPPLIER: CH2M HILL CONSTRUCTORS****PURCHASE ORDER NO.: 670017****FACTORY CUSTOMER ORDER NO.: 65838****3,560 GPM, 700 HP, 6 STAGE, 16DKH/N, P.L. BARREL PUMP****QUANTITY: 1****SERIAL NO.: 65838-8-1****DATE: 03/11/10**

| <b>QTY.</b> | <b>PART #</b> | <b>DESCRIPTION</b>                        | <b>MATERIAL</b> |
|-------------|---------------|-------------------------------------------|-----------------|
| 1           | 305482-014    | O-RING-33.00IDx.25RD                      | BUNA-N          |
| 1           | 549372-1039   | BEARING BRONZE 2.250 x 2.750 x 6.000      | 932 BRZ         |
| 2           | 545874-1008   | RING LANTERN 2.250                        | PTFE            |
| 6           | 549142-1137   | RING PACKING 0.500 SQ x 8.625 LG HI       | JC 100-M        |
| 1           | 545871-102    | GLAND,PACKING-2.25                        | A743-CF-8M      |
| 1           | 305432-1014   | O-RING-05.38IDx.25RD                      | BUNA N          |
| 1           | 303280-1014   | RING O 14.000 x 14.250 x 0.125            | BUNA N          |
| 1           | 302186-1014   | O-RING-12.50IDx.09RD                      | BUNA-N          |
| 5           | 6583805BWWR   | RING,WEAR,BOWL-9.27x9.65x1.38             | 440 SS          |
| 1           | 548303-2102M  | IMPELLER 16DKH W W/R                      | 316 SS          |
| 1           | 550213-2102M  | IMPELLER,16DKN-C-WR                       | 316 SS          |
| 5           | 6583805IMWRH  | RING,WEAR,IMP-8.87x9.24x1.38              | 440 SS          |
| 1           | 6583805IMWRN  | RING,WEAR,IMP-10.24x10.62x1.25            | 440 SS          |
| 6           | 541277-093    | COLLET,IMP-2.25-<br>STD 15DK,16DK,MK,18MK | A276-316SS      |
| 1           | 6583805BLWR   | RING,WEAR,BELL-10.64x11.00x1.25           | 440 SS          |
| 1           | 544837-1071   | DRIVER COLLET 2.250 x 10.00 LG            | 4130 STL        |

# Section 3: Booster Station 2A

## Existing Motor Data



# EMERSON MOTOR COMPANY

8100 WEST FLORISSANT AVE.  
ST. LOUIS, MO 63136

**DATE:** 9/10/2009

**P.O. NO.:** P228148  
**Order/Line NO.:** 20082697 SO 100

**TO:** Floway Pumps  
2494 Railroad Avenue  
PO Box 164  
Fresno, CA, 93706

PO P228148 CO 65838-6 AE MD  
BOYER & SEELEY INC  
BUCKMAN WTP ITEM # CH2M BS5A

**ATTN:**DOCTECH2

**Model Number:** NA  
**Catalog Number:** NA  
Submittals  
CONF,LLC,SUBMITTALS

**REVISIONS:**  
(A)GUAR EFF 95.0  
14648 THRUST CODE H

**ALL DOCUMENTS HEREIN ARE CONSIDERED CERTIFIED BY US ELECTRICAL MOTORS.**

**THANK YOU FOR YOUR ORDER AND THE OPPORTUNITY TO SERVE YOU.**

**Features:**

Horsepower ..... 00700.00~00000.00 ~ KW: 522.2  
Enclosure ..... WPI  
Poles ..... 04~00 ~ RPM: 1800~0  
Frame Size ..... 5012~VP  
Phase/Frequency/Voltage.. 3~060~460 ~ Form Wound  
Service Factor ..... 1.15  
Insulation Class ..... Class "F" ~ Insulife 5000  
Altitude In Feet (Max) .. 6600 Ft.(2000 M)  
Ambient In Degree C (Max) +40 C  
Efficiency Class ..... Premium Efficiency  
Application ..... Vertical Centrifugal Pump  
Customer Part Number .... CO 65838-06  
Base Diameter (Inches) ..... 24.5  
Non-Reverse Ratchet  
Pricebook Thrust Value (lbs).. 10300  
Customer Down Thrust (lbs) ... 14648  
Customer Shutoff Thrust (lbs).  
Up Thrust (lbs) .....  
Inverter Duty Rating:  
Load Type (Base Hz & Below) .. Variable Torque  
Speed Range (Base Hz & Below). 10:1  
"AK" Dimension (Inches).. NA  
Shaft Dimensions:~U=3.125 ~ AH/V=7.000  
KEYWAY=0.750 ~ ES=5.00  
Temperature Rise (Sine Wave): "B" Rise @ 1.0 SF (Resist)  
KVA Code Letter ..... "H"  
Starting Method ..... Direct-On-Line Start  
Duty Cycle ..... Continuous Duty  
Efficiency Value ..... 95.0 % ~ Guaranteed  
Load Inertia (lb-ft<sup>2</sup>): NEMA ~ NEMA Inertia: 2514.00 ~ 1.00  
Number Of Starts Per Hour: NEMA  
Motor Type Code ..... RVEI4  
Rotor Inertia (LB-FT<sup>2</sup>) ..... 180. LB-FT<sup>2</sup>  
Qty. of Bearings PE (Shaft) 1  
Qty. of Bearings SE (OPP) 2  
Bearing Number PE (Shaft) 95BC02J3  
Bearing Number SE (OPP) 150BT02





## EMERSON MOTOR COMPANY

8100 WEST FLORISSANT AVE.  
ST. LOUIS, MO 63136

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PO P228148 CO 65838-6 AE MD  
BOYER & SEELEY INC  
BUCKMAN WTP ITEM # CH2M BS5A

**ATTN:**DOCTECH2

**Model Number:** NA  
**Catalog Number:** NA  
Submittals  
CONF,LLC,SUBMITTALS

**REVISIONS:**  
(A)GUAR EFF 95.0  
14648 THRUST CODE H

**ALL DOCUMENTS HEREIN ARE CONSIDERED CERTIFIED BY US ELECTRICAL MOTORS.  
THANK YOU FOR YOUR ORDER AND THE OPPORTUNITY TO SERVE YOU.**

### Accessories:

26,400 Hours L-10 Bearing Life  
Direct Connected To Load  
Corro-Duty Paint Job  
Counter CW Rotation FODE  
175 % Extra High Thrust  
Ground Lug In Conduit Box  
Insul. Bearings- Both Brackets  
Screens - Standard Material  
115 Volt Space Heaters  
Synthetic Lubrication  
Bearing RTD-100 Ohm,3 Lead  
Both Bearings  
Winding RTD's-100 Ohm,3 Lead  
VFD Duty  
Conduit Box Information: ~ Size 3.5 Conduit Box-Fab Steel  
Conduit Opening Size (AA) .. 3.5" NPT  
3 Conduit Openings ~ Bottom Of Conduit Box  
Q-2 Accessory Outlet Boxes ~ Same & Opposite Side Of Main  
Ground Lug In Conduit Box  
1" NPT Both Boxes  
Two Boxes with Terminal Board  
Shipping Tag Information:  
MOTOR 1: P-041  
MOTOR 2: P-042  
MOTOR 3: P-043  
MOTOR 4: P-044  
ATA Vib. Detect/Prox Probe:  
Vib Det/Prox Probe Type .... ST6900 COMPACT TRANS  
Manufacturer ..... METRIX INSTRUMENTS  
Manufacturer's Part Number.. ST6917-123-0-0  
Test Requirements:  
Short Commer. Test - Unwit  
Complete Initial Test-Unwit.  
Sound Test - Unwitnessed  
Vibration Test-Unwit. (IPS)  
Polarization Index - Unwit

**USE THE DATA PROVIDED BELOW TO SELECT THE APPROPRIATE DIMENSION PRINT**



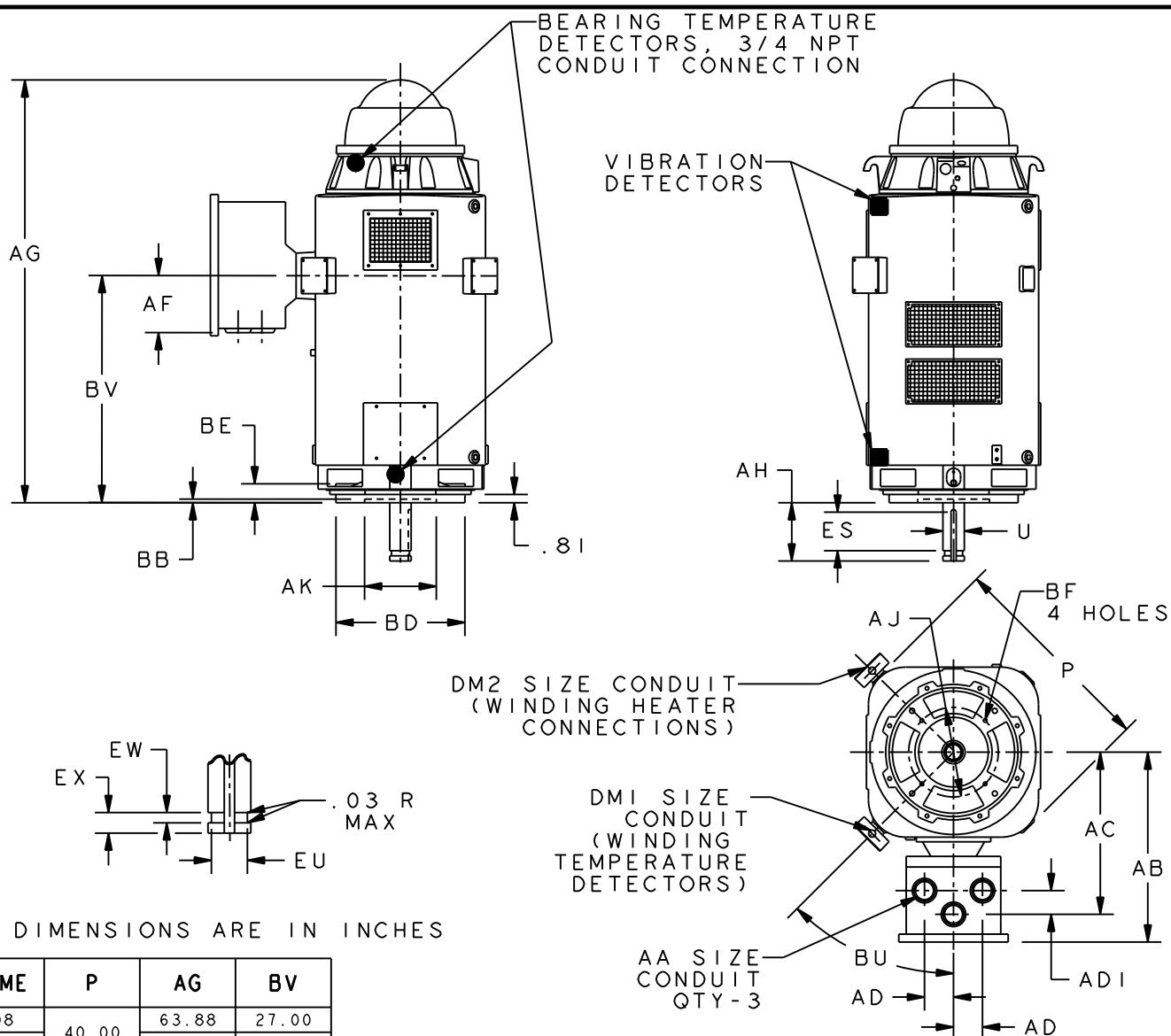
|                                |        |
|--------------------------------|--------|
| <b>Horsepower</b>              | 700    |
| <b>Pole(s)</b>                 | 04     |
| <b>Voltage(s)</b>              | 460    |
| <b>Frame Size</b>              | 5012VP |
| <b>Shaft U Diameter</b>        | 3.125  |
| <b>Outlet Box AF</b>           | 10.81  |
| <b>Outlet Box AA</b>           | 3.5    |
| <b>Accessory Outlet Box DM</b> | 1-1    |



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The Emerson logo is a trademark and service mark of Emerson Electric Co.

EFFECTIVE:  
02-SEP-09SUPERSEDES:  
31-AUG-09

## VERTICAL MOTORS

WEATHER PROTECTED TYPE I  
FRAME: 5000VPH, VP, VPA  
TYPE: RV4PRINT:  
09-2659-76SHEET:  
1 OF 2

| FRAME | P     | AG    | BV    |
|-------|-------|-------|-------|
| 5008  | 40.00 | 63.88 | 27.00 |
| 5012  |       | 78.88 | 42.00 |

| POLE       | U     | AH    | ES   | EU    | EW   | EX    | SO KEY |
|------------|-------|-------|------|-------|------|-------|--------|
| 2          | 2.375 | 5.000 | 3.50 | 2.000 | .375 | .750  | .625   |
| 4 & SLOWER | 3.125 | 7.000 | 5.00 | 2.625 | .500 | 1.000 | .750   |

| C/BOX VOLUME (CU. IN.) | AB    | AC    | AD   | ADI  | AF    | BU  |
|------------------------|-------|-------|------|------|-------|-----|
| 5600                   | 36.13 | 30.13 | 5.50 | 4.50 | 10.81 | 45° |

|  | FRAME               | AJ     | AK<br>+.005 | BB<br>min | BD<br>max | BE   | BF  |
|--|---------------------|--------|-------------|-----------|-----------|------|-----|
|  | 5000VPH             | 14.750 | 13.500      | .25       | 20.00     | 2.19 | .69 |
|  | 5000VP <sup>3</sup> | 14.750 | 13.500      |           | 24.50     |      | .69 |
|  |                     | 22.000 |             |           | .94       |      |     |
|  | 5000VPA             | 26.000 | 22.000      |           | 30.50     |      | .81 |

| AA        | DMI       | DM2       |
|-----------|-----------|-----------|
| 2 NPT     | 1/2 NPT   | 1/2 NPT   |
| 2 1/2 NPT | 3/4 NPT   | 3/4 NPT   |
| 3 NPT     | 1 NPT     | 1 NPT     |
| 3 1/2 NPT | 1 1/4 NPT | 1 1/4 NPT |
| 4 NPT     | 1 1/2 NPT | 1 1/2 NPT |

| TOLERANCES                                  |             |
|---------------------------------------------|-------------|
| FACE RUNOUT                                 | .007 T.I.R. |
| PERMISSIBLE ECCENTRICITY OF MOUNTING RABBET | .007 T.I.R. |
| PERMISSIBLE SHAFT RUNOUT                    | .003 T.I.R. |
| MAXIMUM SHAFT END PLAY                      | .010        |

- 1: DIMENSIONS MAY VARY .25" DUE TO CASTING AND/OR FABRICATION VARIATIONS.  
2: TOLERANCES ARE SHOWN IN INCHES.  
3: 5000VP HAS TWO BOLT CIRCLES.  
4: MAIN OUTLET BOX DIMENSIONS: 24h x 18w x 14d.

|                                 |                                                                                            |                             |
|---------------------------------|--------------------------------------------------------------------------------------------|-----------------------------|
| EFFECTIVE:<br><b>02-SEP-09</b>  | <b>VERTICAL MOTORS</b><br>WEATHER PROTECTED TYPE I<br>FRAME: 5000VPH, VP, VPA<br>TYPE: RV4 | PRINT:<br><b>09-2659-76</b> |
| SUPERSEDES:<br><b>31-AUG-09</b> |                                                                                            | SHEET:<br><b>2 OF 2</b>     |

ALL DIMENSIONS ARE IN MILLIMETERS

|  | FRAME | P    | AG   | BV   |
|--|-------|------|------|------|
|  | 5008  | 1016 | 1623 | 686  |
|  | 5012  |      | 2004 | 1067 |

|  | POLE       | U<br>-.001 | AH<br>±.062 | ES<br>min | EU<br>-.005 | EW<br>+.002 | EX<br>-.005 | SO<br>KEY |
|--|------------|------------|-------------|-----------|-------------|-------------|-------------|-----------|
|  | 2          | 60.33      | 127.00      | 89        | 50.80       | 9.53        | 19.05       | 15.88     |
|  | 4 & SLOWER | 79.38      | 177.80      | 127       | 66.68       | 12.70       | 25.40       | 19.05     |

|  | C/BOX<br>VOLUME<br>(CU. IN.) | AB  | AC  | AD  | ADI | AF  | BU  |
|--|------------------------------|-----|-----|-----|-----|-----|-----|
|  | 5600                         | 918 | 765 | 140 | 114 | 275 | 45° |

|  | FRAME               | AJ     | AK<br>+.005 | BB<br>min | BD<br>max | BE | BF |
|--|---------------------|--------|-------------|-----------|-----------|----|----|
|  | 5000VPH             | 374.65 | 342.90      | 6         | 508       | 56 | 18 |
|  | 5000VP <sup>3</sup> | 374.65 | 342.90      |           | 622       |    | 18 |
|  |                     | 558.80 |             |           |           |    | 24 |
|  | 5000VPA             | 660.40 | 558.80      |           | 775       |    | 21 |

# NAMEPLATE DATA

|                          |       |                  |        |                   |                                               |                 |     |
|--------------------------|-------|------------------|--------|-------------------|-----------------------------------------------|-----------------|-----|
| CATALOG NUMBER:          |       |                  |        | NAMEPLATE PART #: |                                               | 422707-006      |     |
| MODEL                    |       | FR               | 5012VP | TYPE              | RVEI4                                         | ENCL            | WPI |
| SHAFT<br>END BRG         |       | 95BC02J3 - QTY 1 |        | OPP<br>END BRG    |                                               | 150BT02 - QTY 2 |     |
| PH                       | 3     | MAX<br>AMB       | 40 C   | ID#               | (ref: Order#: 20082697, Type: SO, Line#: 100) |                 |     |
| INSUL<br>CLASS           | F     | Asm.<br>Pos.     |        | DUTY              | CONT                                          |                 |     |
| HP                       | 700   | RPM              | 1780   | HP                |                                               | RPM             |     |
| VOLTS                    | 460   |                  |        | VOLTS             |                                               |                 |     |
| FL<br>AMPS               | 766.0 |                  |        | FL<br>AMPS        |                                               |                 |     |
| SF<br>AMPS               | 880.0 |                  |        | SF<br>AMPS        |                                               |                 |     |
| SF                       | 1.15  | DESIGN           | #      | CODE              | H                                             |                 |     |
| NEMA NOM<br>EFFICIENCY   | 95.8  | NOM<br>PF        | 89.3   | KiloWatt          | 522.2                                         |                 |     |
| GUARANTEED<br>EFFICIENCY | 95.0  | MAX<br>KVAR      |        | HZ                | 60                                            |                 |     |

## UL DATA (IF APPLICABLE):

|           |  |          |  |          |  |
|-----------|--|----------|--|----------|--|
| DIVISION  |  | CLASS I  |  | GROUP I  |  |
| TEMP CODE |  | CLASS II |  | GROUP II |  |

## VFD DATA (IF APPLICABLE):

|                   |             |  |  |
|-------------------|-------------|--|--|
| VOLTS             | 460         |  |  |
| AMPS              | 804.3       |  |  |
| TORQUE 1          | 2067.4LB-FT |  |  |
| VFD LOAD TYPE 1   | VT/PWM      |  |  |
| VFD HERTZ RANGE 1 | 6-60        |  |  |
| VFD SPEED RANGE 1 | 180-1800    |  |  |
| SERVICE FACTOR    | 1.00        |  |  |
| NO. POLES         |             |  |  |
| VECTOR MAX RPM    |             |  |  |
| Radians / Seconds |             |  |  |
| TORQUE 2          |             |  |  |
| VFD LOAD TYPE 2   |             |  |  |
| VFD HERTZ RANGE 2 |             |  |  |
| VFD SPEED RANGE 2 |             |  |  |
| FL SLIP           |             |  |  |
| MAGNETIZING AMPS  |             |  |  |
| Encoder PPR       |             |  |  |
| Encoder Volts     |             |  |  |

## TEAO DATA (IF APPLICABLE):

|                     |  |                         |  |                         |  |                       |  |
|---------------------|--|-------------------------|--|-------------------------|--|-----------------------|--|
| HP (AIR OVER)       |  | HP (AIR OVER<br>M/S)    |  | RPM (AIR OVER)          |  | RPM (AIR OVER<br>M/S) |  |
| FPM AIR<br>VELOCITY |  | FPM AIR<br>VELOCITY M/S |  | FPM AIR<br>VELOCITY SEC |  |                       |  |

**ADDITIONAL NAMEPLATE DATA:**

|                           |                     |                           |                  |
|---------------------------|---------------------|---------------------------|------------------|
| Decal / Plate             | WD=499495           | Customer PN               | CO 65838-06      |
| Notes                     |                     | Non Rev Ratchet           | NRR              |
| Max Temp Rise             | 80C RISE/RES@1.00SF | OPP/Upper Oil Cap         | 30 QT/28.4 L     |
| Thermal (WDG)             | OVER TEMP PROT 2    | SHAFT/Lower Oil Cap       | GREASE           |
| Altitude                  | 6600 FASL           |                           |                  |
| EPACT Note                |                     | EPACT Compliance          |                  |
| COS                       |                     | Marine Duty               |                  |
| Balance                   | 0.08 IN/SEC         | Arctic Duty               |                  |
| 3/4 Load Eff.             | 96.1                | Inrush Limit              |                  |
| Motor Weight              | 4850                | Direction of Rotation     |                  |
| Sound Level               |                     | Special Note 1            |                  |
| Vertical Thrust           | 14648               | Special Note 2            |                  |
| Thrust Percentage         | 175% EHT            | Special Note 3            |                  |
| Bearing Life              | 26.4K               | Special Note 4            |                  |
| Starting Method           |                     | Special Note 5            |                  |
| Number of Starts          |                     | Special Note 6            |                  |
| 200/208V 60Hz Max Amps    |                     | SH Max. Temp.             |                  |
| 190V 50 hz Max Amps       |                     | SH Voltage                | SH VOLTS=115V    |
| 380V 50 Hz Max Amps       |                     | SH Watts                  | SH WATTS=384W    |
| NEMA Inertia              |                     | Load Inertia              |                  |
| Sumpheater Voltage        |                     | Sumpheater Wattage        |                  |
| Special Accessory Note 1  | BEARING SET POINTS  | Special Accessory Note 16 |                  |
| Special Accessory Note 2  | ALARM= 120C         | Special Accessory Note 17 | AFFIX N/P 915592 |
| Special Accessory Note 3  | SHUTDOWN= 130C      | Special Accessory Note 18 |                  |
| Special Accessory Note 4  |                     | Special Accessory Note 19 |                  |
| Special Accessory Note 5  |                     | Special Accessory Note 20 |                  |
| Special Accessory Note 6  |                     | Special Accessory Note 21 |                  |
| Special Accessory Note 7  |                     | Special Accessory Note 22 |                  |
| Special Accessory Note 8  |                     | Special Accessory Note 23 |                  |
| Special Accessory Note 9  |                     | Special Accessory Note 24 |                  |
| Special Accessory Note 10 |                     | Special Accessory Note 25 |                  |
| Special Accessory Note 11 |                     | Special Accessory Note 26 |                  |
| Special Accessory Note 12 |                     | Special Accessory Note 27 |                  |
| Special Accessory Note 13 |                     | Special Accessory Note 28 |                  |
| Special Accessory Note 14 |                     | Special Accessory Note 29 |                  |
| Special Accessory Note 15 |                     | Special Accessory Note 30 |                  |



**EMERSON MOTOR COMPANY**  
ST. LOUIS, MO



TYPICAL NAMEPLATE DATA  
ACTUAL MOTOR NAMEPLATE LAYOUT MAY VARY  
SOME FIELDS MAY BE OMITTED



# MOTOR PERFORMANCE

| MODEL NO. | CATALOG NO. | PHASE | TYPE  | FRAME  |
|-----------|-------------|-------|-------|--------|
| NA        | NA          | 3     | RVEI4 | 5012VP |

| ORDER NO. | 20082697 | LINE NO. | 100 |
|-----------|----------|----------|-----|
|-----------|----------|----------|-----|

|                             |        |
|-----------------------------|--------|
| MPI:                        | 117680 |
| HP:                         | 700    |
| POLES:                      | 4      |
| VOLTS:                      | 460    |
| HZ:                         | 60     |
| SERVICE FACTOR:             | 1.15   |
| EFFICIENCY (%):             |        |
| S.F.                        | 95.5   |
| FULL                        | 95.8   |
| 3/4                         | 96.1   |
| 1/2                         | 95.7   |
| 1/4                         | 93.4   |
| POWER FACTOR (%):           |        |
| S.F.                        | 89.6   |
| FULL                        | 89.3   |
| 3/4                         | 87.6   |
| 1/2                         | 82.3   |
| 1/4                         | 64.8   |
| NO LOAD                     | 5      |
| LOCKED ROTOR                | 20.2   |
| AMPS:                       |        |
| S.F.                        | 880    |
| FULL                        | 766    |
| 3/4                         | 584    |
| 1/2                         | 416    |
| 1/4                         | 271    |
| NO LOAD                     | 194.3  |
| LOCKED ROTOR                | 6225   |
| NEMA CODE LETTER            | H      |
| NEMA DESIGN LETTER          | #      |
| FULL LOAD RPM               | 1780   |
| NEMA NOMINAL EFFICIENCY (%) | 95.8   |
| GUARANTEED EFFICIENCY (%)   | 95     |
| MAX KVAR                    | 131.6  |
| AMBIENT (°C)                | 40     |
| ALTITUDE (FASL)             | 7000   |
| SAFE STALL TIME-HOT (SEC)   | 15     |
| SOUND PRESSURE (DBA @ 1M)   | 86     |
| TORQUES:                    |        |
| BREAKDOWN{% F.L.}           | 175    |
| LOCKED ROTOR{% F.L.}        | 60     |
| FULL LOAD{LB-FT}            | 2067.4 |

The Above Data Is Typical. Sinewave Power Unless Noted Otherwise



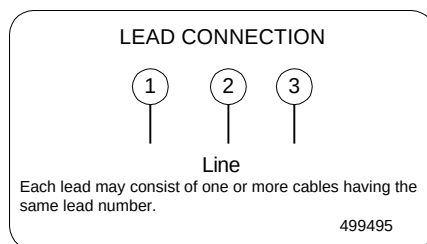
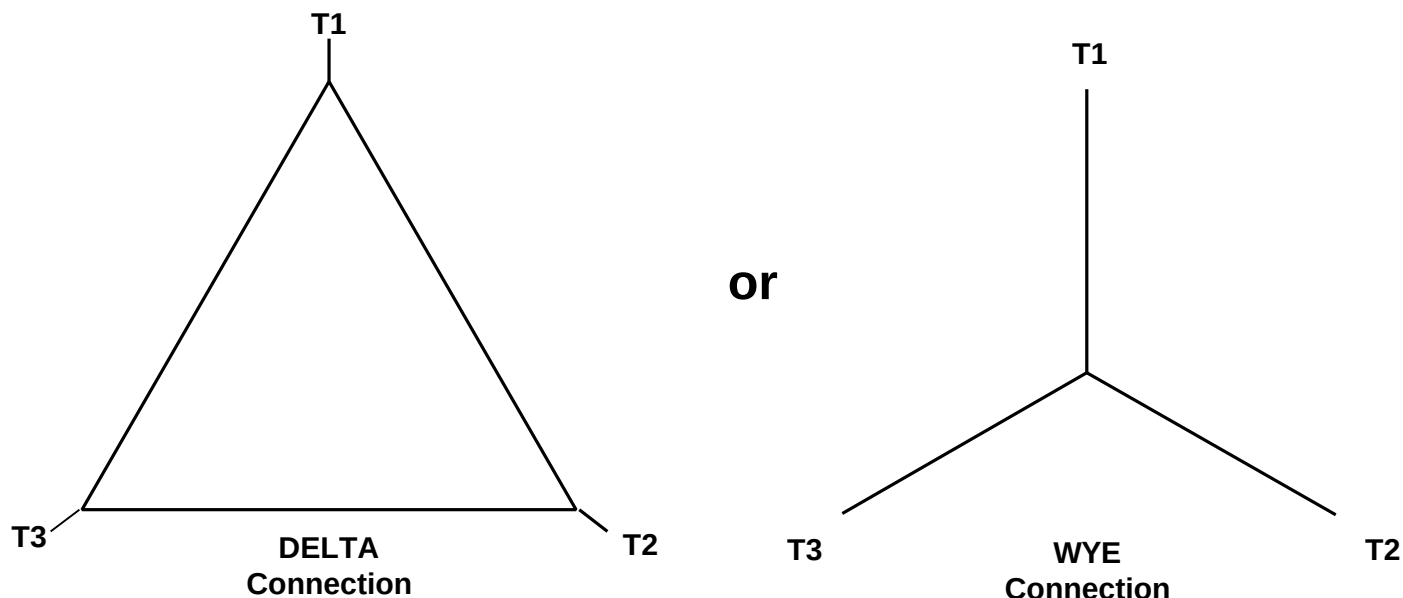
EMERSON MOTOR COMPANY  
ST. LOUIS, MO





499495

## Motor Wiring Diagram



To reverse direction of rotation interchange connections L1 and L2.

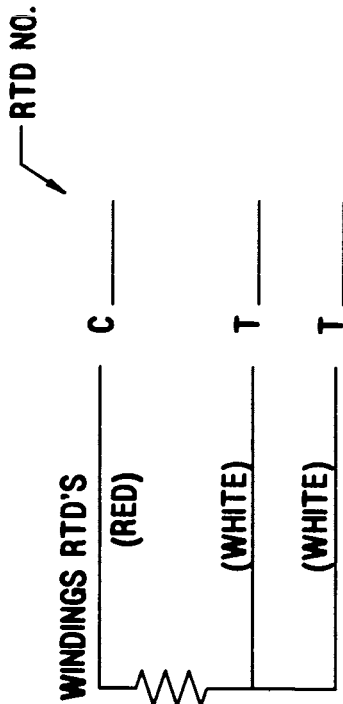
Each lead may be comprised of one or more cables.  
Each cable will be marked with the appropriate lead number.

# WINDING RTD'S

1. THERE ARE QTY-6 RESISTANCE TYPE TEMPERATURE DETECTORS (RTD) INSTALLED IN THE STATOR WINDING, 2 PER PHASE. REFER TO NAMEPLATE ATTACHED TO THE MOTOR ADJACENT TO ACCESSORY OUTLET BOX FOR RATING THE RTD'S.

2. DETECTORS ARE INSTALLED IN PHASES AS SHOWN.

| PHASE   | A     | B     | C     |
|---------|-------|-------|-------|
| RTD NO. | 1, 11 | 2, 22 | 3, 33 |



## ACCESSORY LISTING

QTY-6 3 LEAD RTD'S

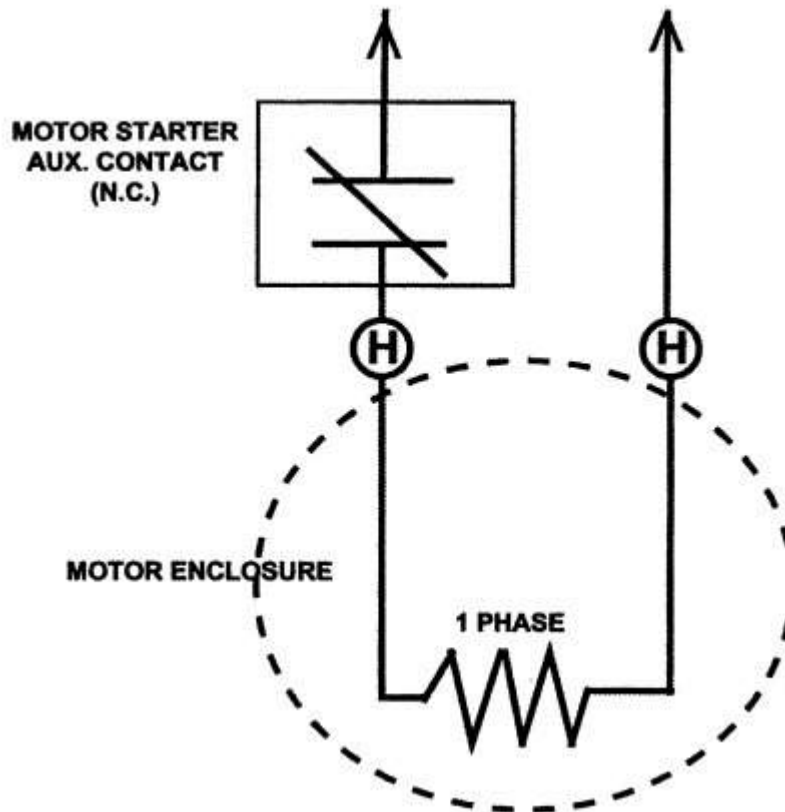
|                            |                        |                                                                                   |   |                    |                                |
|----------------------------|------------------------|-----------------------------------------------------------------------------------|---|--------------------|--------------------------------|
| ALT. CHANGE LET NOTICE NO. | DESCRIPTION OF CHANGE  | U.S. ELECTRICAL MOTORS<br>DIVISION OF EMERSON ELECTRIC CO.<br>ST. LOUIS, MISSOURI |   | TITLE              | CUSTOMER<br>CONNECTION DIAGRAM |
| -                          | REDRAWN ON CAD 8-10-89 | NONE                                                                              |   | DRWN 9-MAY-79, HEB | ---                            |
| A                          | MOD 6-JUN-00 UPDATED   | SCALE 1/2 IN                                                                      |   | RVSD 6-JUN-00, RWK | ---                            |
|                            |                        | MATERIAL                                                                          |   | APPD 8-JUN-00, REP | ---                            |
|                            |                        |                                                                                   |   | TYPE               | ---                            |
|                            |                        |                                                                                   |   | FRAME              | ---                            |
|                            |                        |                                                                                   |   | CSIG               | ---                            |
|                            |                        |                                                                                   |   | PART               | ---                            |
| ALT.                       | 1                      | CDG                                                                               | 9 | 1                  | 833989 A                       |



970798

# SPACE HEATER CONNECTION DIAGRAM

SPACE HEATER LEADS MAY BE LOCATED IN EITHER THE MAIN OUTLET BOX  
OR IF SO EQUIPPED, AN AUXILIARY BOX



THIS EQUIPMENT IS SUPPLIED WITH ANTI-  
CONDENSATION HEATERS. HEATERS  
SHOULD BE ENERGIZED WHEN EQUIPMENT  
IS NOT OPERATING TO PROTECT UNIT BY  
PREVENTING INTERNAL CONDENSATION.  
CONNECT THE "H" OR HEATER  
LEADS TO

|                   |                          |
|-------------------|--------------------------|
| <b>115V</b> VOLTS | <b>384W</b> WATTS RATING |
|-------------------|--------------------------|

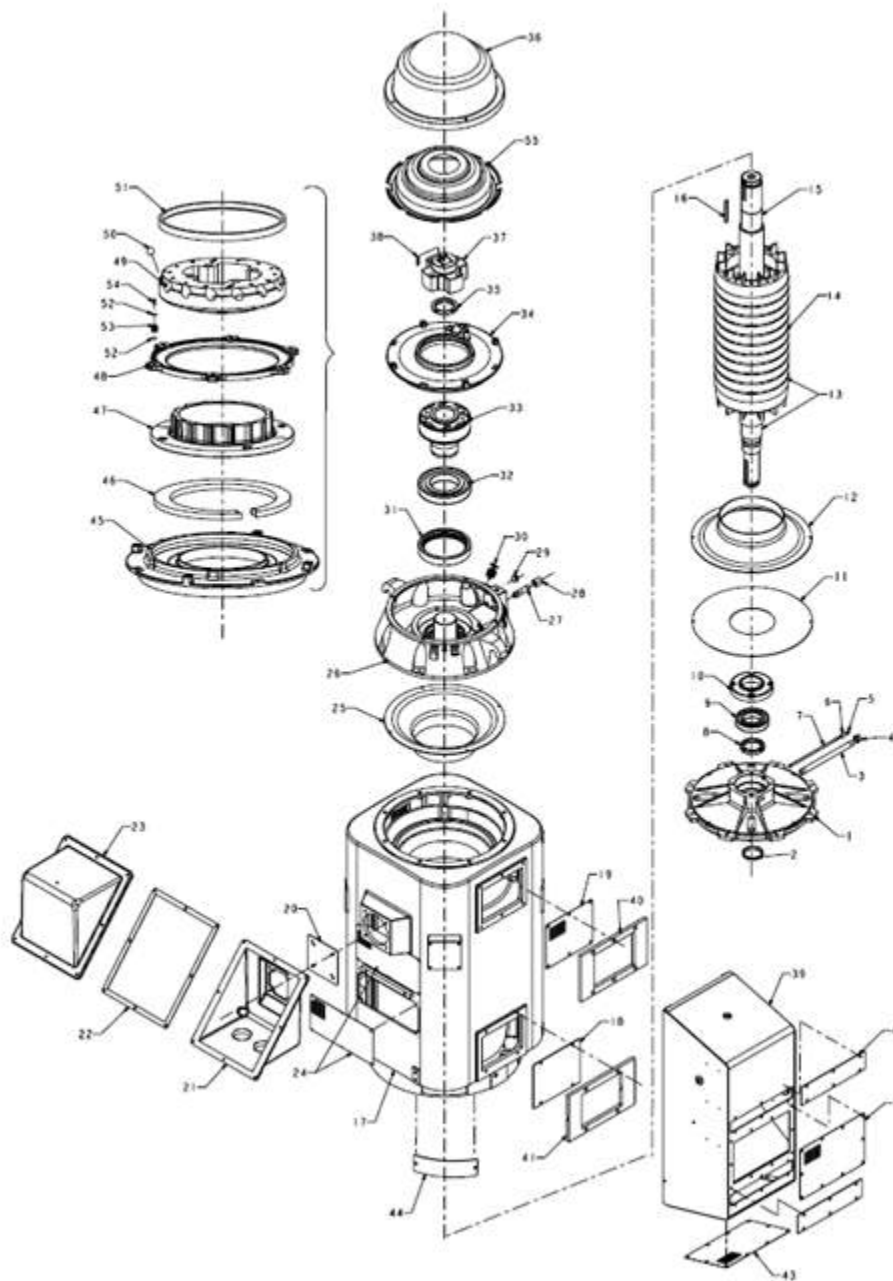
**SPACE HEATER NAMEPLATE (ON MOTOR)**

Revision: 7/30/2008  
Mike Cullen



## RENEWAL PARTS

FRAMES 5008 AND 5012  
TYPES: RU, RUE, RUEI, RV4, RVE4, RVEI4



### WARNING:

Any disassembly or repair work on explosionproof motors will void the Underwriters Laboratories, Inc. label unless done by the manufacturer, or a facility approved by the Underwriters Laboratories, Inc. Refer to your nearest U.S. Electrical Motors office for assistance.

### BEARINGS:

Refer to motor nameplate for the bearing numbers.

### PRICES:

Parts stocking distributors: refer to USEM renewal parts numerical index. All Others: refer to your nearest USEM parts distributor.

reference: Renewal Parts Section 700 - 200



# RENEWAL PARTS

FRAMES 5008 AND 5012  
TYPES: RU, RUE, RUEI, RV4, RVE4, RVEI4

| ITEM NO. | QTY                          | NAME OF PART                           |
|----------|------------------------------|----------------------------------------|
| 1        | 1                            | Lower Bracket                          |
| 2        | 1                            | Shaft Water Slinger                    |
| 3        | 1                            | Pipe Nipple (Lower Grease Drain)       |
| 4        | 1                            | Pipe Cap (Lower Grease Drain)          |
| 5        | 1                            | Grease Zerk Fitting                    |
| 6        | 1                            | Pipe Coupling (Lower Grease Fill)      |
| 7        | 1                            | Pipe Nipple (Lower Grease Fill)        |
| 8        | 1                            | Locknut and Lockwasher (Lower Bearing) |
| 9        | 1                            | Lower Bearing                          |
| 10       | 1                            | Lower Bearing Cap                      |
| 11       | 1                            | Lower Intake Screen (Only on WP-1)     |
| 12       | 1                            | Lower Air Deflector                    |
| 13       | 1                            | Rotor Assembly                         |
| 14       | 1                            | Rotor Core                             |
| 15       | 1                            | Rotor Shaft                            |
| 16       | 1                            | Square Key (Bearing Mounting to Shaft) |
| 17       | 1                            | Stator Assembly                        |
| 18       | 2                            | Lower Air Intake Cover (Only on WP-1)  |
| 19       | 2                            | Upper Air Intake Screen (Only on WP-1) |
| 20       | 1                            | Gasket (Outlet Box Base to Stator)     |
| 21       | 1                            | Outlet Box Base                        |
| 22       | 1                            | Gasket (Outlet Box Cover to Base)      |
| 23       | 1                            | Outlet Box Cover                       |
| 24       | 2-<br>(5008)<br>4-<br>(5012) | Exhaust Screen                         |
| 25       | 1                            | Upper Air Deflector                    |
| 26       | 1                            | Upper Bracket                          |
| 27       | 1                            | Pipe Nipple (Oil Drain)                |
| 28       | 1                            | Pipe Cap (Oil Drain)                   |
| 29       | 1                            | Oil Sight Gauge Window                 |

## WARNING:

Any disassembly or repair work on explosionproof motors will void the Underwriters Laboratories, Inc. label unless done by the manufacturer, or a facility approved by the Underwriters Laboratories, Inc. Refer to your nearest U.S. Electrical Motors office for assistance.

## BEARINGS:

Refer to motor nameplate for the bearing numbers.

## PRICES:

Parts stocking distributors: refer to USEM renewal parts numerical index. All Others: refer to your nearest USEM parts distributor.

reference: Renewal Parts Section 700 - 200

| ITEM NO. | QTY                            | NAME OF PART                                     |
|----------|--------------------------------|--------------------------------------------------|
| 30       | 1                              | Oil Fill Plug (Expanding)                        |
| 31       | 1                              | Bearing Spacer (or Tandem Thrust Bearing)        |
| 32       | 1                              | Upper Thrust Bearing                             |
| 33       | 1                              | Bearing Mounting                                 |
| 34       | 1                              | Dust Cover (Only on Units Without Ratchet)       |
| 35       | 1                              | Locknut and Lockwasher (Brg Mtg to Shaft)        |
| 36       | 1                              | Canopy Cap                                       |
| 37       | 1                              | Thrust Coupling (Only on Hollowshaft)            |
| 38       | 1                              | Gib Key (Only on Hollowshaft)                    |
| 39       | 2                              | WP2 Intake Box (Only on WP-2)                    |
| 40       | 2                              | Upper Adapter Flange (Only on WP-2)              |
| 41       | 2                              | Lower Adapter Flange (Only on WP-2)              |
| 42       | 4                              | Filter Access Cover (Only on WP-2)               |
| 43       | 4                              | Intake Screen (Only on WP-2)                     |
| 44       | 4                              | Cover (Flange Access) (Only on WP-2)             |
| 45       | 1                              | Ratchet Adaptor (Only on Units With Ratchet)     |
| 46       | 1                              | Connection Spring (Only on Units With Ratchet)   |
| 47       | 1                              | Stationary Ratchet (Only on Units With Ratchet)  |
| 48       | 1                              | Pressure Plate (Only on Units With Ratchet)      |
| 49       | 1                              | Rotating Ratchet (Only on Units With Ratchet)    |
| 50       | 12-<br>(5008)<br>14-<br>(5012) | Ratchet Ball (Only on Units with Ratchet)        |
| 51       | 1                              | Ball Retaining Ring (Only on Units With Ratchet) |
| 52       | 4-<br>(5008)<br>12-<br>(5012)  | Plain Washer (Only on Units With Ratchet)        |
| 53       | 4-<br>(5008)<br>6-<br>(5012)   | Die Spring (Only on Units With Ratchet)          |
| 54       | 4-<br>(5008)<br>6-<br>(5012)   | Screw (Only on Units With Ratchet)               |
| 55       | 1                              | Pressurization Baffle                            |

# TYPICAL REED CRITICAL FREQUENCY DATA

USEM MODEL NO: NA  
USEM CATALOG NO: NA

Frame: 5012VP Type: RVEI4

|                                 |           |      |
|---------------------------------|-----------|------|
| REED CRITICAL FREQUENCY:        | 20        | HZ   |
| CENTER OF GRAVITY:              | 34.0      | IN   |
| DEFLECTION @ CENTER OF GRAVITY: | 0.0245    | IN   |
| UNIT WEIGHT:                    | 4850      | LBS. |
| BASE DIAMETER:                  | 24.5      | IN.  |
| MAXIMUM MOTOR DIAMETER:         | 40        | IN.  |
| DATE:                           | 9/10/2009 |      |



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