



770 L Street, Suite 800
Sacramento, California 95814
main 916.447.0700
fax 916.447.4781
www.stoel.com

December 14, 2006

JOHN A. MCKINSEY
Direct (916) 319-4746
jamckinsey@stoel.com

DOCKET 79-AFC-4C
DATE DEC 14 2006
RECD. DEC 14 2006

TN: 38053

BY E-MAIL AND HAND DELIVERY

Mr. Christopher Meyer
Compliance Project Manger
California Energy Commission
1516 Ninth Street, MS-
Sacramento, CA 95814

**Re: Bottle Rock Power Plant (79-AFC-4C)
Compliance Submittal - Condition of Certification 10-5**

Dear Mr. Meyer:

Dear Mr. Meyer:

On December 13, 2006, at the regularly scheduled Business Meeting for the California Energy Commission ("CEC"), the Commission unanimously approved Bottle Rock Power, LLC's ("BRP") Petition to Re-Start the Bottle Rock Power Plant ("BRPP"). To that end, compliance activities related to BRPP's re-start have begun. BRP addresses these activities herein.

Condition of Certification ("COC") 10-5, related to *Structural Engineering*, requires the project owner to file with the CEC Compliance Project Manager ("CPM") substantial design changes to the final plans as required by CBSC 2001. "Substantial changes" are defined to include "all changes requiring an alteration in design concept and preparation of new design plans consistent with the [Application for Certification] conditions of certification..." Therefore, the following changes are considered "substantial" pursuant to COC 10-5. As such, BRP submits the enclosed detailed information in compliance with COC 10-5 regarding the following:

- Installation of vacuum pumps to maintain vacuum in the condenser versus reliance upon steam injectors;
- Installation of a distributive control system for the plant;
- Addition of mercury vapor filter system upstream of the Stretford H₂S abatement system;
- Addition of air spargers in the oxidizer tanks of the Stretford H₂S abatement system; and,
- Changes to the design and operation of the secondary H₂S abatement system.

Oregon
Washington
California
Utah
Idaho



Mr. Christopher Meyer
December 14, 2006
Page 2

Should you have any questions or require additional information regarding these documents, please do not hesitate to contact me at the above number.

Very truly yours,


John A. McKinsey

JAM:kjh

Enclosures.

cc: Ronald E. Suess, JD, President, Bottle Rock Power, LLC

Vacuum Pumps

BOTTLE ROCK POWER CORPORATION (BRPC) VACUUM PUMP INSTALLATION

BRPC is recommending that two 50% capacity vacuum pumps be installed at the facility to assist in the removal of non-condensable gas (NCG). The current NCG removal system is two stages of ejectors. The existing ejector system will be rebuilt and will remain fully functional and serve as a backup system to the proposed vacuum pumps. The seal water from the vacuum pumps will be returned to either the hot-well or to the rich condensate system (both options are currently piped and available). Vacuum pumps are slightly more energy efficient than the ejectors but the main advantages to the plant are as follows:

- The use of vacuum pumps will significantly reduce (almost eliminate) the need to vent unabated steam or NCG's during a plant start. Vacuum can be pulled with the pumps and then the steam line warmed up through the turbine bypass directly to the condenser.
- The vacuum pumps will forward the NCG stream to the Stretford Process at a higher pressure. This will reduce back pressure shut downs and problems caused by minor restrictions (plugging) in the Stretford.
- Vacuum pumps produce less ambient noise than ejectors.

Please see attached drawing showing pumps installed with existing ejectors.

BOTTLE ROCK POWER CORPORATION

COBB, CALIFORNIA

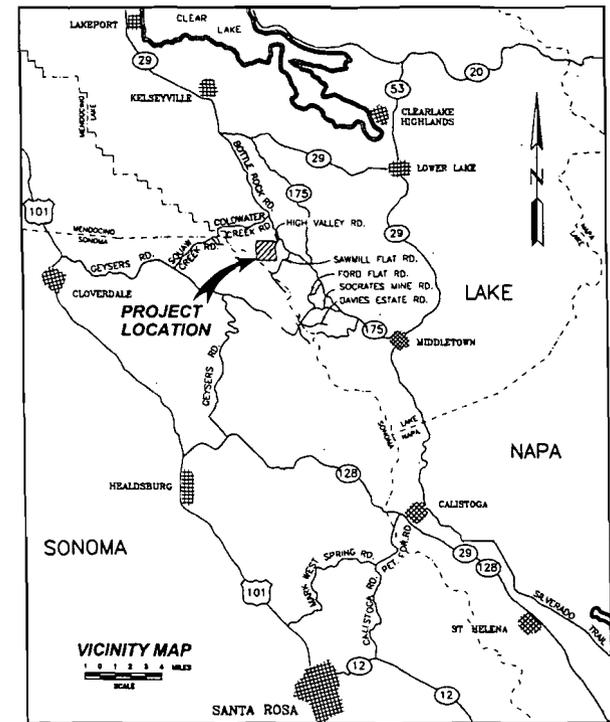
CONTRACT DRAWINGS

FOR CONSTRUCTION OF

VACUUM PUMP INSTALLATION

LAKE COUNTY, CALIFORNIA

JUNE 2006



DRAWING LIST

SHT#	TITLE	SHT#	TITLE
1	TITLE SHEET	7A	SEAL WATER SUPPLY & RETURN PLAN
2	NOTES, LEGEND AND ABBREVIATIONS	8	STANDARD DETAILS
3	GENERAL PLAN	9	FOUNDATION AND GROUNDING DETAILS
4A	P & ID LEGEND - Sht 1	10	VACUUM PUMP AREA E & I PLAN
4B	P & ID LEGEND - Sht 2	11	VACUUM PUMP SINGLE LINE DIAGRAM
4C	P & ID LEGEND - Sht 3	12	VACUUM PUMP TYPICAL CONTROLLER
4D	P & ID	13	VACUUM PUMP INSTRUMENTATION
5	VACUUM PUMP & PIPING PLAN	14	SEPARATOR LEVEL CONTROL DETAILS
6	VACUUM PUMP DETAILS - 1	15	I & C DETAILS
7	VACUUM PUMP DETAILS - 2		

NO.	REVISIONS	BY	APPR.	DATE
B	ADDED SHEET 7A	MKK	HEV	8/23/08
A	ISSUED FOR BID	MAP	MDV	7/31/08

WARNING
IF BAR BELOW
DOES NOT
MEASURE
1 INCH
THEN DRAWING
IS NOT
TO SCALE



VEIZADES & ASSOCIATES, INC.
CONSULTING ENGINEERS
5 THIRD STREET - SUITE 400 - SAN FRANCISCO - CA 94103
TEL: 415 394 8855 FAX: 415 394 8866

DESIGNED BY
FC
CHECKED BY
MAP
DRAFTED BY
JCM
APPROVED BY
MCV
DATE
8/20/08
SCALE
NO SCALE



Bottle Rock Power Corporation
COBB, CALIFORNIA

BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM

TITLE SHEET

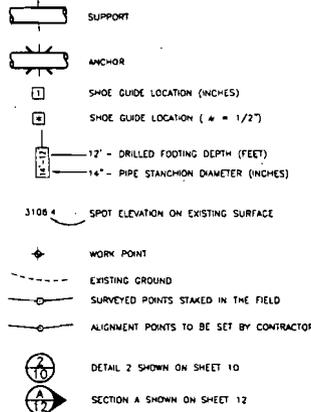
PROJECT NO.
253-003
CONTRACT NO.
CADFILE NO.
003-07
SHEET NO.
1
REV. NO.
B

ABBREVIATIONS

AB ANCHOR BOLT
 ANGLE
 AC ASPHALT CONCRETE
 AGG AGGREGATE
 AHD AHEAD
 ALT ALTERNATE
 @ AT
 B Z BEND ANGLE
 BC BEGIN HORIZONTAL CURVE
 BEG BEGIN
 BK BACK
 BLDG BUILDING
 BM BENCH MARK
 BOP BOTTOM OF PIPE
 BVC BEGIN VERTICAL CURVE
 C Z CUT ANGLE
 C-C CENTER TO CENTER
 CF CUBIC FOOT
 C, CL CENTER LINE
 CL CLASS
 CLR CLEAR, CLEARANCE
 CMP CORRUGATED METAL PIPE
 CONC CONCRETE
 CONST CONSTRUCTION
 COORD COORDINATE
 CORR CORRUGATED
 CSP CORRUGATED STEEL PIPE
 CULV CULVERT
 CY CUBIC YARD
 D DEPTH
 DET DETAIL
 DBL DOUBLE
 DIA DIAMETER
 DIST DISTANCE
 DWG DRAWING
 E EAST COORDINATE
 EA EACH
 EC END HORIZONTAL CURVE
 ET EACH FACE
 EL, ELEV ELEVATION
 EP EDGE OF PAVEMENT
 EQ EQUAL, EQUATION
 EVC END VERTICAL CURVE
 EW EACH WAY
 EVC EXCAVATION
 EXIST EXISTING
 EXP EXPANSION
 FND FOUNDATION
 FG, FIN.GR. FINISH GRADE
 FL FLOW LINE
 FT FOOT OR FEET
 FTG FOOTING
 GA GAGE
 GAL GALLON
 GALV GALVANIZED
 GB GRADE BREAK
 GRND GROUND
 H HEIGHT
 HORIZ HORIZONTAL
 HP HINGE POINT OR HORSE POWER
 ID INSIDE DIAMETER
 IN INCHES
 INV INVERT
 JT JOINT
 LCV LEVEL CONTROL VALVE
 L LENGTH
 LB POUND
 LTFC LIQUID TIGHT FLEXIBLE CONDUIT
 LF LINEAR FOOT
 LOL LAYOUT LINE
 LONGIT LONGITUDINAL
 LT LEFT
 MAX MAXIMUM
 MH MANHOLE
 MI MILE(S)
 MIN MINIMUM
 MISC MISCELLANEOUS
 MOD MODIFIED OR MODIFY

MTL MATERIAL
 N NORTH COORDINATE
 NIC NOT IN CONTRACT
 NO NUMBER
 NTS NOT TO SCALE
 OC ON CENTER
 OD OUTSIDE DIAMETER
 OG ORIGINAL GROUND
 OH OVERHEAD
 PCC POINT OF COMPOUND CURVE
 PCVC POINT OF COMPOUND VERTICAL CURVE
 PERM PERMEABLE, PERMANENT
 PI POINT OF INTERSECTION
 P/L PROPERTY LINE
 PL PLATE
 POC POINT ON HORIZONTAL CURVE
 POL POINT ON LINE
 POT POINT ON TANGENT
 POCV POINT ON VERTICAL CURVE
 PP POWER POLE
 PRC POINT OF REVERSE CURVE
 PRVC POINT OF REVERSE VERTICAL CURVE
 PS PIPE SUPPORT
 PT POINT
 PVC POLYVINYL CHLORIDE
 PVMT PAVEMENT
 R RADIUS
 RC REINFORCED CONCRETE
 RD ROAD
 REIN REINFORCED OR REINFORCING
 REQ REQUIRED
 RET RETAINING
 RP REFERENCE POINT
 RT RIGHT
 R/W RIGHT OF WAY
 RW RETAINING WALL
 S SOUTH COORDINATE, SLOPE
 SCH SCHEDULE
 SEC SECTION
 SERWWTIP SOUTHEAST REGIONAL WWTP
 SG SUBGRADE
 SHT SHEET
 SIM SIMILAR
 SPECS CONTRACT SPECIFICATIONS
 SOFT SOFT FOOT
 SQYD SQUARE YARD
 SS SLOPE STAKE
 STA STATION
 STD STANDARD
 SQ SQUARE
 SYM ABT SYMMETRICAL ABOUT
 TEMP TEMPORARY
 T&B TOP AND BOTTOM
 TC TOP OF CURVE
 TG TOP OF GRATE
 THRD THREADED
 TOC TOP OF CONCRETE
 TOF TOP OF FOOTING
 TOS TOP OF STEEL
 TOW TOP OF WALL
 TRANS TRANSITION
 TYP TYPICAL
 UG UNDERGROUND
 U.O.N. UNLESS OTHERWISE NOTED
 V&A VEIZADES & ASSOCIATES, INC.
 VC VERTICAL CURVE
 VERT VERTICAL
 VPI VERTICAL POINT OF INTERSECTION
 W WEST COORDINATE OR WIDTH
 WID WHERE IT OCCURS
 W/ WITH
 W/O WITHOUT
 WP WORK POINT
 WT WEIGHT
 WWTP WASTEWATER TREATMENT PLANT
 XING CROSSING
 XS EXTRA STRONG

LEGEND



GENERAL NOTES

- NO CHANGES TO THE WORK DEPICTED ON THESE DRAWINGS SHALL BE MADE WITHOUT THE EXPRESS WRITTEN AUTHORIZATION OF THE ENGINEER. ANY DISCREPANCIES BETWEEN THE PLANS, DETAILS OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR ADJUSTMENT PRIOR TO PROCEEDING WITH THE WORK.
- EXISTING UTILITIES SHOWN ARE BASED ON BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY THE LOCATION, SIZE, TYPE AND ELEVATION OF ALL UTILITIES PRIOR TO CONSTRUCTION AND SHALL INFORM THE ENGINEER OF ANY CONFLICTS.
- CONTRACTOR SHALL POTHOLE ALL UNDERGROUND UTILITY CROSSINGS A MINIMUM OF TWO WEEKS IN ADVANCE OF TRENCHING OPERATIONS IN ORDER TO VERIFY CLEARANCE FOR THE PROPOSED WORK. REPORT ANY CONFLICTS TO ENGINEER IMMEDIATELY.
- INSULATION IS EASILY DAMAGED. CONTRACTOR IS RESPONSIBLE FOR REPLACING INSULATION DAMAGED DURING CONSTRUCTION.

PIPELINE SCHEDULE				
LINE DESIGNATOR	LINE SIZE	BEND TYPE	FLANGE CLASS	INSULATION
NC GAS HEADER	16" x 0.188"	LR	150	NONE
NC GAS VACUUM PUMP SUCTION	8" x 0.148"	LR	150	NONE
NC GAS VACUUM PUMP DISCHARGE	6" x 0.134"	LR	150	NONE
NC GAS START-UP RECIRC LINE	3" x 0.216"	LR	150	NONE
SEAL WATER SUPPLY	1-1/2" x 0.216"	LR	150	NONE
	2" x 0.154"	LR	150	NONE
SEAL WATER RETURN	2" x 0.154"	LR	150	NONE

NO.	REVISIONS	BY	APPR.	DATE
B	ISSUE FOR BID	MAP	HDV	7/31/08
A	ISSUED FOR CLIENT REVIEW	FSC	HDV	8/20/08

WARNING
 IF BAR BELOW DOES NOT MEASURE 1 INCH THEN DRAWING IS NOT TO SCALE

VEIZADES & ASSOCIATES, INC.
 CONSULTING ENGINEERS
 5 THIRD STREET - SUITE 400 - SAN FRANCISCO - CA 94103
 TEL: 415.394.8855 FAX: 415.394.8866

DESIGNED BY FSC
 CHECKED BY MAP
 DRAFTED BY JCH
 APPROVED BY HDV
 DATE 8/20/08
 SCALE NO SCALE

Bottle Rock Power Corporation
 COBB, CALIFORNIA

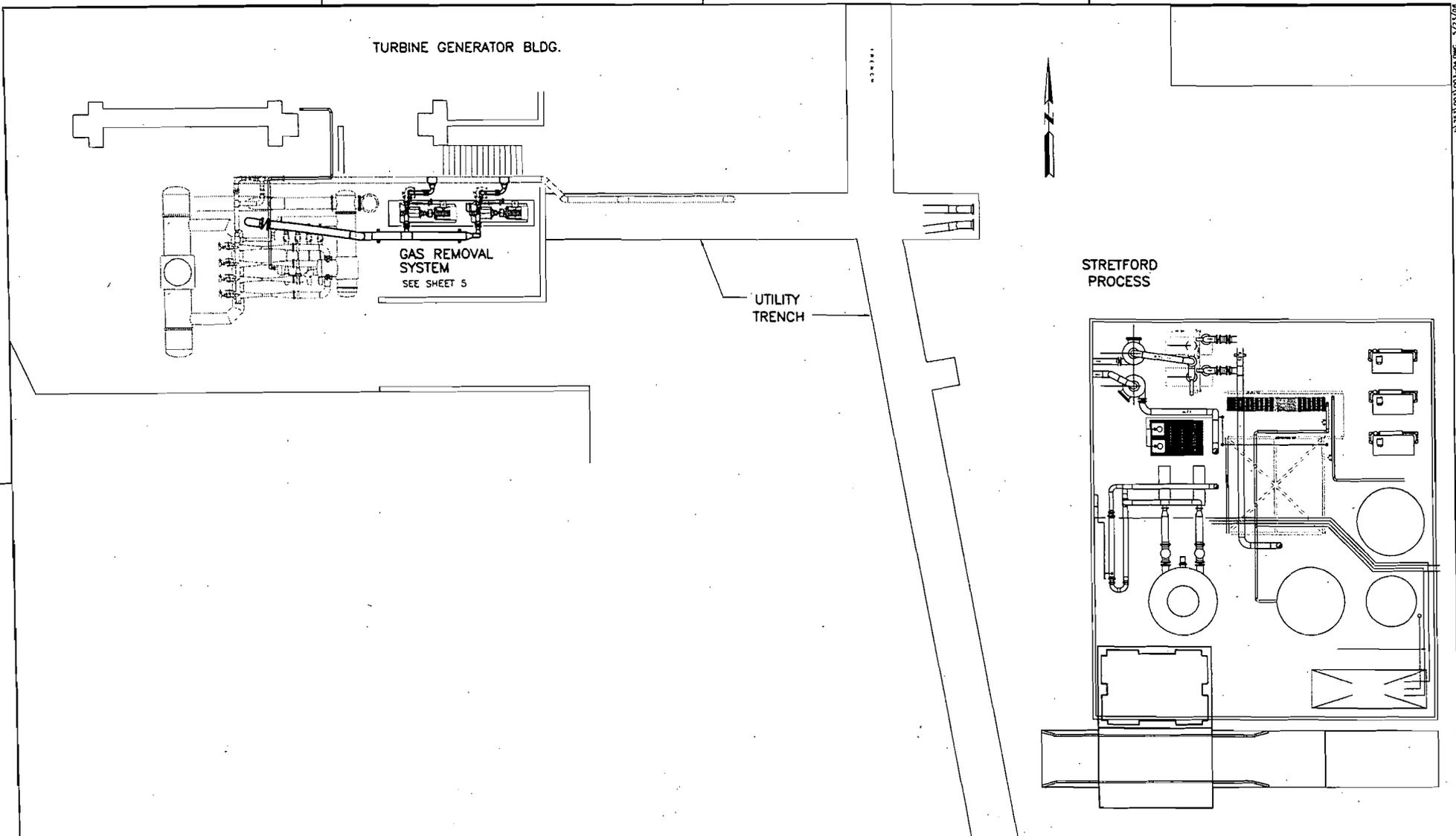
**BOTTLE ROCK GEOTHERMAL POWER PLANT
 HYBRID NC GAS EXTRACTION SYSTEM**

NOTES, LEGEND AND ABBREVIATIONS

PROJECT NO. 253-003
 CONTRACT NO.
 CADFILE NO. 003-08
 SHEET NO. 2
 REV. NO.

1. V&A\2008\003-08.DWG 8/20/08

J:\233\003\003-00-000 7/23/08



NO.	REVISIONS	BY	APPR.	DATE
B	ISSUE FOR BID	SSC	HOV	7/31/08
A	ISSUED FOR CLIENT REVIEW	MAP	HOV	5/23/08

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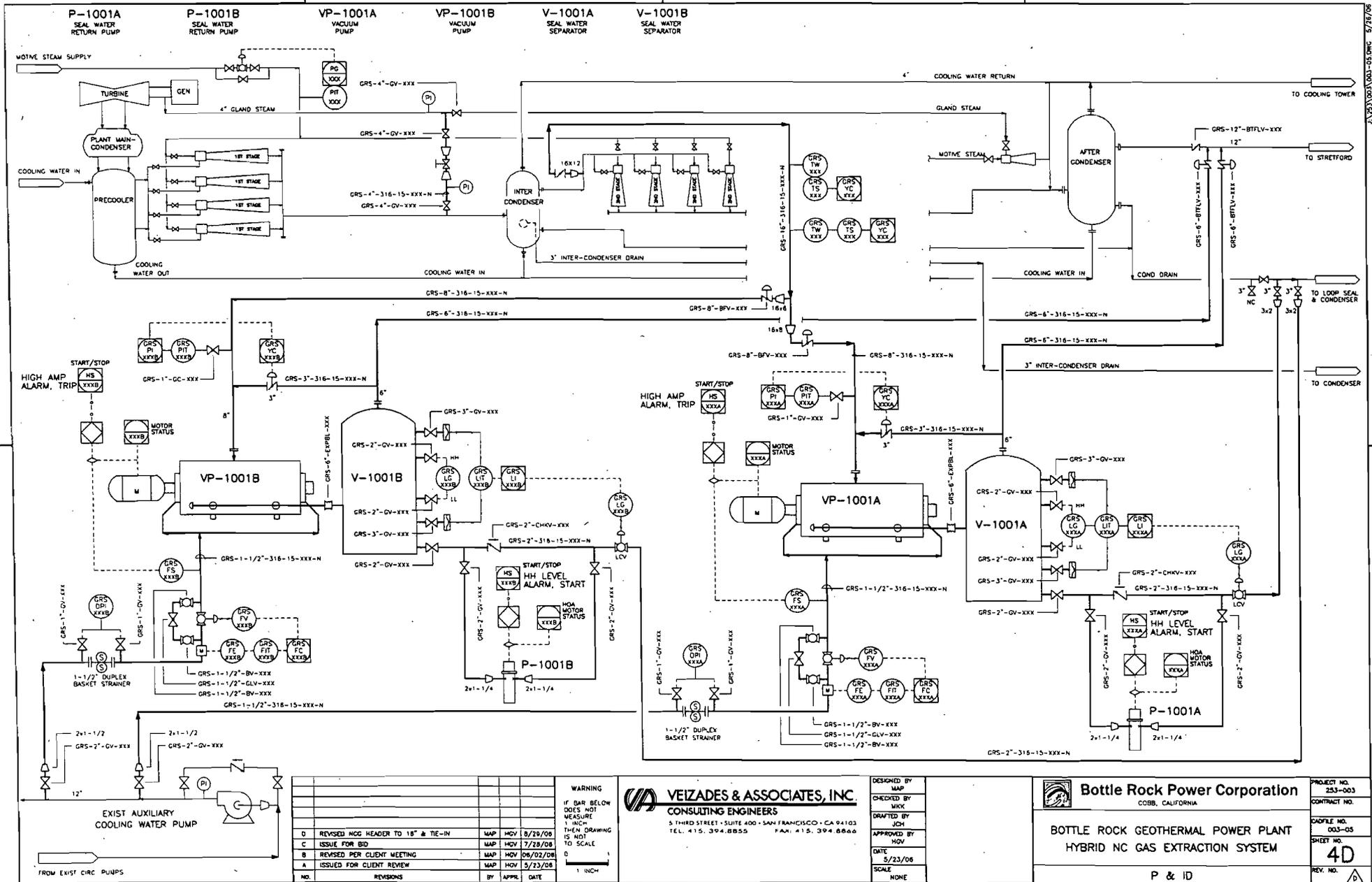
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CHECKED BY
HOV
DRAFTED BY
JCH
APPROVED BY
HOV
DATE
5/23/08
SCALE
1/8"=1'-0"

 **Bottle Rock Power Corporation**
COBB, CALIFORNIA

BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM

GENERAL PLAN

PROJECT NO.
233-003
CONTRACT NO.
CADFILE NO.
003-04
SHEET NO.
3
REV. NO.
8



NO.	REVISIONS	BY	APPR.	DATE
D	REVISED HCC HEADER TO 18" & TIE-IN	MAP	HCV	8/29/08
C	ISSUE FOR BID	MAP	HCV	7/28/08
B	REVISED PER CLIENT MEETING	MAP	HCV	06/02/08
A	ISSUED FOR CLIENT REVIEW	MAP	HCV	5/23/08

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 CONSULTING ENGINEERS
 5 THIRD STREET, SUITE 400 - SAN FRANCISCO, CA 94103
 TEL. 415. 394.8855 FAX: 415. 394.8866

DESIGNED BY: MAP
 CHECKED BY: MKK
 DRAWN BY: JCH
 APPROVED BY: HOV
 DATE: 5/23/08
 SCALE: NONE

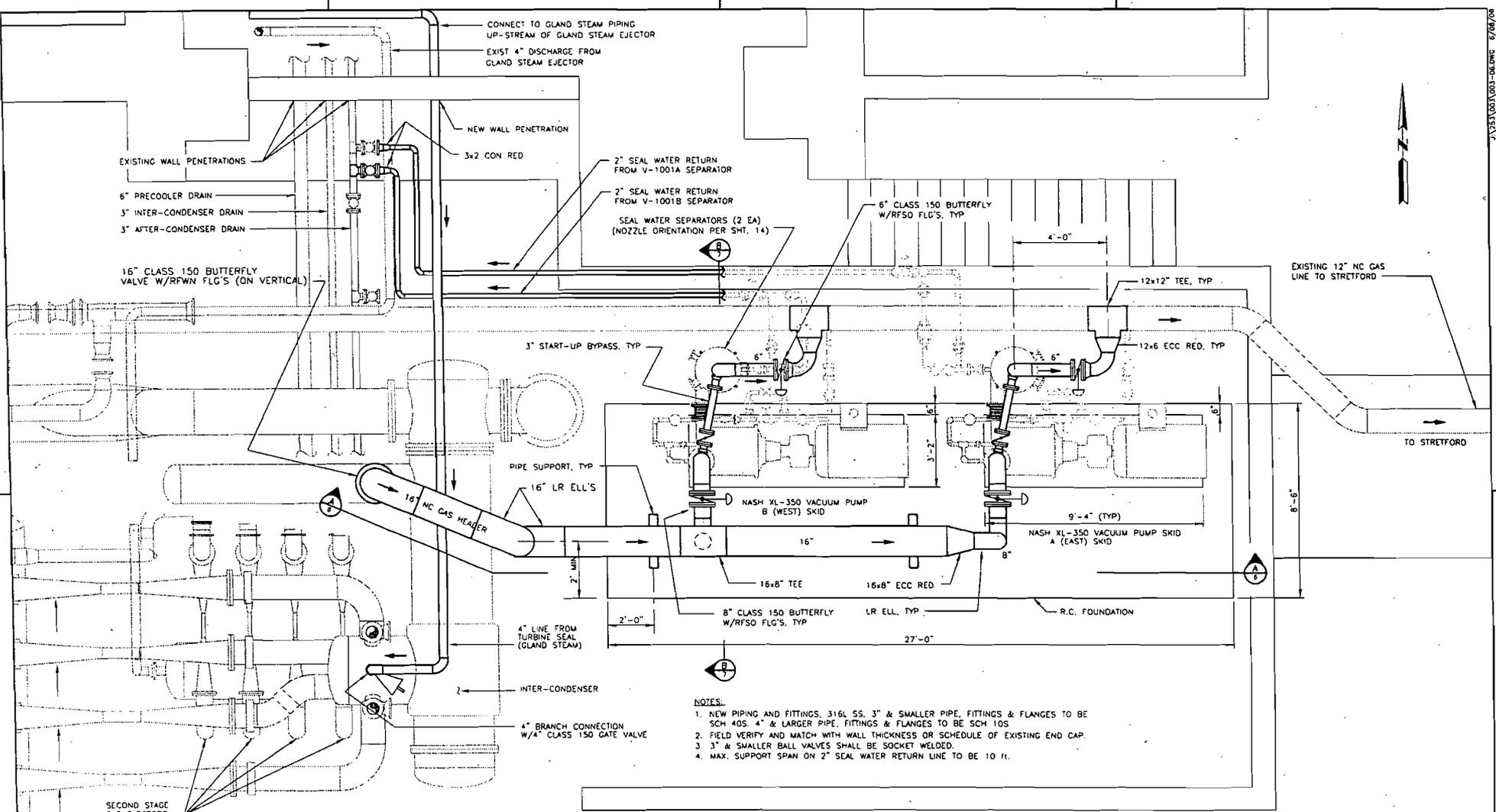
Bottle Rock Power Corporation
 COBB, CALIFORNIA

BOTTLE ROCK GEOTHERMAL POWER PLANT
 HYBRID NC GAS EXTRACTION SYSTEM

P & ID

PROJECT NO. 253-003
 CONTRACT NO.
 DRAWING NO. 003-05
 SHEET NO. 4D
 REV. NO.

J:\351\031\031-06.DWG 6/16/06



- NOTES:**
1. NEW PIPING AND FITTINGS, 316L SS, 3" & SMALLER PIPE, FITTINGS & FLANGES TO BE SCH 40S. 4" & LARGER PIPE, FITTINGS & FLANGES TO BE SCH 10S
 2. FIELD VERIFY AND MATCH WITH WALL THICKNESS OR SCHEDULE OF EXISTING END CAP.
 3. 3" & SMALLER BALL VALVES SHALL BE SOCKET WELDED.
 4. MAX. SUPPORT SPAN ON 2" SEAL WATER RETURN LINE TO BE 10 FT.

NO.	REVISIONS	BY	APPR.	DATE
D	REVISED NCG HEADER TO 16" & TE-IN	MAP	HOV	8/29/06
C	ISSUE FOR BID	MAP	HOV	7/28/06
B	ISSUED FOR NASH REVIEW	MAP	HOV	8/21/06
A	ISSUED FOR CLIENT REVIEW	TC	HOV	8/20/06

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DESIGNED BY	MAP
CHECKED BY	MKK
DRAWN BY	JCH
APPROVED BY	HOV
DATE	8/17/06
SCALE	1/2"=1'-0"

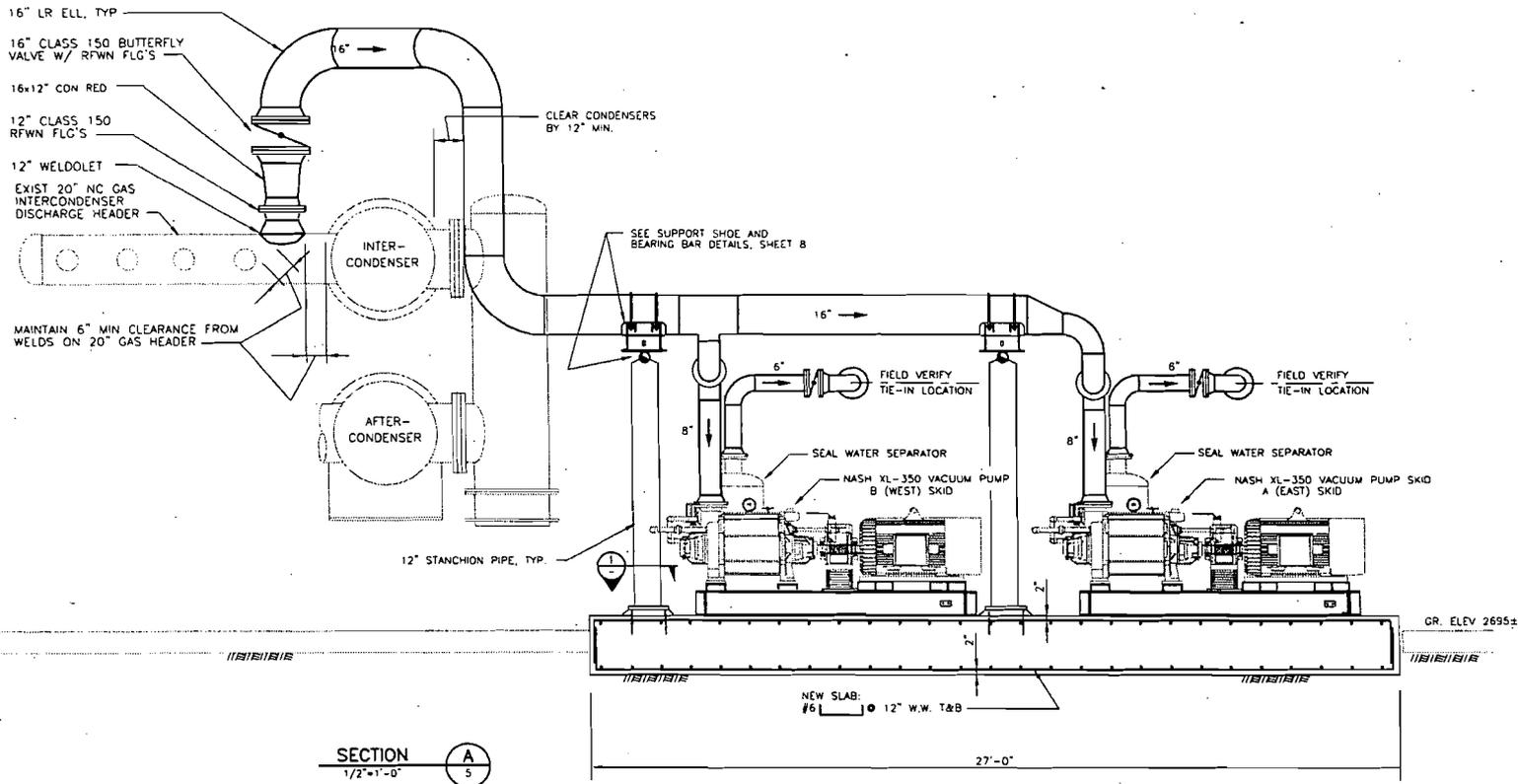
Bottle Rock Power Corporation
 CORB, CALIFORNIA

BOTTLE ROCK GEOTHERMAL POWER PLANT
 HYBRID NC GAS EXTRACTION SYSTEM

VACUUM PUMP & PIPING PLAN

PROJECT NO.	253-003
CONTRACT NO.	
CADFILE NO.	003-06
SHEET NO.	5
REV. NO.	

A:\351\003\003-08.DWG 4/17/08



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

NO.	REVISIONS	BY	APPR.	DATE
C	REVISED NCG HEADER TO 16" & TIE-IN	MAP	HOV	8/29/08
B	ISSUE FOR BID	MAP	HOV	7/28/08
A	ISSUED FOR CLIENT REVIEW	FC	HOV	8/20/08

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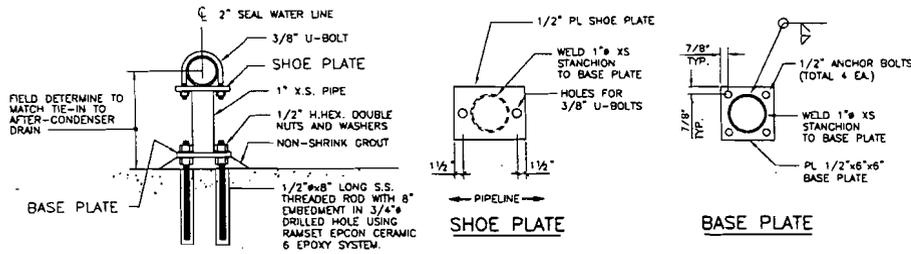
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JCH
APPROVED BY
HOV
DATE
8/17/08
SCALE
1/2"=1'-0"

Bottle Rock Power Corporation
COBB, CALIFORNIA

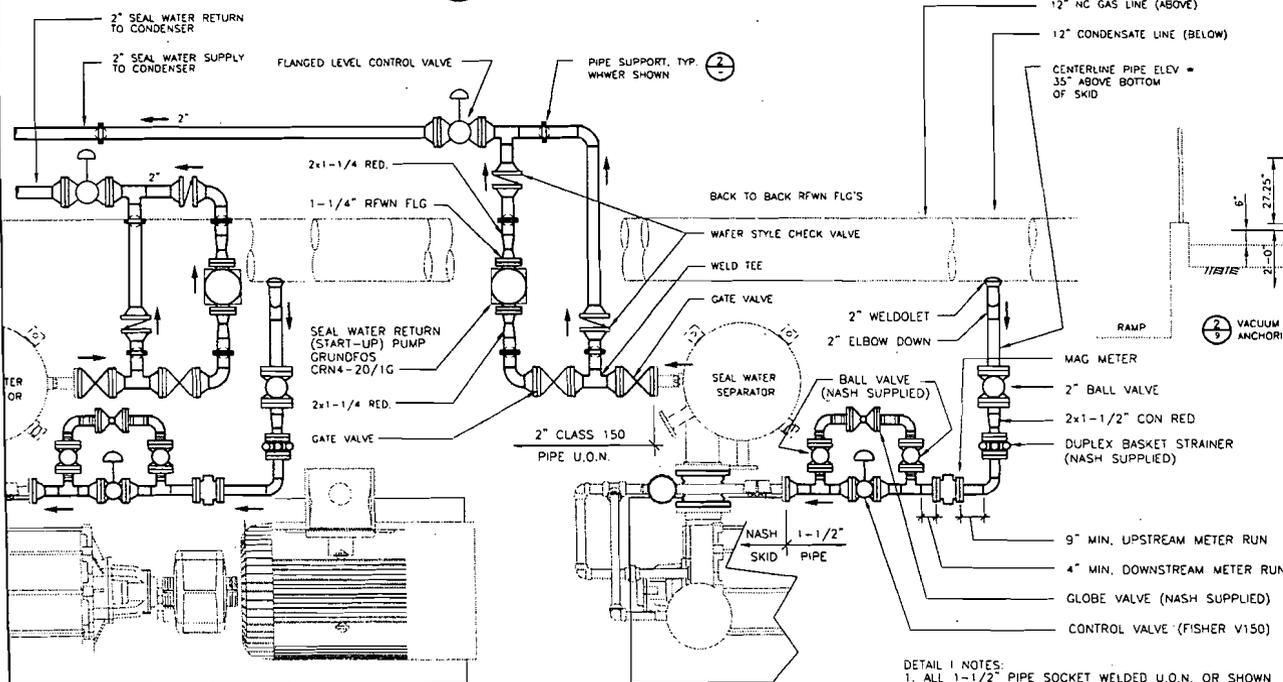
BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM

VACUUM PUMP DETAILS - 1

PROJECT NO.
253-003
CONTRACT NO.
CAPFILE NO.
003-08
SHEET NO.
6
REV. NO.

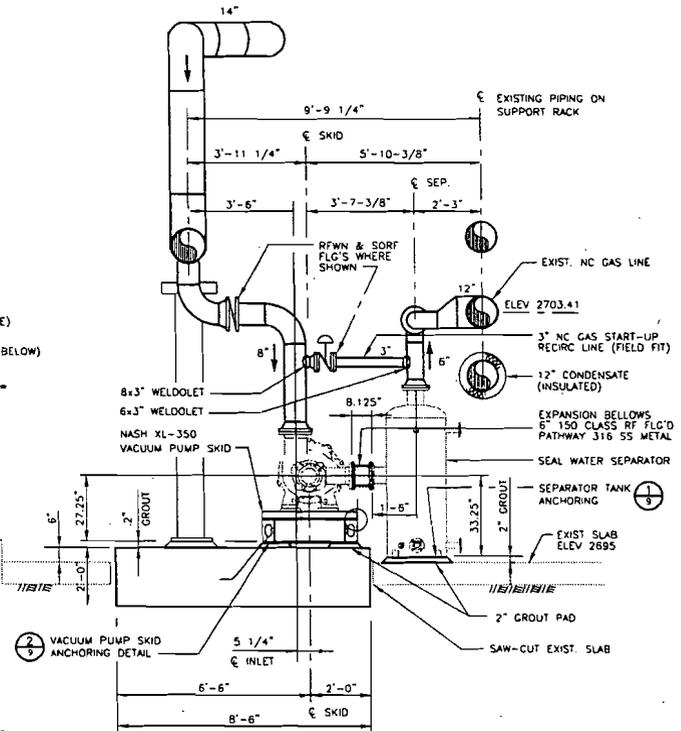


DETAIL 2
1/2"=1'-0"



DETAIL 1
1/2"=1'-0"

DETAIL 1 NOTES:
 1. ALL 1-1/2" PIPE SOCKET WELDED U.O.N. OR SHOWN
 2. DETAILS SIMILAR AT BOTH VACUUM PUMPS & SEPARATORS.
 3. ALL FLANGES RF, CLASS 150
 4. ALL SEAL WATER SUPPLY & RETURN PIPING TO BE STAINLESS STEEL AND MAX. SUPPORT SPAN OF 10'.



SECTION B
1/2"=1'-0"

NO.	REVISIONS	BY	APPR.	DATE
C	RE-ISSUE FOR BID	SSC	MJK	7/31/08
B	ISSUED FOR NASH REVIEW	MAP	HEV	6/21/08
A	ISSUED FOR CLIENT REVIEW	TC	HOV	8/20/08

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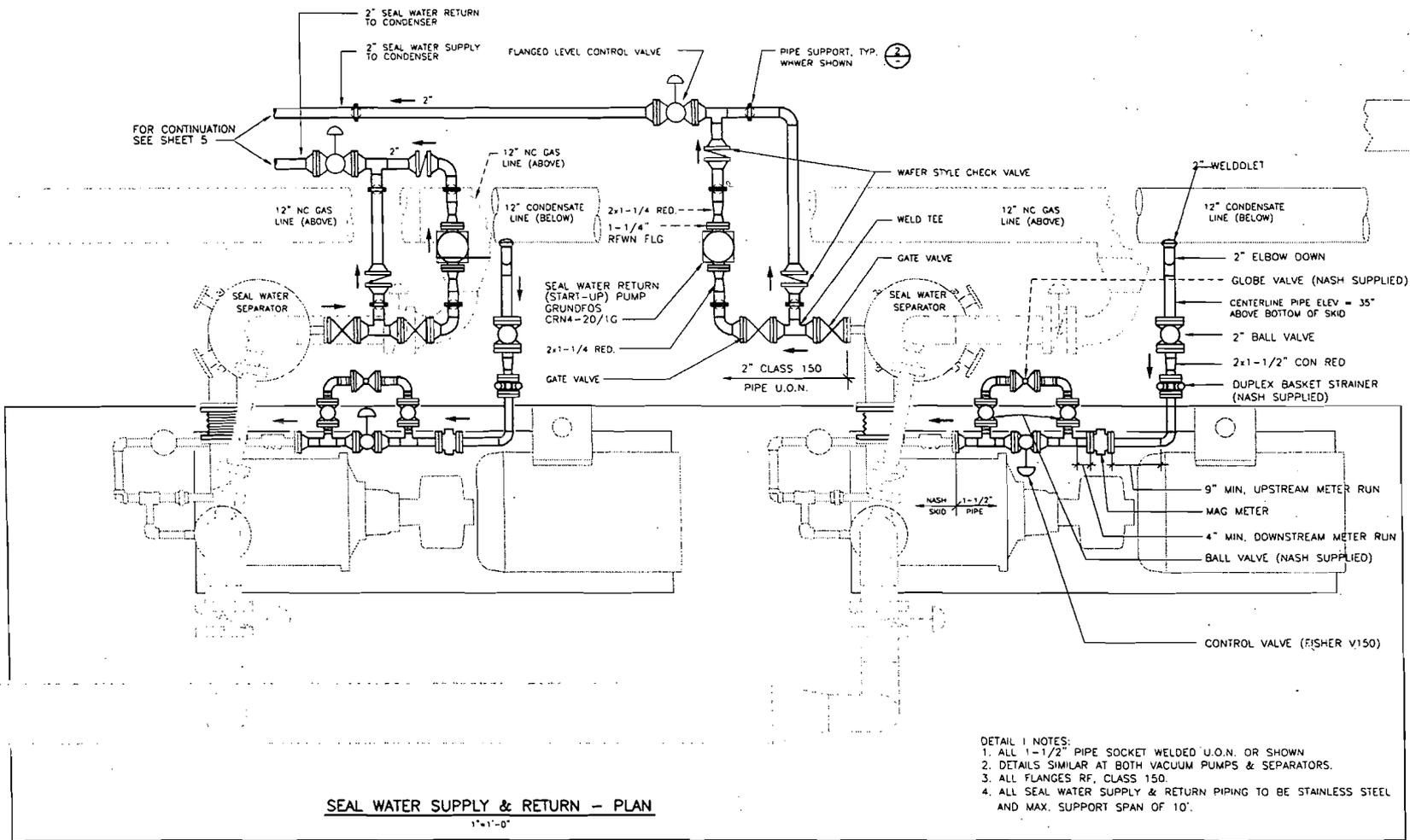
DESIGNED BY	MAP
CHECKED BY	MJK
DRAFTED BY	JCH
APPROVED BY	HOV
DATE	6/17/08
SCALE	1/2"=1'-0"

Bottle Rock Power Corporation
 COBB, CALIFORNIA

BOTTLE ROCK GEOTHERMAL POWER PLANT
 HYBRID NC GAS EXTRACTION SYSTEM

VACUUM PUMP DETAILS - 2

PROJECT NO. 253-003
 CONTRACT NO.
 CHANGE NO. 003-06
 SHEET NO. 7
 REV. NO.



- DETAIL 1 NOTES:
 1. ALL 1-1/2" PIPE SOCKET WELDED U.O.N. OR SHOWN
 2. DETAILS SIMILAR AT BOTH VACUUM PUMPS & SEPARATORS.
 3. ALL FLANGES RF, CLASS 150.
 4. ALL SEAL WATER SUPPLY & RETURN PIPING TO BE STAINLESS STEEL AND MAX. SUPPORT SPAN OF 10'.

SEAL WATER SUPPLY & RETURN - PLAN
 1"=1'-0"

NO.	REVISIONS	BY	APPR.	DATE
D	EXPANDED SHEET 7 FOR CLARITY	MKX	HCV	8/23/08
C	RE-ISSUE FOR BID	SSC	MKX	7/31/08
B	ISSUED FOR NASH REVIEW	MAP	HCV	6/21/08
A	ISSUED FOR CLIENT REVIEW	FC	HCV	6/20/08

WARNING
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DESIGNED BY	MAP
CHECKED BY	MKX
DRAWN BY	JCH
APPROVED BY	HCV
DATE	8/17/08
SCALE	1/2"=1'-0"

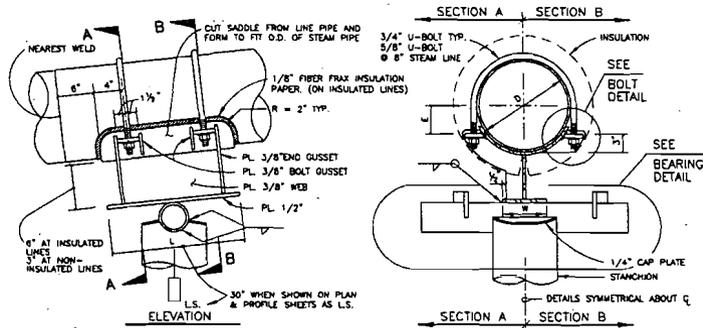
Bottle Rock Power Corporation
 COBB, CALIFORNIA

BOTTLE ROCK GEOTHERMAL POWER PLANT
 HYBRID NC GAS EXTRACTION SYSTEM

SEAL WATER SUPPLY & RETURN PLAN

PROJECT NO.	253-003
CONTRACT NO.	
CADFILE NO.	003-08
SHEET NO.	7A
REV. NO.	

A:\253\003\003-08.DWG 8/17/08

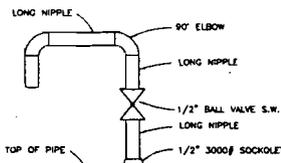
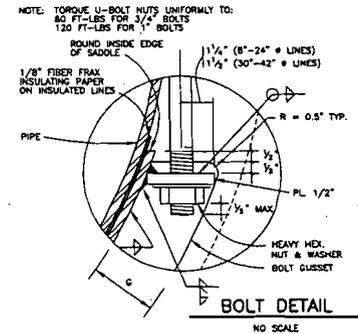
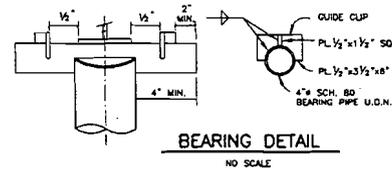


PIPE SUPPORT TYPE PS
8" - 24" PIPE
NO SCALE

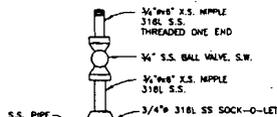
TABLE

D	8	10	12	14
W	6	6	8	8
L	18	18	18	18
E	2 1/2	3 1/4	3 3/8	3 3/4
C	2 1/4	2 1/2	2 1/2	2 1/2

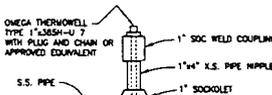
(D=NOM. DIA.) (VALUES IN INCHES)
* 30° FOR LONG SADDLE WHEN "L.S." SHOWN ON PLAN & PROFILE SHEETS



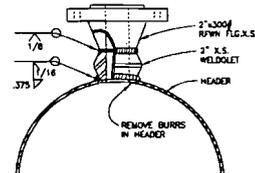
NOTE: ALL MATERIAL STAINLESS STEEL
AIR VENT DETAILS



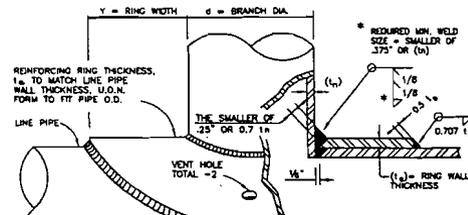
NOTE: ALL MATERIAL 316L STAINLESS STEEL
PRESSURE TAP



NOTE: ALL MATERIAL 316L STAINLESS STEEL
TEMPERATURE TAP

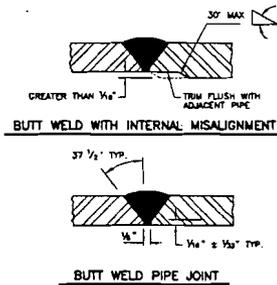


NOTE: ALL MATERIAL 316L STAINLESS STEEL
TAP CONNECTION

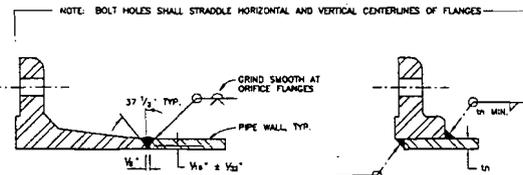


NOTE: ALL MATERIAL 316L STAINLESS STEEL
WELDED BRANCH CONNECTION

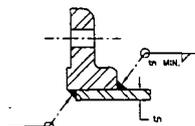
VALUES IN INCHES	
d	Y
NORMAL	
3 - 6	2-3/4
8	3-1/2
10	4-1/2
12	5-1/2
14	6-3/8
18	7-1/4
18	8-1/4
20	8-1/4
24	11-1/4
30	14-1/4
36	17-1/4



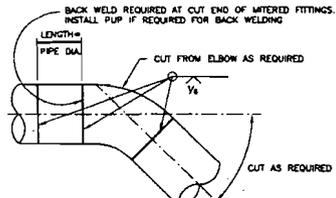
BUTT WELD PIPE JOINT



WELDING NECK FLANGE



SLIP-ON FLANGE



WELDING FITTING DETAIL
(ELBOW SHOWN - SEE SIMILAR)

NOTE: ALL MATERIAL 316L STAINLESS STEEL
PIPE WELDING DETAILS

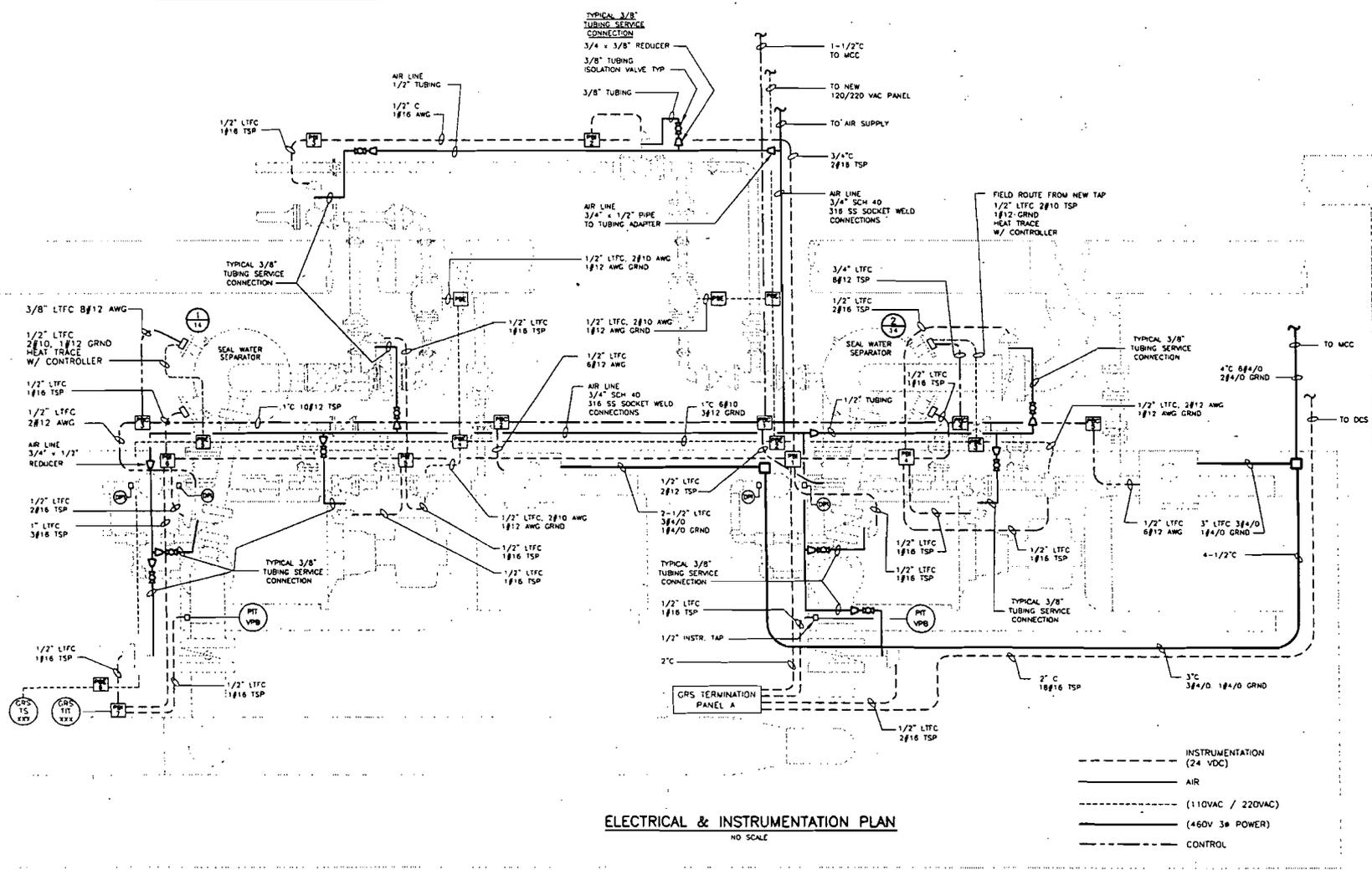
NO.	ISSUED FOR	BY	APPR.	DATE
A	ISSUED FOR BID	MAP	MOY	7/31/08
NO.	REVISIONS	BY	APPR.	DATE

VEIZADES & ASSOCIATES, INC.
CONSULTING ENGINEERS
5 THIRD STREET, SUITE 400, SAN FRANCISCO, CA 94103
TEL: 415. 394.8855 FAX: 415. 394.8866

DESIGNED BY: PSC
CHECKED BY: MAP
DRAWN BY: JCH
APPROVED BY: HOV
DATE: 8/20/08
SCALE: NO SCALE

Bottle Rock Power Corporation
COBB, CALIFORNIA
BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM
STANDARD DETAILS

PROJECT NO.: 253-003
CONTRACT NO.:
DRAWING NO.: 003-08
SHEET NO.: **8**
REV. NO.: A



ELECTRICAL & INSTRUMENTATION PLAN
NO SCALE

- INSTRUMENTATION (24 VDC)
- AIR
- (110VAC / 220VAC)
- (460V 3ø POWER)
- CONTROL

NO.	REVISIONS	BY	APPR.	DATE
A	ISSUED FOR CLIENT REVIEW	MKK	HEV	8/23/08

WARNING
IF BAR BELOW
DOES NOT
MEASURE
1 INCH
THEN DRAWING
IS NOT
TO SCALE

VEIZADES & ASSOCIATES, INC.
CONSULTING ENGINEERS
5 THRD ST/181 - SUITE 400 - SAN FRANCISCO, CA 94103
TEL: 415.394.8855 FAX: 415.394.8866

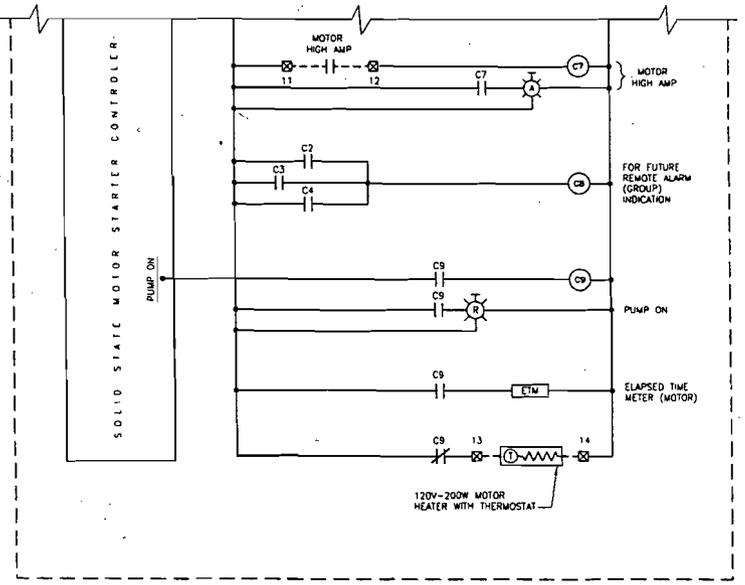
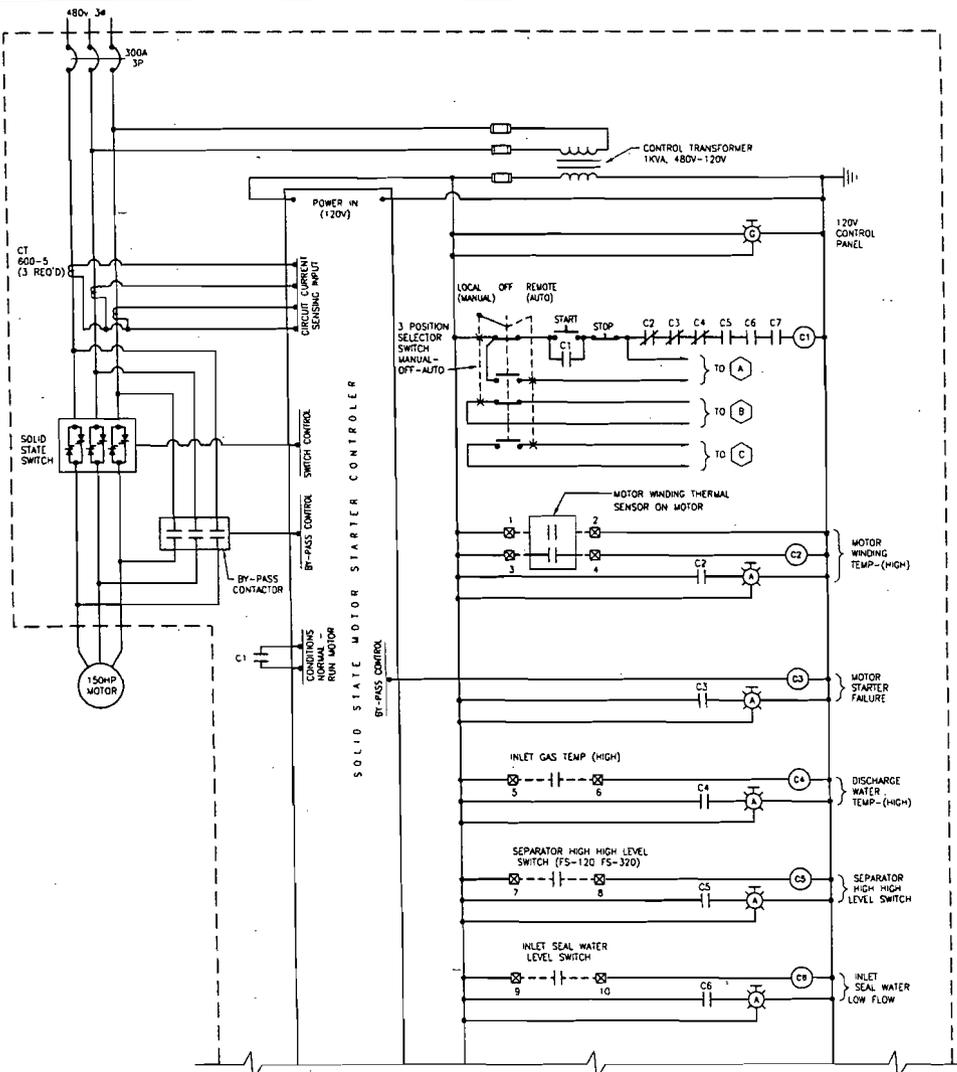
DESIGNED BY: MKK
CHECKED BY: HDV
DRAFTED BY: JCH
APPROVED BY: HEV
DATE: 8/16/08
SCALE: 1/2"=1'-0"

Bottle Rock Power Corporation
COBB, CALIFORNIA

**BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM**

VACUUM PUMP AREA ELECT. & INSTR. PLAN

PROJECT NO.: 253-003
CONTRACT NO.:
SHEET NO.: 10
REV. NO.:



NO.	ISSUED FOR CLIENT REVIEW	BY	APPR.	DATE
A	ISSUED FOR CLIENT REVIEW	MKR	HEV	8/23/08
	REVISIONS			

WARNING
IF BAR BELOW
DOES NOT
MEASURE
1/4 INCH
THEN DRAWING
IS NOT
TO SCALE

0
1 INCH

VEIZADES & ASSOCIATES, INC.
CONSULTING ENGINEERS
3 THIRD STREET SUITE 400 - SAN FRANCISCO - CA 94103
TEL 415.394.0955 FAX 415.394.9864

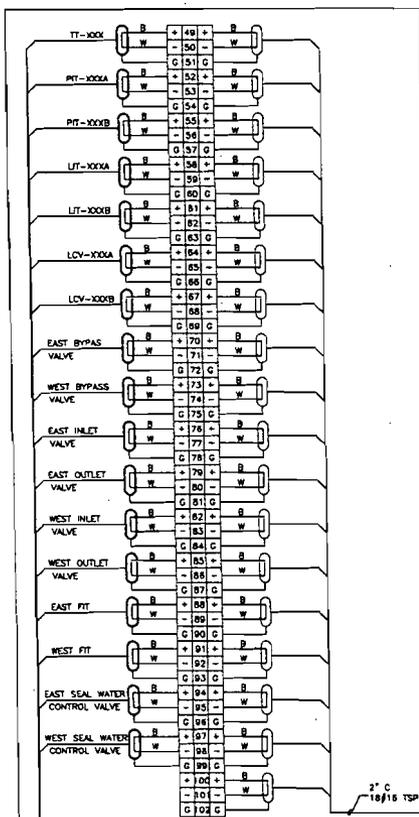
DESIGNED BY
CHK
CHECKED BY
MAP
DRAFTED BY
JCH
APPROVED BY
HOV
DATE
22/AUG/08
SCALE
NO SCALE

Bottle Rock Power Corporation
COBB, CALIFORNIA

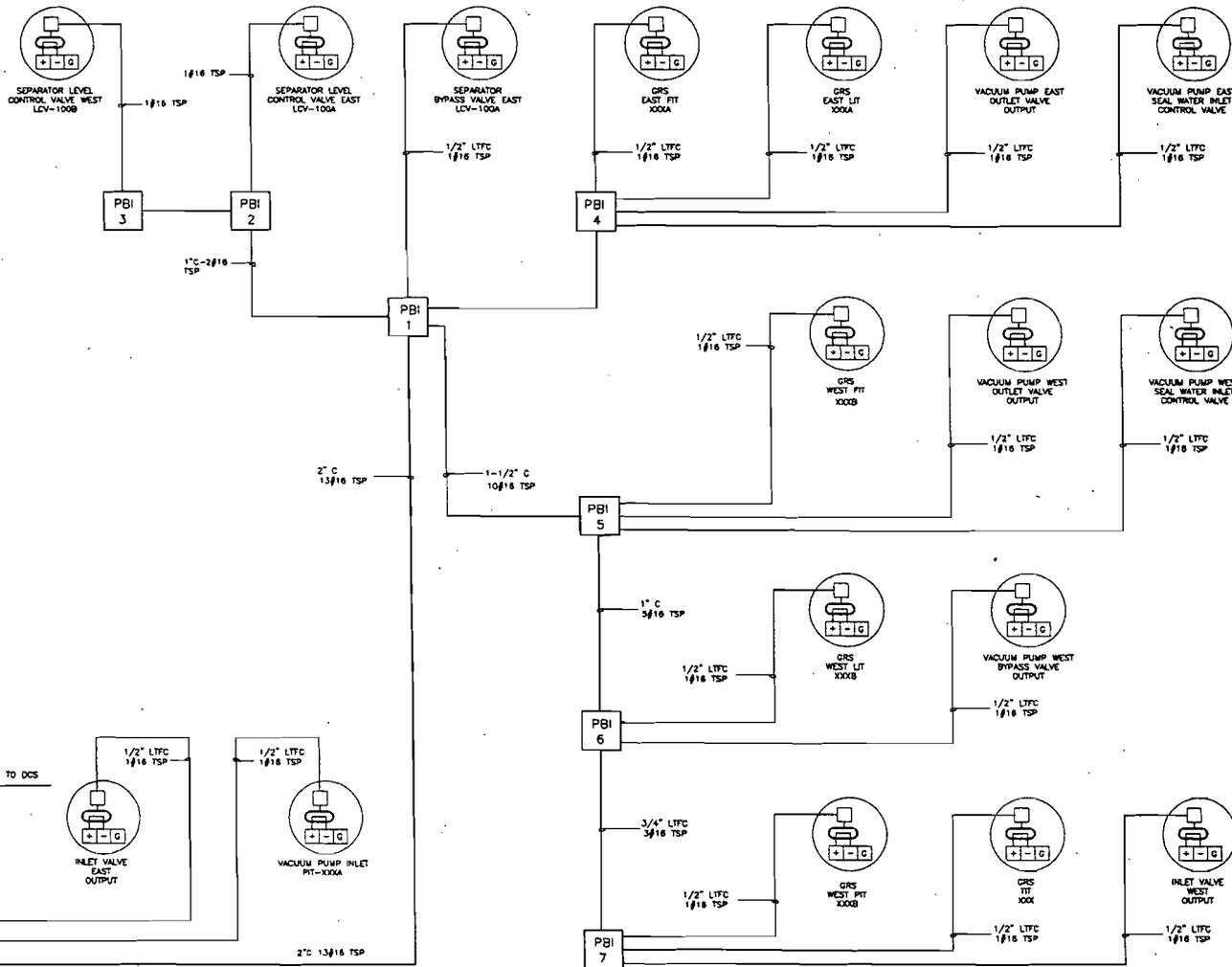
BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM

VACUUM PUMP TYPICAL CONTROLLER

PROJECT NO.
253-003
CONTRACT NO.
SCHEDULE NO.
003-18
SHEET NO.
12
REV. NO.



**TERMINAL STRIP
VACUUM PUMPS**
(EXISTING CIRCUITS NOT SHOWN)



NO.	ISSUED FOR CLIENT REVIEW	BY	CHKD	DATE
A	ISSUED FOR CLIENT REVIEW	MKK	HCY	8/23/08
	REVISIONS			

WARNING
IF BAR BELOW DOES NOT MEASURE 1 INCH THEN DRAWING IS NOT TO SCALE
0
1 INCH



VEIZADES & ASSOCIATES, INC.
CONSULTING ENGINEERS
5 THIRD STREET - SUITE 400 - SAN FRANCISCO - CA 94103
TEL: 415.394.8855 FAX: 415.394.8860

DESIGNED BY: MKK
CHECKED BY: MAP
DRAFTED BY: JCH
APPROVED BY: HCY
DATE: 8/20/08
SCALE: NO SCALE



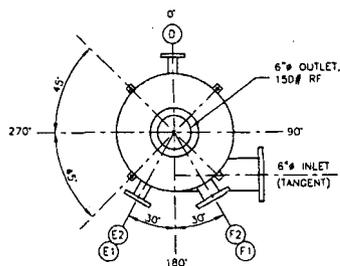
Bottle Rock Power Corporation
COBB, CALIFORNIA

**BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM**

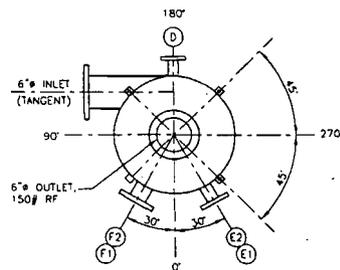
VACUUM PUMP INSTRUMENTATION

PROJECT NO. 253-003
CONTRACT NO.
CADDLE NO. 003-13
SHEET NO. **13**
REV. NO.

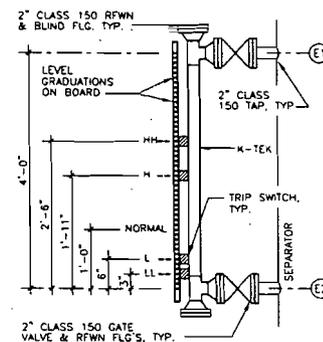
DATE: 08/23/08



PLAN VIEW (WEST PUMP)

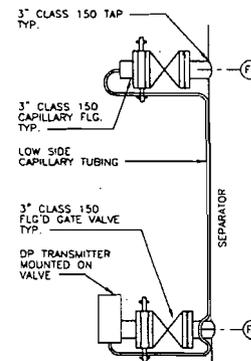


PLAN VIEW (EAST PUMP)



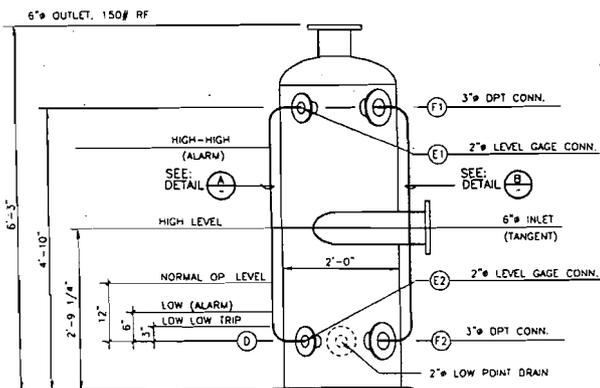
SEPARATOR LEVEL GAGE
(NOZZLES E)

DETAIL A
NO SCALE



SEPARATOR LEVEL GAGE
(NOZZLES F)

DETAIL B
NO SCALE

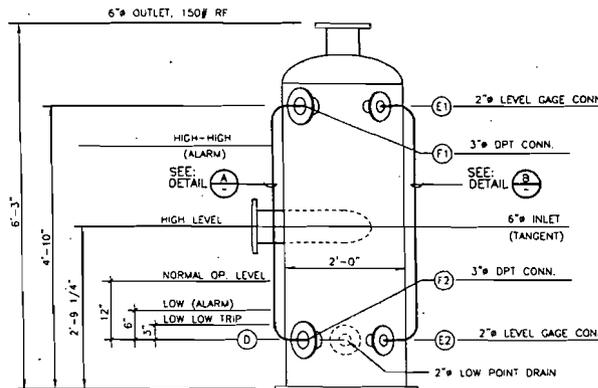


SET POINTS FOR DCS CONTROL
XL350 VACUUM PUMP
24" DIA. SEPARATOR
1"=1'-0"

XL350 SEAL WATER
NORMAL OP. FLOW = 22 GPM
MIN. FLOW (PUMP TRIP) = 15 GPM

AT WEST VACUUM PUMP

1
10



SET POINTS FOR DCS CONTROL
XL350 VACUUM PUMP
24" DIA. SEPARATOR
1"=1'-0"

XL350 SEAL WATER
NORMAL OP. FLOW = 22 GPM
MIN. FLOW (PUMP TRIP) = 15 GPM

AT EAST VACUUM PUMP

2
10

NO.	REVISIONS	BY	APPR.	DATE
A	ISSUED FOR CLIENT REVIEW	MKK	MEV	8/23/08

WARNING
IF BAR BELOW
DOES NOT
MEASURE
1 INCH
THEN DRAWING
IS NOT
TO SCALE



VEIZADES & ASSOCIATES, INC.
CONSULTING ENGINEERS

5 THIRD STREET - SUITE 400 - SAN FRANCISCO, CA 94103
TEL 415 394.8855 FAX 415 394.8866

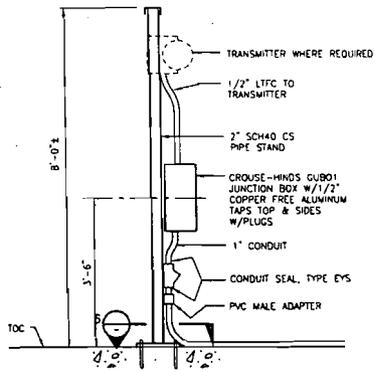
DESIGNED BY	MKK
CHECKED BY	MAP
DRAFTED BY	JCH
APPROVED BY	MEV
DATE	22/AUG/08
SCALE	1"=1'-0"

Bottle Rock Power Corporation
COBB, CALIFORNIA

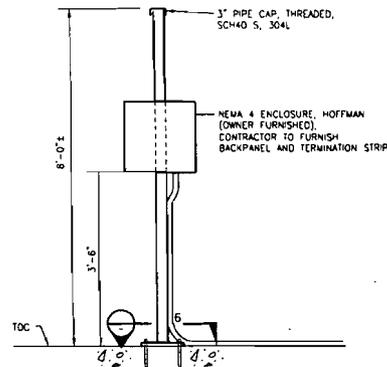
BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM

SEPARATOR LEVEL CONTROL DETAILS

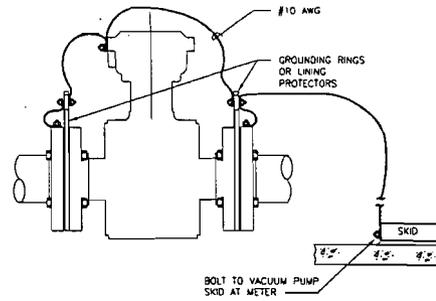
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CONTRACT NO.	
CADFILE NO.	003-18
SHEET NO.	14
REV. NO.	



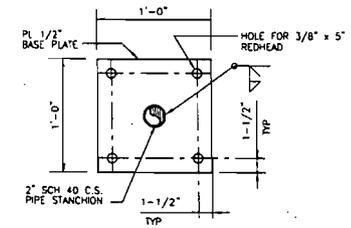
TRANSMITTER / PULLBOX STAND ①
NO SCALE



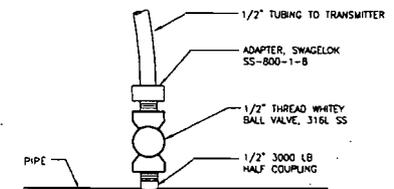
TYPICAL PANEL INSTALLATION ②
NO SCALE



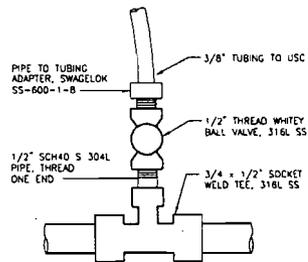
**MAGNETIC FLOWMETER
GROUNDING DETAIL** ③
NO SCALE



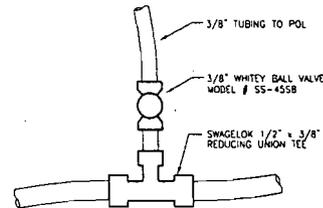
BASE PLATE DETAIL ④
NO SCALE



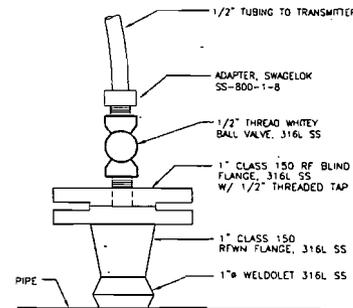
**STRAINER
DIFFERENTIAL PRESSURE TAP** ⑤
NO SCALE



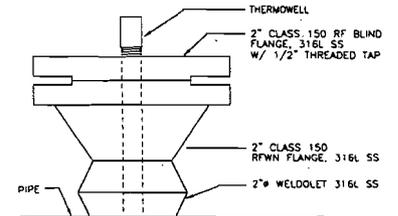
TYPICAL PIPE INSTRUMENT AIR TAP ⑥
NO SCALE



TYPICAL TUBING INSTRUMENT AIR TAP ⑦
NO SCALE



TYPICAL PRESSURE TAP ⑧
NO SCALE



TYPICAL TEMPERATURE TAP ⑨
NO SCALE

NO.	REVISIONS	BY	APPR.	DATE
A	ISSUED FOR CLIENT REVIEW	MJK	HEV	8/23/08

WARNING
IF BAR BELOW
DOTS NOT
MEASURE
1 INCH
THEN DRAWING
IS NOT
TO SCALE
0
1 INCH

VEIZADES & ASSOCIATES, INC.
CONSULTING ENGINEERS
3 THIRD STREET SUITE 400 SAN FRANCISCO, CA 94103
TEL: 415.394.8855 FAX: 415.394.8866

DESIGNED BY	MJK
CHECKED BY	MAP
DRAWN BY	JCH
APPROVED BY	HEV
DATE	8/25/08
SCALE	NO SCALE

Bottle Rock Power Corporation
COBB, CALIFORNIA

**BOTTLE ROCK GEOTHERMAL POWER PLANT
HYBRID NC GAS EXTRACTION SYSTEM**

I & C DETAILS

PROJECT NO.	253-003
CONTRACT NO.	
DRAWING NO.	003-20
SHEET NO.	15
REV. NO.	

Distributive Control System

BOTTLE ROCK POWER CORPORATION (BRPC) POWER PLANT AND STEAMFIELD CONTROL SYSTEM

Introduction

The supervisory control system originally installed at the Bottle Rock facility is at present in a non-operational state due to failed and missing equipment. The technologies utilized in the existing system are non-standard, are in general obsolete, and are severely handicapped by a lack of suitable repair parts and maintenance equipment necessary for startup and long term operations and maintenance. Other concerns include a lack of integration between the power block, gas treatment, and steam field control sub-systems, high operational manpower requirements, and in general a lack of redundancy in any of the subsystems. BRPC is recommending that a new Digital Control System (DCS) be installed that will use all of the existing measurement and control points, but will now allow these points to be viewed and controlled from either the power plant control room or from the Stretford control area.

Replacement System Criteria

Due to the aforementioned issues, a replacement control system has been designed to provide superior total project performance through tight system integration and enhanced control system algorithms, reduced operational and maintenance manpower loading by the utilization of advanced system and human machine interface (HMI) programming packages, advanced data collection, monitoring, and manipulation capabilities, continued long term hardware and software support, reduced spare parts inventory, and high overall reliability. Allen Bradley, the market share leader in PLC based automation systems, has been selected to provide the system hardware and programming software for the project. An Allen Bradley approved system integrator, Wood Group, has been contracted to engineer, construct, program, and commission the system.

System Description

The Bottle Rock control system architecture is based on Allen Bradley's ControlLogix family of automation processors. These processors are among the most advanced automation controllers available in the market today, offering a high performance control platform for multidiscipline control as well as the widest range of communication, analog, and digital I/O modules available in the industry.

The proposed system implementation for the Bottle Rock project is outlined in Figure 1. Redundant ControlLogix processors and power supplies on the turbine/generator, balance of plant, and H₂S abatement control subsystems provide bumpless switchover to the backup process assembly in the highly unlikely event of a processor or power supply failure. Communications between the processors and their associated I/O modules is accomplished using Allen Bradley ControlNet protocol, allowing high speed, deterministic bi-directional transfer of time critical data. The ControlNet protocol also

supports media redundancy to ensure continued system operation in the event of failure of one of the redundant data highways.

Communications between the Operator Interface Consoles, I/O Servers, and the processor controller systems will utilize Industrial Ethernet protocol. Industrial Ethernet provides ease of networking, seamless integration with standard IT systems, as well as a nearly endless selection of hardware and software options. Redundant I/O servers located in the Main and Stretford control rooms will allow operations personnel to perform all plant operations from either location as well as allow continued plant operation in the event of a single I/O server failure. Citech HMI software will enable all plant and wellfield process variables to be monitored, logged, and adjusted as required from any of the OIC or server workstations.

Communications between the remote wellfield control systems and the main plant control will be accomplished via encrypted wireless Ethernet. Non-redundant CompactLogix processors will be utilized as hot standby is not required, however a full complement of spares will be located on site to enable expedient system repairs if required.

Required electrical protection protective relaying will utilize modern microprocessor based equipment designed to provide adequate system protection as well as meet CAISO and PG&E system protection requirements. Redundant relays will be installed as required ensure high system availability.

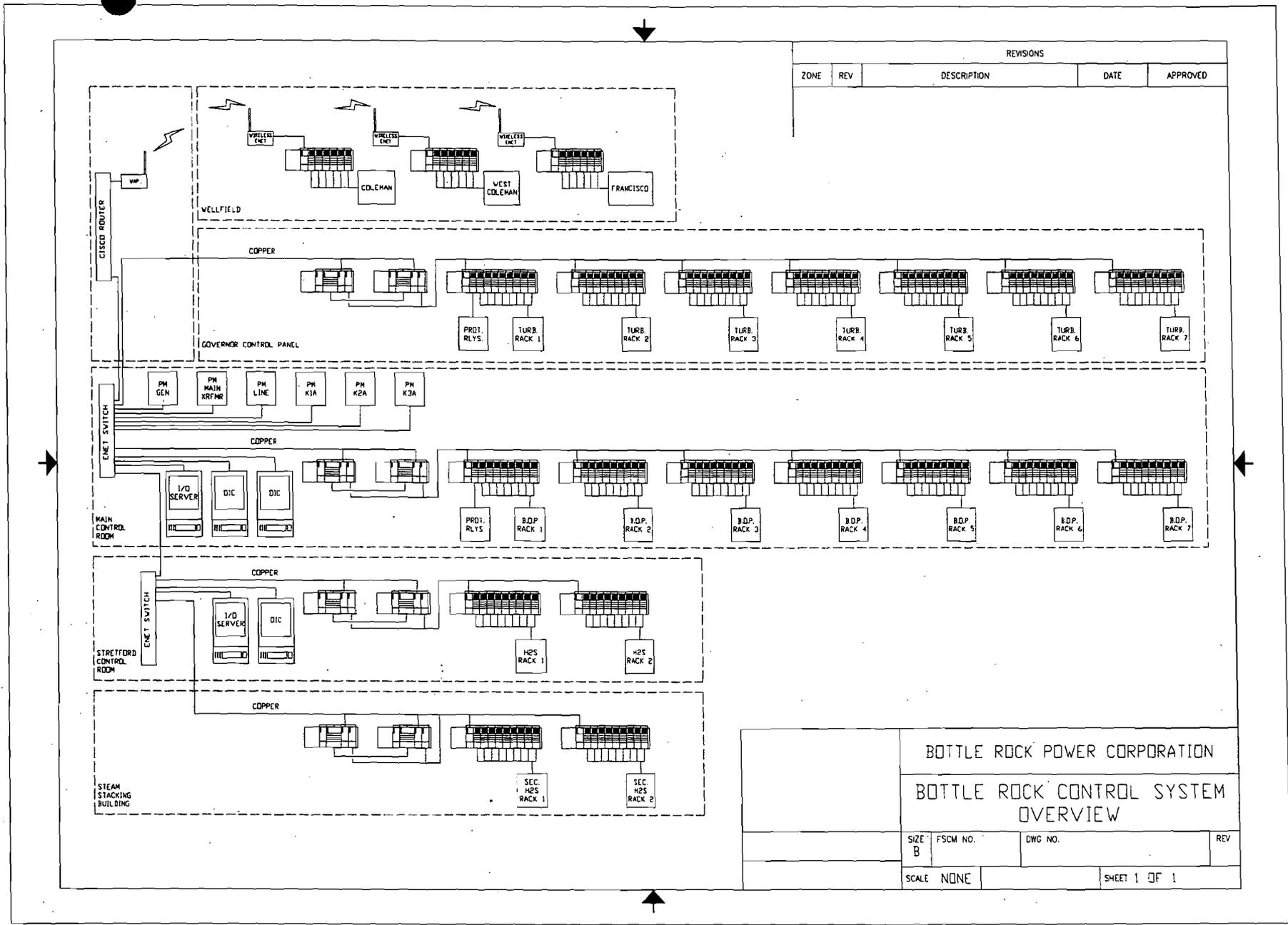


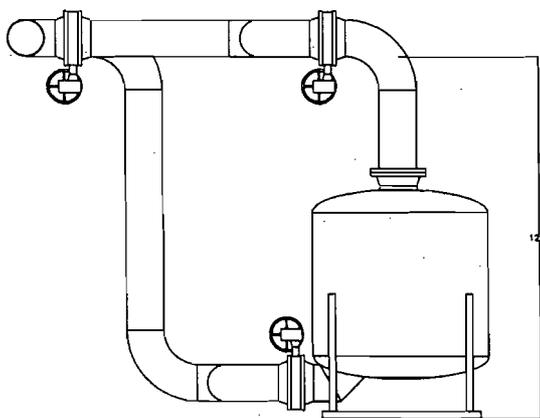
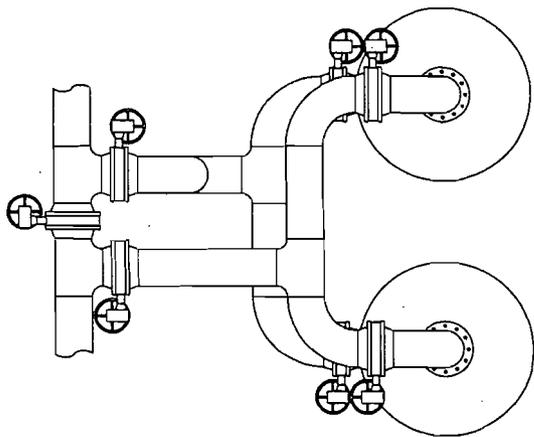
Figure 1. Control System Overview

**Mercury Vapor Filter Abatement
System**

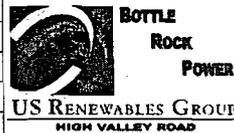
**BOTTLE ROCK POWER CORPORATION (BRPC)
STRETFORD SYSTEM MODIFICATION**

Installation of carbon filters.

The plant proposes adding one (and in the future possibly a second) 100% flow, carbon bed filters to aid in the removal of mercury from the non-condensable gas stream. The size is yet to be determined but will be approximately 120 cubic feet of carbon.

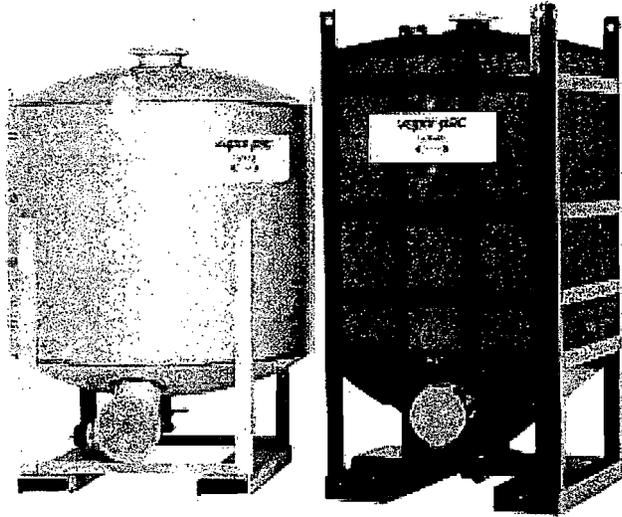


REVISIONS								REFERENCE DRAWINGS		BOTTLE ROCK POWER			
ZONE	REV	DESCRIPTION	DATE	DRN	DSGN	CKD	APPD			CARBON FILTER INSTALLATION			
	0	PRELIMINARY DESIGN	08/05/06	LEB	LEB								



SIZE	FILE NAME:	DWG NO.	REV
B	BRP-MECH-SFD-CF-001.DWG	BRP-MECH-SFD-CF-001	0
SCALE NONE		SHEET 1 OF 1	

VAPOR-PAC® Service Based Equipment



VAPOR-PAC® Stainless Steel

VAPOR-PAC® Plastic

Calgon Carbon's VAPOR-PAC® Service meets industrial needs for cost-effective removal of volatile organic compounds (VOCs) at air emission sources.

The VAPOR-PAC® Service features a small, easily transportable adsorber which contains 1,800 pounds of activated carbon. The adsorber can handle air flows up to 1,000 cfm.

Designed to remove both toxic and non-toxic VOCs, the adsorption system is especially useful for short term projects and for treatment of low volume flows that contain low to moderate VOC concentrations. Common applications include VOC removal from process vents, soil remediation vents, and air stripper off-gases.

To accommodate a wide variety of process conditions, VAPOR-PAC® adsorbers are available in two basic designs: a polyethylene model that offers excellent corrosion-resistance, and a stainless steel model that can withstand higher temperatures and slight pressure or vacuum conditions.

Calgon Carbon provides the adsorber, carbon, spent carbon handling, and carbon reactivation (after the carbon meets the company's acceptance criteria) as part of the VAPOR-PAC® Service. Ductwork and fans are the only equipment that require a capital expenditure by the user.

When carbon becomes saturated with VOCs, the system is replaced with another adsorber containing fresh carbon.

By using this unique service, users can generally achieve VOC removal and regulatory compliance objectives, minimize operating costs, and eliminate maintenance cost because the equipment is owned and maintained by Calgon Carbon.* Additionally, because organic compounds are safely destroyed through the carbon reactivation process, costs and regulations typically associated with waste disposal can be eliminated.

Please contact a Calgon Carbon Technical Sales Representative to learn more about the advantages of VAPOR-PAC® Service for your specific VOC control needs.

* Damage to VAPOR-PAC® Unit caused by negligence or misapplication is the responsibility of the user.

Features and Benefits of VAPOR-PAC® Service

- Adsorbers are specifically designed for ease of installation and operation.
- Adsorbers are available in plastic (polyethylene) and metal (stainless steel) construction to accommodate a wide variety of applications.
- Can operate in series or parallel mode or a combination of both to handle various flows and concentrations.
- System exchange eliminates on-site carbon handling.
- Recycling of spent carbon (as approved by carbon acceptance testing) eliminates disposal problems.
- Capital expenditure is eliminated since Calgon Carbon Corporation owns and maintains the equipment.

Installation Instructions

See bulletin #ES-IB1026-0305 for details on how to install a VAPOR-PAC®.

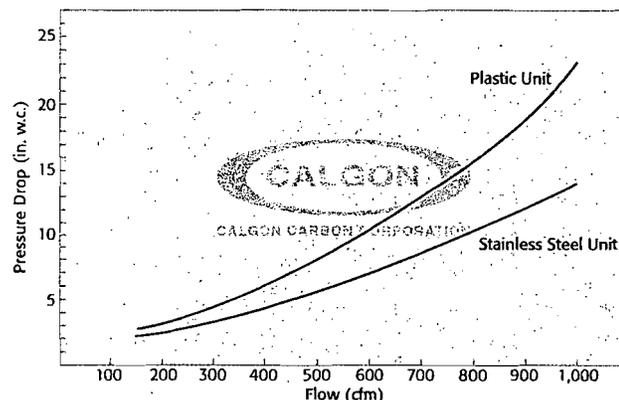
Safety Considerations

See safety bulletin #TI-006-08/94 for important safety considerations.

Optional Equipment

Inlet and outlet flange adaptors for ANSI flange or stub hose connections.

Vapor Pac Unit Pressure Drop
(upflow with 1,800 lbs., 4x10 mesh dense packed carbon)



VAPOR-PAC[®]

Service Based Equipment



VAPOR-PAC[®] (Plastic) Specifications

Vessel Dimensions	44 1/4" x 44 1/4" x 89 3/8"
Inlet & Discharge Connections	6" PS 15-69 duct flanges
Carbon Volume	60 cu. ft. (1,800 lbs.)
System Shipping Weight	Empty - 2,400 lbs., Spent - 4,200 lbs.
Temperature Rating	150° F (max)
Static Pressure Rating above Carbon Level	20" w.c. (max)
Vacuum Pressure Rating above Carbon Level	2" w.c. (max)

Materials of Construction

Vessel	Polyethylene
Frame	Epoxy coated carbon steel
Inlet Flanges, Elbow, Septum	PVC
Discharge Flange	Polyethylene
Fasteners & Bottom Valve Support Plate	Steel, plated
Sample Fittings & Sample Canister	PVC

VAPOR-PAC[®] (Stainless Steel) Specifications

Vessel Diameter	5'
Vessel Height	7' 1"
Inlet & Discharge Connections	8" PS 15-69 duct flanges
Carbon Volume	60 cu. ft. approx. (1,800 lbs.)
System Shipping Weight	Empty - 2,800 lbs., Spent - 4,600 lbs.
Static Pressure Rating above Carbon Level	15 psig
Vacuum Pressure Rating above Carbon Level	Full

Materials of Construction

Vessel	316L stainless steel
Skid and Support Frame	304 stainless steel
Inlet Flanges, Elbow, Septum	316L stainless steel
Discharge Flange	316L stainless steel
Fasteners & Bottom Valve	300 series stainless steel
Sample Fittings & Sample Canister	PVC

Caution

Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing activated carbon, appropriate sampling

and work procedures for potentially low oxygen spaces should be followed, including all applicable Federal and State requirements.

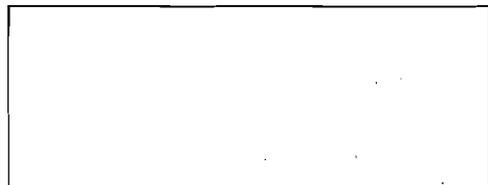


Calgon Carbon Corporation
P.O. Box 717
Pittsburgh, PA USA 15230-0717
1-800-422-7266
Tel: 412-787-6700
Fx: 412-787-6713

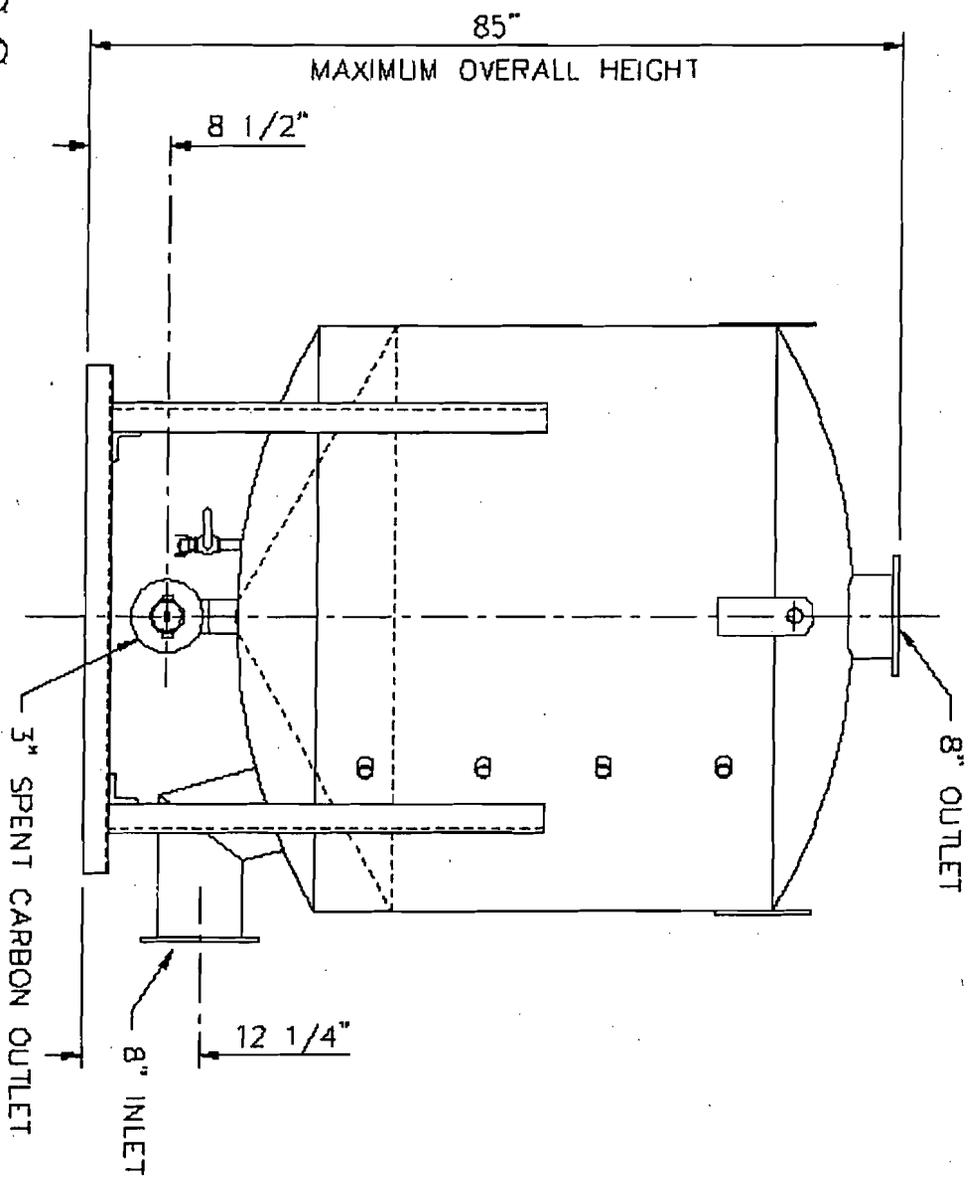
Calgon Carbon Asia
65 Chulia Street
#37-03 OCBC Centre
Singapore 049513
Tel: +65 6 221 3500
Fx: +65 6 221 3554

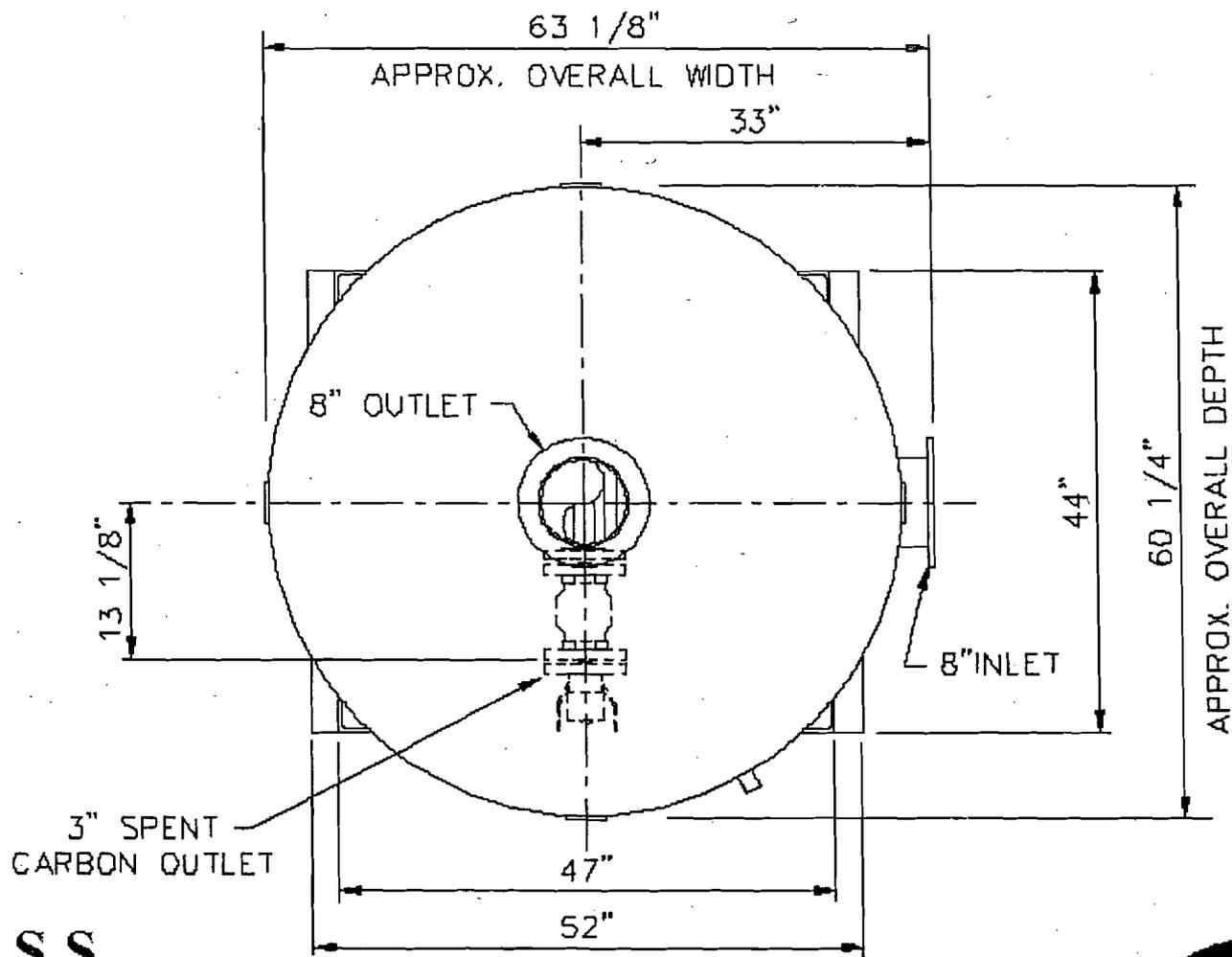
Chemviron Carbon
European Operations of
Calgon Carbon Corporation
Zoning Industriel C de Feluy
B-7181 Feluy, Belgium
Tel: + 32 (0) 64 51 18 11
Fx: + 32 (0) 64 54 15 91

Your local office



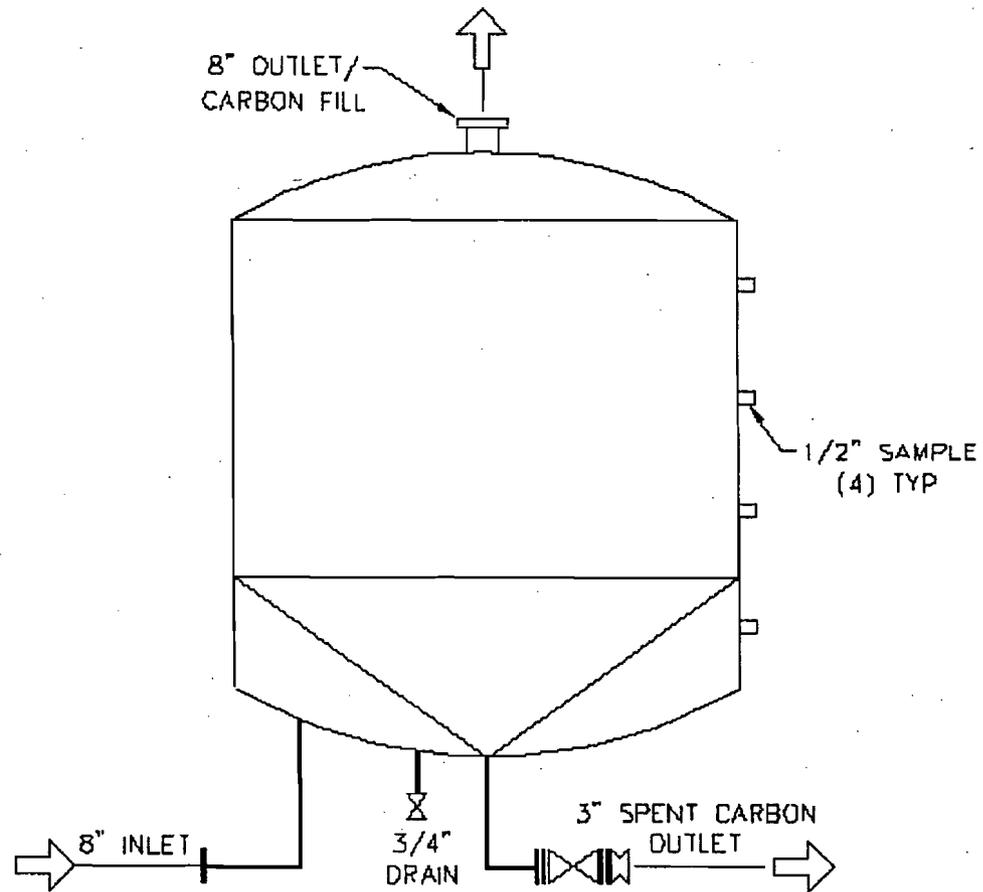
VaporPac S.S.
Elevation View





VaporPac S.S.
Plan View





VaporPac S.S.
Flow Diagram



Air Spargers to Oxidizer Tanks

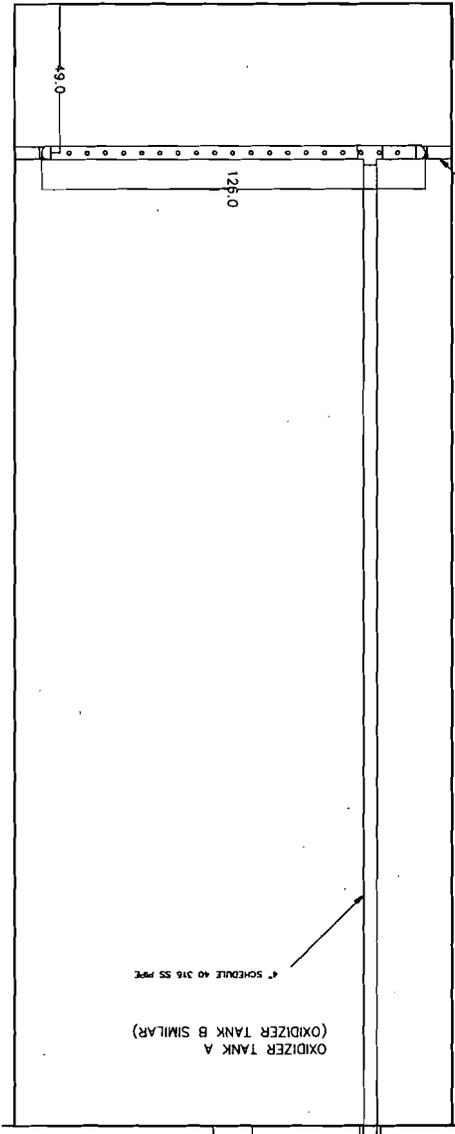
**BOTTLE ROCK POWER CORPORATION (BRPC)
STRETFORD SYSTEM MODIFICATION**

Delivery of atmospheric air to the oxidizer tanks.

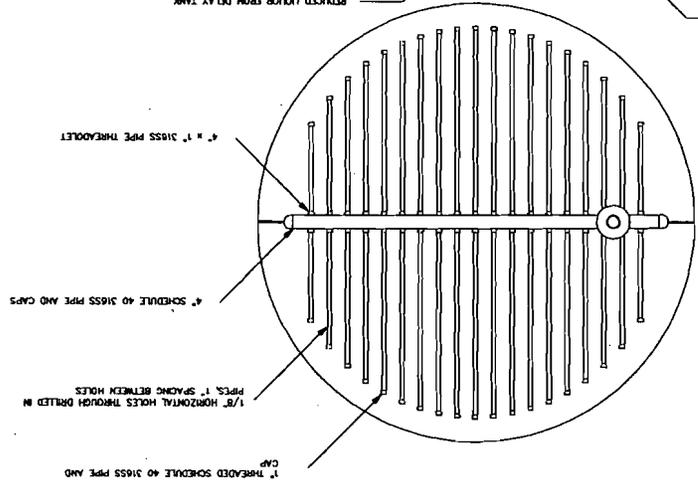
Air is currently introduced into the oxidizer tanks at four mixing venturis per tank. Atmospheric air commingles with Stretford solution that is discharging into the delay tank. The air and Stretford solution enters the delay tank about 4' off the bottom of the tank. The venturis have a tendency to plug due to small amount of elemental sulphur precipitating out at this point.

The plant proposes adding a sparging header inside each tank about 5' off the bottom. This header will deliver air more evenly and will potentially eliminate the plugging that occurs in the venturis. The original delivery system described above will remain in place and fully functional.

4" X 8" X .25" 316SS FLAT BAR WELDED TO EXISTING TANK WALL. 4" X 8" X .25" 316SS FLAT BAR WELDED TO PIPE CAPS THROUGHOUT TO CONSIST OF THREE 3/4" 316SS CAP SCREWS, NUTS, AND LOCK WASHERS.



AIR SUPPLY FROM AIR BLOWERS
 6" 150# 316SS BLIND FLANGE DRILLED FOR 4" SCHEDULE 40 316 SS PIPE
 REDUCED JOUWER FROM DELAY TANK



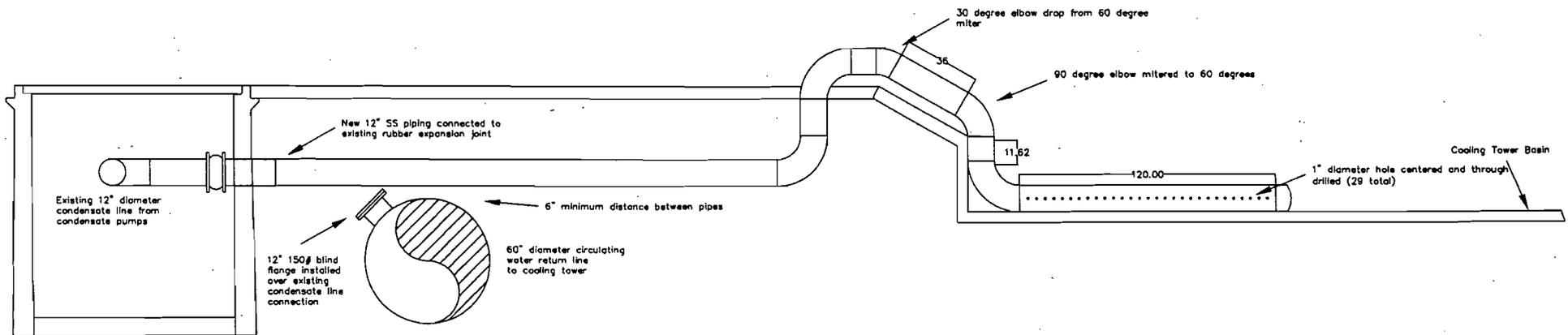
REVISIONS				REFERENCE DRAWINGS			
ZONE	REV	DESCRIPTION	DATE	DRN	DSGN	CHK	APPD
0		PRELIMINARY DESIGN	08/05/06	LEB			

BOTTLE ROCK POWER STRETTFORD OXIDIZER AIR SPARGER MODIFICATIONS			
SIZE	FILE NAME:	DWG NO.	REV
B	BRP-MECH-SFD-OX-001.DWG	BRP-MECH-SFD-OX-001	0
SCALE	NONE	SHEET	1 OF 1

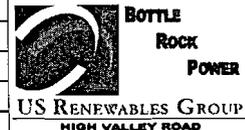
Secondary H₂S Abatement System

BOTTLE ROCK POWER CORPORATION (BRPC)
Cooling Tower Sparger

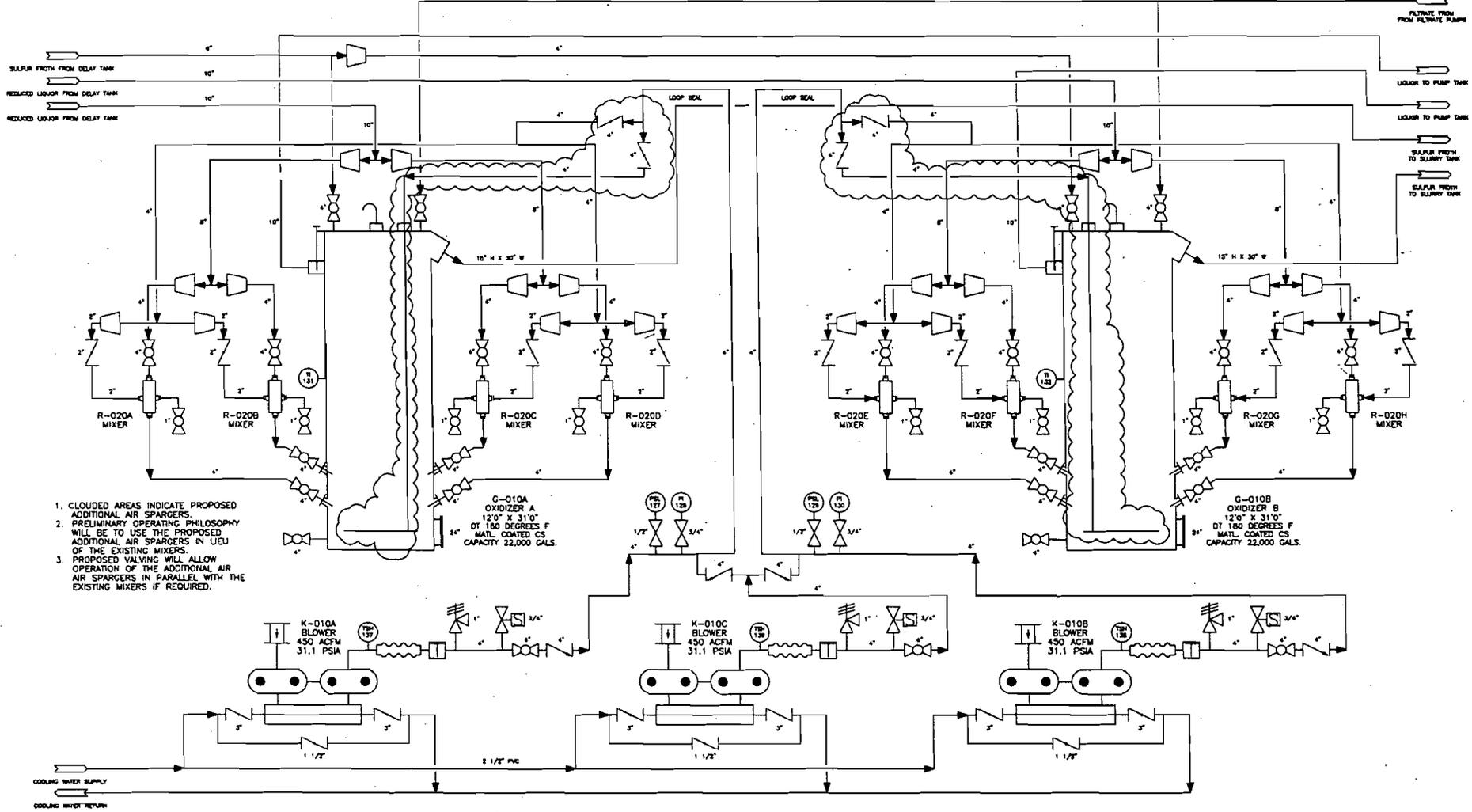
Per the request of LCAQMD the plant is submitting a design for returning hotwell condensate directly to the cooling tower basin and dispensing the condensate through a distribution header. Also, BRPC currently has multiple options for routing the condensate: (A) Commingle the condensate with the circulating water just prior to the cooling tower risers. (B) Commingle the condensate with the circulating water at the discharge of the condenser. (C) Commingle the condensate with the circulating water at the inlet to the condenser. (D) In combination with any of the above listed condensate flow paths, up to 50% of the hotwell condensate can be reinjected through a spray header into the vacuum side of the main condenser. Thus offering an additional opportunity to volatilize entrained hydrogen sulfide.



REVISIONS									REFERENCE DRAWINGS		BOTTLE ROCK POWER			
ZONE	REV	DESCRIPTION	DATE	DRN	DSGN	CKD	APPD			CONDENSATE SPARGING SYSTEM				
	0	PRELIMINARY DESIGN	08/05/06	LEB	LEB									



SIZE	FILE NAME:	DWG NO.	REV
B	BRP-MECH-CT-SPG-001.DWG	BRP-MECH-CT-SPG-001	0
SCALE NONE		SHEET 1 OF 1	



1. CLOUDED AREAS INDICATE PROPOSED ADDITIONAL AIR SPARGERS.
2. PRELIMINARY OPERATING PHILOSOPHY WILL BE TO USE THE PROPOSED ADDITIONAL AIR SPARGERS IN LIEU OF THE EXISTING MIXERS.
3. PROPOSED VALVING WILL ALLOW OPERATION OF THE ADDITIONAL AIR SPARGERS IN PARALLEL WITH THE EXISTING MIXERS IF REQUIRED.

C-010A
OXIDIZER A
12'0" X 31'0"
DT 180 DEGREES F
MATEL COATED CS
CAPACITY 22,000 GALS.

C-010B
OXIDIZER B
12'0" X 31'0"
DT 180 DEGREES F
MATEL COATED CS
CAPACITY 22,000 GALS.

K-010A
BLOWER
450 ACFM
31.1 PSIA

K-010C
BLOWER
450 ACFM
31.1 PSIA

K-010B
BLOWER
450 ACFM
31.1 PSIA

REVISIONS								REFERENCE DRAWINGS		BOTTLE ROCK POWER			
ZONE	REV	DESCRIPTION	DATE	DRN	DSGN	CKD	APPD			STRET FORD OXIDIZER UNIT A AND B P AND ID			
										SIZE	FILE NAME:	DWG NO.	REV
										B	BRP-PID-STRET-002.DWG	BRP-PID-STRET-002	1
0		PRELIMINARY DESIGN	08/30/06	LEB	LEB					SCALE NONE			SHEET 1 OF 1

