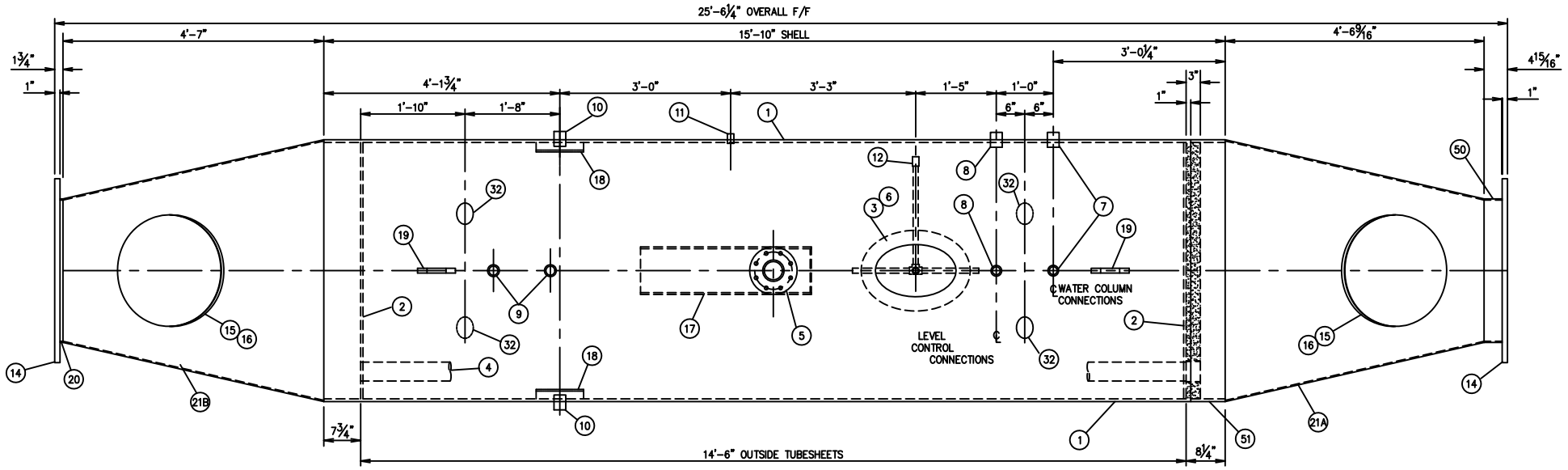
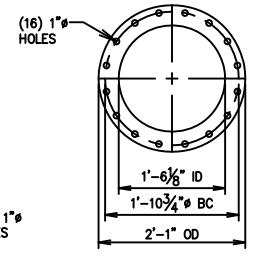
GENERAL NOTES:

1. VESSEL FROM TUBESHEET TO TUBESHEET SHALL MEET ASME REQUIREMENTSFOR UNFIRED PRESSEL VESSEL CODE. VENDOR SHALL BE HELD RESPONSIBLE THAT THE DESIGN, MATERIALS, WELDING & CONSTRUCTION MEET THE CODE REQUIREMENTS. CODE STAMP IS REQUIRED.
2. DESIGN CONDITIONS:
   A) SHELL SIDE
      1) WORKING MEDIUM – SATURATED STEAM AND FEED WATER.
      2) DESIGN PRESSURE – 200 PSIG.
      3) WORKING PRESSURE – 150 PSIG.
   B) TUBE SIDE
      1) WORKING MEDIUM – CARBON BLACK & OFF GAS FROM FURNACE TYPE REACTOR
      2) DESIGN PRESSURE – 10 PSIG.
      3) WORKING PRESSURE – 2 PSIG.
      4) DESIGN CARBON BLACK INLET TEMPERATURE – 1100° F.
3. SHOP TESTS – HYDROSTATIC TEST TO MEET CODE REQUIREMENTS.
4. PAINT – NO PAINT REQUIRED.
5. DIAGONAL BRACING
   A) BRACES WELD TO TUBESHEETS AND TO SIDE WALLS. LENGTH OF BRACES SHALL BE MINIMIZED TO PROVIDE CLEARANCE INSIDE VESSEL BUT SHALL MEET CODE REQUIREMENTS.
   B) BRACES SHALL BE SPACED TO HAVE MAX. DISTANCE OF 5.25" BETWEEN BRACES, 5.25" BETWEEN BRACES AND EDGE OF TUBE WALL AND 5.96" BETWEEN BRACES & INNER WALL OF SHELL.
6. ALTERNATES TO SPECIFIED MATERIALS REQUIRED FOR CODE REQUIREMENTS SHALL BE REVIEWED BY ORION ENGINEERED CARBONS ADEQUATE CORROSION RESISTANCE.
7. ALL FLANGE BOLT HOLES TO STRADDLE CENTERLINES.
8. CORROSION ALLOWANCE SHALL BE ⅛".
9. PROVIDE AS–BUILT DRAWING AND COPY OF CODE CALCULATIONS.
10. FERRULES WILL BE SECURED WITH THREE ONE INCH LONG WELDS EQUALLY SPACED. IF NECESSARY FOR FIT UP. THE FERRULES CAN BE WRAPPED WITH UP TO ⅛" THICKNESS OF UINFRAX 880 FIBERFRAX PAPER.

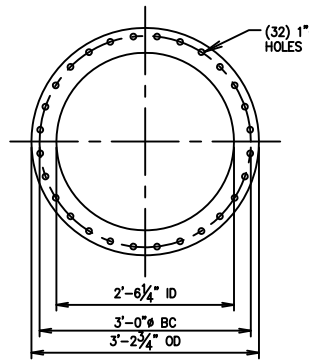
WEIGHT EMPTY:
16,100 LBS.



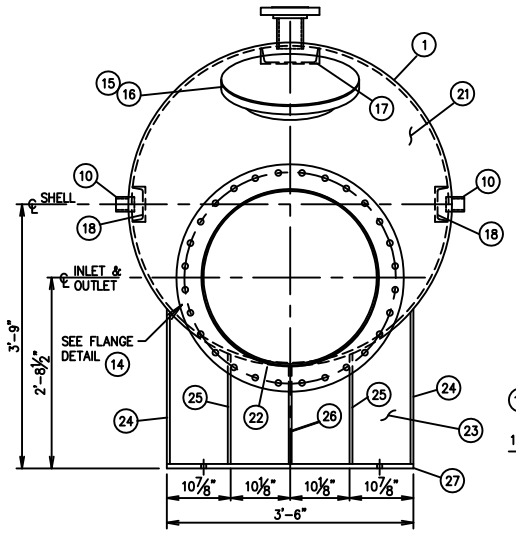
PLAN VIEW



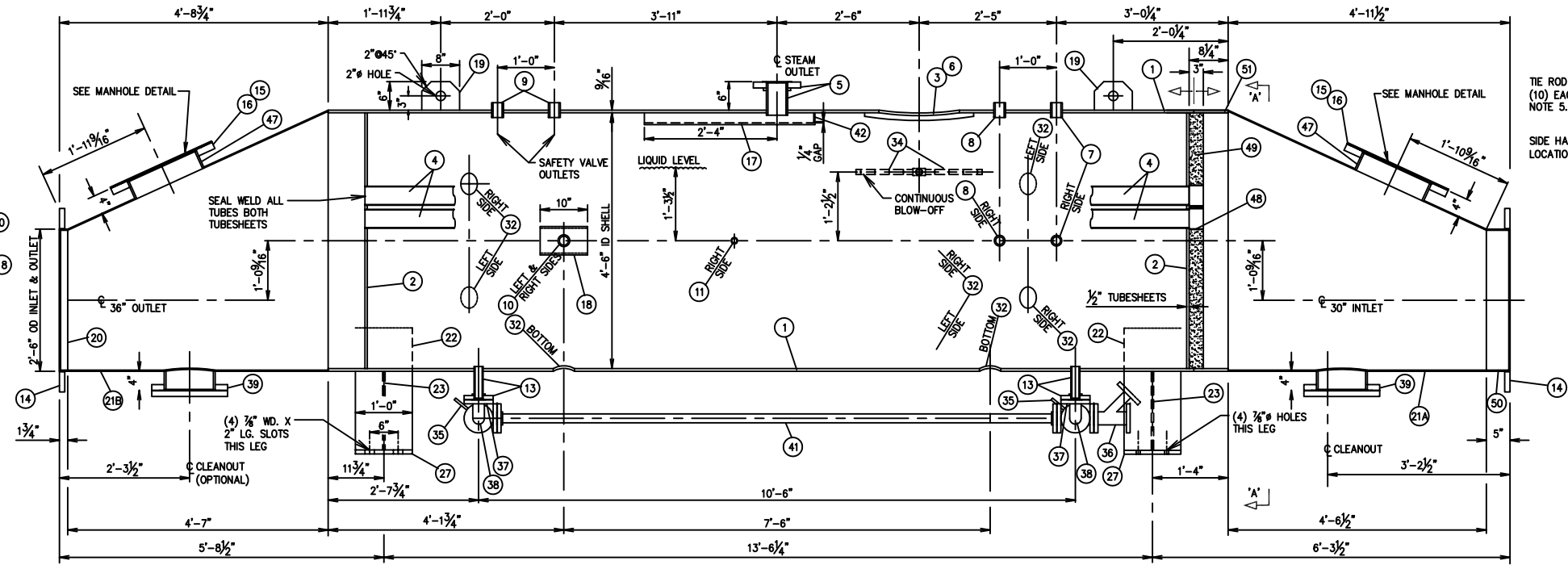
MANHOLE DETAIL



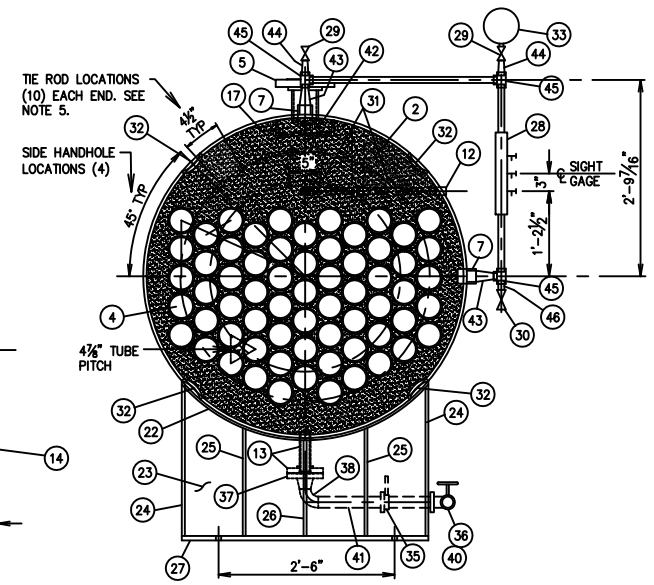
INLET/OUTLET FLANGE



OUTLET END VIEW



SIDE ELEVATION VIEW



SECTION 'A-A'

BILL OF MATERIALS		
ITEM	QTY	DESCRIPTION
1	2	⅜" SHELL PLATES: 7'–9" WD X 14'–5⅜" LONG FLANGE STEEL 55K TENSILE MIN ROLL TO 54" ID
2	2	1" TUBE SHEETS: 53⅞" OD FIREBOX STEEL 55K TENSILE MIN
3	1	MANHOLE REINFORCING RING FLANGE STEEL 55K TENSILE
4	64	4" OD TUBES X 14'–6" LG, 10 GA. .135" WALL
5	1	4" 300# FS RF FLANGE STEAM OUTLET w/SCH. 80 SMLS PIPE
6	1	12" X 16" MANHOLE ASSEMBLY
7	2	1½" 3000# THD CPLGS: WATER COL. CONNECTIONS
8	2	1½" 3000# THD. CPLG: CUSTOMERS WATER FEED CONTROL
9	2	1½" 3000# THD. CPLG: SAFETY VALVE OUTLETS 200#
10	2	1½" 3000# THD. CPLG: WATER FEED CONNECTIONS EACH SIDE
11	1	¾" 3000# THD. CPLG: CHEMICAL FEED OPENING
12	1	¾" 3000# THD. CPLG: SURFACE BLOWOFF
13	2	1½" 300# FS RF FLANGE BLOWDOWN OUTLET w/SCH. 80 SMLS PIPE
14	2	1" A–36 PLATE FLANGE 30" 125# DRILLING INLET & OUTLET SEE DETAIL
15	2	⅜ A–36 MANWAY COVERS 18" DETAIL W/BLUEGUARD GASKET
16	2	¾" A–36 PLATE FLANGE 18" MANHOLE DETAIL
17	1	C10 X 15.3# A–36 CHANNEL X 36" LG DRY PIPE
18	2	C6 X 13# A–36 CHANNEL X 10" FEED WATER BAFFLE
19	2	1" A–36 PLATE LIFTING LUGS DWG
20	2	¾" X 6¾" A–36 PLATE X 9'–5⅜" LG ROLL TO 3'–0" OD
21A	1	¾" A–36 PLATE ECCENTRIC 4'–6" X 3'–0" DIAMETERS
21B	1	¾" A–36 PLATE ECCENTRIC 4'–6" X 3'–0" DIAMETERS

BILL OF MATERIALS (CONT)		
ITEM	QTY	DESCRIPTION
22	2	⅜" A–36 PLATE X 1'–0" X 4'–0" LG SADDLE
23	2	½" A–36 PLATE X 2'–2" X 3'–6" LG SUPPORT WEB
24	4	½" A–36 PLATE X 12" X 2'–1½" LG LEGS
25	8	½" A–36 PLATE X 4" X 18⅜" LG GUSSETS
26	4	½" A–36 PLATE X 4" X 16¾" LG GUSSETS
27	2	¾" A–36 PLATE X 12" X 3'–6" LG
28	1	1½" WATER COL COMPLETE w/REFLEX GAGE GLASS
29	2	½" 600# FS THD. GATE VALVE
30	1	¾" 600# FS THD. GATE VALVE WATER COL BLOWDOWN
31	20	1½" DIAGONAL BRACES (10 EACH HEAD)
32	6	3" X 4" HANDHOLES COMPLETE
33	1	6", 0–300# PRESS GAGE ½" NPT MNPT BOTTOM CONNECTION
34	2	¾" X 12" LG PERFORATED SPARGE PIPE w/(4) ¼"ø HOLES EACH PIPE
35	2	1½" FIG #4001 EVERLASTING BLOWOFF COCKS
36	1	1½" FIG #134 JENKINS "Y" BLOWOFF VALVE
37	7	1½" 300# FS RF WN FLG
38	1	1½" SCH 80 90° LR WELD ELL
39	2	6" 150# R.F.THD. FLANGE w/BLIND FLANGE CLEANOUT
40	1	1½" SCH 80 WELD TEE
41	20'	1½" SCH 80 SMLS PIPE
42	1	½" A–36 PLATE WELD TO END OF #17 10" CHANNEL
43	2	1½" X ¾" SCH 80 CS SWAGE NIPPLE TBE
44	2	¾" X ½" SCH. 80 CS SWAGE NIPPLE TBE

BILL OF MATERIALS (CONT)		
ITEM	QTY	DESCRIPTION
45	3	¾" 3000# FS THD TEE
46	1	¾" SCH 80 CS THD CLOSE NIPPLE
47	2	⅜"A–36 PLATE ROLLED TO 18"O.D. X 3–3/4"LG.
48	64	310 S.S. SCH. 10 PIPE FERRULES
49	A.R.	GREEN LITE 45 CASTABLE
50	1	¼" X 4 ¾" 304 SS PLATE X 7'–10 ¼" LG. ROLL TO 30"O.D.
51	1	⅜" THK 304 SS SHELL PLATE: 7 ¼"WD X 14'–5 ⅜"LG ROLL TO 54"ID

ISSUED FOR CONSTRUCTION

DATE: 10/01/12

REV	DATE	DESCRIPTION	BY	APPR
				APPROVED
				DATE
3	10/01/12	ISSUED FOR CONSTRUCTION	VHP	SDS
2	7/25/12	ADDED 3' OF CASTABLE @ INLET TO SUSTAIN NEW APH HIGHER TEMPS	VP	SS
1	10–12–10	CORRECT OAL PER FLD. MEASURE,CHG'd. TUBE FROM 11 GA.	JR	SS
0	6–24–10	REDRAWN ON CAD PREVIOUS No. J–091266–1	JR	SS
B	11–21–66	RELOCATE B.O. PIPING TO RIGHT SIDE, ADD 10" CLEANOUTS		
A	11–3–66	RELOCATE WATER COLO,ADD B.O. PIPING		

PROJ/CAR 2457

LOCATION IVANHOE
UNIT 3
DRAWN BY R.K.
DATE 9–12–66
CHK'D BY N.J.
DATE 9–12–66
SCALE 3/4"=1'–0"
PLOT

orion ENGINEERED CARBONS
KINGWOOD, TEXAS

54" ID WASTE HEAT BOILER
BUR–D.P 200# PSIG – 1100° F INLET

DWG. No. 1902–MD–015 REV. 3