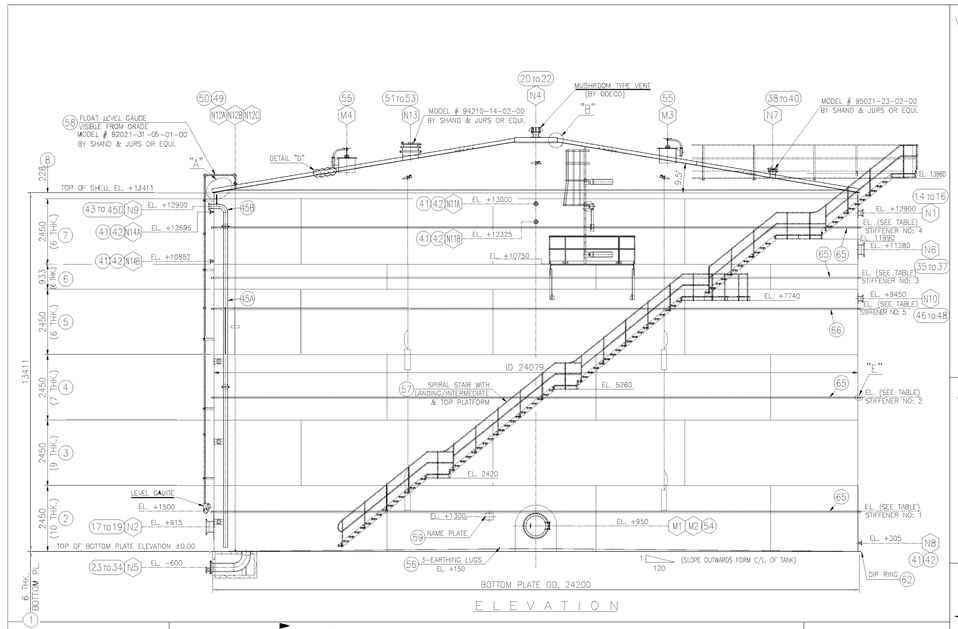
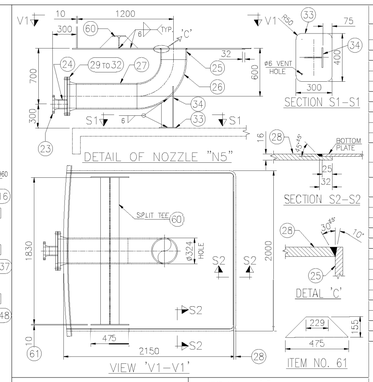
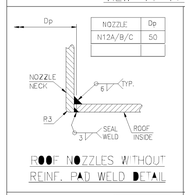
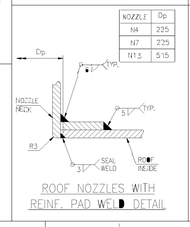
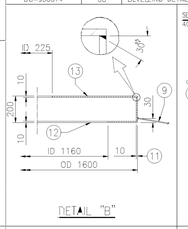
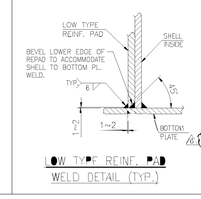


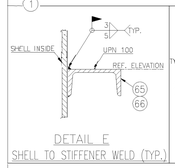


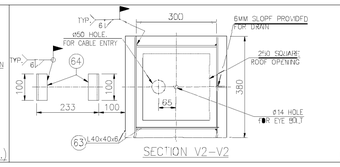


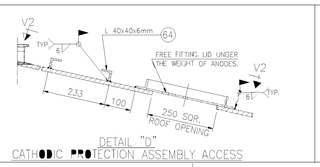


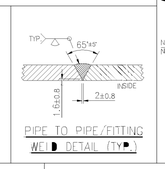












ODECO REFERENCE DRAWINGS/DOCS.

DRAWING No.	DESCRIPTION
40005-M01-02	SHELL, ROOF & BOTTOM PLATE LAYOUT FOR B25-D-0.33A
40005-M01-03	SHELL, ROOF & BOTTOM PLATE LAYOUT FOR B25-D-0.33B
40005-M01-04	SHELL & ROOF MANHOLES DETAIL
40005-M01-06	SPIRAL STAIR & PLATFORM DETAIL
40005-M01-06	SPIRAL STAIR & PLATFORM DETAIL
40005-M01-07	MISCELLANEOUS DETAILS
40005-M01-08	PIPE SUPPORTS DETAILS
40005-M01-09	NAME PLATE & BRACKET
40005-M01-10	MUSHROOM VENT DETAILS
40005-D01-01	DESIGN CALCULATIONS FOR B25-D-0.33A/B

CLIENT REFERENCE DRAWINGS/SPECS.

DWG./SPEC. No.	REV.	DESCRIPTION
BD-711029 SHT. 1 OF 1	0	DATA SHEET FOR FIRE/DRINKING WATER TANK ITEM No. B25-D-0033A/B
32-SAMSS-005	31 DEC.2003	MANUFACTURING OF ATMOSPHERIC TANKS
32-SAMSS-007	30 MAR.2005	FABRICATION OF STRUCTURAL & MISCELLANEOUS STEEL
SAES-A-007	29 DEC.2004	POSITIVE MATERIAL IDENTIFICATION
SAES-H-100	31 JUL.2004	PAINTING REQUIREMENTS FOR INDUSTRIAL FACILITIES
SAES-H-101	31 AUG.2003	APPROVED PROTECTIVE COATING SYSTEM
SAES-W-017	30 MAR.2005	WELDING REQUIREMENTS FOR API TANK
SAES-X-500	28 APR.2004	CATHODIC PROTECTION OF VESSEL & TANK INTERNALS
AA-036354	10	CATHODIC PROTECTION, WATER STORAGE TANK INTERIOR GALV. ANODE INSTALLATION
AA-036451	–	PREHEAT LEVELS FOR WELDING CARBON STEEL
AB-036003	02	MANWAY & VENTS FOR TANKS
AB-036387	03	TANK GROUNDING
AC-036501	–	CIRCUMFERENTIAL STAIRWAY FOR CONE ROOF TANKS
AD-036061	08	ROOF CENTER VENT DETAILS FOR CONE ROOF TANKS
DC-950014	00	BEVELLING DETAILS FOR API TANKS

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. FLANGE BOLT HOLES TO STRADDLE THE NORMAL HORIZONTAL & VERTICAL CENTERLINES.
3. THE FINISH OF THE FLANGES FACING SHALL BE SMOOTH FINISH 125 TO 250 AARH.
4. GASKET : GARLOCK 3123 / SSFW
5. BREAK ALL SHARP EDGES, REMOVE ALL BURRS AND WELD SPATTERS.
6. ALL REINFORCEMENT PADS FOR SHELL NOZZLES TO BE PROVIDED WITH ø1/4" NPT HOLES. THESE HOLES TO BE FILLED WITH PLASTIC SEALANT OR GREASE AFTER PRESSURE TESTING AT 15 Psig.
7. ALL NOZZLE INTERNAL NECK EDGES TO BE GROUND AT RADIUS OF 6mm MIN.
8. ALL MISCELLANEOUS PADS SHALL HAVE THEIR CORNERS ROUNDED TO A MIN. RADIUS OF 50mm.
9. PRIMED AND CAPPED STEELS SHALL NOT BE USED FOR SHELL, BOTTOM AND ROOF PLATES.
10. ALL BOLTING FOR FLANGE JOINTS SHALL BE COATED WITH A FLUROPOLYMER/CERAMIC COATING IN ACCORDANCE WITH D9-SAMSS-107.
11. SURFACE PREPARATION & PAINTING

11.1 EXTERNAL PAINTING (SHELL, ROOF, NOZZLES & DRIP RING)

a. SHELL/ ROOF	= APCS-1B	
b. NOZZLES	= APCS-1B	PLATFORMS : ALUMINUM RAL-9006
c. LADDERS/PLATFORM	= APCS-1B	RAILING COLOR : YELLOW RAL 1018
d. APPURTENANCES	= APCS-1D	CAGE LADDER : YELLOW RAL 1018
e. SURFACE PREPARATION	= SA 2-1/2 (SP10)	

f. TANK CONTENTS & NUMBER TO BE PAINTED IN BOTH ARABIC & ENGLISH AT 90° INTERVALS AROUND MID HEIGHT OF TANK SHELL. ALL LETTERING SHALL BE MIN 150 mm HIGH.

11.2 TANK BOTTOM (SOUR SIDE)
TANK BOTTOM (SOIL SIDE) AS PER APCS-3
LEAVE A MINIMUM 2.5 CM WIDE STRIP OF UNCOATED STEEL ALONG THE UNDERSIDE OF THE FLOOR PLATES CENTERED ON, AND DIRECTLY BELOW WELD SEAM.
(SEE PARA 1.5.2 OF SAES-H-001)

11.3 INTERNAL PAINTING
BOTTOM PLATE COMPLETE, ROOF UNDERSIDE & SHELL WALL FULLY PAINTED INCLUDING NOZZLES, MANHOLES & COVERS, INTERNAL PIPES, ETC. AS PER APCS-2B
(EPOXY COATING SYSTEM FOR POTABLE IMMERSION SERVICES SELF PRIMING)
TOP COAT SHADE NO / COLOUR = 50900 / LIGHT RED
PRIOR TO EPOXY LINING THE INTERNAL SURFACES SHALL BE BLAST CLEANED.

12. FABRICATION, ERECTION, WELDING, AND TESTING AS PER API 650.
13. WELDING REQUIREMENTS SHALL BE PER SAUDI ARAMCO STANDARD SAES-W-017. ALL INSIDE WELDS & EDGES TO BE SMOOTHED, ALL INSIDE SURFACES TO BE SEAL WELDED. ALL INSIDE WELDS MUST BE SMOOTH WITH NO POROSITY, HOLES, HIGH SPOTS, LUMPS OR POCKETS.
14. CATHODIC PROTECTION PER SAES-X-500.
15. THE INSIDE FILLET WELDS OF THE SHELL TO BOTTOM WELD JOINTS SHALL BE EXAMINED BY MAGNETIC PARTICLE METHOD BEFORE HYDROSTATIC TEST.
16. UPON COMPLETION OF WELDING THE TANK BOTTOM, ALL BOTTOM JOINTS INCLUDING BOTTOM TO SHELL JOINTS SHALL BE TESTED BY USING A VACUUM BOX FIT FOR THE JOINTS GEOMETRY, WITH A SOAP SOLUTION, BEFORE ANY COATING IS APPLIED. WATER SHALL NOT BE PUMPED UNDERNEATH THE BOTTOM TO DETECT LEAKS.
17. FOR NDE REQUIREMENT REFER APPENDIX T OF API 650 EDITION 98 ADD.4
18. ALL GROUNDING OF TANK TO BE DONE AS PER AB-036387-001 REV.03 (BY OTHERS)
19. REMOVE GALVANIZING OVER THE AREA OF GROUNDING LUG JOINING TO LEGS PRIOR TO WELDING.
20. SPARE PARTS :

SPARE PARTS COMMISSIONING AND START-UP
GASKET : 200%
10% STUD/2 NUTS (MIN. 2 PIECES)

21. THE GIVEN DOG IS ONLY FOR ONE TANK.
REQUIRED QUANTITY = 02
22. FLOAT LEVEL GAUGE COMPLETE INSTALLATION SHALL BE DONE BY OLAYAN.
23. ATLEAST TWO 300mm x 300mm ANODE ACCESS HATCHES TO BE PROVIDED (BY ODECO).
24. INTERNAL CATHODIC PROTECTION TO BE DONE (BY ODECO).
25. GRATING, KICK PLATE AND FASTENERS TO BE HOT DIP GALVANIZED.

STIFFENER ELEVATION TABLE

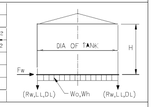
STIFFNER NO.	TANK #25-D-0033A	TANK #25-D-0033B
1	1500	1600
2	4266	4416
3	10260	10360
4	12133	12133
5	–	9206

DESIGN DATA

DESIGN CODE		API 650 10TH ED. 98, ADD.4-2005, APPENDIX F & R.
CLIENT'S SPECIFICATIONS		32-SAMSS-005
SERVICE		FIRE/DRINKING WATER
ITEM No.		B25-D-0033A/B
ROOF TYPE		EXTERNALLY STIFFENED CONE ROOF
NOMINAL CAPACITY	m^3	6064.3
NET WORKING CAPACITY	m^3	6451.34
DESIGN SPECIFIC GRAVITY		1
FILLING FLOW RATE	m^3/hr.	33.0694
DRAW OFF FLOW RATE	m^3/hr.	857.149
DESIGN PRESSURE (INT./EXT.) KPa(Psig)/KPa(Psig)		ATM
DESIGN TEMPERATURE	°C (°F)	82.22 (180)
OPERATING PRESSURE	KPa(Psig)	ATMOSPHERIC
OPERATING TEMPERATURE (MAX.)	°C (°F)	37.78 (100)
MINIMUM DESIGN METAL TEMPERATURE	°C (°F)	10° (50°)
CORROSION ALLOWANCE	mm	NIL
RADIOGRAPHY		AS PER SEC.6 OF API 650 & 32-SAMSS-005
STRESS RELIEF		NO
POST WELD HEAT TREATMENT		NO
DYE PENETRANT TEST		YES (PER SAES-W-017 PARA 16.5)
ULTRASONIC TEST		NO
MAGNETIC PARTICLE TEST		YES (PER SAES-W-017 & ASME SEC.V ARTICLE 7)
IMPACT TEST		NO
HARDNESS TEST		NO
VACUUM BOX TEST		YES (SEE NOTES)
HYDROSTATIC PRESSURE		FULL OF WATER (AS PER API 650)
TOLERANCES		AS PER API 650 PARA. 5.5 & 32-SAMSS-005
DESIGN WIND SPEED	Km/Hr (mph)	155 (96.31)
SURFACE PREPARATION & PAINTING		SEE NOTES
INSULATION		25 mm (ONLY ON ROOF) BY OTHERS
FIRE PROOFING		NO
SEISMIC ZONE		0
CATHODIC PROTECTION		INTERNAL (BY ODECO) & EXTERNAL (BY OTHERS)
INSPECTION		ODECO/CLIENT
WEIGHT FABRICATED	kgs	~13400 (INCLUDED TENTATIVE PLATFORMS & LADDER WEIGHTS)
OPERATING WEIGHT	kgs	~6238500
TEST WEIGHT (FULL OF WATER)	kgs	~6238500
P.O. NO.		017229-SC5210-04

FOUNDATION LOADING DATA

DEAD LOAD PER UNIT LENGTH	D_L	14.59 KN/m
LIVE LOAD PER UNIT LENGTH	L_L	7.33 KN/m
UNIFORM LOADING, OPERATING CONDITION	W_o	1.34.40 KN/m²
UNIFORM LOADING, HYDROSTATIC TEST CONDITION	W_h	1.34.40 KN/m²
BASE SHEAR DUE TO WIND LOAD	F_w	206.14 KN
REACTION DUE TO WIND LOAD	R_w	0.83 KN/m
MOMENT DUE TO WIND LOAD	M_w	1520.7 KN-m



* FROM THE INTERSECTION OF CENTER LINE OF NOZZLE WITH ROOF OUTER SIDE.

NOZZLE DATA

MARK NO.	QTY.	PIPE/NECK DATA: SIZE	SCH./THK.	RATING	FLANGE DATA: SIZE	SCH./THK.	THK. / OD.	SERVICE	REINF. PAD	PROJECTION FROM SHELL
M4	1	24	6 THK.	API 650	6	1150		ROOF MANWAY W/HINGE		350
M3	1	24	6 THK.	API 650	6	1150		ROOF MANWAY W/HINGE		450
M2	1	30	14 THK.	API 650	10	1545		SHELL MANWAY W/DAVIT		250
M1	1	30	14 THK.	API 650	10	1545		SHELL MANWAY W/DAVIT		250
N1-4A/B	2	2	80	CL.300	WNRF	80	N/A	N/A	LIT	150
N1,5	1	24	10 THK.	CL.150	WNRF	STD	6	1150	EMERGENCY VENT	* 300
N12A/B/C	3	1 1/2	40	CL.150	WNRF	40	N/A	N/A	LEVEL GAUGE	* 150
N11A/B	2	2	80	CL.300	WNRF	80	N/A	N/A	LIT	150
N10	1	6	80	CL.150	WNRF	80	6	400	DRAINING WATER OUTLET	200
N9	1	6	80	CL.150	WNRF	80	6	400	OVER FLOW	200
N8	1	2	80	CL.300	WNRF	80	N/A	N/A	LIT	150
N7	1	8	40	CL.150	WNRF	40	6	450	SAMPLE & GAUGE HATCH	* 200
N6	1	14	14 THK.	CL.150	WNRF	XS	6	750	MINIMUM FLOW	250
N5	1	12x4	XS/80	CL.150	WNRF	XS/80	14	855	CLEANOUT/WATER DRAW-OFF	SEE DWG.
N4	1	8	40	CL.150	WNRF	40	10	450	MUSHROOM TYPE VENT	* 200
N3	1	16	14 THK.	CL.150	WNRF	40	10	850	OUTLET W/VORTEX BREAKER	300
N1	1	6	80	CL.150	WNRF	80	6	400	INLET	200

NMR NO:

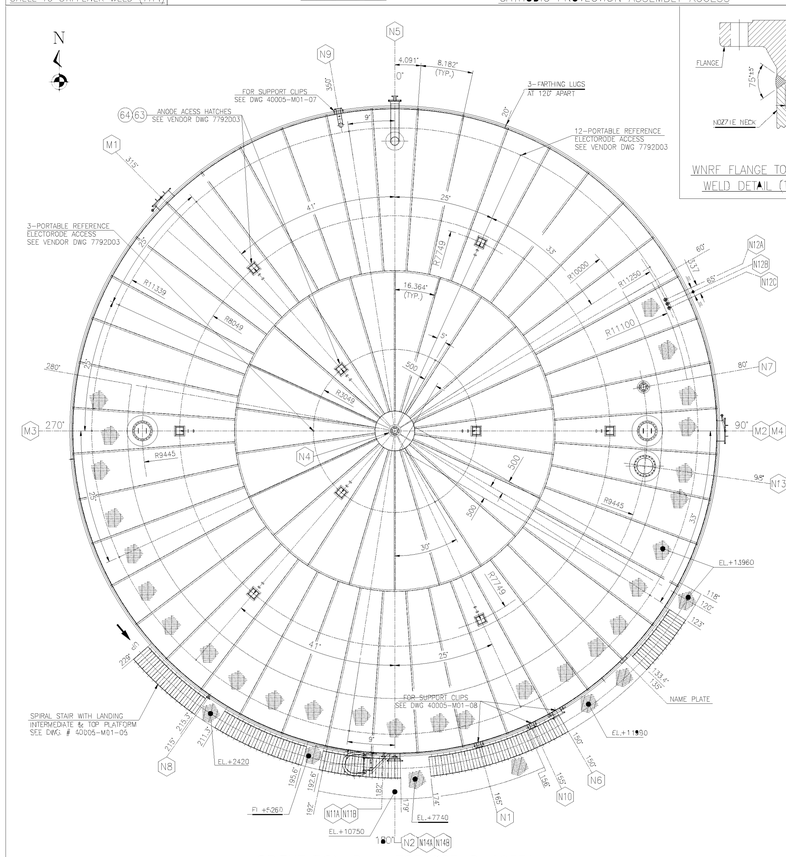
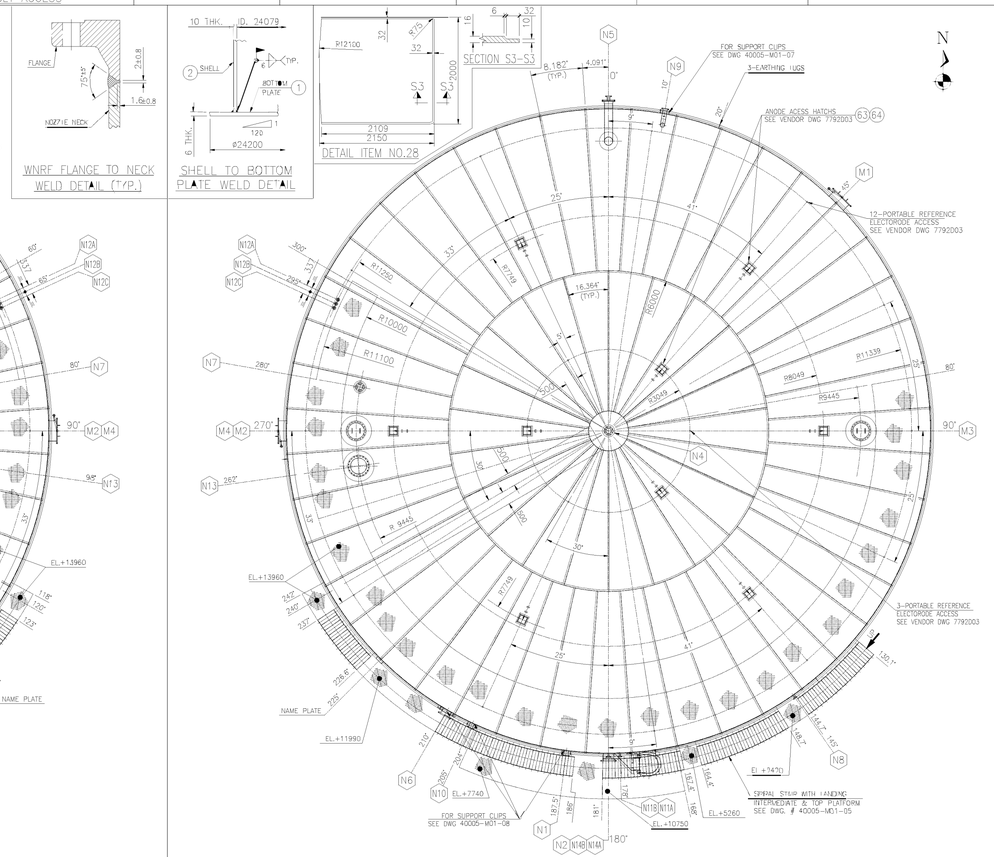
VENDOR DOCUMENT CONTROL			VENDOR DOCUMENT REVIEW
CONTRACT	RECEIVED BY	DATE	FOR CONFORMITY WITH SPECIFICATIONS AND DESIGN DRAWINGS.
–			☐A NO FURTHER SUBMITTAL REQUIRED BEFORE FABRICATION.
PURCHASE ORDER	SERIAL	SUBMISSION	☐B MODIFY AS NOTED, RESUBMIT BEFORE FABRICATION.
	-	01	☐C MODIFY AS NOTED, COMPLETE FABRICATION AND RESUBMIT.
ITEM TAG	V.D.B INDEX NO.		☐D SUITABLE COMPLETE FABRICATION AND RESUBMIT CERTIFIED AS-BUILT DOCUMENTS.
	-		☐E OTHER, AS INDICATED ON THE TRANSMITTAL.
			☐F FINAL UPON CERTIFIED AS-BUILT DOCUMENTS, NO FURTHER RESUBMITTAL (UNLESS REQUIRED BY VENDOR)
			THIS REVIEW DOES NOT RELIEVE THE FABRICATOR OF HIS RESPONSIBILITY FOR ERRORS IN THE DESIGN AND DETAILING OF CONNECTIONS/DIMENSIONS/SIZES.
	STATUS	RECEIVED BY	DATE

REV.	DESCRIPTION	DRAWN/ REVISED	CHECKED	APPROVED
10	ISSUED	DATE	DATE	DATE
9	ISSUED			
8	ISSUED			
7				
6				
5				
4				
3				
2				
1				

REVISIONS

COMPUTER REFERENCE DRAWING NUMBER :

DESIGNED:	CLIENT:
DRAWN:	PROJECT:
SCALE:	TITLE: GENERAL ARRANGEMENT OF 6000 CU.M CONICAL ROOF
DATE	WORK ORDER / DRAWING NO. / REV.

BILL OF MATERIAL

ITEM NO.	DESCRIPTION	QTY.	MATERIAL	WT.KG.	REF. DWG. & REMARKS
66	UPN 100 ~76.5 M LG.	RL	A 36	807.9	STH STIFFNER FOR 33B ONLY
65	UPN 100 ~304.5 M LG.	PL	A 36	3215.9	STIFFENER FOR BOTH TANKS
64	ANGLE 40x40x6 100 LG.	18	A 36	6.2	C.CABLE DEVICE SUPP.
63	ANGLE 40x40x6 ~12.5 M LG.	R-L	A 36	42.5	ANODE ACCESS
62	DIP RING	3	A 36	–	40005-M01-07
61	RB PLATE 10 THK. 155 x 475 LG (AS SHOWN)	2	A 36	22.8	NOZZLE N5
60	FABRICATED W16 x 13 ~1810LG.	1	A 36	35	NOZZLE N5
59	NAME PLATE WITH BRACKET DETAIL	1	–	–	DWG. 40005-M01-09
58	FLOAT LEVEL GAUGE	1	–	–	DWG. 40005-M01-07
57	STAIR, PLATFORM & ROOF HANDRAIL	–	–	–	DWG. 40005-M01-05
56	EARTHING LUGS	3	–	–	DWG. 40005-M01-07
55	NPS24 ROOF MANWAYS M3,M4 WITH DAVIT	–	–	–	DWG. 40005-M01-03
54	NPS30 SHELL MANWAYS M1,M2 WITH HINGE	–	–	–	DWG. 40005-M01-03
53	REINF. PAD 6 THK. ID. 613, OD. 1150	1	A 36	35.0	NOZZLE N13
52	PLATE 10 THK. 205 x 1885 LG.	1	A 36	30.3	NOZZLE N13
51	FLANGE NPS24 WNRF CL.150, SCH.STD	1	A 105	121.3	NOZZLE N13
50	PIPE NPS 1-1/2 SCH.40, 58 LG.	3	A 106-B	1.2	NOZZLE N12A/B/C
49	FLANGE NPS 1-1/2 WNRF CL.150, SCH.40	3	A 105	5.61	NOZZLE N12A/B/C
48	REINF. PAD 6 THK. ID. 171, OD. 400	1	A 36	4.8	NOZZLE N10
47	PIPE NPS6 SCH.80, 117 LG.	1	A 106-B	4.97	NOZZLE N10
46	FLANGE NPS6 WNRF CL.150, SCH.80	1	A 105	13.4	NOZZLE N10
450	GASKET 3 THK. x NPS.6 x CL.150	2+4	SEE NOTE 4	–	NOZZLE N9
45C	STUD BOLT WITH 2-NUTS 63/4" UNC x 100 LG.	16+4	A193-B7 / A194-2H	6.18	NOZZLE N8
45B	ELBOW 90° LR NPS6 SCH. 80	1	A 234-WPB	30.0	NOZZLE N9
45A	PIPE NPS6 SCH.80, 12165 LG.	1	A 106-B	534.0	NOZZLE N9
45	REINF. PAD 6 THK. ID. 171, OD. 400	1	A 36	4.8	NOZZLE N9
44	PIPE NPS6 SCH.80, 317 LG.	1	A 106-B	14.0	NOZZLE N9
43	FLANGE NPS6 WNRF CL.150, SCH.80	5	A 105	42.5	NOZZLE N9
42	PIPE NPS 2 SCH.80, 88 LG.	5	A 106-B	3.2	NOZZLE N11A/B/N14A/B
41	FLANGE NPS 2 WNRF CL.300, SCH.80	5	A 105	19.2	NOZZLE N11A/B/N14A/B
40	REINF. PAD 6 THK. ID. 222, OD. 450	1	A 36	5.6	NOZZLE N7
39	PIPE NPS8 SCH.40, ~173 LG.	1	A 106-B	7.35	NOZZLE N7
38	FLANGE NPS8 WNRF CL.150, SCH.40	1	A 105	18.7	NOZZLE N7
37	REINF. PAD 6 THK. ID. 368, OD. 750	1	A 36	16.0	NOZZLE N6
36	PLATE 14 THK. x 1082 x 130 LG.	1	A 36	15.4	NOZZLE N6
35	FLANGE NPS14 WNRF CL.150, SCH.XS	1	A 105	55.07	NOZZLE N6
34	FABRICATED W712 x 42 @ ~550 LG.	1	A 36	34.3	NOZZLE N5 SUPPORT
33	PLATE 12 THK. x 300 x 400	1	A 36	11.3	NOZZLE N5 SUPPORT
32	STUD BOLT WITH 2-NUTS ø7/8" UNC x 120 LG.	12+3	A193-B7 / A194-2H	2	NOZZLE N5
31	GASKET 3 THK. x NPS.12 x CL.150	1	SEE NOTE 4	–	NOZZLE N5
30	BLIND FLANGE NPS12 WNRF CL.150,	1	A 105	50	NOZZLE N5
29	FLANGE NPS12 WNRF CL.150, SCH.XS	1	A 105	41.8	NOZZLE N5
28	REINF. PLATE 16 THK. (SEE DWG)	1	A 36	31.2	NOZZLE N5
27	PIPE NPS12 SCH.XS, 757 LG.	1	A 106-B	73.6	NOZZLE N5
26	ELBOW 90° L.R. NPS12, SCH.XS	1	A 234-WPB	70	NOZZLE N5
25	PIPE NPS12 SCH.XS, 144 LG.	1	A 106-B	14.7	NOZZLE N5
24	PIPE NPS4 SCH.80, 106 LG.	1	A 106-B	2.26	NOZZLE N5
23	FLANGE NPS4 WNRF CL.150, SCH.80	1	A 105	7.85	NOZZLE N5
22	REINF. PAD 10 THK. ID. 222, OD. 450	1	A 36	8.4	NOZZLE N4
21	PIPE NPS8 SCH.40, 105 LG.	1	A 106-B	4.66	NOZZLE N4
20	FLANGE NPS8 WNRF CL.150, SCH.40	1	A 105	18.7	NOZZLE N4
19	REINF. PAD 10 THK. ID. 409, OD. 850	1	A 36	34.2	NOZZLE N2
18	PLATE 14 THK. x 1241 x 185 LG.	1	A 36	25.2	NOZZLE N2
17	FLANGE NPS16 WNRF CL.150, SCH.40	1	A 105	67.94	NOZZLE N2
16	REINF. PAD 6 THK. ID. 171, OD. 400	1	A 36	4.8	NOZZLE N1
15	PIPE NPS6 SCH.80, 117 LG.	1	A 106-B	4.97	NOZZLE N1
14	FLANGE NPS6 WNRF CL.150, SCH.80	1	A 105	12.62	NOZZLE N1
13	RING 10 THK. x OD 1600 x ID 225	1	A 36	154.7	COMP. RING
12	RING 10 THK. x OD 1600 x ID 1160	1	A 36	74.8	COMP. RING
11	PLATE 10 THK. x 180 x 4995 LG.	1	A 36	70.6	COMP. RING
10	COMPRESSION PLATE 12 THK. (AS SHOWN)	1	A 36	4115	DWG. 40005-M01-03/03
9	ROOF PLATE 6 THK. (AS SHOWN)	1	A 36	19905	DWG. 40005-M01-02/03
8	PLATE 12 THK. x 228 x 75665 LG.	1	A 36	1625	DWG. 40005-M01-02/03
7	SHELL PLATE 6 THK. x 2450 x 75665 LG.	1	A 36	8731.3	DWG. 40005-M01-02/03
6	SHELL PLATE 6 THK. x 833 x 75665 LG.	1	A 36	3325	DWG. 40005-M01-03/03
5	SHELL PLATE 6 THK. x 2450 x 75665 LG.	1	A 36	8731.3	DWG. 40005-M01-02/03
4	SHELL PLATE 7 THK. x 2450 x 75668 LG.	1	A 36	10186.9	DWG. 40005-M01-02/03
3	SHELL PLATE 9 THK. x 2450 x 75675 LG.	1	A 36	13098.7	DWG. 40005-M01-02/03
2	SHELL PLATE 10 THK. x 2450 x 75678 LG.	1	A 36	14554.7	DWG. 40005-M01-02/03
1	BOTTOM PLATE 6 THK. ø24200	1	A 36	21664.2	DWG. 40005-M01-02/03