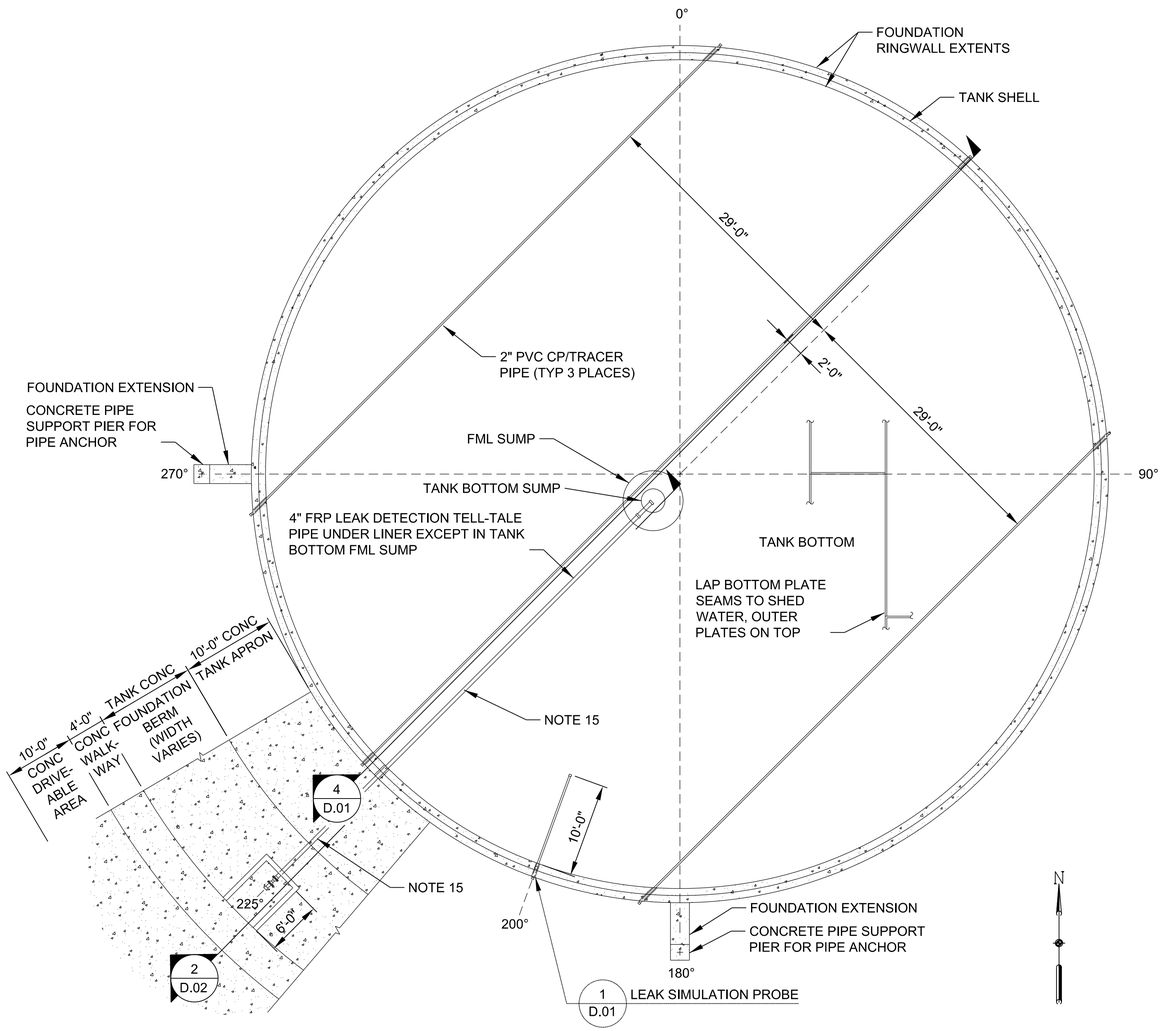
40,000 BBL TANK NOZZLE/EQUIPMENT SCHEDULE

ITEM	DESCRIPTION	SIZE (IN)	ANGLE (DEGREES)	DISTANCE (NOTE 1)	DETAIL SHOWN (DETAIL/SHEET)	NOTES
A	ISSUE	24	270	2'-¾"	4/D.08	4, 5, 10
B	FILL	18	180	1'-6¾"	1/D.08	4, 5, 10
C	LOW SUCTION	4	-	2'-¾"	5/D.07, 1/D.10	5, 13
D	WATER DRAW-OFF	2	-	1'-11¾"	3/D.07, 1/D.10, 5/D.13	9, 13
E	PRODUCT RETURN	2	260	7"	5/D.13	
F	SHELL MANHOLES (LOWER)	36	-	3'-6"	3/D.10, 6/D.10	2, 17
G	SHELL MANHOLE (UPPER)	36	167	9'-9"	3/D.10, 6/D.10	6, 17
H	ATG GAUGE WELL	10	231	41'-6"	4/D.07	16
I	ATG WATER PROBE WELL	8	225	3'-3"	3/D.07	8
J	MECHANICAL TAPE LEVEL GAUGE	1½	137	-	1/D.07	
K	LOW & LOW-LOW LEVEL ALARM NOZZLES	1	217	X'-X", X'-X"	1/D.12	
L	HIGH & HIGH-HIGH LEVEL ALARM AND HLV NOZZLES	1	217	X'-X", X'-X"	2/D.12	7
M	SAMPLE GAUGE WELL	10	239	41'-6"	2/D.07	16
N	ROOF MAHOLE/LADDER HATCH	36 X 48	247	38'-6"	3/D.09	
O	CENTER ROOF VENT	24	-	-	2/D.09	
P	CIRCULATION VENT/INSPECTION HATCHES	18 X 24	36, 108, 180, 252, 324	-	1/D.09	
Q	OVERFLOW/CIRCULATION VENT	12 X 36	0, 36, 54, 72, 108, 324	44'-0"	6/D.07	12
R	PAN INSTALLATION HATCH	-	45	-	-	3
S	SUMP	30	225	4'-0"	5/D.07	
T	GROUNDING LUGS	3 X 3 X ⅜	18, 108, 198, 288	1'-0"	3/D.14	
U	FLOATING PAN LOW LEG LEVEL	-	-	3'-11"	-	11
V	SCAFFOLD CABLE SUPPORTS	-	135, 315	6'-0"	-	
W	SHELL CIRCULATION VENTS	-	144, 216, 288	52'-8"	6/D.07	



40,000 BBL TANK BOTTOM, FOUNDATION, AND INTERSTITIAL PIPING PLAN

SCALE: ⅛"=1'-0"

0 4' 8' 16'

NOTES:

1. DISTANCE VALUES SHOWN ON TABLE FOR SHELL NOZZLES ARE AS MEASURED FROM THE BOTTOM OF THE SHELL TO THE CENTERLINE OF SHELL NOZZLES. DISTANCE VALUES SHOWN ON TABLE FOR ROOF NOZZLES ARE AS MEASURED FROM THE CENTER OF THE TANK TO THE CENTERLINE OF ROOF NOZZLES. DISTANCE VALUE SHOWN ON TABLE FOR TANK BOTTOM SUMP IS MEASURED FROM THE CENTER OF THE TANK TO THE CENTERLINE OF THE SUMP.

2. ALIGN LOWER SHELL MANHOLES 180° APART AND PARALLEL WITH PREVAILING WINDS.

3. PROVIDE A PAN INSTALLATION HATCH ON THE FIXED ROOF IN ACCORDANCE WITH THE PAN MANUFACTURER'S REQUIREMENTS.

4. SIZE OF FILL AND ISSUE NOZZLES AND PIPING MUST BE DETERMINED BY THE DESIGNER. REFER TO UFC 3-460-01 FOR DESIGN FLOWRATES WHEN SIZING TANK PIPING.

5. ADJUST SIZE OF FILL, ISSUE AND LOW SUCTION NOZZLES TO SUIT SITE CONDITIONS SUCH AS DISTANCE TO PUMPS AND OPERATIONAL REQUIREMENTS.

6. LOCATE UPPER SHELL MANHOLE 3'-6" ABOVE UPPER SURFACE OF FLOATING PAN AT HIGH LEG POSITION.

7. HIGH LEVEL SHUT-OFF VALVE FLOAT PILOT ASSEMBLY, AS WELL AS HIGH AND HIGH-HIGH LEVEL ALARM SENSORS, SHALL BE ACCESSIBLE FROM SPIRAL STAIRWAY INTERMEDIATE PLATFORM.

8. MOUNT THE 6" ATG WATER PROBE WELL OVER THE TANK BOTTOM SUMP THROUGH AN 8" FLANGED ROOF NOZZLE PER THE INDICATED DETAILS.

9. THE 2" WATER DRAW-OFF NOZZLE SHOWN IN THIS STANDARD IS BASED ON THE SMALLEST DOUBLE BLOCK AND BLEED VALVE AVAILABLE AT THE TIME THIS STANDARD WAS WRITTEN. FOR TANKS THAT ARE EXPECTED TO RECEIVE A MINIMUM AMOUNT OF WATER AND EXPECTED TO PRODUCE MINIMUM CONDENSATE, PROVIDE INTERNAL WATER DRAW-OFF PIPING REDUCED TO 1" SIZE NEAR THE INTERNAL NOZZLE FLANGE TO LIMIT THE AMOUNT OF WATER THAT IS RETAINED IN THE INTERNAL PIPING.

10. THE ELEVATION OF FILL AND ISSUE NOZZLE SIZES 12" AND LARGER SHALL BE AS LOW AS ALLOWED BY API STD 650 USING LOW TYPE REINFORCING PLATES. FILL AND ISSUE NOZZLE SIZES SMALLER THAN 12" SHALL BE AS LOW AS ALLOWED BY API STD 650 USING REGULAR TYPE REINFORCING PLATES.

11. FLOATING PAN LOW-LEG LEVEL SHALL PROVIDE A MINIMUM OF 6" CLEARANCE FROM THE TOP OF ANY INTERNAL NOZZLE FLANGE TO THE BOTTOM OF THE FLOATING PAN.

12. PROVIDE AT LEAST ONE OVERFLOW FOR EVERY 1200 GPM OF RECEIPT. DO NOT LOCATE OVERFLOWS OVER STAIRS OR SHELL NOZZLE ISOLATION VALVES. WHERE THE PATTERN OF ROOF PERIMETER CIRCULATION VENTS WOULD RESULT IN AN OVERFLOW/CIRCULATION VENT OVER PRODUCT PIPING OR THE STAIRWAY, PROVIDE A SHELL CIRCULATION VENT CONSTRUCTED SIMILAR TO AN OVERFLOW CIRCULATION VENT BUT 1'-0" HIGHER IN ELEVATION AT THAT LOCATION AND ENSURE THE REMAINING OVERFLOWS ARE ADEQUATE.

13. INSTALL LOW SUCTION AND WATER DRAW-OFF NOZZLES PARALLEL TO THE ISSUE NOZZLE.

14. ALL SHELL AND ROOF NOZZLES SHALL BE FLANGED UNLESS OTHERWISE INDICATED.

15. INTERSTITIAL PIPING FOR ELEVATED TANK FOUNDATION IS SHOWN, FOR NON-ELEVATED TANK BOTTOM, FOUNDATION, AND INTERSTITIAL PIPING PLAN, SEE 3/D.01.

16. MOUNT THE 8" ATG AND SAMPLE GAUGE WELLS THROUGH 10" FLANGED ROOF NOZZLES PER THE INDICATED DETAILS.

17. THE MAXIMUM DISTANCE FROM THE SHELL MANHOLE REINFORCING PLATE TO THE BACKSIDE OF THE MANHOLE FLANGE, AS MEASURED HORIZONTALLY ON THE VERTICAL CENTERLINE, SHALL NOT BE MORE THAN 6".

SYM	DESCRIPTION	DATE	APPR

NAVFAC

US ARMY CORPS OF ENGINEERS OMAHA DISTRICT

SEAL

A/E INFO

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO

DES MSO | DRW MHK | CHK WVB

SUBMITTED BY:

DATE: APRIL 2015

NAVAL FACILITIES ENGINEERING COMMAND – ALANTIC

DOD STANDARD DESIGN AW78-24-27

FUEL TANKS WITH FIXED ROOFS ABOVEGROUND VERTICAL STEEL

40,000 BBL TANK NOZZLE SCHEDULE & INTERSTITIAL PIPING PLAN

SCALE: AS NOTED

EPROJECT NO.: XXXXX

CONSTR. CONTR. NO. XXXXX

NAVFAC DRAWING NO. XXXXX

SHEET 38 OF 57

40.02

DRAWFORM REVISION: 10 MAY 2014