

GENERAL NOTES (CONTINUED)

G. TANK SIZING SEQUENCE/PROCEDURE (TANKS WITH FLOATING PANS):

1. THE TANK DESIGN WILL VARY WITH THE INLET AND OUTLET FLOWRATES AND NOZZLE SIZES, THE TANK HEIGHT (AIRFIELD HEIGHT RESTRICTIONS, ETC.), THE PRESENCE OR NON-PRESENCE OF A FLOATING PAN, AND OTHER FACTORS. THE FLOATING PAN ELEVATION, THE LEVEL SWITCHES, AND THE HLV SETPOINT ELEVATIONS IN PARTICULAR DEPEND ON THESE. THESE VALUES SHOULD BE CALCULATED FOR TANK SIZES, HEIGHTS, CONFIGURATIONS, AND/OR NOZZLE COMBINATIONS NOT SHOWN ON TABLE 1 ON SHEET G.07.
2. THE FOLLOWING IS THE PHILOSOPHY USED TO LAY OUT THE TANKS IN THIS STANDARD. IT CAN BE APPLIED TO TANK SIZES AND CONFIGURATIONS NOT INCLUDED HEREIN.
 - a. CHOOSE THE NOMINAL TANK SIZE. FOR THE MOST COMMON TANK SIZES, THE TABLE ON DRAWING G.07 WILL SHOW THE SHELL HEIGHT (FIXED AS AN EVEN PRODUCT OF 8' SHELL COURSES) AND THE TANK DIAMETER. FOR OTHER SIZES, USE THE GENERAL PROPORTIONS SHOWN HEREIN AND EXTRAPOLATE OR INTERPOLATE AS REQUIRED; UNLESS IMPRACTICABLE, USE TANK HEIGHTS THAT ARE ALSO A PRODUCT OF 8' SHELL COURSES.
 - b. THE FLOATING PAN LOW LEG POSITION IS BASED ON NOZZLE SIZES. LEVEL SWITCH SETPOINT ELEVATIONS ARE BASED ON THE FLOATING PAN LOW LEG POSITION AND NOZZLE FLOWRATES. NOZZLE SIZES FOR EACH TANK SIZE COVERED IN THIS STANDARD HAVE BEEN SELECTED BASED ON THE EXPECTED TYPICAL FLOWRATES AND NOZZLES SIZES FOR THAT SIZE TANK AND ARE AS INDICATED ON THE TABLE ON SHEET G.07. IF FLOWRATES ARE DIFFERENT THAN THOSE INDICATED, USE PIPING VELOCITIES IN UFC 3-460-01 TO SIZE THE NOZZLES. FOR LARGER NOZZLE SIZES THAN THOSE INDICATED, THE TANKS MAY HAVE TO BE RE-SIZED (INCREASED HEIGHT OR DIAMETER OR BOTH) TO ACCOMMODATE THE LARGER NOZZLES, OR A SMALLER USABLE VOLUME ACCEPTED. FOR SMALLER NOZZLE SIZES THAN THOSE INDICATED, USE THE SAME TANK DIMENSIONS, LOWER THE FLOATING PAN LOW LEG POSITION AND THE HLV, OVERFLOW PORT, AND LEVEL SWITCH SETPOINT ELEVATIONS.
 - c. SET THE 0% ELEVATION AT THE BOTTOM OF THE SHELL.
 - d. SET THE LOW LEG POSITION OF THE FLOATING PAN SUCH THAT THE BOTTOM OF THE PAN CLEARS THE LARGEST TANK NOZZLE INTERIOR FLANGE BY 6".
 - e. USING THE DESIGN OUTLET FLOWRATE, SET THE ELEVATION OF THE LOW-LOW LEVEL SWITCH SUCH THAT IT ACTUATES 1 MINUTE BEFORE THE FLOATING PAN BOTTOMS OUT WHEN THE FLOATING PAN LEGS ARE SET IN THE LOW POSITION.
 - f. USING THE DESIGN OUTLET FLOWRATE, SET THE ELEVATION OF THE LOW LEVEL SWITCH SUCH THAT IT ACTUATES 5 MINUTES BEFORE ACTUATING THE LOW-LOW LEVEL SWITCH.
 - g. USING THE NOMINAL TANK VOLUME, CALCULATE THE DISTANCE BETWEEN THE LOW LEVEL AND HIGH LEVEL SWITCHES. THIS ELEVATION IS THE SETPOINT OF THE HIGH LEVEL SWITCH AND DEFINES THE 95% FUEL LEVEL. CONFIRM THE 95% WITH THE LOCAL AND/OR FEDERAL CODES AND REGULATIONS FOR THAT LOCATION AS THIS SOMETIMES VARIES.
 - h. SET THE ELEVATION OF THE HIGH-HIGH LEVEL SWITCH SUCH THAT IT ACTUATES WHEN THE LEVEL OF THE FUEL REACHES THE CALCULATED 98% FUEL LEVEL. CONFIRM THE 98% WITH THE LOCAL AND/OR FEDERAL CODES AND REGULATIONS FOR THAT LOCATION AS THIS SOMETIMES VARIES.
 - i. SET THE ELEVATION OF THE HLV FLOAT PILOT SUCH THAT IT ACTUATES WHEN THE LEVEL OF THE FUEL REACHES A POINT MIDWAY BETWEEN THE HIGH AND HIGH-HIGH LEVEL SWITCH SETPOINTS (TYPICALLY 96.5%).
 - j. SET THE OVERFLOW/CIRCULATION VENT AT THE ELEVATION OF THE CALCULATED 100% FUEL LEVEL. CHECK THAT THE FLOATING PAN WILL ADEQUATELY CLEAR THE ROOF STRUCTURE. CONSIDER THE ROOF STRUCTURE DEPTH, ALLOWANCES AGAINST SLOSHING DURING A SEISMIC EVENT, THE HEIGHT OF THE FLOATING PAN PERIMETER SEALS, AND A REASONABLE CLEARANCE (6" MINIMUM) BETWEEN THE FLOATING PAN PERIMETER SEAL ASSEMBLY AND THE ROOF STRUCTURE. THE DISTANCE FROM THE OVERFLOW AND THE ROOF-TO-SHELL JOINT WILL VARY DEPENDING ON THE ABOVE AND OTHER FACTORS.
 - k. USING THE DESIGN INLET FLOWRATE, CALCULATE THE NUMBER OF MINUTES BETWEEN ACTUATION OF THE HIGH LEVEL SWITCH AND THE HLV, THEN BETWEEN THE HLV AND THE HIGH-HIGH LEVEL SWITCH, AND THEN BETWEEN THE HIGH-HIGH LEVEL SWITCH AND THE OVERFLOW PORT. IT IS RECOMMENDED THAT THE TIME BETWEEN THESE EVENTS BE BETWEEN 5 AND 12 MINUTES APART.
3. THE FOLLOWING DESIGN PARAMETERS/LIMITS ARE A PARTIAL LIST OF THOSE OTHER ITEMS THAT WILL ALSO NEED TO BE TAKEN INTO ACCOUNT AT EACH SITE WHEN DESIGNING TANKS FOR A SPECIFIC PROJECT.
 - LOCAL CODES (LEVEL ALARM SETPOINTS, SEISMIC DESIGN, AIR QUALITY)
 - FLIGHT LINE CLEARANCES (TANK HEIGHT)
 - ORIENTATION WITH SUN (MELT ICE ON STAIRWAYS AND LANDINGS)
 - PREVAILING WINDS (ORIENT SHELL MANHOLES WITH)
 - MAINTENANCE ACCESS

DATE	
DESCRIPTION	
SYN	



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DATE	OCTOBER 2011		

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NAVY CAPITAL IMPROVEMENTS
NORFOLK, VIRGINIA

DOD STANDARD DESIGN AT 78-24-27
ABOVEGROUND VERTICAL STEEL FUEL TANKS WITH FIXED ROOFS

GENERAL NOTES

SCALE:	AS NOTED
PROJECT NO.:	
CONSTR. CONTR. NO.	
NAVFAC DRAWING NO.	
SHEET	4 OF 38

G.04
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