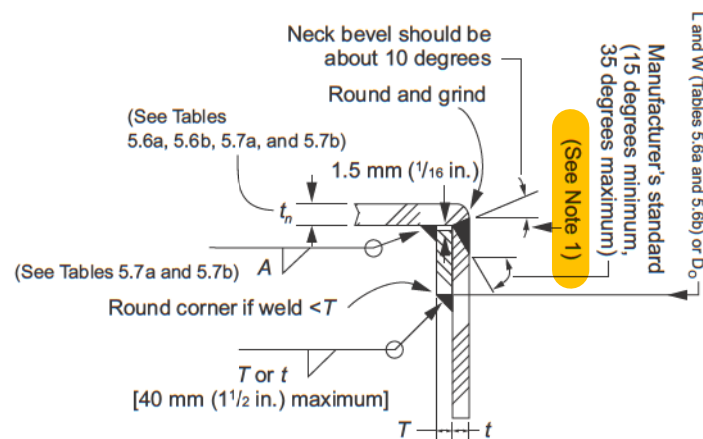
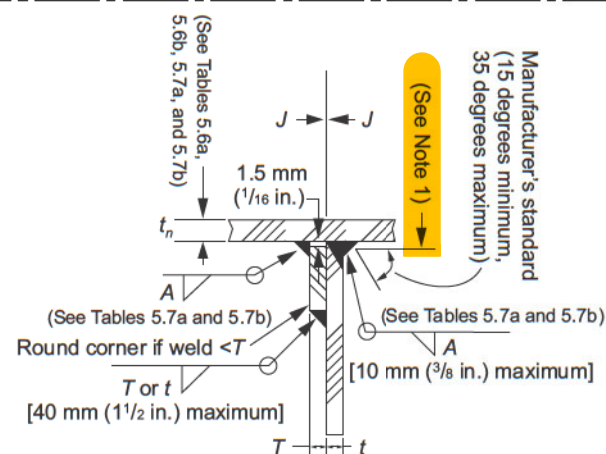


Title:	Suggestion for Change - API 650 Tables 5.7a and 5.7b Agenda 650-1137	
Date:	August 25, 2026	
Contact:	Name:	Sean Austin
	Company:	HMT LLC
	Phone:	210-833-7457
	Email:	Sean.austin@hmttank.com
Purpose:	To add Note 1 from API 650 Figure 5.7b to API 650 Tables 5.7a and 5.7b. The note specifies a shell cutout minimum diameter. Add another note with the opening-to-nozzle dimension from Figure 5.8. Therefore the dimensional tolerances, both the minimum and maximum diameters of the hole in shell plate are specified within both tables.	
Comment:	Perform technical editing. Suggested change in red font.	
Impact:	Neutral	
Standard or Practice:	API 650	
Section:	5	
Table	5.7a and 5.7b – Note Section	
Current Text:	a If a shell plate thicker than required is used for the product and hydrostatic loading (see 5.6), the excess shell-plate thickness, within a vertical distance both above and below the centerline of the hole in the tank shell plate equal to the vertical dimension of the hole in the tank shell plate, may be considered as reinforcement, and the thickness <i>T</i> of the nozzle reinforcing plate may be decreased accordingly. In such cases, the reinforcement and the attachment welding shall conform to the design limits for reinforcement of shell openings specified in 5.7.2. b This column applies to flanged nozzles NPS 26 and larger. See 4.5 for piping materials. NOTE See Figure 5.8.	
Suggested Change:	Add Notes “c” and “d” and reference to “Figure 5.7a & b” within API 650 Tables 5.7a and 5.7b. See highlighted changes in attachment.	
Suggested Text:	a If a shell plate thicker than required is used for the product and hydrostatic loading (see 5.6), the excess shell-plate thickness, within a vertical distance both above and below the centerline of the hole in the tank shell plate equal to the vertical dimension of the hole in the tank shell plate, may be considered as reinforcement, and the thickness <i>T</i> of the nozzle reinforcing plate may be decreased accordingly. In such cases, the reinforcement and the attachment welding shall conform to the design limits for reinforcement of shell openings specified in 5.7.2. b This column applies to flanged nozzles NPS 26 and larger. See 4.5 for piping materials. c For shell nozzles with reinforcing plates, the shell cutout shall not be less than the outside diameter of the neck plus 13 mm (1/2) in. d For unreinforced shell nozzles penetrating the shell or nozzles within thickened inserts, the shell cutout shall not be less than the outside diameter of the neck plus 3 mm (1/8) in. NOTE See Figure 5.7a, 5.7b & 5.8.	

Nozzle

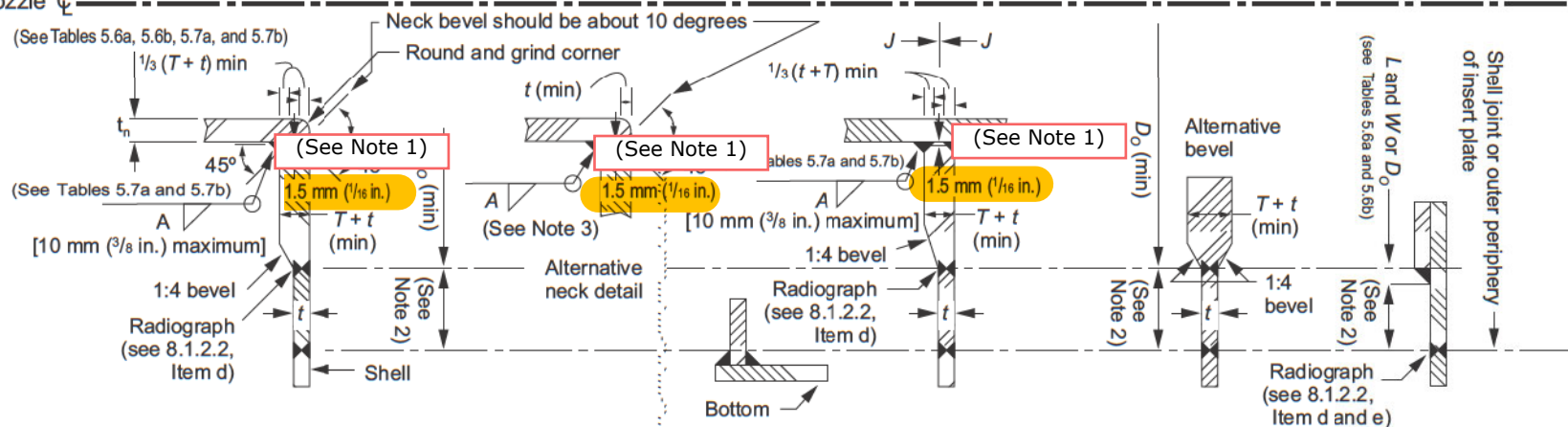


Manhole or Nozzle



Nozzle

Nozzle

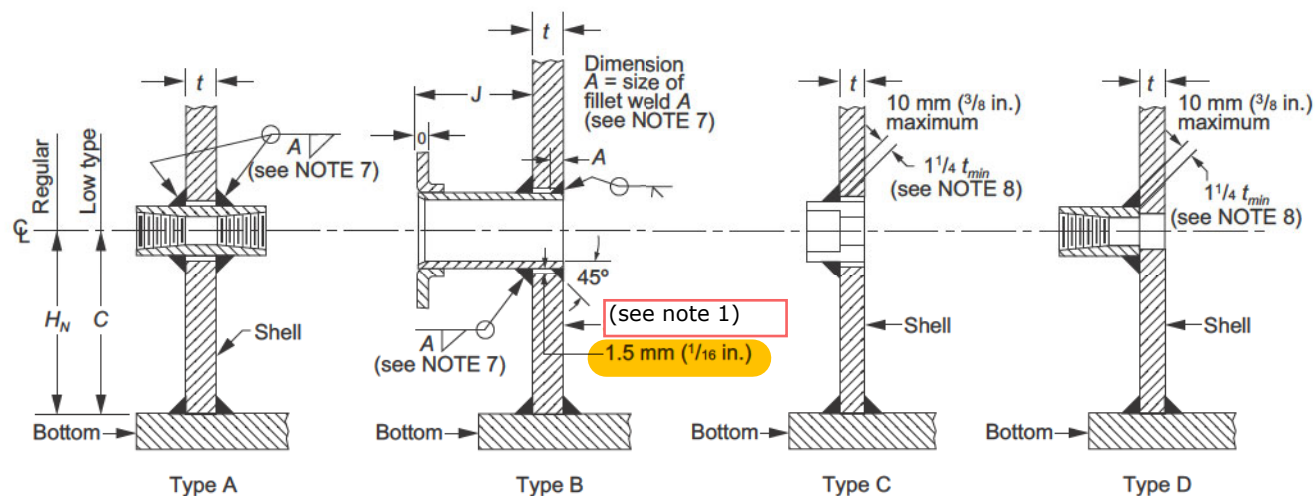


remove "which shall not be less than the outside diameter of the neck plus 13mm ($1/2$) in."

Notes:

1. See Table 5.7a and Table 5.7b, Column 3, for the shell cutout, which shall not be less than the outside diameter of the neck plus 13 mm ($1/2$) in.
2. See 5.7.3 for minimum spacing of welds at opening connections.
3. The weld size shall be either A (from Table 5.7a and Table 5.7b, based on t) or t_n (minimum neck thickness from Table 5.4a, Table 5.4b, Table 5.6a, Table 5.6b, Table 5.7a and Table 5.7b), whichever is greater.
4. Other permissible insert or thickened insert details are shown in Figure 5.8 of API Standard 620. The reinforcement area shall conform to 5.7.2.
5. Dimensions and weld sizes that are not shown are the same as those given in Figure 5.7a and Table 5.4a through Table 5.8b.
6. Details of welding bevels may vary from those shown if agreed to by the Purchaser.

Figure 5.7b—Details of Shell Manholes and Nozzles



Couplings and Flanged Fittings, NPS 3/4 Through NPS 2 (see NOTE 9)

NOTES (continued)

7. See Table 5.7a and Table 5.7b, Column 6.
 8. t_{min} shall be 19 mm ($3/4$ in.) or the thickness of either part joined by the fillet weld, whichever is less.
 9. The construction details apply to unreinforced threaded, non-threaded, and flanged nozzles.
 10. See Tables 5.7a and 5.7b, column 4.

Figure 5.8b—Shell Nozzles (see Tables 5.6a, 5.6b, 5.7a, 5.7b, 5.8a, and 5.8b) (Continued)

Table 5.6a—Dimensions for Shell Nozzles (SI)

Dimensions in millimeters

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9 ^c
NPS (Size of Nozzle)	Outside Diameter of Pipe <i>OD</i>	Nominal Thickness of Flanged Nozzle Pipe Wall ^a <i>t_n</i>	Diameter of Hole in Reinforcing Plate <i>D_R</i>	Length of Side of Reinforcing Plate ^b or Diameter <i>L = D_o</i>	Width of Reinforcing Plate <i>W</i>	Minimum Distance from Shell- to-Flange Face <i>J</i>	Minimum Distance from Bottom of Tank to Center of Nozzle	
							Regular Type ^d <i>H_N</i>	Low Type <i>C</i>
Flanged Fittings								
60	1524.0	e	1528	3068	3703	400	1641	1534
54	1371.6	e	1375	2763	3341	400	1488	1382
52	1320.8	e	1324	2661	3214	400	1437	1331
50	1270.0	e	1274	2560	3093	400	1387	1280
48	1219.2	e	1222	2455	2970	400	1334	1230
46	1168.4	e	1172	2355	2845	400	1284	1180
44	1117.6	e	1121	2255	2725	375	1234	1125
42	1066.8	e	1070	2155	2605	375	1184	1075
40	1016.0	e	1019	2050	2485	375	1131	1025
38	965.2	e	968	1950	2355	350	1081	975
36	914.4	e	918	1850	2235	350	1031	925
34	863.6	e	867	1745	2115	325	979	875
32	812.8	e	816	1645	1995	325	929	820
30	762.0	e	765	1545	1865	300	879	770
28	711.2	e	714	1440	1745	300	826	720

Table 5.6b—Dimensions for Shell Nozzles (USC) (Continued)

Dimensions in inches

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8		Column 9 ^c
NPS (Size of Nozzle)	Outside Diameter of Pipe OD	Nominal Thickness of Flanged Nozzle Pipe Wall ^a t_n	Diameter of Hole in Reinforcing Plate D_R	Length of Side of Reinforcing Plate ^b or Diameter $L = D_o$	Width of Reinforcing Plate W	Minimum Distance from Shell- to-Flange Face J	Minimum Distance from Bottom of Tank to Center of Nozzle		
							Regular Type ^d H_N	Low Type C	
1½ ^f	1.90	0.200	2	—	—	6	6	h	
1 ^f	1.315	0.250	—	—	—	6	6	h	
¾ ^f	1.05	0.218	—	—	—	6	6	h	
Threaded and Socket-Welded Couplings									
3 ^g	4.250	Coupling	4 ¾	11 ¼	14 ¼	—	9 ⅝	5 ⅝	
2 ^f	3.000	Coupling	3 ⅞	—	—	—	7	h	
1½ ^f	2.500	Coupling	2 ⅝	—	—	—	6	h	
1 ^f	1.750	Coupling	1 ⅞	—	—	—	6	h	
¾ ^f	1.375	Coupling	1 ½	—	—	—	5	h	

^a For extra-strong pipe, see ASTM A53 or A106 for other wall thicknesses; however, piping material must conform to 4.5.

^b The width of the shell plate shall be sufficient to contain the reinforcing plate and to provide clearance from the girth joint of the shell course.

^c Low type reinforced nozzles shall not be located lower than the minimum distance shown in Column 9. The minimum distance from the bottom shown in Column 9 complies with spacing rules of 5.7.3 and Figure 5.6.

^d Regular type reinforced nozzles shall not be located lower than the minimum distance H_N shown in Column 8 when shell thickness is equal to or less than ½ in. Greater distances may be required for shells thicker than ½ in. to meet the minimum weld spacing of 5.7.3 and Figure 5.6.

^e See Table 5.7b, Column 2.

^f Flanged nozzles and couplings in pipe sizes NPS 2 or smaller do not require reinforcing plates. D_R will be the diameter of the hole in the shell plate, and Weld A will be as specified in Table 5.7b, Column 6. Reinforcing plates may be used if the construction details comply with reinforced nozzle details.

^g A coupling in an NPS 3 requires reinforcement.

^h See 5.7.3 and Figure 5.6.

NOTE See Figure 5.8.

Table 5.7a—Dimensions for Shell Nozzles: Pipe, Plate, and Welding Schedules (SI)

Dimensions in millimeters

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Thickness of Shell and Reinforcing Plate ^a t and T	Minimum Pipe Wall Thickness of Flanged Nozzles ^b t_n	Maximum Diameter of Hole in Shell Plate (D_p) Equals Outside Diameter of Pipe Plus c, d	Size of Fillet Weld B	Size of Fillet Weld A	
				Nozzles Larger Than NPS 2	NPS ¾ to 2 Nozzles
5	12.7	16	5	6	6
6	12.7	16	6	6	6
8	12.7	16	8	6	6
10	12.7	16	10	6	6
11	12.7	16	11	6	6
13	12.7	16	13	6	8
14	12.7	20	14	6	8

Table 5.7a—Dimensions for Shell Nozzles: Pipe, Plate, and Welding Schedules (SI) (Continued)

Dimensions in millimeters

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Thickness of Shell and Reinforcing Plate ^a t and T	Minimum Pipe Wall Thickness of Flanged Nozzles ^b t_n	Maximum Diameter of Hole in Shell Plate (D_p) Equals Outside Diameter of Pipe Plus c, d	Size of Fillet Weld B	Size of Fillet Weld A	
				Nozzles Larger Than NPS 2	NPS $\frac{3}{4}$ to 2 Nozzles
16	12.7	20	16	8	8
17	12.7	20	18	8	8
20	12.7	20	20	8	8
21	12.7	20	21	10	8
22	12.7	20	22	10	8
24	12.7	20	24	10	8
25	12.7	20	25	11	8
27	14	20	27	11	8
28	14	20	28	11	8
30	16	20	30	13	8
32	16	20	32	13	8
33	18	20	33	13	8
35	18	20	35	14	8
36	20	20	36	14	8
38	20	20	38	14	8
40	21	20	40	14	8
41	21	20	40	16	8
43	22	20	40	16	8
45	22	20	40	16	8

^a If a shell plate thicker than required is used for the product and hydrostatic loading (see 5.6), the excess shell-plate thickness, within a vertical distance both above and below the centerline of the hole in the tank shell plate equal to the vertical dimension of the hole in the tank shell plate, may be considered as reinforcement, and the thickness T of the nozzle reinforcing plate may be decreased accordingly. In such cases, the reinforcement and the attachment welding shall conform to the design limits for reinforcement of shell openings specified in 5.7.2.

^b This column applies to flanged nozzles NPS 26 and larger. See 4.5 for piping materials.

NOTE See Figure 5.8.

c For shell nozzles with reinforcing plates, the shell cutout shall not be less than the outside diameter of the neck plus 13 mm (1/2) in.

d For unreinforced shell nozzles penetrating the shell or nozzles within thickened inserts, the shell cutout shall not be less than the outside diameter of the neck plus 3 mm (1/8) in.

NOTE See Figure 5.7a, 5.7b, & 5.8

- b) The reinforcing plate. Reinforcing plates for manholes, nozzles, and other attachments shall be of the same nominal composition (i.e. same ASME P-number and Group Number) as the tank part to which they are attached, unless approved otherwise by the Purchaser (refer to 9.2.1.3).

Table 5.7b—Dimensions for Shell Nozzles: Pipe, Plate, and Welding Schedules (USC)

Dimensions in inches

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Thickness of Shell and Reinforcing Plate ^a t and T	Minimum Pipe Wall Thickness of Flanged Nozzles ^b t_n	Maximum Diameter of Hole in Shell Plate (D_p) Equals Outside Diameter of Pipe Plus c, d	Size of Fillet Weld B	Size of Fillet Weld A	
				Nozzles Larger Than NPS 2	NPS $\frac{3}{4}$ to 2 Nozzles
$\frac{3}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{5}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{16}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{7}{16}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{5}{16}$
$\frac{9}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{9}{16}$	$\frac{1}{4}$	$\frac{5}{16}$
$\frac{5}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{5}{16}$	$\frac{5}{16}$
$\frac{11}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{16}$	$\frac{5}{16}$	$\frac{5}{16}$
$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{5}{16}$	$\frac{5}{16}$
$\frac{13}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{3}{8}$	$\frac{5}{16}$
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{3}{8}$	$\frac{5}{16}$
$\frac{15}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{3}{8}$	$\frac{5}{16}$
1	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{7}{16}$	$\frac{5}{16}$
$\frac{11}{16}$	$\frac{9}{16}$	$\frac{3}{4}$	$\frac{11}{16}$	$\frac{7}{16}$	$\frac{5}{16}$
$\frac{11}{8}$	$\frac{9}{16}$	$\frac{3}{4}$	$\frac{11}{8}$	$\frac{7}{16}$	$\frac{5}{16}$
$\frac{13}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{1}{2}$	$\frac{5}{16}$
$\frac{11}{4}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{11}{4}$	$\frac{1}{2}$	$\frac{5}{16}$
$\frac{15}{16}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{15}{16}$	$\frac{1}{2}$	$\frac{5}{16}$
$\frac{13}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{8}$	$\frac{9}{16}$	$\frac{5}{16}$
$\frac{17}{16}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{17}{16}$	$\frac{9}{16}$	$\frac{5}{16}$
$\frac{11}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{11}{2}$	$\frac{9}{16}$	$\frac{5}{16}$

c For shell nozzles with reinforcing plates, the shell cutout shall not be less than the outside diameter of the neck plus 13 mm ($\frac{1}{2}$) in.

d For unreinforced shell nozzles penetrating the shell or nozzles within thickened inserts, the shell cutout shall not be less than the outside diameter of the neck plus 3 mm ($\frac{1}{8}$) in.

NOTE See Figure 5.7a, 5.7b, & 5.8

^a If a shell plate thicker than required is used for the product and hydrostatic loading (see 5.6), the excess shell-plate thickness, within a vertical distance both above and below the centerline of the hole in the tank shell plate equal to the vertical dimension of the hole in the tank shell plate, may be considered as reinforcement, and the thickness T of the nozzle reinforcing plate may be decreased accordingly. In such cases, the reinforcement and the attachment welding shall conform to the design limits for reinforcement of shell openings specified in 5.7.2.

^b This column applies to flanged nozzles NPS 26 and larger. See 4.5 for piping materials.

NOTE See Figure 5.8.