CURVED BRICK WALLS

Introduction

Curved brick walls are often used by designers to add interest to a brick project. Curved walls may be constructed of specially-shaped brick, or of cut or uncut standard brick. Specially-shaped brick are used when a tight radius is specified or when a smooth appearance is desired. Standard brick are an economical choice for slightly larger radii, when cutting is permissible, or when a textured appearance is acceptable. This *Brick Brief* gives some of the sizes of brick and radii which can be used when detailing curved brick walls with standard brick.
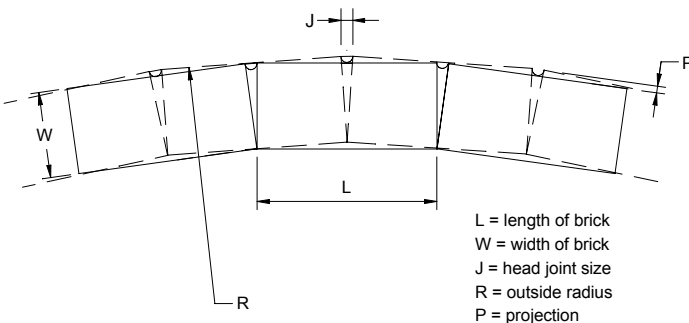
Design

The size of the radius and amount of cutting (if any) is a function of the brick dimensions, its orientation and mortar joint sizes. Table 1 gives the minimum radius obtainable for four brick sizes laid in running bond without any cuts. The inner edges of the brick are assumed to be touching (no mortar joint) and to have a head joint thickness of $3/8$ in. (9.5 mm) or $1/2$ in. (12.7 mm) on the outer face, as shown in Figure 1. Table 1 can be used even if the primary brick size on a project is larger than those listed. By using a matching brick of a shorter length than one of those listed, or a specially made brick, a smaller radius may be turned without any cutting. Changing the brick orientation will also permit a smaller radius.

For brick sizes other than those shown, the minimum outside radius, R, can be approximated by the equation: $R = W [(L/J) + 1]$ where all dimensions are in inches. (See Figure 1.)

Radii smaller than those listed in Table 1 can be achieved by cutting standard brick. One or both ends may be cut while maintaining the original face dimension. Table 2 gives the cut(s) necessary on a brick of a given size to layout a wall with a given radius. See Figure 2 for details of the cut(s).

For radii other than those shown C_2 can be approximated within $1/16$ in. by the equation:

$$C_2 = \frac{WL}{2R} - \frac{J}{2}$$ where all dimensions are in inches.
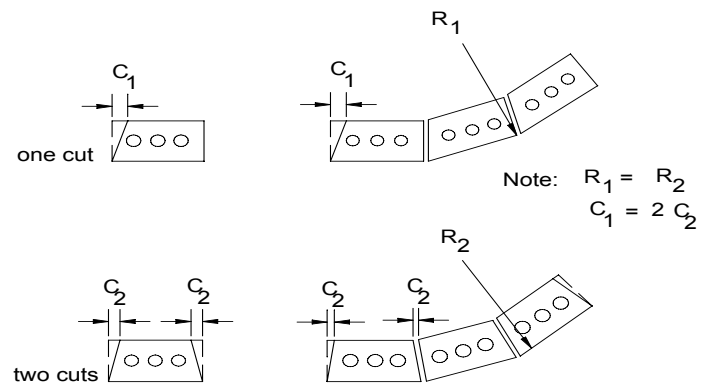
(See Figures 1 and 2.)

TABLE 1
Minimum Radius Using Standard Brick Without Cuts

Brick Size, W x L (in.)	Head Joint Size Inner Face (in.)	Head Joint Size Outer Face (in.)	Outside Radius, R (ft-in.)	No. Brick For Circle	Projection, P (in.)
3-5/8 x 7-5/8	0	1/2	4'-11"	46	1/8
	0	3/8	6'-6"	61	3/32
3-3/4 x 8	0	1/2	5'-4"	47	5/32
	0	3/8	7'-0"	63	3/32
3 x 9-5/8	0	1/2	5'-0"	38	3/16
	0	3/8	6'-8"	50	5/32
3-5/8 x 11-5/8	0	1/2	7'-4"	46	3/16
	0	3/8	9'-8"	61	5/32

Note: Radii specified are to the outer face. See Figure 1.

TABLE 2
Cut(s) Required Using Standard Brick in a Specified Radius

Brick Size, W x L (in.)	Head Joint Size, J (in.)	Cut Dimensions C_1 (in.)	Cut Dimensions C_2 (in.)	Projection (in.)
2'-0" Radius				
3-5/8 x 7-5/8	3/8	7/8	7/16	5/16
3-3/4 x 8	3/8	1	1/2	3/8
3 x 9-5/8	3/8	7/8	7/16	1/2
3-5/8 x 11-5/8	3/8	1-1/2	3/4	3/4
4'-0" Radius				
3-5/8 x 7-5/8	3/8	1/4	1/8	5/32
3-3/4 x 8	3/8	5/16	5/32	3/16
3 x 9-5/8	3/8	1/4	1/8	1/4
3-5/8 x 11-5/8	3/8	9/16	9/32	3/8

Note: Radii specified are outside radii. See Figure 2.

J = head joint size
L = length of brick
W = width of brick
J = head joint size
R = outside radius
P = projection

Figure 1
Curved Wall with Standard Brick

one cut

two cuts

Note: $R_1 = R_2$
$C_1 = 2 C_2$

Figure 2
Detail of Cut Brick in a Curved Wall

Standard brick will project slightly when laid in running bond in a curved wall, as shown in Figures 1 and 3. The amount of projection is a function of the size of the brick used and the curve radius. Tables 1 and 2 include the projection or overhang of the end of a brick beyond the face of the brick in the course directly above or below it for the given radii. This projection becomes smaller and less evident as the curve radius increases. The appearance of the projection becomes negligible when the radii reach the values in Table 3.

Figure 3
Projection of Brick Ends in a Curved Wall

TABLE 3
Minimum Radii for Negligible Projection

| Brick Length, L (in.)	Radius, R (ft)
7 5/8	15
8	17
9 5/8	24
11 5/8	35

Orientation

Smaller radii can be achieved by using brick in header, rowlock or soldier orientations, as shown in Figure 4. Table 4 indicates the smallest radius that can be achieved without cutting any brick, other than the length of headers and rowlocks. The mortar joint on the outer face is $3/8$ in. (9.5 mm). The face dimension along the radius and thickness dimensions listed in Table 4 correspond to F and T in Figure 5, respectively.

Figure 4
Brick Headers Used for a Small Radius Curve

TABLE 4
Minimum Radii Using Various Brick Orientations

Face Dimension, F (in.)	Wall Thickness, T (in.)	Outside Radius, R (in.)
2 1/4	3 5/8	2' - 1 3/8"
2 3/4	2 3/4	1' - 10 7/8"
2 3/4	3	2' - 1"
2 3/4	3 5/8	2' - 6 1/8"
3	3	2' - 3"
3 5/8	3 5/8	3' -2 5/8"
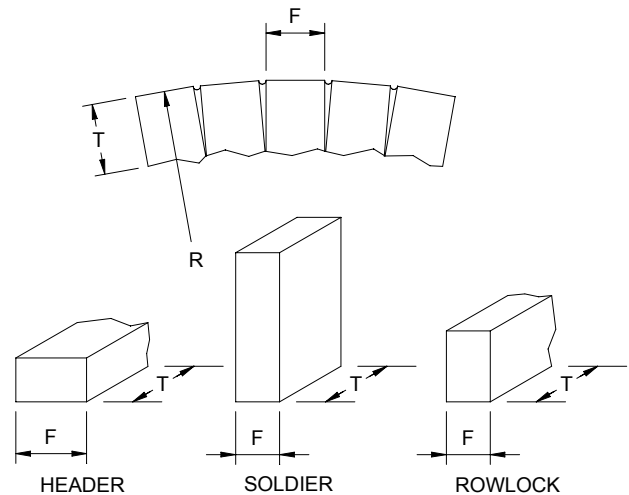
Figure 5
Face and Thickness Dimensions

Brick Briefs *are short discussions of a particular topic. The information contained herein is based on the experience of Brick Industry Association technical staff and must be used with good technical judgment. Final decisions on the use of this information must rest with the project designer and owner.*