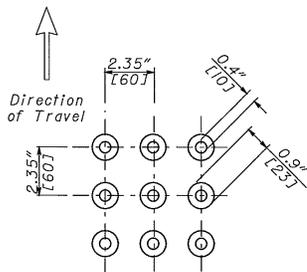
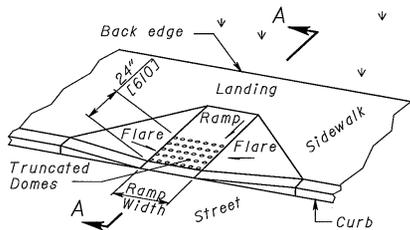


HEIGHT AND DIAMETER

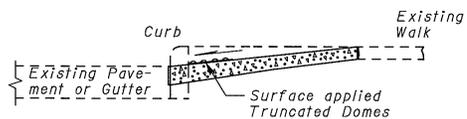


SQUARE PATTERN, PARALLEL ALIGNMENT

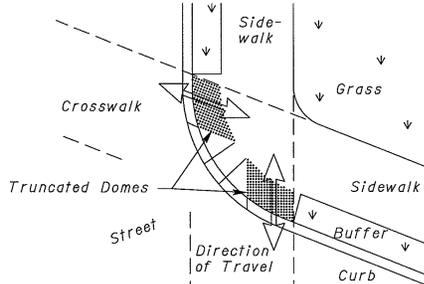
TRUNCATED DOMES DETAILS



TRUNCATED DOME PLACEMENT ON PERPENDICULAR CURB RAMP



SECTION A-A



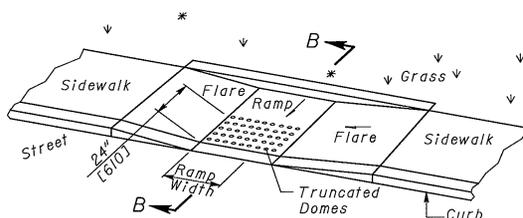
Orient In-line domes alignment with primary direction of travel.

HOME ALIGNMENT

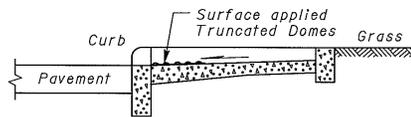
GENERAL: This drawing depicts the application of truncated domes on existing concrete curb ramps where the existing ramps are otherwise ADAAG compliant, and has sound concrete. For the installation of truncated domes with new curb ramps, see SCD BP-7.1.

DETECTABLE WARNINGS: Truncated domes are the only acceptable method for providing detectable warnings. Domes pattern and alignment should be as shown in TRUNCATED DOME DETAILS.

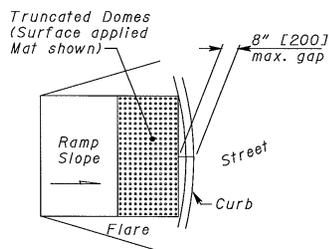
PLACEMENT: Truncated domes are to be installed at any location where pedestrians might cross paths with vehicular traffic lanes, such as the base of curb ramps or at blended curbs. A 24" [610] strip of domes is to be installed for the full width of the ramp. Typical placement locations for standard curb ramp types are shown below.



TRUNCATED DOME PLACEMENT ON PARALLEL CURB RAMP



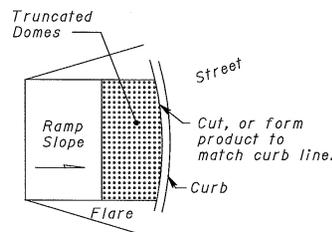
SECTION B-B



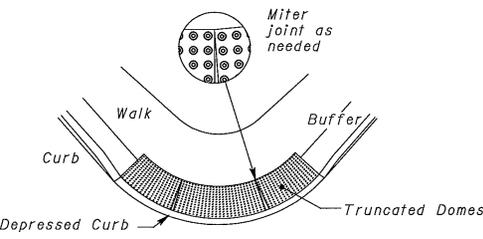
PREFERRED METHOD

Use Preferred Method for aligning truncated domes unless curb curvature would produce gap more than 8" [200] from front of curb to the domes. If gap will be greater than 8" [200] miter truncated dome product to match the back of the curb as shown in the Alternate Method. NOTE: Some approved Truncated Domes products are easier to miter than others.

HOME ALIGNMENT ON RADIUSED CURB



ALTERNATE METHOD



Install 24" [610] strip of truncated domes at border of a depressed corner to identify the transition between the sidewalk and the street. NOTE: Some products are difficult to align, and may need extensive mitering to maintain proper dome alignment. Some products are difficult to miter, other products should be installed in these situations. Cast iron products are available in a few standard radiuses.

TREATMENT AT BLENDED CURBS

NOTES

ALIGNMENT: Truncated domes should be aligned with the primary direction of pedestrian travel as shown on the DOME ALIGNMENT Detail. Normally the domes should be flush with the back of the curb, but in skewed conditions can be up to 8" [200] behind the curb, as shown on the DOME ALIGNMENT ON RADIUSED CURB Detail. For non-standard layouts, dome materials may have to be mitered and placed segmentally as shown on TREATMENT AT BLENDED CURBS Detail.

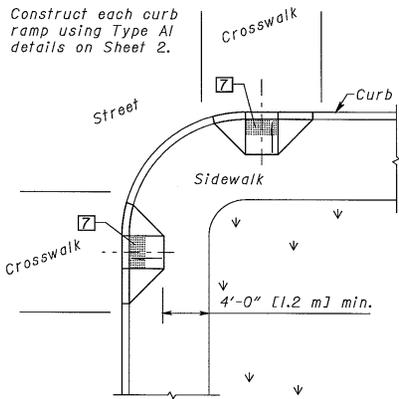
VISUAL CONTRAST: Color of the truncated domes should contrast with surrounding concrete walk and ramp. Use of a red blend is recommended for concrete curb ramps. Black is not an acceptable color.

EDGES: Truncated dome products used in conjunction with this drawing must be installed flush with the surrounding concrete walk/ramp surface. If the unbeveled edge lip of any product is greater than 1/4" [6] (or a beveled edge more than 1/2" [13]), then the domes have to be recessed into existing concrete. Sawcut existing concrete, chip and prepare surface according to manufacturer's instructions. Seal any cut edges as directed by the Engineer.

PRODUCTS: Only products on the Office of Roadway Engineering Service's Truncated Domes Approved List (www.dot.state.oh.us/roadwayengineering/standards/index.asp) are permitted to be used with this drawing. Such products must be installed according to the product's manufacturer. For surface applied products, this would include any mechanical fasteners and adhesives (including cure times).

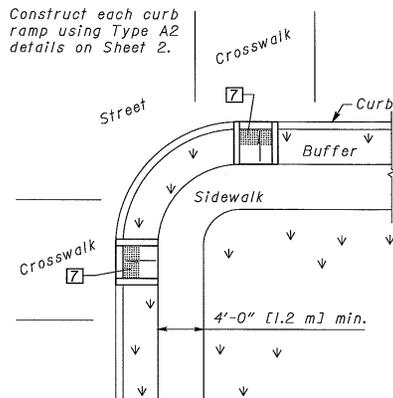
PROHIBITED PRODUCTS: Stamped concrete methods or flexible mats are not currently allowed.

PAYMENT: All work needed to install a completed truncated dome retrofit is included in Item 608 - Truncated Domes, Each. This includes existing concrete preparation, products, adhesives/fasteners, installation and sealing as necessary to install product in accordance with manufacturer's instructions. Payment also includes all additional costs of sawing and preparing concrete to install a recessed product, (pavers or cast-iron, and etc.) if used.



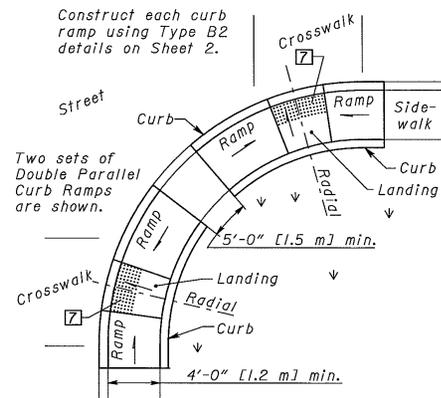
Construct each curb ramp using Type A1 details on Sheet 2.

Use curb ramps with flared sides at locations with wide sidewalks.



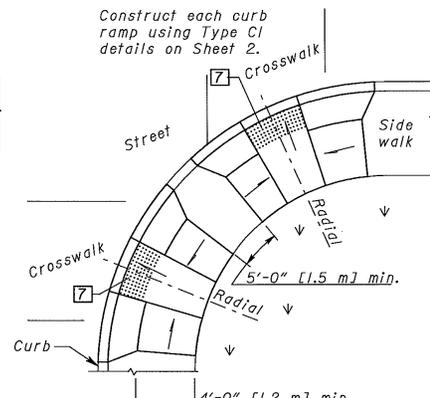
Construct each curb ramp using Type A2 details on Sheet 2.

Use curb ramps with returned curbs where buffer is wide enough to accommodate ramp slope.



Construct each curb ramp using Type B2 details on Sheet 2.

Place on streets having wide turning radius and where sidewalks are narrow.



Construct each curb ramp using Type C1 details on Sheet 2.

Curb ramp placement where streets have wide turning radius, and sufficient sidewalks width.

PERPENDICULAR CURB RAMPS

PARALLEL CURB RAMPS

COMBINATION CURB RAMPS

PREFERRED CONSTRUCTION PLACEMENT

CURB RAMP NOTES

GENERAL: This drawing shows curb ramp types details and placement examples for new curb ramp construction, including the installation of truncated domes. To retrofit existing curb ramps with truncated domes, see SCD BP-7.2.

Curb ramp types are shown on Sheet 2 and include Perpendicular, Parallel, and Combined types as specified to be constructed in the locations shown on the project plans. The contractor may adjust the placement of curb ramps if existing field conditions warrant, according to CONSTRUCTION PLACEMENT details (this sheet), and with the approval of the Engineer.

DETECTABLE WARNINGS: Install Truncated Domes on each curb ramp with approved materials, as shown on Sheet 3. Install these proprietary products as per manufacturer's written instructions.

DRAINAGE: Contractor is to ensure the base of each constructed curb ramp allows for proper drainage, without exceeding allowable cross slope or ramp slopes. Vertical change in level exceeding 1/8" [3] between the 1) pavement and gutter, and 2) gutter and ramp, are not allowed.

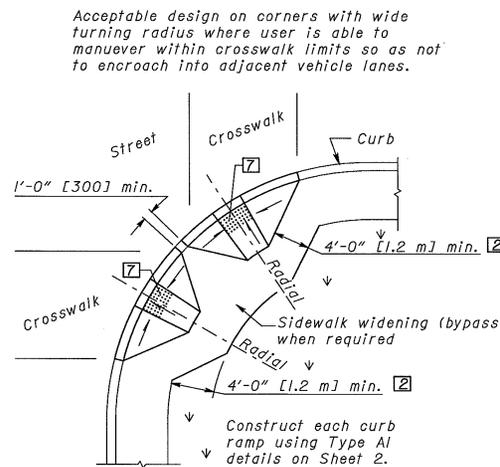
SURFACE TEXTURE: Texture of concrete surfaces by coarse brooming transverse to the ramp slopes and is to be rougher than the adjacent walk.

JOINTS: Provide expansion joints in the curb ramp as extensions of walk joints and consistent with Item 608.03 requirements for a new concrete walk. Provide a 1/2" [13] Item 705.03 expansion joint filler around the edge of ramps built in existing concrete walks. Lines shown on this drawing indicate the ramp edges and slope changes, and do not necessarily indicate joint lines.

PAYMENT: Measure Walk and Curb, Items 608 and 609, through the curb ramp area paid for under their respective Items. Removal of existing curb, walk (or existing curb ramps) are paid under Item 202.

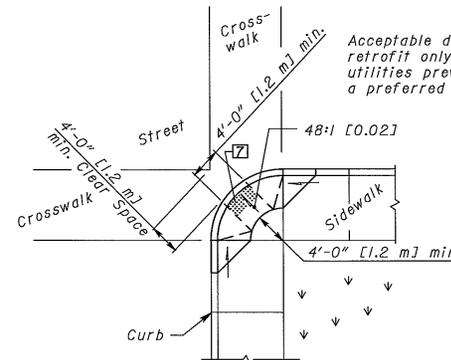
New curb ramps constructed in curb and walks are paid for under Item 608 - Curb Ramp, Type (A1, A2, B1, B2, C1, or C2). Each includes the cost of any additional materials and installation (including truncated domes), grading, forming and finishing. Curb ramps constructed in existing curb and walk are paid under Item 608 - Curb Ramp, Type (A1, A2, B1, B2, C1, C2, or D) Square Foot [Meter], includes the cost of furnishing and installing all materials, (including truncated domes), grading, forming, and finishing of the curb and walk of the curb ramp.

For LEGEND, See Sheet 2.



Acceptable design on corners with wide turning radius where user is able to maneuver within crosswalk limits so as not to encroach into adjacent vehicle lanes.

PERPENDICULAR RAMPS



Acceptable design for retrofit only where utilities prevent using a preferred layout.

Use this design only for existing walks, and when site constraints prohibit other designs. The diagonal Type D ramp may be constructed as either a Perpendicular, Parallel or Combination curb ramp type. Avoid using where curb radii are less than 20'-0" [6.0 m]. Since these are unique designs, each occurrence should be individually detailed on the project plans.

DIAGONAL RAMP (Type D)

ACCEPTABLE CONSTRUCTION PLACEMENT

THIS DRAWING REPLACES BP-7.1 DATED 7-28-00.

OHIO DEPARTMENT OF TRANSPORTATION	1-19-07
ROADWAY DESIGN ENGINEER	DATE
<i>Paul Ennon</i>	
STDS. ENGR.	
D. Foote	
All metric dimensions (in brackets []) are in millimeter unless otherwise noted.	
ROADWAY ENGINEERING SERVICES	
STANDARD ROADWAY CONSTRUCTION DRAWING	
NEW CURB RAMPS	
(with Truncated Domes)	
NUMBER	
BP-7.1	
1/3	

LEGEND

- 1 Dimension may be reduced to 3'-0" [915] in existing sidewalks if the landing is unconstrained along the back edge.
- 2 May be reduced to 3'-4" [1.02 m] in existing sidewalks to better fit the walk configuration or where site conditions are restricted by narrow walks, pole foundations, drainage inlets, etc. The width may be tapered.
- 3 Where landing width (D) has been reduced to 3'-0" [915] the flared sides shall have a maximum slope of 12:1 [0.083].
Flared sides are not required where the edges of a curb ramp are protected by landscaping or other barriers to travel by wheel chair users or pedestrians across the edge of the curb ramp. However, if the flared sides are used in these areas, they may be of any slope.
- 4 The slope of the ramp toward the curb is preferred to be 12:1 [0.083] or flatter related to the horizontal.
In existing sidewalks, where the maximum ramp slope (S_R) is not feasible, it may be reduced as follows:
A) 10:1 [0.10] for a max. rise of 6" [150],
B) 8:1 [0.125] for a max. rise of 3" [75],
C) 6:1 [0.167] over a max. run of 2'-0" [610] for historic areas where a flatter slope is not feasible.
- 5 The minimum length of a perpendicular ramp is 6' [2.0 m] from the back of a 6" [150] curb and may be increased where feasible to obtain a flatter ramp slope or to better blend with the walk configuration.
- 6 Gutter counter slopes at the foot of perpendicular curb ramps should not exceed 20:1 [0.05] over a distance of 2'-0" [610] from the curb.
- 7 Detectable Warnings (truncated domes) are to be installed in the location shown. Dimensions of the domes are 24" [610] from the back of the curb by the width of the ramp. See DETECTABLE WARNINGS NOTES on Sheet 3.

See Sheet 3 for Sections.

* See Equations and Table to the left.

$$L_{LOW} = \frac{\text{Curb height}}{0.083 + \text{Street Slope}}$$

$$L_{HIGH} = \frac{\text{Curb height}}{0.083 - \text{Street Slope}}$$

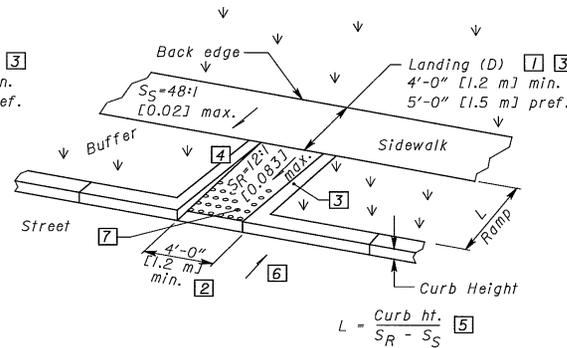
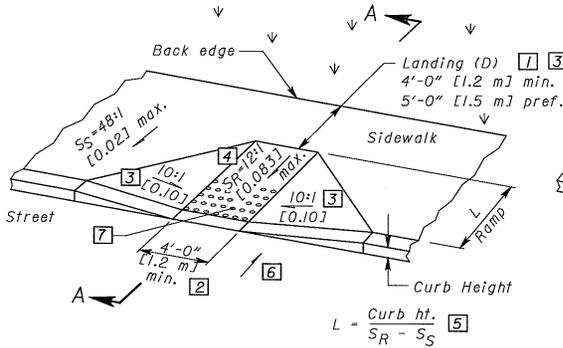
Dimensions derived by equations are nominal. Construct ramps to meet required slopes and existing conditions.

Street Slope	Ramp Length @ 1"/ft [0.083]	
	L _{LOW} SIDE*	L _{HIGH} SIDE*
0.01	5'-5" [1.6 m]	6'-10" [2.1 m]
0.02	4'-10" [1.5 m]	7'-11" [2.4 m]
0.03	4'-5" [1.3 m]	9'-5" [2.9 m]
0.04	4'-1" [1.2 m]	11'-8" [3.6 m]
0.05	3'-9" [1.1 m]	15'-2" [4.6 m]

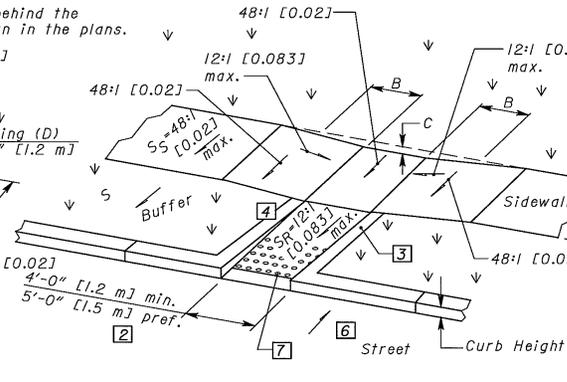
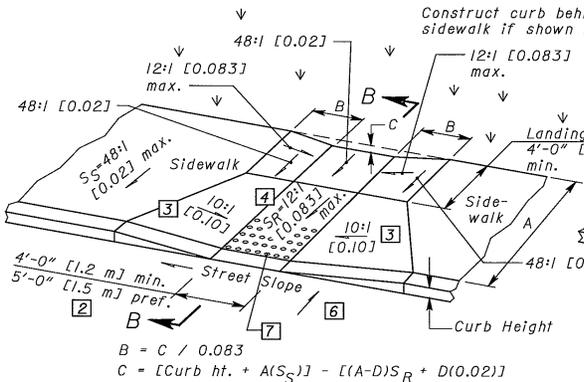
* Measured along the back of a 6" [150] high curb.

For Parallel Ramps construct curb behind the sidewalk if required elsewhere in the plans.

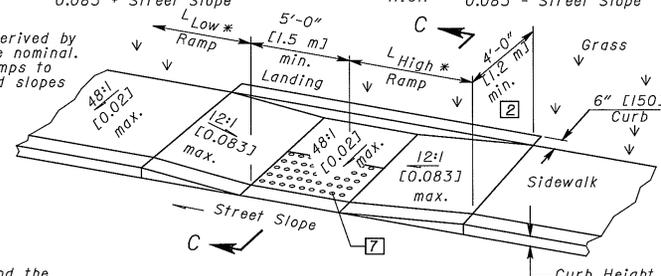
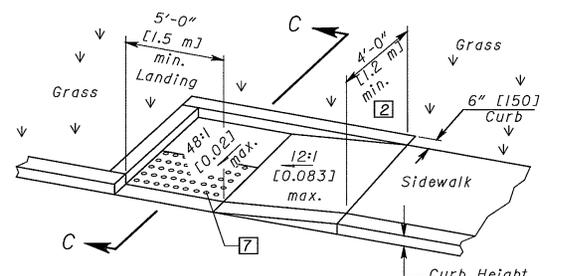
PARALLEL CURB RAMP DETAILS



Type A1 (Perpendicular with flared sides) Type A2 (Perpendicular with returned curb)
PERPENDICULAR CURB RAMP DETAILS

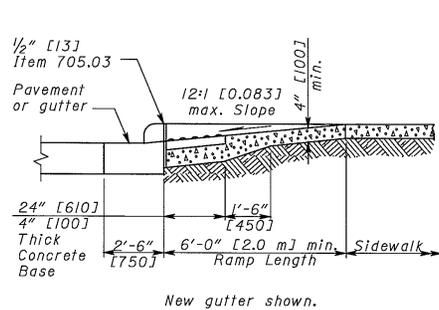


Type C1 (Combined with flared sides) Type C2 (Combined with returned curb)
COMBINED CURB RAMP DETAILS

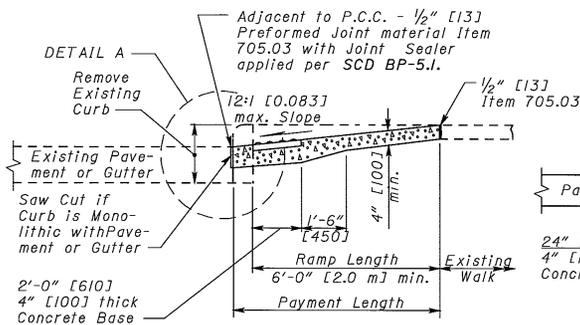


Type B1 (Single sided Parallel)

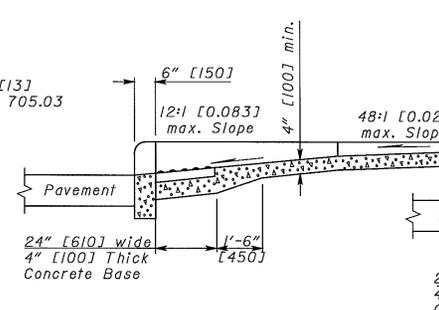
Type B2 (Double sided Parallel)



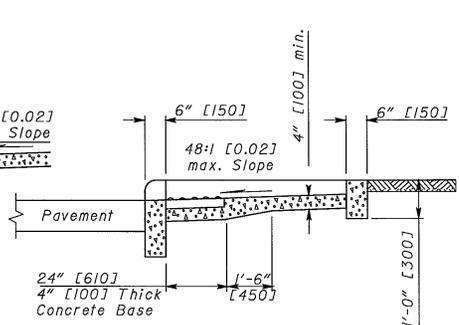
SECTION A-A
NORMAL DETAIL
See Sheet 2.



SECTION A-A
EXISTING WALK DETAIL
See Sheet 2.



SECTION B-B
See Sheet 2.



SECTION C-C
See Sheet 2.

DETECTABLE WARNINGS NOTES

PLACEMENT: Truncated domes are to be installed at any location where pedestrians might cross paths with vehicular traffic lanes, such as the base of curb ramps or at blended curbs. A 24" [610] strip of domes is to be installed for the full width of the ramp. Typical street corner placement locations are shown on Sheet 1.

Ramp cross sections underneath truncated domes are a 4" [100] thick concrete base. Ramp cross sectional details shown here depict nominal 2" [50] thick pavers. Increase base thickness to maintain the 4" [50] thickness if using deeper pavers. Do not decrease thickness for thinner products. See DETAIL A.

ALIGNMENT: Truncated domes should be aligned with the primary direction of pedestrian travel as shown on the DOME ALIGNMENT Detail. Normally the domes should be flush with the back of the curb, but in skewed conditions can be up to 6" [150] to 8" [200] behind the curb, as shown on the DOME ALIGNMENT ON RADIUS CURB Detail. For non-standard layouts, dome materials may have to be mitered and placed segmentally (see TREATMENT AT BLENDED CURBS Detail on SCD BP-7.2).

VISUAL CONTRAST: Color of the truncated domes should contrast with surrounding concrete walk and ramp. Use of a red blend is recommended for concrete curb ramps. Black is not an acceptable color.

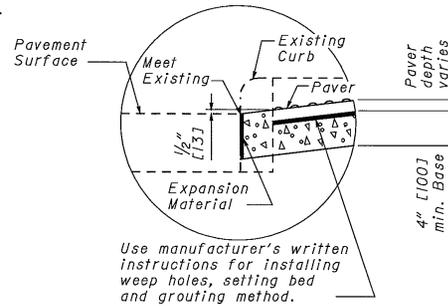
PRODUCTS: Approved products include clay and concrete pavers, cast iron, and cast-in-place engineered plastics and a listing of them may be found on the Office of Roadway Engineering Service's Truncated Domes Approved List (at www.dot.state.oh.us/roadwayengineering/index.asp). Install products as per manufacturer's printed instructions, with added instructions for pavers shown below.

If using pavers, setting bed and joints to be grouted in accordance with manufacturer's written instructions and provide written copies to the Engineer. If the installation method requires a grout bed, bonding group or other cementitious materials, provide documentation that the materials have freeze thaw resistance equal to the pavers.

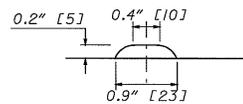
Mortared joints are to be flush with top surface and struck so as to give a smooth surface. Pavers shall be laid such that joints are level with adjoining joints to provide a smooth transition from brick to brick and brick to concrete surface.

The width of paver joints are to be between 5/32" [4] and 1/16" [1.5]. Pavers should not directly touch each other unless they have spacing bars.

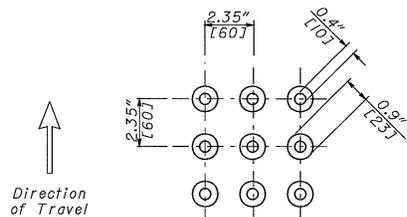
The surface of any two adjacent units should not differ by more than 1/8" [3] in height. Place pavers in a running bond pattern. Face of all pavers are to be clean of cement and protected to avoid chipping during installation.



DETAIL A

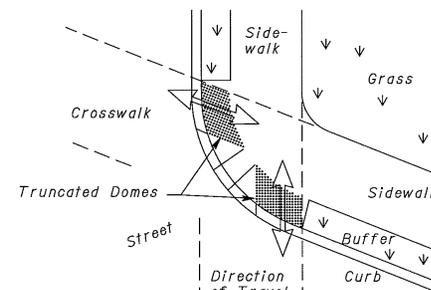


HEIGHT AND DIAMETER



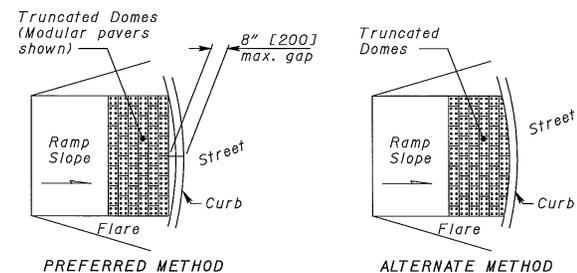
SQUARE PATTERN, PARALLEL ALIGNMENT

TRUNCATED DOMES DETAILS



Orient in-line domes alignment with primary direction of travel.

DOME ALIGNMENT



PREFERRED METHOD

ALTERNATE METHOD

Use Preferred Method for aligning truncated domes unless curb curvature would produce gap more than 8" [200] from front of curb to the domes. If gap will be greater than 8" [200] miter truncated dome product to match the back of the curb as shown in the Alternate Method. NOTE: Some approved Truncated Domes products are easier to miter than others.

DOME ALIGNMENT ON RADIUS CURB

