Index 5200 Precast Sound Barriers (Rev. 07/12)

Design Criteria

AASHTO LRFD Bridge Design Specifications, 6th Edition; ***Structures Design Guidelines (SDG)***

Design Assumptions and Limitations

See ***SDG*** 3.16 for structural design criteria.

This Design Standard has not been designed for vehicle impact loads. If there is insufficient room to accommodate the sound barrier and required set back, use Index 5210 and/or 5211.

General Assumptions/Limitations:

- Elevation at the base of the wall is the same as the surrounding terrain.
- Foundations depths are calculated using Broms method for overturning.
- Post heights range from 12' to 22' in 1'-0" increments.
- Post Spacing is either 10' or 20'.
- Panels are designed for the 150 MPH wind speed (wind pressure = 52 psf) and a maximum panel height of 12'.
- Posts are designed for 110 MPH, 130 MPH and 150 MPH wind speeds.

Ensure system is constructible with consideration of overhead clearances (i.e. overhead services, tree canopies, existing overhead structures, etc.) and existing underground services along the entire length of barrier. Field stake wall alignment at 20'-0" spacing during the design process to locate potential conflicts or severe base elevation changes.

- If vertical clearance is limited, consider the low clearance post/foundation option and shorter panel heights. (minimum of 4'). Minimum vertical clearance for use of Standard designs is controlled by the height of the post plus the tallest required panel height and the panel lifting mechanism. Special construction and/or connection details may be required if vertical clearance is severely limited and is not covered by this Standard.
- If underground services/restrictions exist and make the use of an auger cast pile impractical, consider the use of spread footings at the affected locations. Special construction details for all special footings and required locations shall be included in the plans.
- If non-standard soils (N values less than 4 or greater than 40) are present within the project limits, special foundation designs may be required. If rock or very strong soils are encountered at shallow depths, project specific foundation designs are required. See Plan Content Requirements below.
- Consider the aesthetic and sound barrier qualities if the barrier or panel is to traverse a section with dramatic base elevation changes (drainage ditch crossings etc.).

Plan Content Requirements

Include the "Report of Core Borings" (Soil Information Data) on a separate sheet in the plans.

All non-standard sound barrier components such as spread footings, special foundations, posts, panels, etc. shall be fully detailed in the plans.

Drainage Holes: Locate wall drainage holes based on site requirements. Show drainage holes in the Control Drawings (including Type).

Fire Access Holes: Locate fire access holes at all existing and proposed hydrant locations. If fire access holes are required, consider marking the panel with the adjoining street name where the hydrant is located.

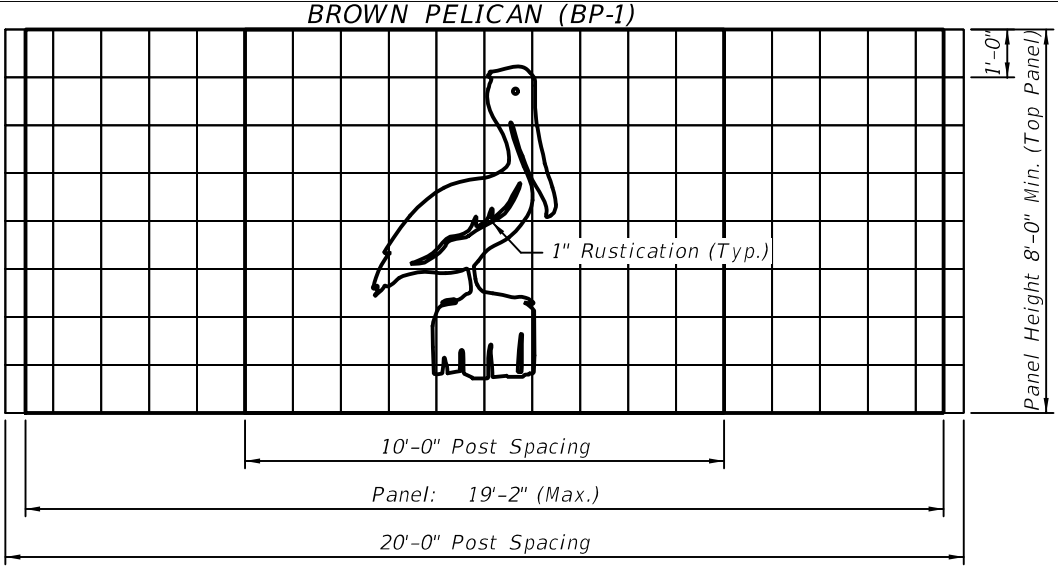
Anti-Graffiti Coating: Consider coating all publicly accessible portions of the wall panels and posts with an anti-graffiti coating (front and/or back of wall). See ***SDM*** 4.4 for limits of anti-graffiti coatings. Tabulate limits of anti-graffiti shown on the "LIMITS OF ANTI-GRAFFITI COATING" Data Table. Specify “sacrificial”, “non-sacrificial” or “water cleanable” coating system based on District Maintenance recommendations (See Pay Items). Anti-Graffiti Coating shall match the Class 5 Finish color.

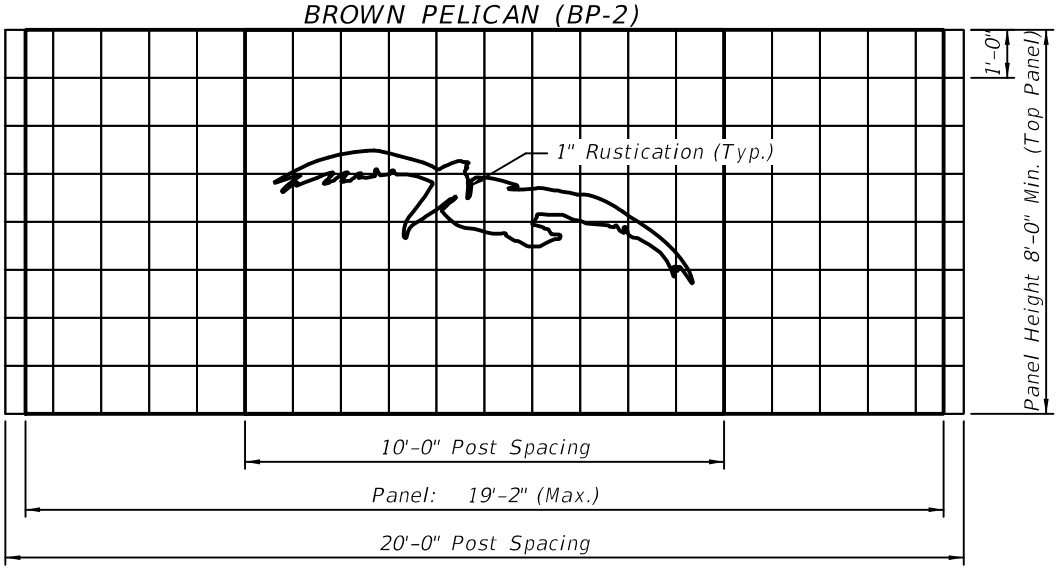
Wall Textures: Specify textures for the front and/or back face of wall. All textures except Type "H" may be used for either the back face or front face of the wall. The Type "H" texture is limited to the front face only. Textures on the front face shall be formed. If wall panels are cast horizontally, textures on the back face must be rolled or pressed, therefore random pattern types on the back face may be more suitable. If wall panels are cast vertically, textures on the back face will be formed, rolled or pressed. For flush face panel options, the textures on the back face may be limited to either "Broom" finish or Type "A" (smooth) finish due to the forming techniques of some manufactures. Type "A" (smooth) finish will provide a surface requiring less maintenance cleaning than that with a "Broom" finish.

Graphics: When required for aesthetics, form wall graphics into the wall panels. Show all graphic locations in the Control Drawings.

Prepare project specific graphics details when required using the Blank Grid Sound Barrier Graphics CADD cell and include them in the plans. Designate each individual project specific graphic with a unique name for identification and cross reference purposes.

The following possible standard graphic options are available in the FDOT Structures Bar Menu (and/or CADD cell updates) as Sound Barrier Graphics CADD cells:


BROWN PELICAN (BP-1)
1" Rustication (Typ.)
1'-0"
Panel Height 8'-0" Min. (Top Panel)
10'-0" Post Spacing
Panel: 19'-2" (Max.)
20'-0" Post Spacing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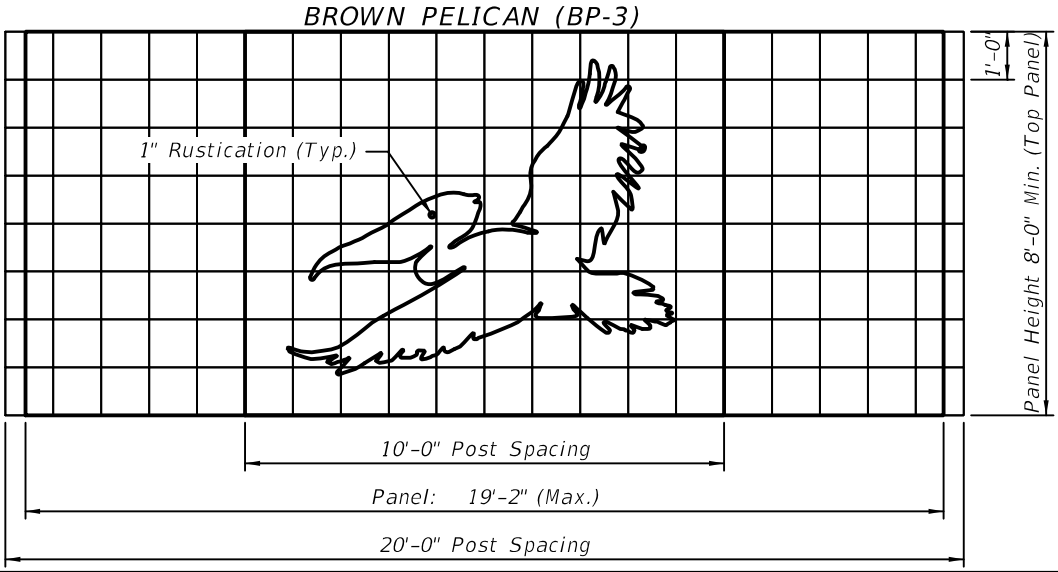
Panel: 19'-2" (Max.)
20'-0" Post Spacing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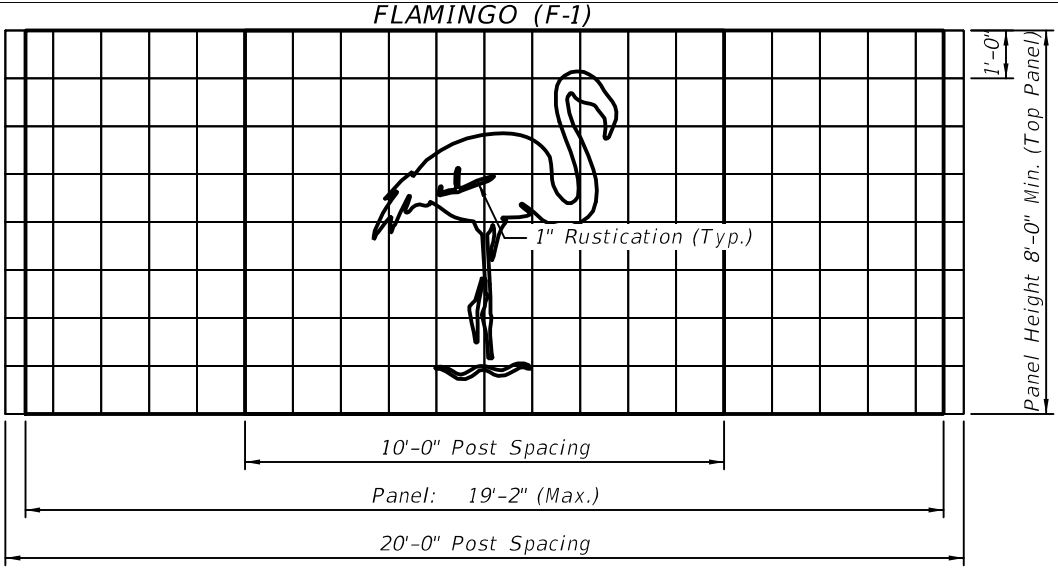
Panel: 19'-2" (Max.)
20'-0" Post Spacing

FLAMINGO (F-1)



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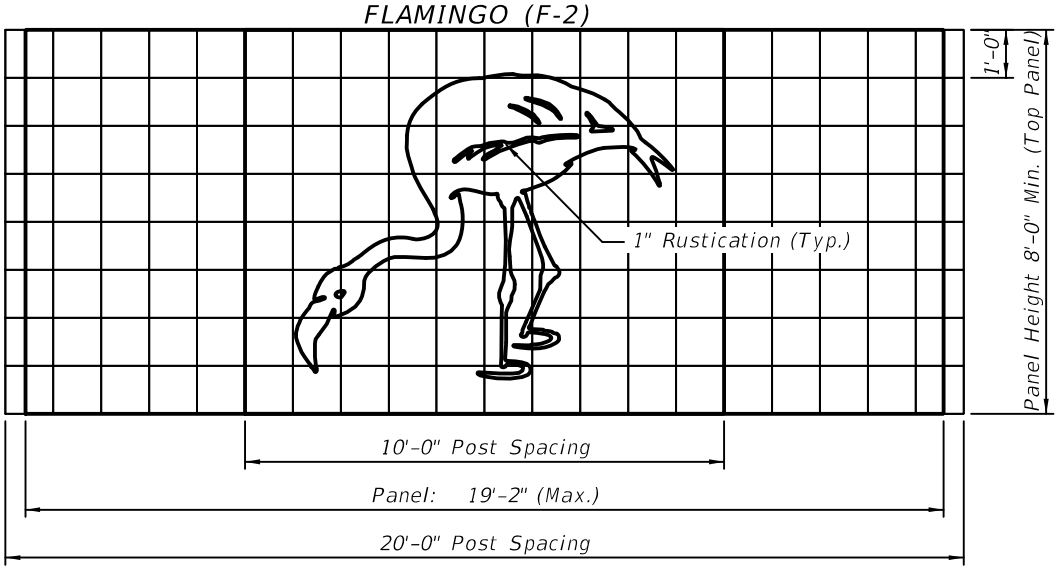
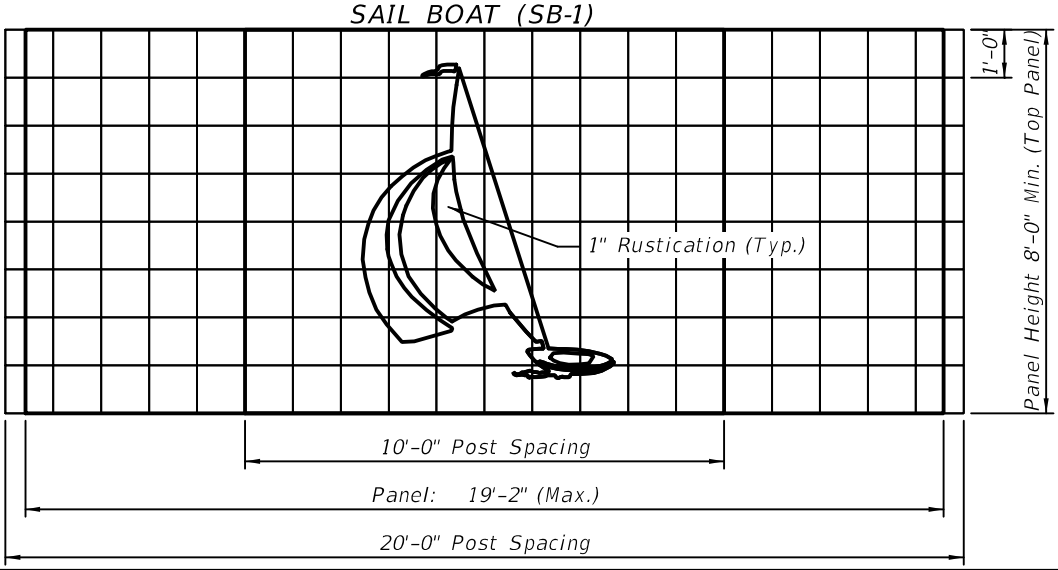
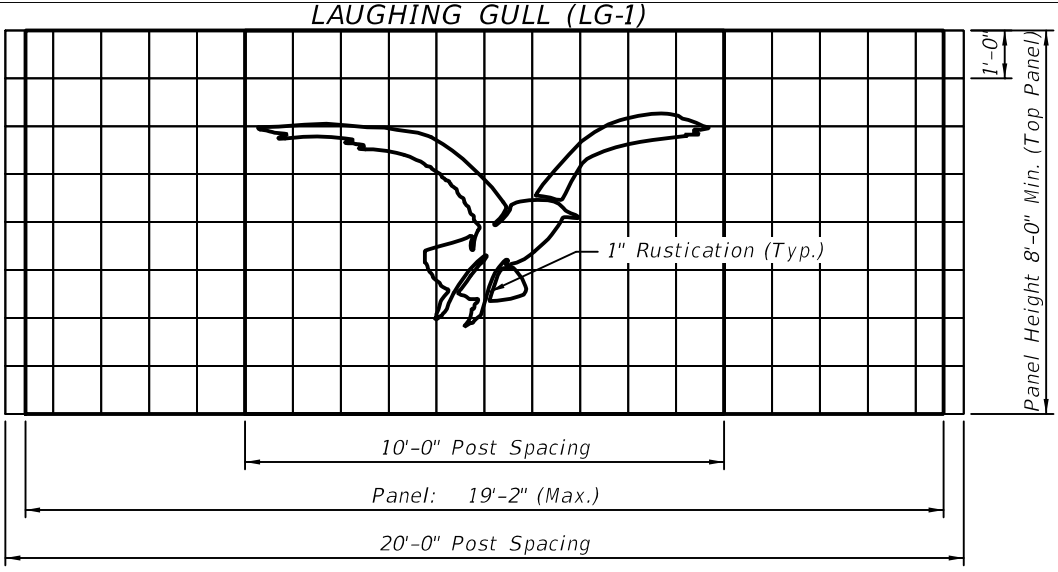
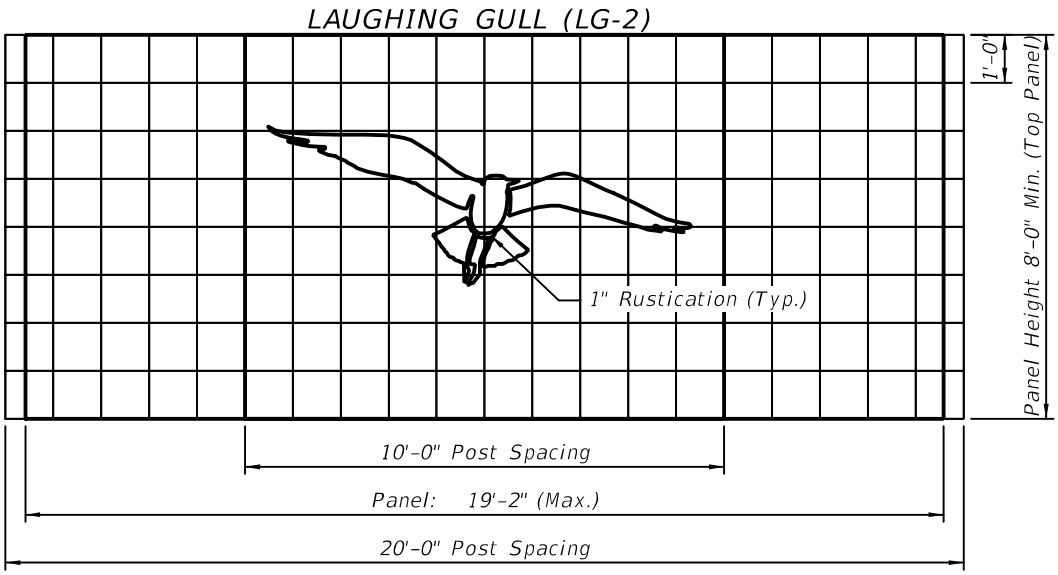


SAIL BOAT (SB-1)




LAUGHING GULL (LG-1)
1'-0"
Panel Height 8'-0" Min. (Top Panel)
1" Rustication (Typ.)
10'-0" Post Spacing
Panel: 19'-2" (Max.)
20'-0" Post Spacing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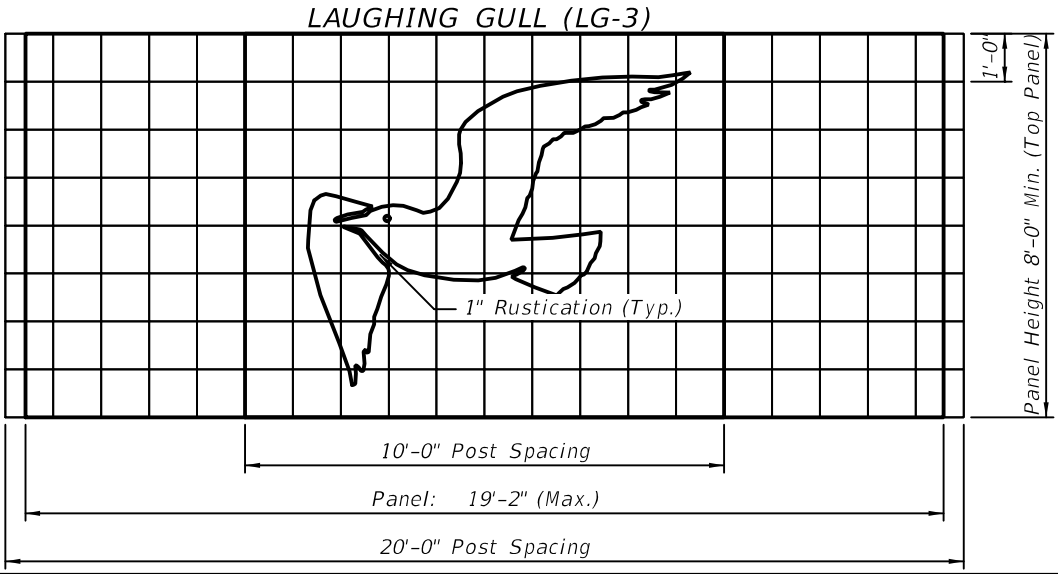
10'-0" Post Spacing
Panel: 19'-2" (Max.)
20'-0" Post Spacing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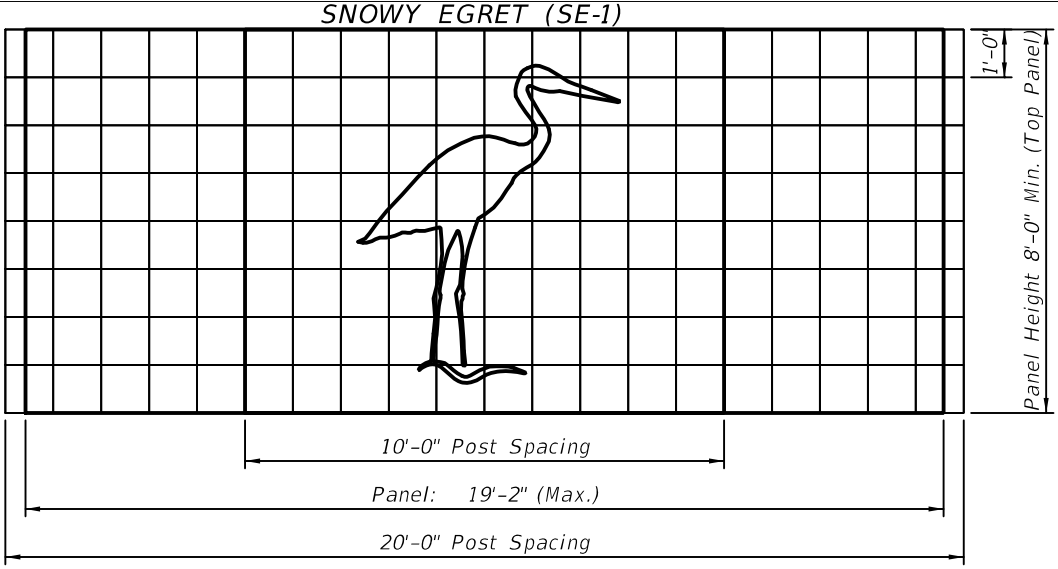
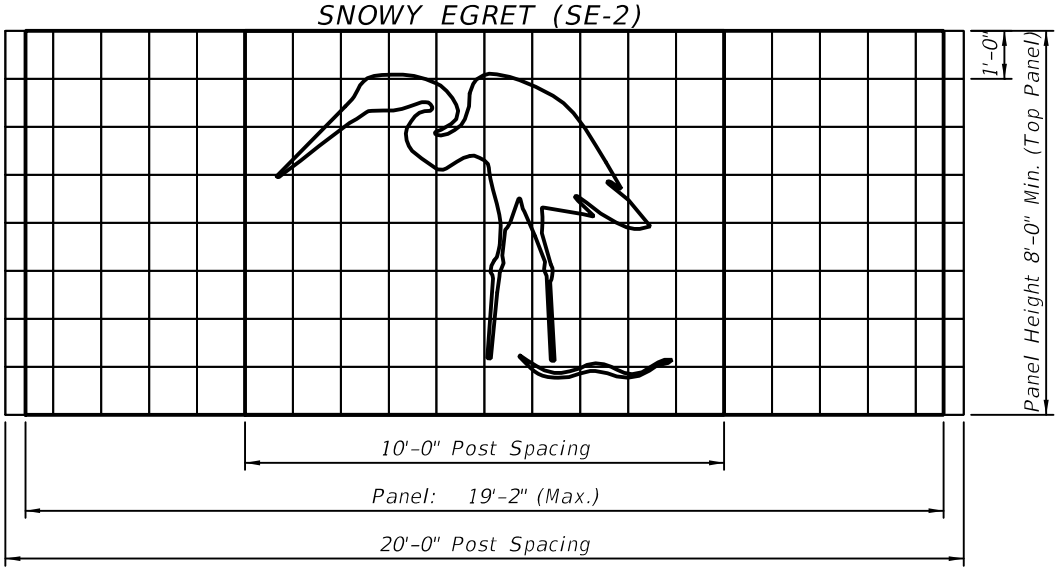
1'-0"
Panel Height 8'-0" Min. (Top Panel)
1" Rustication (Typ.)
10'-0" Post Spacing
Panel: 19'-2" (Max.)
20'-0" Post Spacing

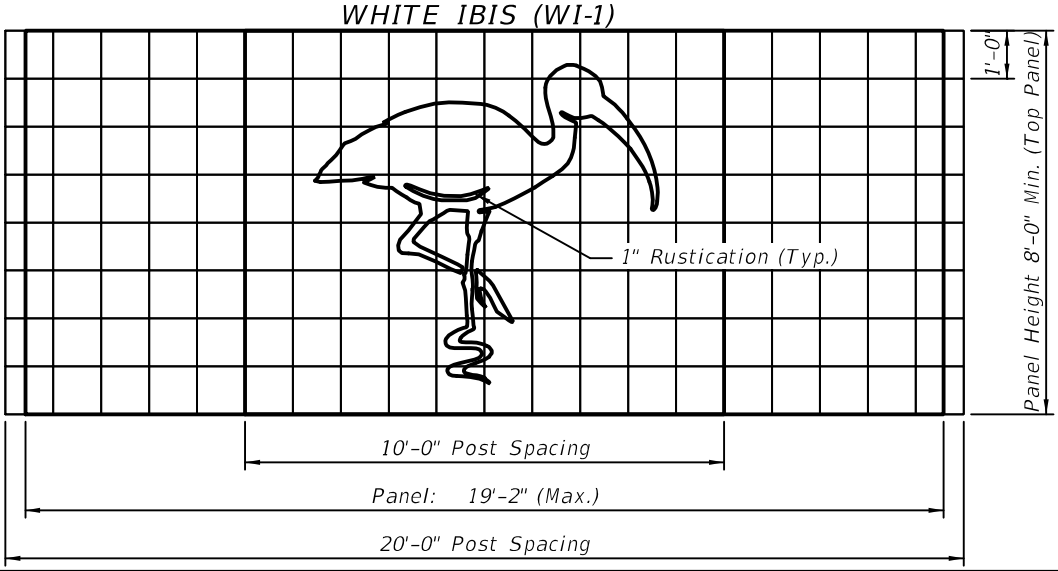
SNOWY EGRET (SE-1)

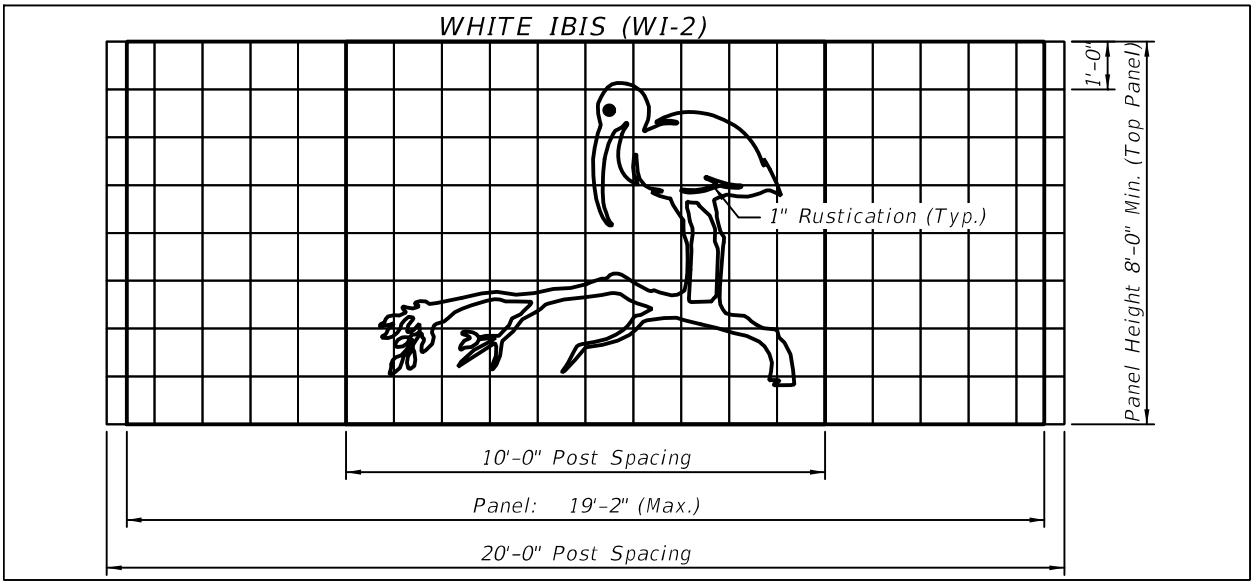


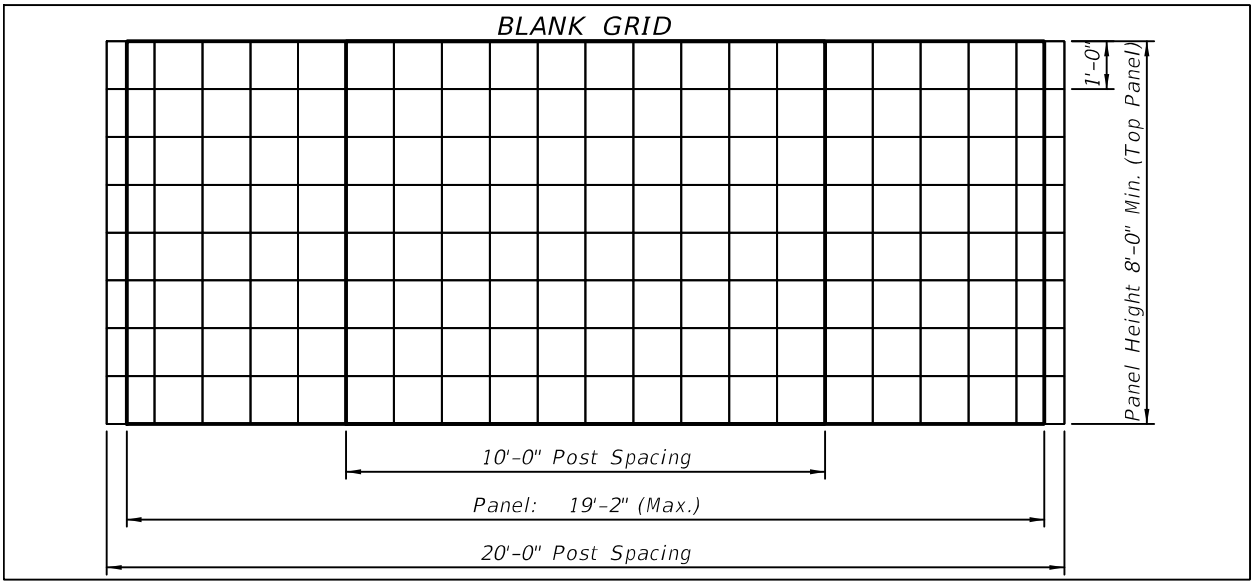
SNOWY EGRET (SE-2)



WHITE IBIS (WI-1)







Using the Blank Grid shown above, the Designer may create other graphics as project requirements dictate. Designate each individual project specific graphic with a unique name for identification and cross-reference purposes. General considerations in creating graphics are as follows:

Wall graphics shall be simple and fully detailed in the plans.

Wall graphics should be as large as possible (approximately 8 ft. in height).

Local community input should be considered when determining graphic types.

Post Caps: Indicate in the "PROJECT AESTHETIC REQUIREMENTS" Data Table if Post Caps are required. Only consider Post Caps when enhanced aesthetics are necessary.

Guardrails and delineators may be required at the back face of wall along local streets.

Prepare Control Drawings containing the following information and include them in the plans.

Plan View

- Sound Barrier Alignment / Location
- Begin/End Sound Barrier Stationings and Offsets
- Offset definition, usually from baseline to front face of Sound Barrier
- Step Locations
- Fire Access Hole Stations
- Drainage Hole Stations
- Adjacent Overhead or In-ground Services
- Limits of sod or seeding/topsoil application
- Emergency access doors - min 6' high by 3' wide (if required)
- Where removal of or improvements to organic soils are necessary, show the limits of organic soils and the limits of required improvements in the plans along with removal/ improvement methods and method of payment.

Elevation

- Ground line Elevations
- Top of Sound Barrier Elevations
- Bottom of Sound Barrier Elevations
- Fire Access Holes
- Drainage Holes (Including type)
- Adjacent Overhead or In-ground Services
- Locations and names of Sound Barrier Graphics
- Limits of Anti-graffiti coating (if required)
- Emergency access doors (if required)

Complete the following Data Tables and include them in the plans. See Introduction I.3 for more information regarding use of Data Tables.

In the FOUNDATION column of the “SUMMARY OF FOUNDATIONS AND WALL QUANTITIES” enter either "1" for Medium Dense Granular Soils (SPT N values between 10 and 40), "2" for Loose Granular Soils (SPT N values between 4 and 9) or "SD" for Special Design. Use “1” for the majority of foundations (SPT values between 10 and 40). Use “2” only if soil conditions warrant (SPT values between 4 and 9) and "SD" only when required.

SOUND BARRIERS DATA TABLES

PROJECT REQUIREMENTS — Table Date 7-01-12

BARRIER NO.	WIND SPEED (MPH)	REQUIRED: (YES/NO)			REQUIRED TEXTURES:				PANEL TYPE (FLUSH/ RECESSED/ EITHER)
					PANELS:		POSTS:		
		GRAPHICS (1)	COLORED COATINGS (2)	PRECAST POST CAP (3)	FRONT FACE	BACK FACE	FRONT FACE	BACK FACE	

(1) See Control Drawings.
(2) Coat all exposed faces of panels and posts with Class 5 Applied Finish Coating. The color shall be per Federal Color Chart, Federal Standard No. 595C color _____.
(3) Coat post caps the same color as posts, with a Class 5 Applied Finish Coating. The color shall be per Federal Color Chart, Federal Standard No. 595C color _____.

SUMMARY OF FOUNDATIONS AND WALL QUANTITIES — Table Date 1-01-12

BARRIER NO.	STATION TO STATION	FOUNDATION (4)	TOP OF WALL ELEV. (FT)	BOTTOM OF WALL ELEV. (FT)	AREA (SF)
				TOTAL:	

(4) 1 = Medium Dense Granular Soil (10≤N≤40)
2 = Loose Granular Soils (4≤N≤9)
SD = Special Design details (See Contract Plans)

LIMITS OF ANTI-GRAFFITI COATING (5) — Table Date 1-01-12

BARRIER NO.	STATION TO STATION	* FRONT FACE/ BACK FACE/ BOTH	MINIMUM HEIGHT **	AREA (SF)
			TOTAL:	

(5) Coat limits shown in table with _____ (sacrificial/non-sacrificial/water cleanable) anti-graffiti coating.
* Includes Posts and Panels.
** Height is measured from final grade.

GENERAL NOTES [Notes Date 7-01-12]:

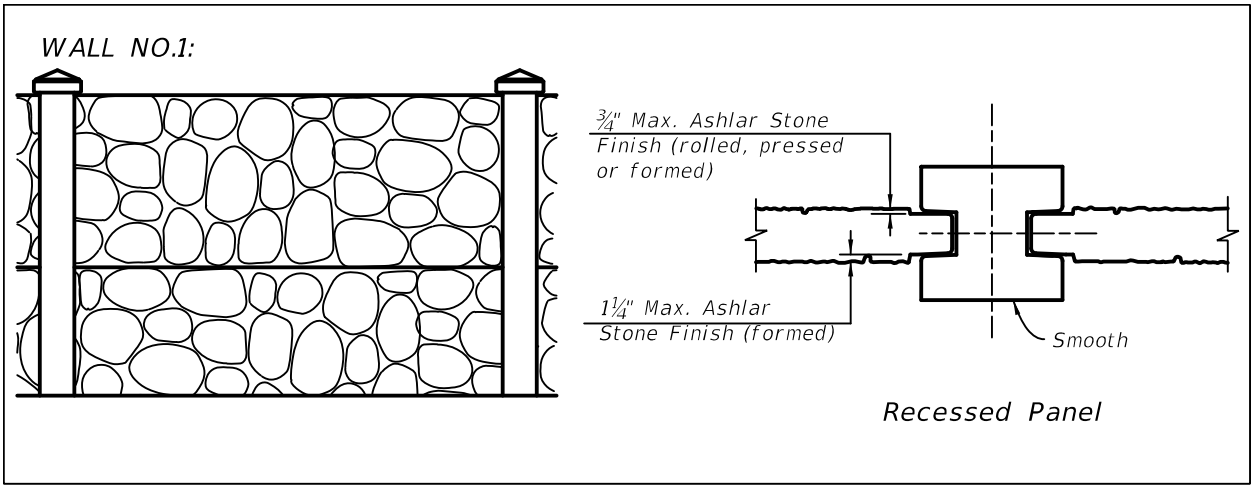
1. Work these Data Tables with Index No. 5200.
2. Sound barriers shall meet the project aesthetic requirements as depicted in the above table and elsewhere in the plans.
3. Front Face indicates roadway side of wall. Back Face indicates non-roadway side of wall.

Payment

Item number	Item description	Unit Measure
534-72-101	Concrete Sound Barrier, Permanent	SF
534-72-102	Concrete Sound Barrier, Temporary	SF

Example

Wall No. 1 is located in a 130 MPH zone. Aesthetics require a recessed panel type wall with Type C post caps. The front and back face panel textures are to be Ashlar Stone. The post texture is to be smooth. The wall will not have any graphics. The color of the wall, posts and caps is to be a light brown, (color number 33446).



Wall No. 2 is to be located in an interior County with 110 MPH wind requirements. Aesthetics require a flush panel type wall. The front face of panels and posts are to be Trapezoid Vertical Fins with Fractured Face (Colorado Drag), with graphics. The Back Face Panel texture is to be Pea Gravel. The color of the wall is to be light brown, color number 33446. Post caps are not required.

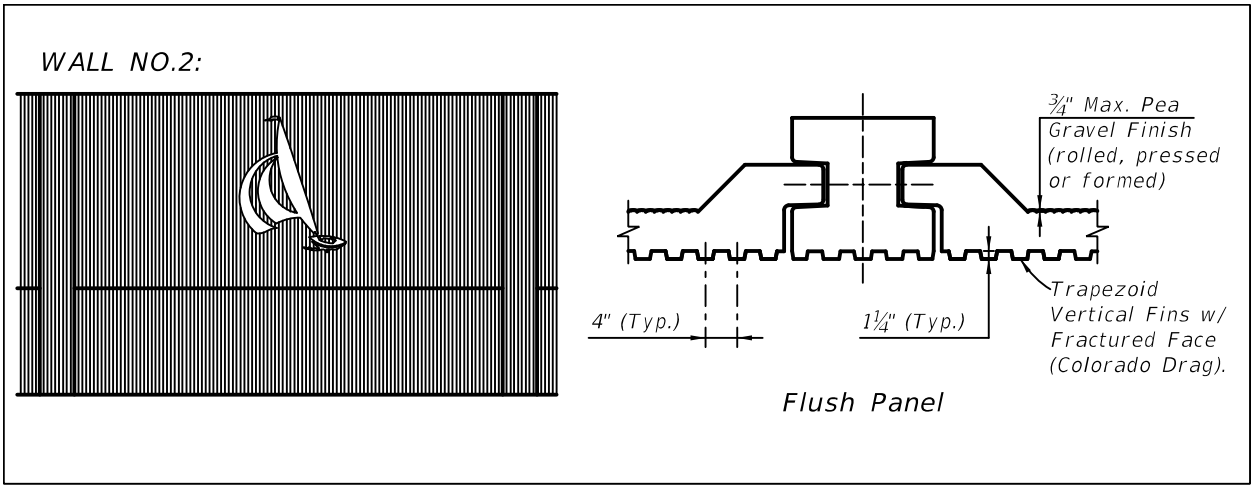


TABLE OF VARIABLES, CADD CELL 05200 "SOUND BARRIER DATA TABLE"

PROJECT REQUIREMENTS									Table Date 1-01-12
BARRIER NO.	WIND SPEED (MPH)	REQUIRED: (YES/NO)			REQUIRED TEXTURES:				PANEL TYPE (FLUSH/ RECESSED/ EITHER)
		GRAPHICS (1)	COLORED COATINGS (2)	PRECAST POST CAP (3)	PANELS:		POSTS:		
					FRONT FACE	BACK FACE	FRONT FACE	BACK FACE	
1	130	NO	YES	C	B	B	A	A	RECESSED
2	110	YES	YES	NO	H	F	H	A	FLUSH

(1) See Control Drawings.
(2) Coat all exposed faces of panels with Class 5 Applied Finish Coating. The color shall be per Federal Color Chart, Federal Standard No. 595C color 33446.
(3) Coat post caps the same color as posts, with a Class 5 Applied Finish Coating. The color shall be per Federal Color Chart, Federal Standard No. 595C color 33446.