

Index 5200 Precast Noise Walls (Rev. 07/13)

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 is not designed for vehicle impact loads. If noise walls cannot be placed outside the clear zone or at required set back distances behind traffic railings, use Index 5210 and/or 5211.

General Design Assumptions:

- Wall heights range from 12' to 22' in 1'-0" increments
- Wall Panel segments are limited to a 12'-0" maximum height
- Wall Panels will withstand pressure from 150 MPH wind (pressure = 52 psf) when installed between posts spaced at 20'-0" or less
- Post reinforcing and foundation depths are based on either a 10'-0" or 20'-0" post spacing.
- Posts are designed and detailed to resist wind pressures based on requirements of **SDG** 2.4 at wind speeds of 110, 130, or 150 MPH. Velocity Pressure Exposure Coefficient (K_z) for each wind speed is calculated to the centroid of each foot of wall height
- Elevation at the base of the wall is the same as the surrounding terrain.
- Foundations depths are calculated using Broms method for overturning. Generally use the average N value over the foundation depth; however, the top 5 feet of soil is the most critical for overturning and may control foundation depths.

General Design Limitations:

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 the wall. During the design process, field stake wall alignment at 20'-0" spacing to locate potential conflicts or abrupt base elevation changes and address them in the plans.

- If vertical clearance is limited along the length of the wall, consider the low clearance post/foundation option and shorter panel heights (minimum of 4'). Minimum vertical clearance for use of top-installed panels is controlled by the height of the post plus the tallest panel height and the panel lifting mechanism. Side-installed panel details are included in the Standard; however, use is limited to locations where the vertical clearance between posts prohibits top-installation.

- If underground services/restrictions exist and make the use of an auger cast pile impractical, consider designing spread footings for the affected locations. See Plan Content Requirements below.
- If foundations will be installed on a slope or on a berm, adjust the foundation depths based on the ***Soils and Foundations Handbook***, Appendix B.
- 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.
- The designer must consider both the aesthetic and noise canceling qualities of the wall design. If the base elevations or wall height requirements change along the length of the project, step bottom and/or top of wall panels and post elevations to maintain the aesthetic and noise canceling qualities. If the wall is interrupted or access is required, include wall offset distances and lap lengths.

Plan Content Requirements

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

All non-standard noise wall 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. Evaluate the capacity of drainage openings and locate horizontally and vertically to ensure that offsite stormwater inflows are accommodated without increasing offsite stormwater stages for the appropriate regulatory design events. Refer to the ***Drainage Manual*** for additional guidance. Show drainage holes in the Control Drawings (including Type).

Fire Access Holes: Locate fire access holes at all existing and proposed hydrant locations.

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.

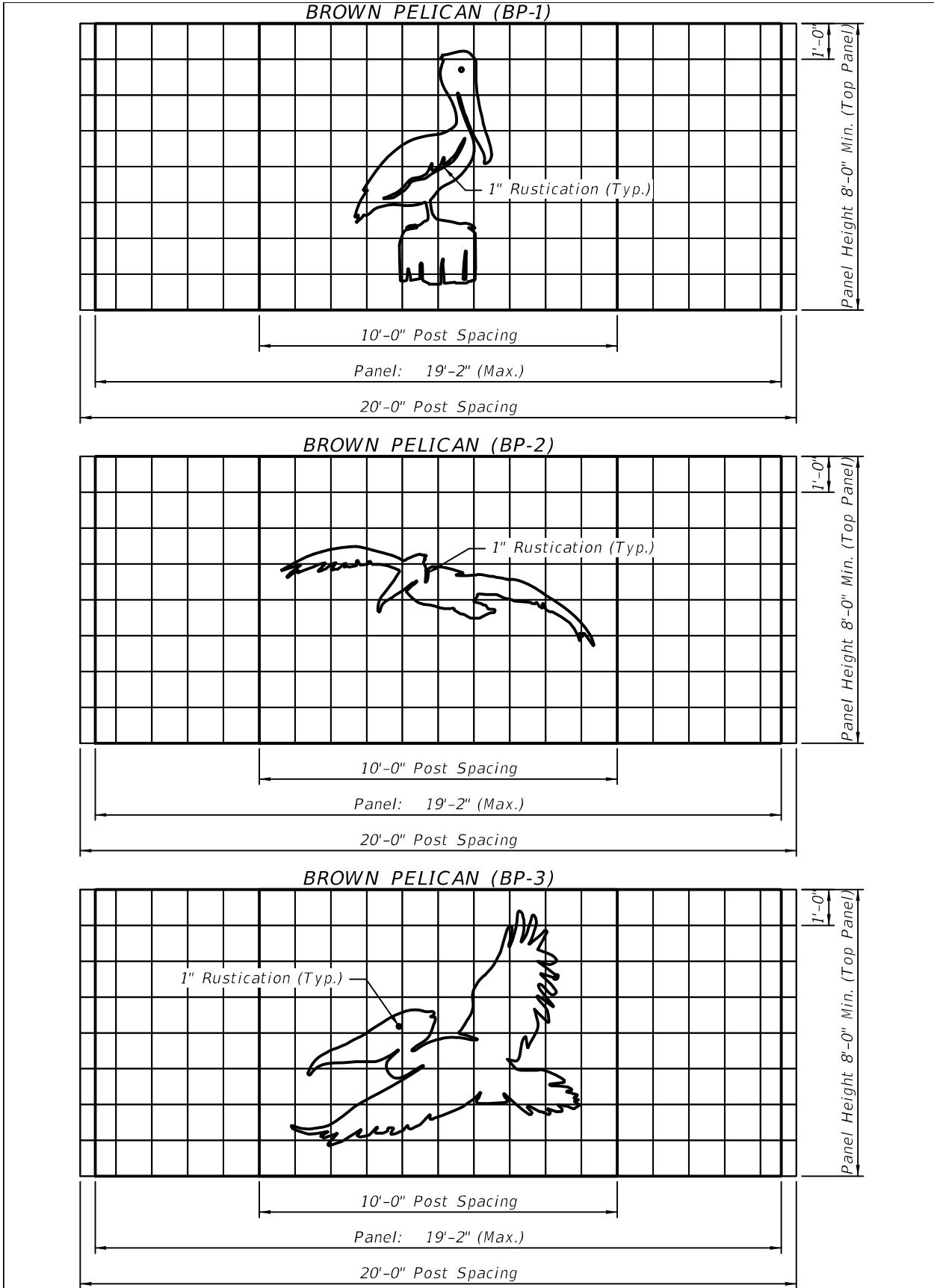
Wall Textures: Specify textures for the front and/or back face of wall. All textures except Type "H" may be used for either the back face or front face of the wall. The Type "H" texture is limited to the front face only. Textures on the front face shall be formed. If wall panels are cast horizontally, 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"

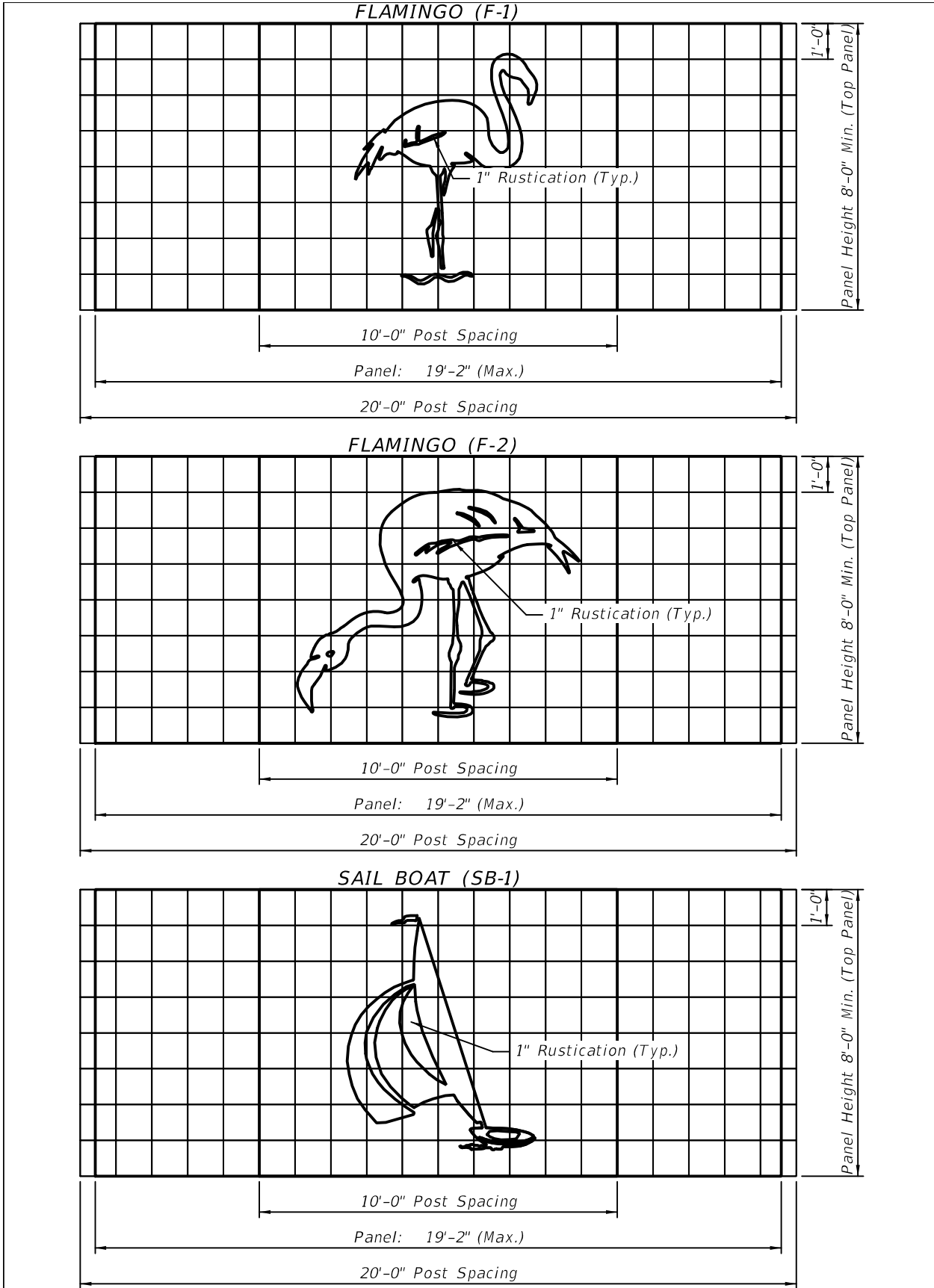
(smooth) finish will provide a surface requiring less maintenance cleaning than that with a "Broom" finish.

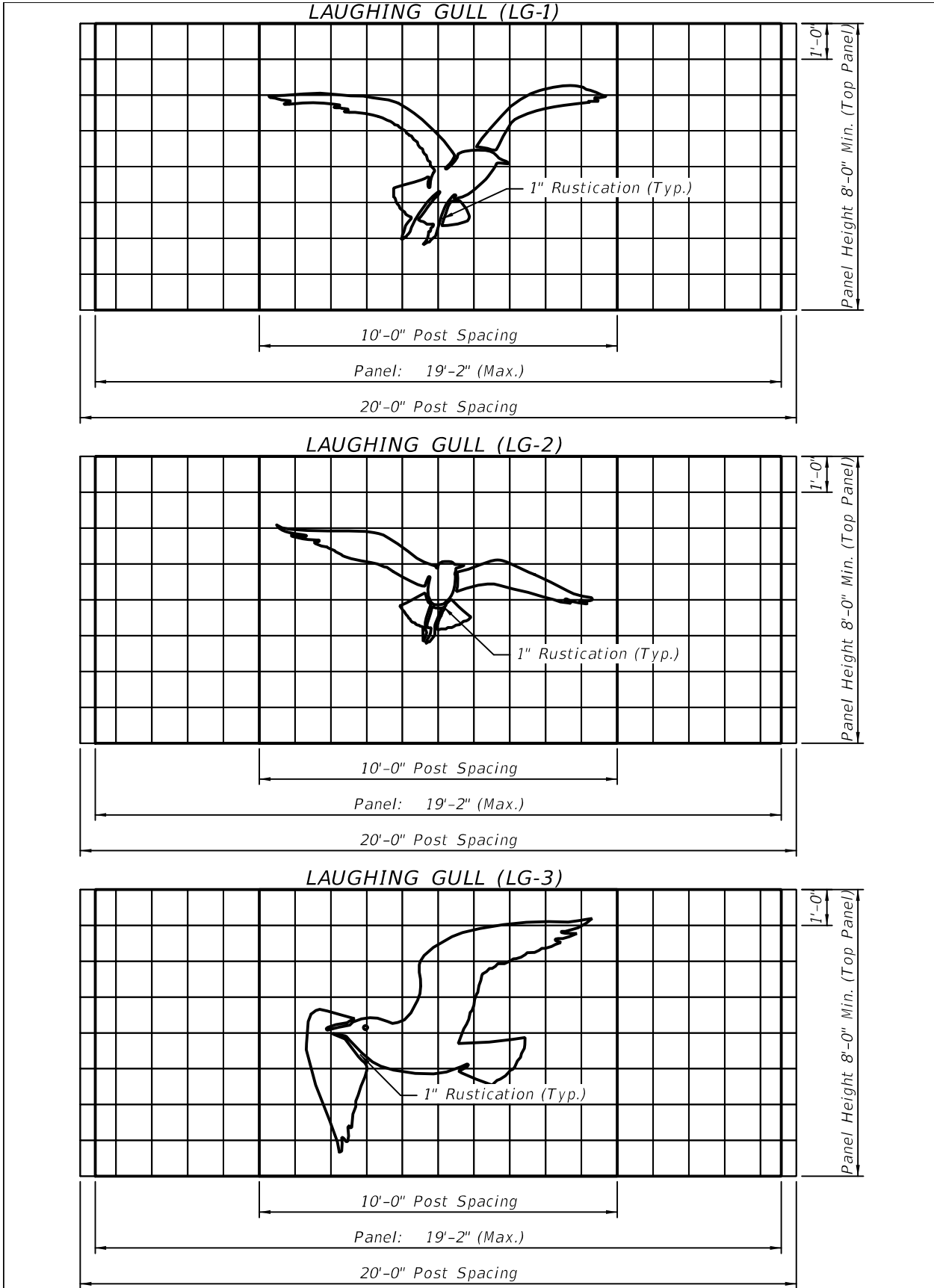
Graphics: When required for aesthetics, form wall graphics into the wall panels. Show all graphic locations in the Control Drawings.

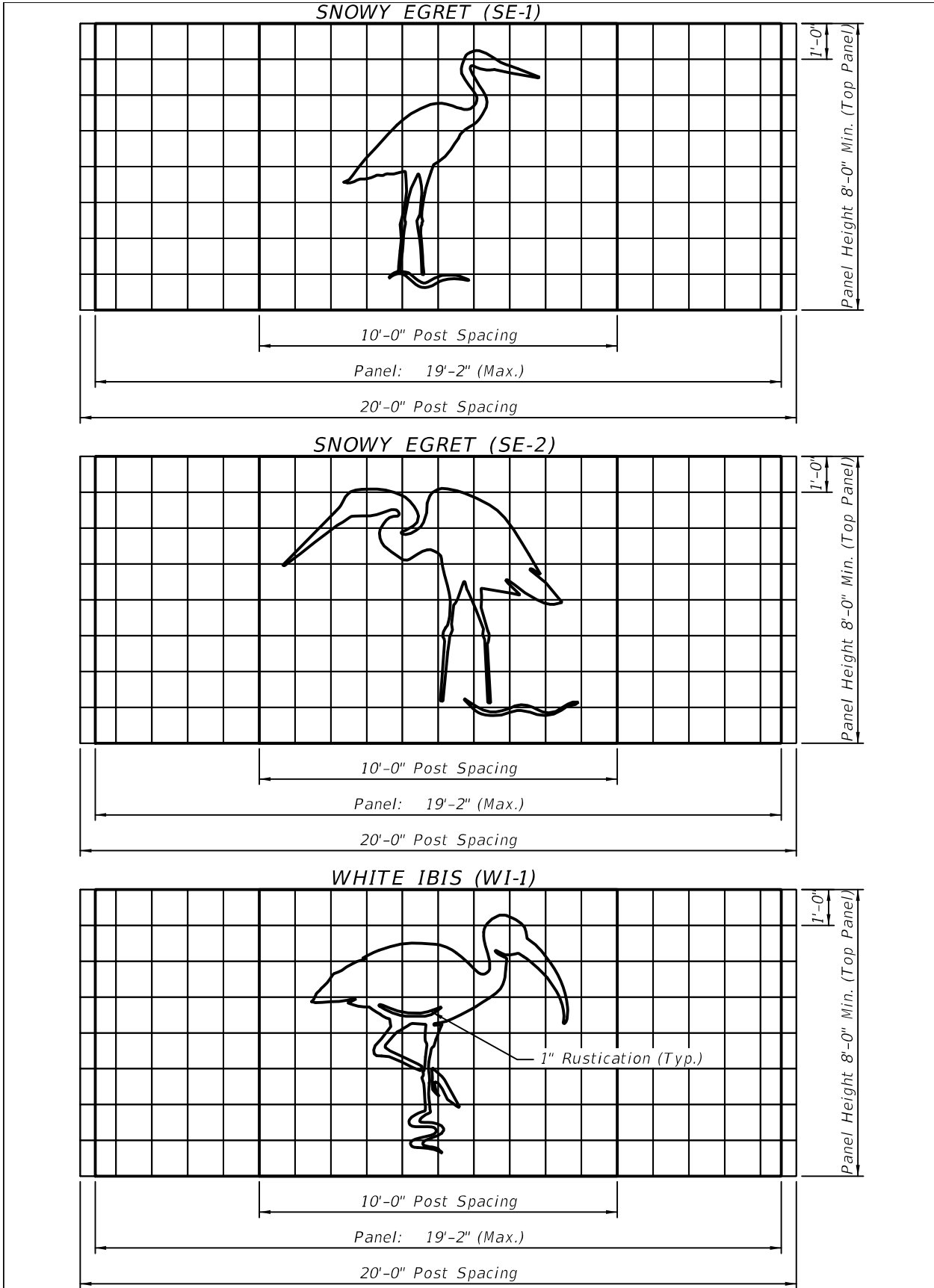
If project specific graphics are required, prepare graphic details using the Blank Grid Noise Wall Graphics CADD cell and include them in the plans.

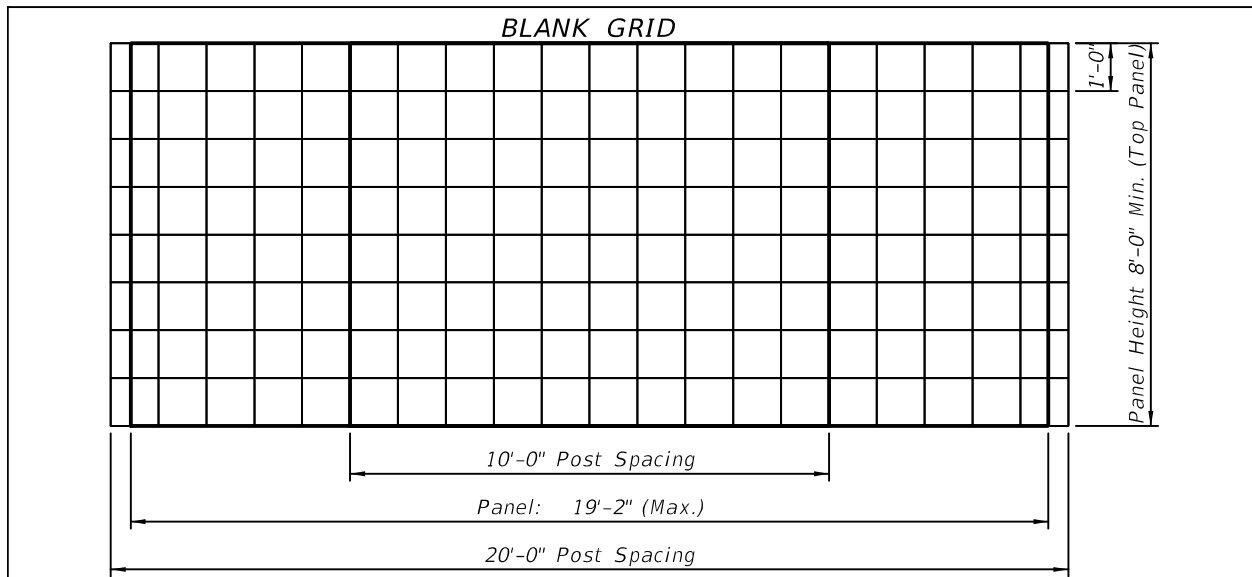
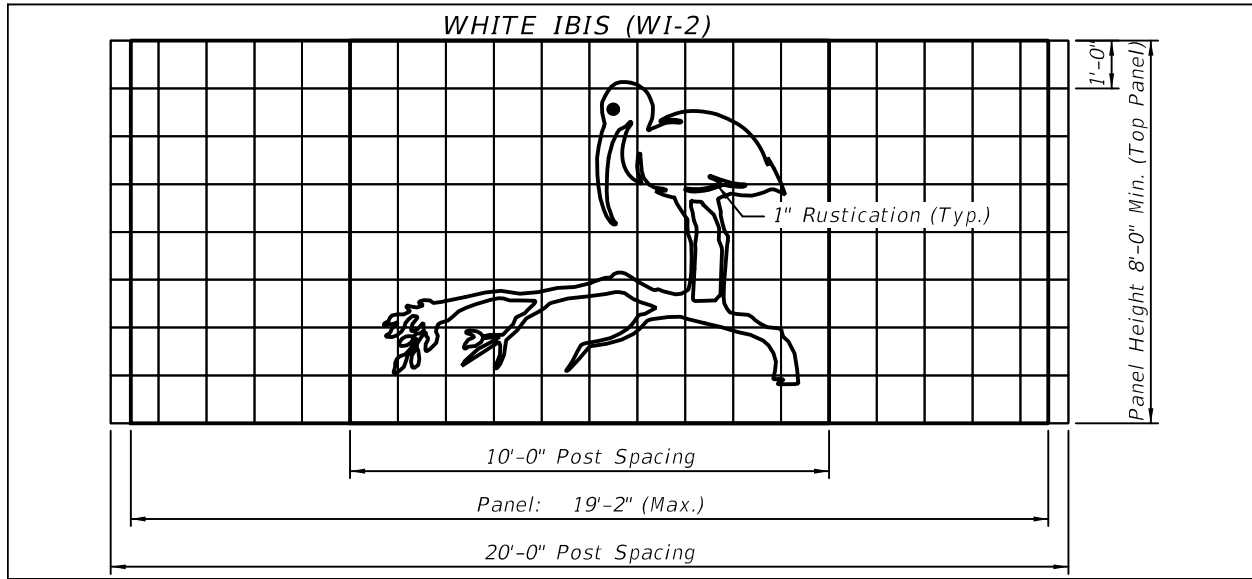
The following possible standard graphic options are available in the FDOT Structures Bar Menu (and/or CADD cell updates) as Noise Wall Graphics CADD cells:











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

- Noise Wall Alignment / Location
- Begin/End Noise Wall Stationings and Offsets
- Offset definition, usually from baseline to front face of Noise Wall
- Step Locations
- Fire Access Hole Stations
- Drainage Hole Type and Stations
- Adjacent overhead or in-ground services
- Limits of sod or seeding/topsoil application
- Emergency access doors - minimum 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 Noise Wall elevations
- Bottom of Noise Wall elevations
- Fire Access Holes
- Drainage Holes (Including type)
- Adjacent overhead or in-ground services
- Locations and names of Noise Wall 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.

NOISE WALLS DATA TABLES

PROJECT REQUIREMENTS								Table Date 7-01-13	
WALL 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) See Control Drawings.
- (2) Coat all exposed faces of wall with anti-graffiti coating or Class 5 Applied Finish Coating. The panel color shall be per Federal Color Chart, Federal Standard No. 595C color _____.
- (3) The post and cap color shall be per Federal Color Chart, Federal Standard No. 595C color _____.

LIMITS OF ANTI-GRAFFITI COATING (5)					Table Date 07-01-13
WALL NO.	STATION TO STATION	FRONT FACE/ BACK FACE/ BOTH (6)	MINIMUM HEIGHT(7)	AREA (SF)	

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

SUMMARY OF FOUNDATIONS AND WALL QUANTITIES							Table Date 07-01-13
WALL NO.	STATION TO STATION	FOUNDATION (4)	TOP OR SIDE INSTALLED (T, S)	TOP OF WALL ELEV. (FT)	BOTTOM OF WALL ELEV. (FT)	AREA (SF)	

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

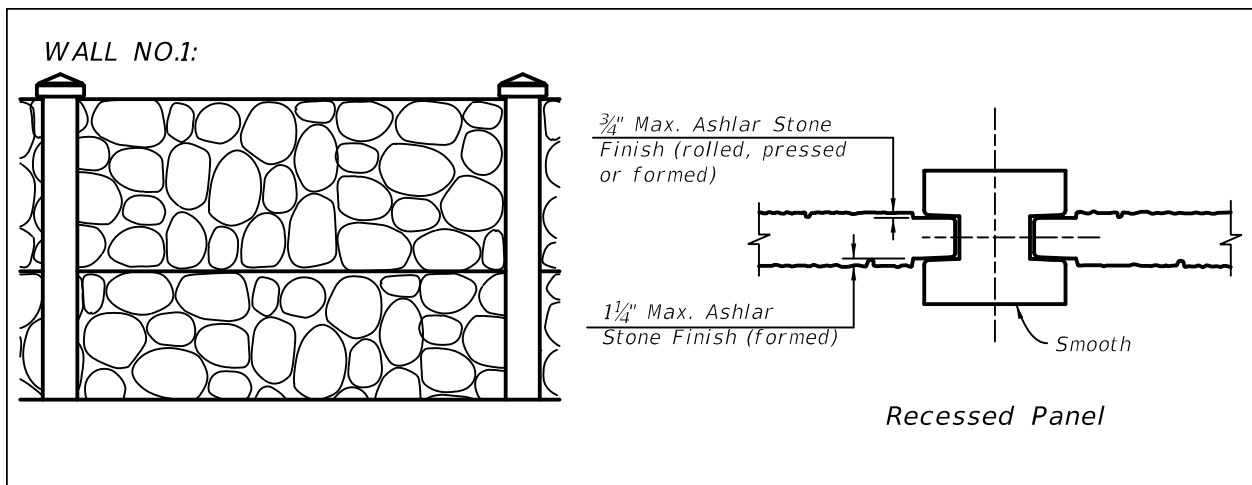
- GENERAL NOTES [Notes Date 7-01-13]:
1. Work these Data Tables with Index No. 5200.
 2. Noise Walls shall meet the project aesthetic requirements as depicted in the above table and elsewhere in the plans.
 3. Front Face indicates roadway side of wall. Back Face indicates non-roadway side of wall.

Payment

Item number	Item description	Unit Measure
534-72-101	Concrete Noise Wall, Permanent	SF
534-72-102	Concrete Noise Wall, 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.

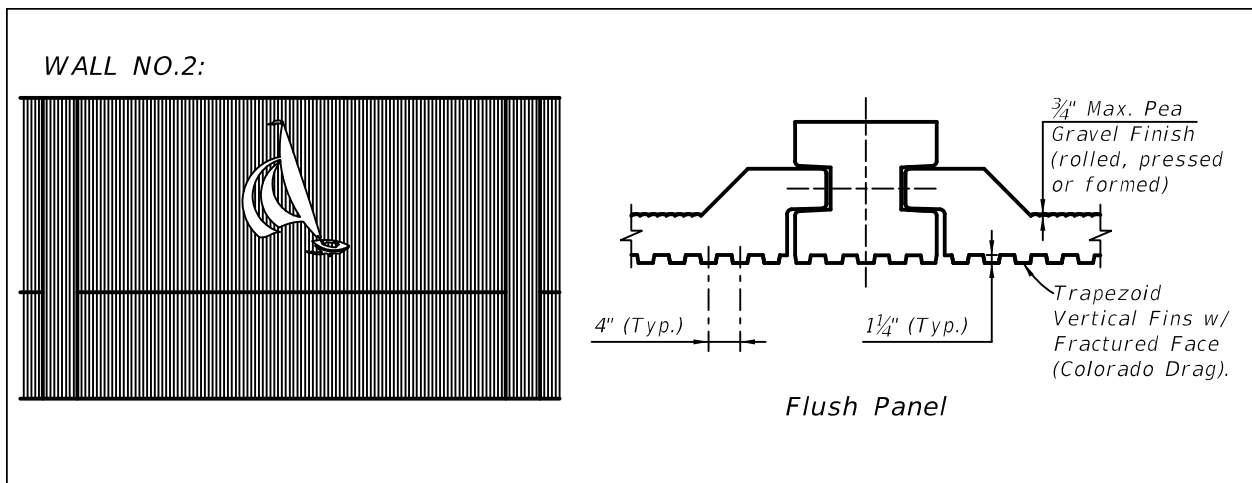


TABLE OF VARIABLES, CADD CELL 05200 "NOISE WALLS DATA TABLES"

PROJECT REQUIREMENTS									Table Date 07-01-13
WALL 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.