

# FIRST COAST CHAPTER

INTERNATIONAL CODE COUNCIL (ICC) AND  
BUILDING OFFICIALS ASSOCIATION OF FLORIDA, INC. (BOAF)  
SERVING BAKER, BRADFORD, CLAY, DUVAL, NASSAU, PUTNAM, ST. JOHNS &  
UNION COUNTIES

## Northeast Florida BOAF Consensus Group on Exposure Categories FBC 1609.4 with Commentary

**Introduction.** The new language in Section 1609.4, 2007 FBC, regarding Wind Exposure Categories, is very different from the previous editions. Section 1609.4 is based on ASCE 7, but the two documents differ in several areas, making it difficult to use ASCE 7 for guidance.

The purpose of this commentary is to clarify the provisions of Sec. 1609.4, alert designers and builders to some of the issues involved, and provide recommendations for determining Wind Exposures. **This Commentary is advisory only**; the code official alone possesses the authority and responsibility for interpreting the code.

The full text of Sec. 1609.4, 2007 FBC is printed, below, followed by numbered comments and schematic drawings.

**1609.4 Exposure category.** For each wind direction considered, an exposure category that adequately reflects the characteristics of ground surface irregularities shall be determined for the site at which the building or structure is to be constructed. Account shall be taken of variations in ground surface roughness that arise from natural topography and vegetation as well as from constructed features.

**Exception:** An intermediate exposure between the exposure categories defined is permitted in a transition zone, provided that it is determined by a rational analysis method.

### [Comment 1]

**1609.4.1 Wind directions and sectors.** For each selected wind direction at which the wind loads are to be evaluated, the exposure of the building or structure shall be determined for the two upwind sectors extending 45 degrees (0.79 rad) either side of the selected wind direction. The exposures in these two sectors shall be determined in accordance with Sections 1609.4.2 and 1609.4.3 and the exposure resulting in the highest wind loads shall be used to represent winds from that direction. **(refer to attached Schematic Diagram 2 on page 3)**

**1609.4.2 Surface roughness categories.** A ground surface roughness within each 45-degree (0.79 rad) sector shall be determined for a distance upwind of the site as defined in Section 1609.4.3 from the categories defined below, for the purpose of assigning an exposure category as defined in Section 1609.4.3. **[Comment 2]**

**Surface Roughness B.** Urban and suburban areas, wooded areas or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.

**Surface Roughness C.** Open terrain with scattered obstructions having heights generally less than 30 feet (9144 mm). This category includes flat open country, grasslands, and all water surfaces in hurricane-prone regions. This surface roughness shall also apply to any building located within surface roughness B-type terrain where the building is within 100 feet horizontally in any direction of open areas of surface roughness C-type terrain that extends more than 600 feet (182.9 m) and width greater than 150 ft. in the upwind direction. **[Comment 4]** Short-term (less than two year) changes in the pre-existing terrain exposure, for the purposes of development, shall not be considered surface roughness C. Where development build-out will occur within three years and the resultant condition will meet the definition of surface roughness B, surface roughness B shall be

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regulating for the purpose of permitting. **[Comment 5]** This category includes flat open country, grasslands and ocean or gulf shorelines and shall extend downwind for a distance of 1500 feet.

**Surface Roughness D.** Reserved.

**1609.4.3 Exposure categories.** An exposure category shall be determined in accordance with the following: **[Comment 3]**

**Exposure B.** Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the upwind direction for a distance of at least 2,600 feet (792 m) or 20 times the height of the building, whichever is greater.

**Exception:** For buildings whose mean roof height is less than or equal to 30 feet (9144 mm), the upwind distance is permitted to be reduced to 1,500 feet (457 m).

**Exposure C.** Exposure C shall apply for all cases where Exposure B does not apply. Buildings located within a distance of 600 feet of inland bodies of water that present a fetch of 1 mile (1.61 km) or more or inland waterways or rivers with a width of 1 mile (1.61 km) or more shall be classified as Exposure C and roof sheathing uplift and roof-to-wall uplift loads shall be increased by 20 percent. **[Comment 6]**

**Exposure D.** This exposure category is not applicable in Florida.

### COMMENTARY (by number referred from code provisions)

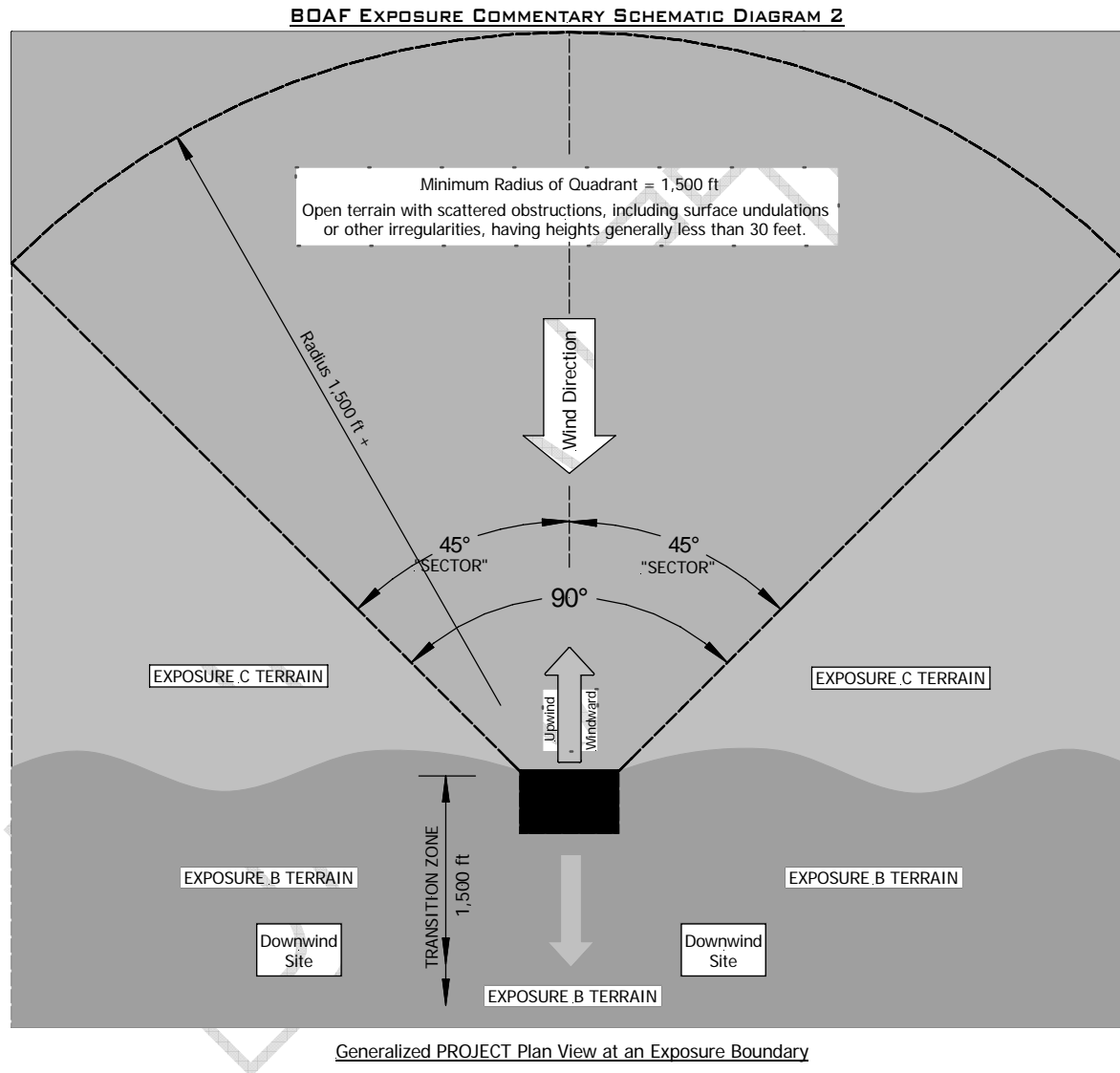
- 1)** A Transition Zone is an overlap of boundaries between two exposure categories. The starting (boundary) of the transition zone occurs at the interface of the higher pressure category (exposure C) with the lower pressure category (exposure B) and extends into the lower category (B) for a distance of 1,500 ft. from the interface, or ten times the height of the building (under consideration), whichever is greater (**refer to attached Schematic Diagram 1 on page 4**). Within a transition zone the design pressures of the greater category apply, or they may be interpolated using rational analysis as specified by ASCE7.
- 2)** Exposure category shall be determined by the surface roughness as defined in ASCE7. When considering the Exposure Category (i.e. surface roughness) in any direction from the building under consideration, and more than one roughness category exists in the first 1,500 ft. (mixed roughness categories), the exposure category shall be determined by extending the view and adding the lengths of each roughness category until one or the other totals 1,500 ft. This Category will apply to the entire distance. (**See Comment 4**)
- 3)** The most restrictive exposure category in any wind direction shall govern the Component and Cladding design wind pressures for the entire building. The Main Wind Force Resisting System (MWFRS) design wind pressures can vary by the exposure in a specific direction.
- 4)** A building within 100 ft. of at least 600 ft. by 150 ft. of Exposure C type surface roughness in the upwind direction (but less than an area of 1,500 ft. by 1,500 ft.) shall also be classified as Exposure C. This rule only applies to buildings directly adjacent to, and within 100 ft. of the "open patch", and exposed to the wind from at least 600 ft. of Exposure C-type surface roughness; there is no transition zone. (**Refer to attached Schematic Diagram 3 on page 5**)
- 5)** These provisions are to account for temporary situations created by the act of development. The 2 year provision is to account for removal of obstructions for the sake of the development (where the site is located). The 3 year provision is to account for neighboring areas (outside the development under consideration) which may provide newly created obstructions (and therefore an exposure B

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classification) for the building site. If the subdivision is platted and the infrastructure is in place the exposure shall be that which will exist at the time the subdivision building construction is completed.

6) The 20% increase in design wind pressures applies to areas exposed to wind flowing over open water for a fetch of at least one mile and within 600 feet of the shoreline exposed to these winds; there is no transition zone. The 20% increase in wind pressures applies **only** to the fastening of the roof sheathing and the roof-to-wall connections. **(Refer to attached Schematic Diagram 4 on page 4 and DEC Statement DCA08-DEC-194)**

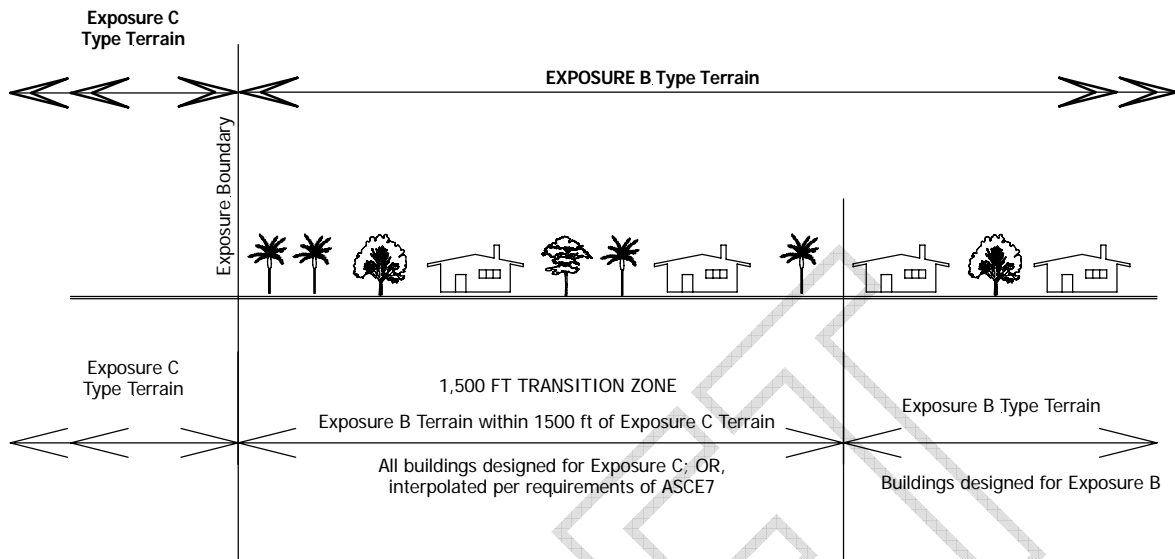


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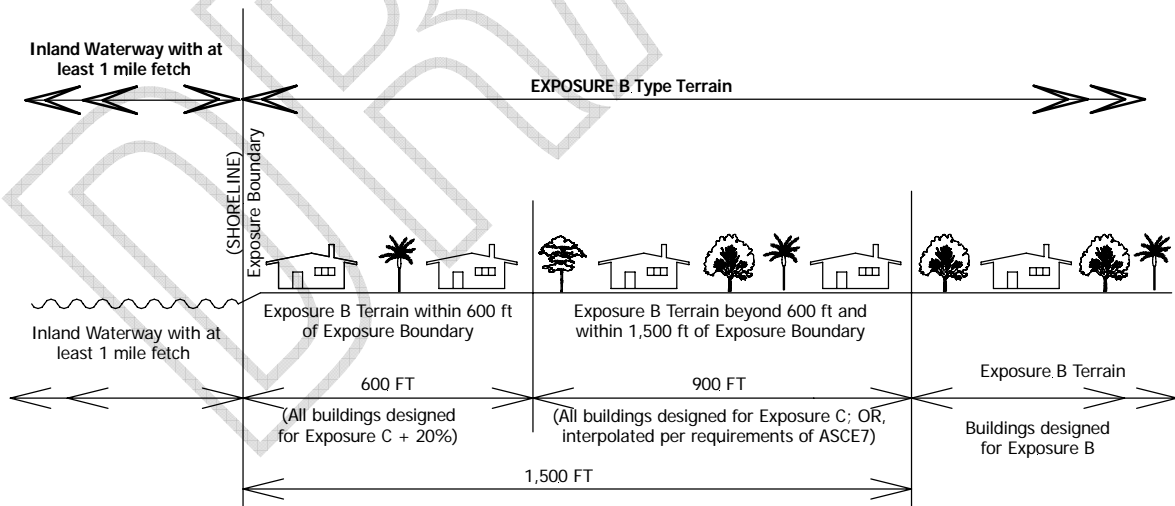
**BOAF EXPOSURE COMMENTARY SCHEMATIC DIAGRAM 1**

(Referred in Comment 1)



**SCHEMATIC ELEVATION FOR AN EXPOSURE C TO EXPOSURE B TRANSITION**

**BOAF EXPOSURE COMMENTARY SCHEMATIC DIAGRAM 4**

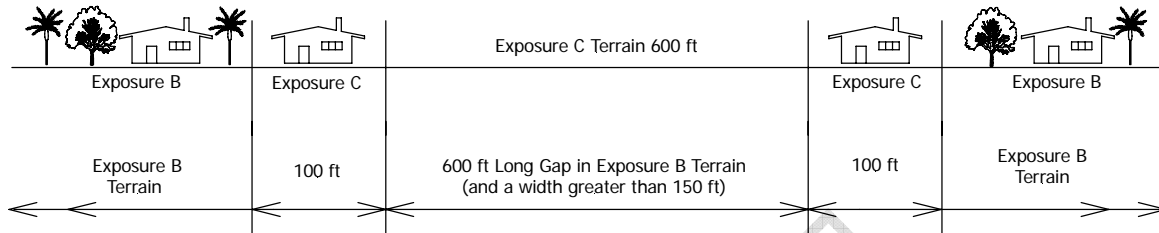


**SCHEMATIC ELEVATION OF EXPOSURE C + 20% & TRANSITION ZONES**

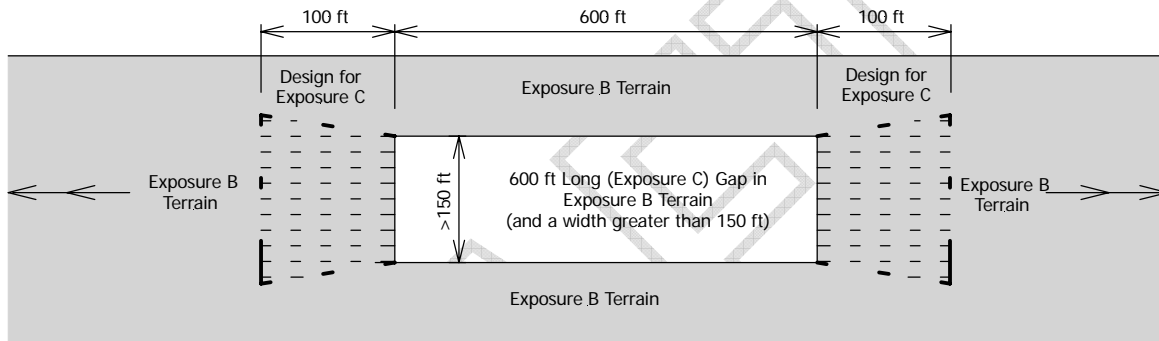
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## BOAF EXPOSURE COMMENTARY SCHEMATIC DIAGRAM 3 (Referred in Comment 5)



### SCHEMATIC ELEVATION OF EXPOSURE CATEGORY ZONES



### SCHEMATIC PLAN OF "PATCH" EXPOSURE C ZONE

There are only two Exposure Categories, B & C (the C+20% rule should only be used as a specific condition occurring in exposure C near inland bodies of water). Exposure B is the least severe exposure category but each site must be individually evaluated as detailed by the code. A jobsite (project) can be classified as a more severe category (exposure C) in various ways (according to the code and commentary).

General evaluation procedure:

- 1) Rotate the 45° "point of view" (from the project under consideration) a full 360° (analogous to a lighthouse beacon). The exposure category for the proposed project shall be determined by the most severe surface roughness condition in any 45° sector for the entire circle (refer to Comment 2 and Schematic Diagram 2 on page 3). If no 45° sector's surface roughness qualifies as exposure C, then;
- 2) Check for the proximity of the jobsite to existing transition zones (refer to comment 1), then;
- 3) Check each point of view for the 600 ft. patch (as explained in comment 4); then,
- 4) Check for temporary conditions which may affect the exposure category as outlined in comment 5), then;
- 5) Check each point of view for proximity to an inland water shoreline (refer to comment 6).