Proposed Code Modifications

This document created by the Florida Department of Business and Professional Regulation - 850-487-1824

WITH COMMENTS

Total Mods for **Code Administration** in **No Affirmative Recommendation with a Second: 3**

Total Mods for report: 3

Sub Code: Building

CA6430

1

Date Submitted	10/22/2015	**Section**	101.2	**Proponent**	Joe Bigelow
Chapter	1	**Affects HVHZ**	No	**Attachments**	No
TAC Recommendation	No Affirmative Recommendation with a Second				
Commission Action	Pending Review				

Comments

General Comments Yes

Alternate Language Yes

Related Modifications

Summary of Modification

The intent of the mod is to clarify that snow load or earthquake load do not apply to Florida.

Rationale

Exception 2 was added to clarify that snow load and earthquake load do not apply to Florida.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact. The proposed language is merely a clarification.

Impact to building and property owners relative to cost of compliance with code

No impact. The proposed language is merely a clarification.

Impact to industry relative to the cost of compliance with code

No impact. The proposed language is merely a clarification.

Impact to small business relative to the cost of compliance with code

No impact. The proposed language is merely a clarification.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No impact. The proposed language is merely a clarification.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

No impact. The proposed language is merely a clarification.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No impact. The proposed language is merely a clarification.

Does not degrade the effectiveness of the code

No impact. The proposed language is merely a clarification.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

NO

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO

Alternate Language

2nd Comment Period

6430-A4

Proponent James Schock **Submitted** 6/17/2016 **Attachments** Yes

Rationale

While in general Seismic design does not govern building design in Florida it has been found that in the case of high rise buildings in the Northern portion of the state minimal seismic design may govern over wind design resulting in under designed high rise structures

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The impact is that Engineers designing high rise structures in specific parts of the state must test there design for seismic as well as wind. This test is performed by way of a simple software program

Impact to building and property owners relative to cost of compliance with code

In general the cost to property owners is minimal. This only effects a small portion of construction. In Florida the Seismic design category is most likely going to be a design category B or C not requiring the more stringent seismic design requirements

Impact to industry relative to the cost of compliance with code

This effects a small portion of overall construction in Florida and therefore has minimal impact

Impact to Small Business relative to the cost of compliance with code

No impact. The proposed language is merely a clarification.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Prevents the under design of high rise building protecting the public health, safety and wellfare

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Strengthens the code by preventing under designed high rise structures

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The code proposal address the design not product or methods of constructiion

Does not degrade the effectiveness of the code

This proposal strengthens the code

Is the proposed code modification part of a prior code version? No

Alternate Language

2nd Comment Period

6430-A1

Proponent Andrew Lovenstein **Submitted** 5/20/2016 **Attachments** Yes

Rationale

This modification incorporates seismic desisgn in the areas of Florida where seismic loading could be the controling factor for the types of buildings meantioned in the modification. This alos exempts the portions of the state where seismic loading will never be the controling factor in design.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Local entitys in portions of the state where the Ground Motion Response acceleration is or exceeds 4% will have to enforce and review plans for new and exising buidings with risk catagory III or IV, and other buildings at the descretion of the local building official.

Impact to building and property owners relative to cost of compliance with code

There will be minimal increase in the fees for structural engineering on subject buildings. There may also be minimal material cost increases if seismic design is a controlling factor. We anticipate the overall cost increases to a structure will be less than 0.5% of the cost of of construction.

Impact to industry relative to the cost of compliance with code

There will be minimal increase in the fees for structural engineering on subject buildings. There may also be minimal material cost increases if seismic design is a controlling factor. We anticipate the overall cost increases to a structure will be less than 0.5% of the cost of of construction.

Impact to Small Business relative to the cost of compliance with code

No impact. The proposed language is merely a clarification.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Mandates that seismic loading be checked in areas and building types where it could be factor in design.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Mandates that seismic loading be checked in areas and building types where it could be factor in design.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate

Does not degrade the effectiveness of the code

It does not lessen code effectivness

Is the proposed code modification part of a prior code version? No

2nd Comment Period

CA6430-G3

Proponent Truly Burton **Submitted** 6/3/2016 **Attachments** Yes

Comment:

BASF's High-Rise Council respectfully asks the Structural TAC to SUPPORT Mod. 6430, but REJECT Mod. 6462.

2nd Comment Period

CA6430-G4

Proponent James Schock **Submitted** 6/21/2016 **Attachments** Yes

Comment:

Attached is supporting documentation forCA6430-A4 including seismic history of Florida, Design calculations for a minimal high rise structure with differing soil conditions and summary of the calculation. As well as seismic design requirements for design category A,B and C which is most likely to be encountered in Florida

1st Comment Period History

CA6430-G1

Proponent Jerry Peck **Submitted** 1/28/2016 **Attachments** No

Comment:

The Florida Building Code should not exclude any code section which is in the base code, even if some may think that a code section is not applicable in Florida, such as snow load.

References to snow load in the Florida Building Code do not need to be removed, it snow loading is not applicable to a given project, snow loading is not applied to that project.

If something is in the code but is not applicable to any given project, then that code section is, like many other code sections most of the time, not applicable to the project in question and that code section is simply not applied to the project in question.

There is no reason to specifically limit the Florida Building Code from being applicable - if a code section is applicable, that code section is applied; if a code section is not applicable, that code section is not applied.

Non-applicable code sections (not applicable to any given project) are found throughout the code, there is no justification to remove something which does not require removal.

1st Comment Period History

CA6430-G2

Proponent Randall Shackelford **Submitted** 2/25/2016 **Attachments** No

Comment:

I am opposed to this modification, and favor S6462, which does the opposite.
The code is designed so that just as different areas have different wind loads, different areas have different seismic loads. But seismic loading still has to be considered. Designers can look at the map and determine that snow load design is not required for Florida.

1. Snow and Seismic loading shall be exempt in this state, except for buildings with a height of more than 75 feet shall be evaluated for seismic loading when the Ground Motion Response Acceleration for 1-Second Spectral Response Acceleration is 4% or higher as shown in Figure 1613.3.1.

-

Where the Ground Motion Response Acceleration of 1-second Spectral Response Acceleration is 4% or higher, existing buildings greater than 75 feet, and which are undergoing repairs to Substantial Structural Damage, shall be evaluated for seismic loads in accordance with the Florida Building Code for Existing buildings. All other existing buildings do not need to be designed for seismic loads.

Remove from scoping preface of the Florida Building Code for Existing Buildings

The *Florida Building Code* is based on national model building codes and national consensus standards which are amended where necessary for Florida's specific needs. ~~However, code requirements that address snow loads and earthquake protection are pervasive; they are left in place but should not be utilized or enforced because Florida has no snow load or earthquake threat~~. The code

incorporates all building construction-related regulations for public and private buildings in the State of Florida other than those specifically exempted by Section 553.73, *Florida Statutes*. It has been harmonized with the *Florida Fire Prevention Code*, which is developed and maintained by the Department of Financial Services, Office of the State Fire Marshal, to establish unified and consistent standards.

101.2 Scope.
The provisions of this code shall apply to the construction, *alteration*, relocation, enlargement, replacement, *repair*, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

Exception 1: Detached one- and two-family *dwellings* and multiple single-family *dwellings (townhouses)* not more than three *stories above grade plane* in height with a separate *means of egress*, and their accessory structures not more than three *stories above grade plane* in height, shall comply with the *International Residential Code*.

Exeption 2: Snow and Seismic loading shall be exempt in this state except for risk category of III or IV buildings, and other buildings at the discretion of the building official, shall include seismic loading if the Ground Motion Response Acceleration for 1-Second spectral Response Acceleration is 4% or higher as shown in Figure 1613.3.1.

Exception 3: Where the Ground Motion Response Acceleration of 1-second Spectral Response Acceleration is 4% or higher, existing buildings of Risk Categories III and IV and other existing buildings at the discretion of the Building Official, which are undergoing repairs to Substantial Structural Damage or undergoing alterations classified as Substantial Structural Alteration, shall be designed for seismic loads. All other existing buildings do not need to be designed for seismic loads. All existing buildings shall be exempt from snow loading.

Exceptions:

1. Detached one- and two-family dwellings and multiple single-family *dwellings* (town houses) not more than three stories above *grade plane* in height with a separate *means of egress* and their accessory structures shall comply with the ~~International Residential Code~~ *Florida Building Code, Residential.*

2. Code Requirements that address snow loads and earthquake protection are pervasive; they are left in place but shall not be utilized or enforced because Florida has no snow load or earthquake threat.

Tom P. Murphy, Jr.
Honorary Chair
Ben Solomon, Esq.
President
Al Zichella
First Vice President
Truly Burton
Executive Vice President

BASF
BUILDERS ASSOCIATION OF SOUTH FLORIDA
BUILDING GREAT CITIES
WWW.BASFONLINE.ORG

Main Office
111 NW 183rd Street, Suite 111
Miami Gardens, FL 33169
Dade: 305-556-6300
Broward: 954-399-9233
Fax: 954.639.7107
Brickell Office
1200 Brickell Avenue
Penthouse Suite 20th floor
Miami, FL 33131

June 3, 2016

Chair and Members
Structural Technical Advisory Committee
Florida Building Commission

Submitted As Public Comment at:
www.floridabuilding.org

Re: Public comment to proposed modifications 6430 and 6462 re seismic loading calculations for high-rise buildings

Dear Mr Chairman and Members:

I am writing to you on behalf of the Builders Association of South Florida's (BASF) High-Rise Council (Council) regarding the above referenced proposed modification. This letter is submitted as a public comment to two proposed modifications regarding the inclusion or exclusion of seismic calculations for structures. Respectfully, they ask that you **accept Modification 6430 as proposed by DBPR staff but reject** Modification 6462. The basis for their positions is outlined below.

Our members concur with Modification 6430. Briefly, it reinstates language in the Code's preface, which says, in part, that "…snow loads and earthquake protection…are left in place but shall not be utilized or enforced because Florida has no snow load or earthquake threat."

- Further, BASF High-Rise Council Members reviewed the attached USGS seismic activity map. It shows that the entire state of Florida and large portions of the states of Georgia, Alabama and South Carolina, are **not in the seismic zone** as shown in this map.

- Finally, based on the attached Fiure map, which accompanied the proposed modification, it appears that the portion of the state from central Florida and southward, experiences little or no seismic activity.

- In doing some additional research on these modifications, our members did note an occasional tremor, (once every 30 years) which could have been associated with dynamite blasting for the creation of retention ponds, as required by various Water Management Districts.

- Given the above information, it indicates that there is none or nearly no seismic activity, nor has there been in the past. Thus, our members support Modification 6430.

Conversely, our Council members ask that you reject Modification 6462 for the same reasons stated above. Through what appear to be some editorial deletions, we are told that Modification 6462 proposes deletions which would trigger a requirement for engineering calculations to be made to eliminate the need for seismic reinforcement of high-rise buildings.

Florida Building Commission
Page Two
Public Comment Re: Modifications 6430, 6462

Given that there is clear information based on two maps – the USGS map and the Fiure map – which show that there is no seismic activity, there would be no need for calculations for any structure to withstand a seismic event. Florida simply does not have them with any frequency – to require them.

Respectfully, Council Members think that high-rise buildings must continue to meet wind load requirements, which are an apparent and on-going concern to all building code officials, residents and the public alike. Until seismic activity can be calibrated, and shown to be a consistent and on-going threat to high-rise construction, they cannot support language providing this information

They ask that you please adopt Modification 6430 and reject Modification 6462, based on the above information. Thank you for your interest in the High-Rise Council's concerns on these two proposals.

Sincerely,

Truly Burton
Executive Vice President

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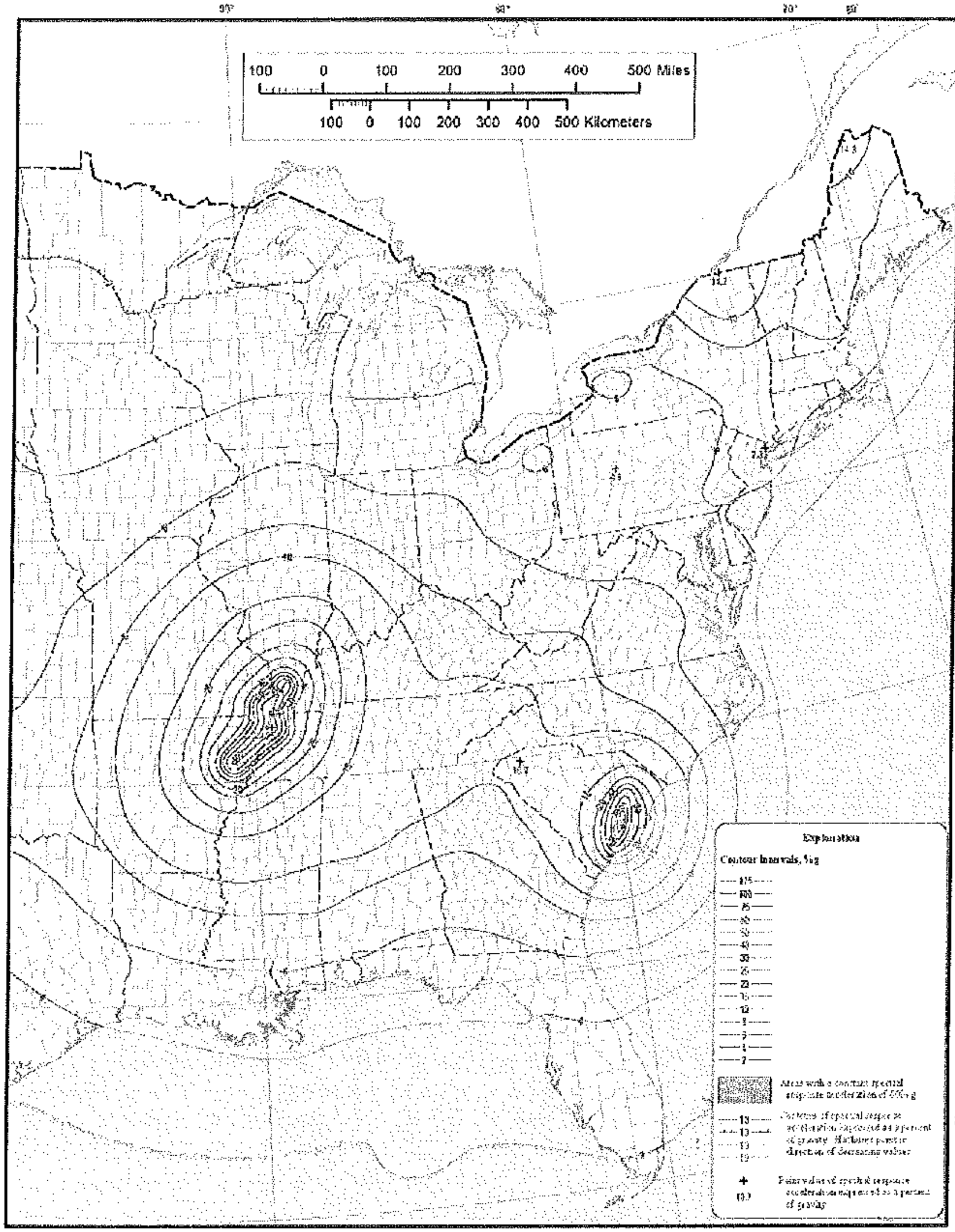

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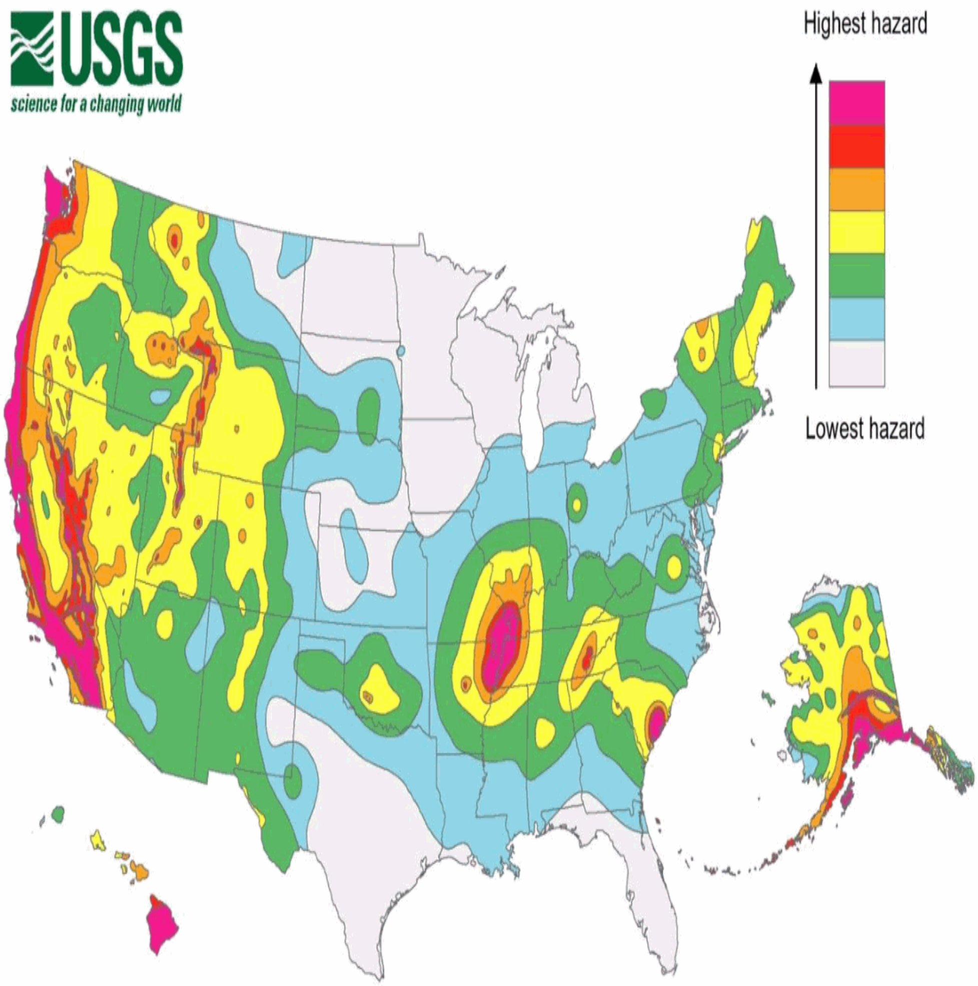

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Earthquake Hazards Program

Florida

Earthquake History of Florida: 1727 to 1981

Charles J. Mott
Division of Science and Mathematics,
St. Petersburg Junior College,
Clearwater, Florida 33515

Abstract: Published accounts of seismic events reported in Florida are reported from the time of occupation of the Florida Peninsula to December 1981. Events are cited by date, time and geographic locality. Note is taken that a continuously recording seismograph has been operational since October 1977.

While the seismic events reported from the Florida peninsula and panhandle have indeed been rare, earthquakes have occurred and been felt. Thirty-three are identified herein. Spanning over 250 yr. reports have come from Pensacola to Key West. Shocks varied from slight shudders to violent shakings that destroyed buildings.

Few records of seismic shock have corroborative seismic evidence in the form of seismogram data. Many of the shocks reported or recorded in Florida seem to be related to seismic events elsewhere in North America.

Earliest seismic reported were plotted on the 10-point Rossi-Forel Scale. This scale measured earthquake intensity and was based on a subjective set of criteria. The more recent Modified Mercalli Scale is a 12-point scale that is slightly more objective. Earthquake ratings on this scale are written as upper case Ms followed by the Roman numeral designating the intensity of the tremor. For example, MMIV would represent an intensity 4 shock on the Modified Mercalli Scale. Rossi-Forel estimates have been converted to Modified Mercalli intensity equivalents in this paper.

1727 October 12. "Severe" tremors were reported and mentioned by Campbell (1943) and Lane (1976). However, the original record of these quakes has been lost. A severe shock was reported in New England on this date at 10:40. Reports of another shock came from Martinique on the same day. The relationship of either of these to the St. Augustine tremor was not established.

1780 February 6. A mild tremor was reported from Pensacola on this date (Lane, 1976). No damage was reported.

1781 May 8. A severe earthquake was reported at a military installation near Pensacola. While no fatalities were reported, shocks tore ammunition racks from barracks walls and leveled a house in the area (Lane, 1976).

1842 May 7. This tremor was felt from Florida to Louisiana. It may have been associated with a severe earthquake that struck Santo Domingo at about the same time. Sources report the disappearance of some Florida lakes on the day of this earthquake (Niles National Register, 1842).

1843 February 8. An earthquake was reported from the rural areas of the State. This tremor might have been associated with a tremor on the West Indies which occurred at the same time (Lane, 1976).

1879 January 12. Two severe shocks of about 30 sec each occurred from an area from Ft. Myers to Daytona and from Tallahassee to Jacksonville, and from all areas in between. The epicenter was located at 29°30'N, 82°00'W (U.S. Coast and Geodetic Survey, 1938). The shock was reported by hundreds of residents over a 25,000 square mile area of the Florida peninsula, and ranged from MMVIII to MMIX.

At St. Augustine, articles were thrown from shelves. In other locations, windows rattled violently and walls cracked. Rockwood (1880) indicated that the tremor progressed from the NW toward the SE between Gulf Hammock and Okahumpa. In the Tampa Bay area, Campbell (1943) states that the shock seemed to move from the SW to NE and was preceded by a rumbling sound ". . . as of a distant railroad train." MMVI was reported near Gainesville (Lane, 1976).

1880 January 22-23. On this date, a violent series of earth tremors struck at Cristobal, Cuba. At about the same time, 5 shocks were felt in Key West. Additional, more gentle shocks were felt in Key West through 26 January (U.S. Coast and Geodetic Survey, 1938).

1886 January 8 (a). Reid (1886) reported a shock in Jacksonville with no damage or injuries.

1886 August 31 (b). There were a series of strong shocks in Charleston, South Carolina on this date. The tremors in Charleston began at 21:51. In Tampa, residents reported 2 shocks, the first at 21:51, the second at 22:00. The first appeared to move NE to SW, while the second seemed to travel SW to NE.

In St. Augustine, church bells tolled as the tremor passed, while near Tallahassee, the water in Lake Jackson disappeared. A well near Graceville began to flow (Campbell, 1943).

1886 September 1-9 (c). Many reports of shocks were from throughout the area, with most coming from Jacksonville. These tremors were probably associated with aftershocks from the Charleston, South Carolina earthquake (Reid, 1886).

1886 September 22 (d). A 3-sec shock was felt in Archer, Florida. No damage, no injuries (Reid, 1886).

1886 September 29 (e). Slight shock reported. No injuries, no damage (Reid, 1886).

1886 October 22 (f). A single tremor passed through Jacksonville causing windows and dishes to rattle. On this date, similar shocks were felt in Charleston, South Carolina, as well as in Atlanta and Augusta, Georgia (Campbell, 1943).

1893 June 20. A shock of at least 10 sec duration was felt in Jacksonville, MMIV (Reid, 1907).

1900 October 10 (Stover et al., 1979). Reid (1907) estimates the epicenter of this tremor to have been at 30°20'N, 81°40'W. It was felt at Jacksonville at 11:15 and afterward. Eight distinct shocks were reported without damage and injuries. The intensity of this tremor was MMV. A tremor was also felt in Lake City about this time.

1902 May 20-21. Residents reported hearing a noise like heavy cannon fire at a distance. The noises preceded the actual tremor by about 3 min. Tremors were slight and without damage (Reid, 1907).

1903 January 23. A shock wave of MMVI was felt in north Florida and in Savannah, Georgia. No damage (Lane, 1976).

1905 September 4. MMIII shock was accompanied by slight rumbling noises. Duration was 10 sec without damage (Reid, 1907).

1924 October 20. A tremor of intensity MMIV shook the area. Windows and doors rattled, but there was no damage (U.S. Coast and Geodetic Survey, 1924). An earthquake was felt throughout Virginia, Tennessee and South Carolina at about the same time (Bollinger, 1977).

1930 July 19. Widespread shocks were felt over a wide area of west-central Florida. The shocks were so evenly spaced that blasting, at first, was thought to be the source of the shocks. However, Campbell (1943) points out that the size of charge necessary for a shock to be felt over such a large area would be highly unusual. Furthermore, no blasting of any sort was scheduled or recorded on that day. He suspects a seismic origin for the shocks.

1935 November 13. Two short tremors were felt. The second tremor lasted 15 sec. In Palatka, shocks were abrupt and forceful enough to cause people to run from their homes and into the streets. No damage or injuries were reported (Seismological Society Bulletin, 1936).

1940 December 26. A slight shock was felt in the Tampa Bay area. Campbell (1943) reports that a seismic origin for this shock is in doubt, but gives no details. However, the U.S. Coast and Geodetic Survey (1940) does list a tremor on this date and time.

1942 January 19. Five to 7 evenly spaced tremors were felt from Miami throughout the Everglades. Each shock lasted about 1 min, and the shocks were spaced at 3 min intervals (Campbell, 1943). In Hollywood, whole houses shook. Moorehaven, on the south shore of Lake Okeechobee, reported 12 tremors. Still farther west, Alva reported 20 shocks, ranging from MMV to MMVII (U.S. Coast and Geodetic Survey, 1942).

1945 December 22. Press reports state that alarmed citizens felt a seismic shock in the area. A seismograph at Spring Hill College, near Mobile, Alabama recorded a slight earthquake on this date and time (U.S. Coast and Geodetic Survey, 1948).

1948 November 8. A sudden jar caused doors and windows to rattle. Residents report an accompanying sound like distant heavy explosion. Recorded as MMV (U.S. Coast and Geodetic Survey, 1948).

1952 November 18. This was a MMIV tremor felt in Lake City and in Quincy. A policeman in Quincy is said to have noted the exact time of the passing tremor on the back of a parking citation which he was issuing at the time (U.S. Coast and Geodetic Survey, 1952).

1953 March 29 (Stover et al., 1979). Slight tremor felt in Orlando.

1964 March 2. No surface expression of a tremor, but significant oscillations were noted in water well data collected by the United States Geological Survey. These oscillations were possibly associated with the Good Friday Alaska earthquake which happened in this date (Stencil, 1976).

1973 October 27 (a). Slight tremor reported in a broad area of central Florida (Stover et al., 1979).

1973 December 5 (b). Tremor reported at 11:30, Seminole and Orange counties.

1975 December 4. A MMIII to MMIV tremor was detected by most residents within a 10-mi radius of Daytona Beach (Stover et al., 1979).

1977 November 27. In October, 1977 the Earthquake Seismograph Station at the University of Florida became operational (Smith, 1978). No local events were recorded until November, 1977 when slight shock was recorded north over peninsular Florida. This tremor was not large enough to be felt, but was recorded as Richter magnitude .8.

At this writing (December, 1981) no additional tremors have been recorded. However, with the advent of continuous seismic recording for Florida, continuous updating of this record may now be accomplished. (Smith, Dec. 1981, pers. comm.)

Literature Cited

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U.S. Earthquakes, Coast and Geodetic Survey: 1952, Serial Number 773, page 7; 1948. Serial Number 746, page 6; 1945, Serial Number 699, page 6; 1942, Serial number 662, page 4; 1940, Serial number 647. page 14; 1938, Serial number 608, pages 24 and 30; 1935, Serial Number 600, page 15; 1930, Serial number 539, page 5; 1925, Serial Number 388, pages 72 to 74.

Abridged from Earthquake History of Florica: 1727 TO 1981. Florida Scientist Volume 46, Spring 1983, No. 2: 116-120.

Wind VS. Seismic Load Evaluation

Enclosed is design study for loading in high rise buildings comparing Wind a Seismic loading. The sample building is this study was 75 feet wide 200 feet long and 75 feet high risk category II and III with soil classifications C,D and E. The purpose of this study was to establish a reasonable break point to determine what size building should be reviewed for seismic loading as well as wind and to further support code Modification CA6430-A4. This building design was based on a concrete rigid frame.

Findings:

Forces applied in the East-West direction

Wind base shear in a 130 MPH design is 134K
Seismic base shear Risk Cat III Soil Classification C is 321 K
Seismic base shear Risk Cat III Soil Classification D is 428K
Seismic base shear Risk Cat III Soil Classification E is 670K
Seismic base shear Risk Cat II Soil Classification E is 563K
Seismic base shear Risk Cat II Soil Classification D is 343K

Forces applied in the North – South direction

Wind base shear in a 130 MPH design is 357KK
Seismic base shear Risk Cat III Soil Classification C is 321 K
Seismic base shear Risk Cat III Soil Classification D is 428K
Seismic base shear Risk Cat III Soil Classification E is 670K
Seismic base shear Risk Cat II Soil Classification E is 563K
Seismic base shear Risk Cat II Soil Classification D is 343K

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Title Block" selection.
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Project Title:
Engineer:
Project Descr:

Project ID:

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ASCE Seismic Base Shear

File = U:\My Documents\ENERCALC Data Files\earthquake example.ec6
ENERCALC, INC. 1983-2016, Build:6.16.4.15, Ver 6.16.4.15

Lic. # : KW-06005560 Licensee : JEFFREY K. HULSBERG PE

Example for Jacksonville Area, Risk Cat III, Soil Class C

Risk Category — Calculations per ASCE 7-10

Risk Category of Building or Other Structure : "III" : Buildings and other structures that represent a substantial hazard to human life in the event of a failure. — *ASCE 7-10, Page 2, Table 1.5-1*

Seismic Importance Factor = 1.25 — *ASCE 7-10, Page 5, Table 1.5-2*

Gridded Ss & S1 values ASCE 7-10 Standard — ASCE 7-10 11.4.1

Max. Ground Motions, 5% Damping :

S_S = 0.1149 g, 0.2 sec response
S_1 = 0.06070 g, 1.0 sec response

Latitude = 30.389 deg North
Longitude = 81.681 deg West
Location :

Site Class, Site Coeff. and Design Category

Site Classification "C" : Shear Wave Velocity 1,200 to 2,500 ft/sec = C — *ASCE 7-10 Table 20.3-1*

Site Coefficients Fa & Fv — *ASCE 7-10 Table 11.4-1 & 11.4-2*
(using straight-line interpolation from table values)
Fa = 1.20
Fv = 1.70

Maximum Considered Earthquake Acceleration
$S_{MS} = Fa * Ss$ = 0.138 — *ASCE 7-10 Eq. 11.4-1*
$S_{M1} = Fv * S1$ = 0.103 — *ASCE 7-10 Eq. 11.4-2*

Design Spectral Acceleration
$S_{DS} = S_{MS} * 2/3$ = 0.092 — *ASCE 7-10 Eq. 11.4-3*
$S_{D1} = S_{M1} * 2/3$ = 0.069 — *ASCE 7-10 Eq. 11.4-4*

Seismic Design Category = **B** — *ASCE 7-10 Table 11.6-1 & -2*

Resisting System — *ASCE 7-10 Table 12.2-1*

Basic Seismic Force Resisting System . . . **Moment Resisting Frame Systems**
Intermediate reinforced concrete moment frames

Response Modification Coefficient " R " = 5.00
System Overstrength Factor " Wo " = 3.00
Deflection Amplification Factor " Cd " = 4.50

NOTE! See ASCE 7-10 for all applicable footnotes.

Building height Limits :
Category "A & B" Limit: No Limit
Category "C" Limit: No Limit
Category "D" Limit: Not Permitted
Category "E" Limit: Not Permitted
Category "F" Limit: Not Permitted

Lateral Force Procedure — *ASCE 7-10 Section 12.8.2*

Equivalent Lateral Force Procedure
The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-10 12.8

Determine Building Period — *Use ASCE 12.8-8*

-->> User acknowledged that "Story Height" is at least 10 feet
Number of Stories = 7.0 (*limited to 12*)

" Ta " Approximate fundemental period using Eq. 12.8-8 : Ta = 0.1 * Number of Stories = 0.700 sec
"TL" : Long-period transition period per ASCE 7-10 Maps 22-15 -> 22-20 8.000 sec

Building Period ' Ta ' Calculated from Approximate Method selected = 0.700 sec

" Cs " Response Coefficient — *ASCE 7-10 Section 12.8.1.1*

S_{DS} : Short Period Design Spectral Response	=	0.092	From Eq. 12.8-2, Preliminary Cs	=	0.023
" R " : Response Modification Factor	=	5.00	From Eq. 12.8-3 & 12.8-4 , Cs need not exceed	=	0.025
" I " : Seismic Importance Factor	=	1.25	From Eq. 12.8-5 & 12.8-6, Cs not be less than	=	0.010

Cs : Seismic Response Coefficient = **0.0230**

Seismic Base Shear — *ASCE 7-10 Section 12.8.1*

Cs = **0.0230 from 12.8.1.1**

W (see Sum Wi below) = 14,000.00 k
Seismic Base Shear V = Cs * W = 321.72 k

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ASCE Seismic Base Shear

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Vertical Distribution of Seismic Forces

ASCE 7-10 Section 12.8.3

" k " : hx exponent based on Ta = 1.10

Table of building Weights by Floor Level...

Level #	Wi : Weight	Hi : Height	(Wi * Hi) ^k	Cvx	Fx=Cvx * V	Sum Story Shear	Sum Story Moment
7	2,000.00	10.50	26,566.74	0.1429	45.96	45.96	0.00
6	2,000.00	10.50	26,566.74	0.1429	45.96	91.92	0.00
5	2,000.00	10.50	26,566.74	0.1429	45.96	137.88	0.00
4	2,000.00	10.50	26,566.74	0.1429	45.96	183.84	0.00
3	2,000.00	10.50	26,566.74	0.1429	45.96	229.80	0.00
2	2,000.00	10.50	26,566.74	0.1429	45.96	275.76	0.00
1	2,000.00	10.50	26,566.74	0.1429	45.96	321.72	0.00

Sum Wi = 14,000.00 k   Sum Wi * Hi = 185,967.16 k-ft   Total Base Shear = 321.72 k

Base Moment = 3,378.1 k-ft

Diaphragm Forces : Seismic Design Category "B" to "F"

ASCE 7-10 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force
7	2,000.00	45.96	45.96	2,000.00	45.96	45.96	91.92	45.96	45.96
6	2,000.00	45.96	91.92	4,000.00	45.96	45.96	91.92	45.96	45.96
5	2,000.00	45.96	137.88	6,000.00	45.96	45.96	91.92	45.96	45.96
4	2,000.00	45.96	183.84	8,000.00	45.96	45.96	91.92	45.96	45.96
3	2,000.00	45.96	229.80	10,000.00	45.96	45.96	91.92	45.96	45.96
2	2,000.00	45.96	275.76	12,000.00	45.96	45.96	91.92	45.96	45.96
1	2,000.00	45.96	321.72	14,000.00	45.96	45.96	91.92	45.96	45.96

Wpx . . . . Weight at level of diaphragm and other structure elements attached to it.

Fi . . . . Design Lateral Force applied at the level.

Sum Fi . . . . Sum of "Lat. Force" of current level plus all levels above

MIN Req'd Force @ Level . . . . $0.20 * S_{DS} * I * Wpx$

MAX Req'd Force @ Level . . . . $0.40 * S_{DS} * I * Wpx$

Fpx : Design Force @ Level . . . . Wpx * SUM(x->n) Fi / SUM(x->n) wi, x = Current level, n = Top Level

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ASCE Seismic Base Shear

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Example for Jacksonville Area, Risk Cat III, Soil Class D

Risk Category — Calculations per ASCE 7-10

Risk Category of Building or Other Structure : "III" : Buildings and other structures that represent a substantial hazard to human life in the event of a failure. — *ASCE 7-10, Page 2, Table 1.5-1*

Seismic Importance Factor = 1.25 — *ASCE 7-10, Page 5, Table 1.5-2*

Gridded Ss & S1 values ASCE-7-10 Standard — ASCE 7-10 11.4.1

Max. Ground Motions, 5% Damping :

S_S = 0.1149 g, 0.2 sec response
S_1 = 0.06070 g, 1.0 sec response

Latitude = 30.389 deg North
Longitude = 81.681 deg West
Location :

Site Class, Site Coeff. and Design Category

Site Classification "D" : Shear Wave Velocity 600 to 1,200 ft/sec = D — *ASCE 7-10 Table 20.3-1*

Site Coefficients Fa & Fv — Fa = 1.60; Fv = 2.40 — *ASCE 7-10 Table 11.4-1 & 11.4-2*
(using straight-line interpolation from table values)

Maximum Considered Earthquake Acceleration
S_{MS} = Fa * Ss = 0.184 — *ASCE 7-10 Eq. 11.4-1*
S_{M1} = Fv * S1 = 0.146 — *ASCE 7-10 Eq. 11.4-2*

Design Spectral Acceleration
S_{DS} = S_{MS} * 2/3 = 0.123 — *ASCE 7-10 Eq. 11.4-3*
S_{D1} = S_{M1} * 2/3 = 0.097 — *ASCE 7-10 Eq. 11.4-4*

Seismic Design Category = B — *ASCE 7-10 Table 11.6-1 & -2*

Resisting System — *ASCE 7-10 Table 12.2-1*

Basic Seismic Force Resisting System . . . **Moment Resisting Frame Systems**
Intermediate reinforced concrete moment frames

Response Modification Coefficient " R " = 5.00
System Overstrength Factor " Wo " = 3.00
Deflection Amplification Factor " Cd " = 4.50

NOTE! See ASCE 7-10 for all applicable footnotes.

Building height Limits :

Category "A & B" Limit:	No Limit
Category "C" Limit:	No Limit
Category "D" Limit:	Not Permitted
Category "E" Limit:	Not Permitted
Category "F" Limit:	Not Permitted

Lateral Force Procedure — *ASCE 7-10 Section 12.8.2*

Equivalent Lateral Force Procedure
The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-10 12.8

Determine Building Period — *Use ASCE 12.8-8*

—>> User acknowledged that "Story Height" is at least 10 feet

Number of Stories = 7.0 *(limited to 12)*

" Ta " Approximate fundemental period using Eq. 12.8-8 : Ta = 0.1 * Number of Stories = 0.700 sec
"TL" : Long-period transition period per ASCE 7-10 Maps 22-15 -> 22-20 8.000 sec

Building Period " Ta " Calculated from Approximate Method selected = 0.700 sec

" Cs " Response Coefficient — *ASCE 7-10 Section 12.8.1.1*

S_{DS} : Short Period Design Spectral Response	=	0.123	From Eq. 12.8-2, Preliminary Cs	=	0.031
" R " : Response Modification Factor	=	5.00	From Eq. 12.8-3 & 12.8-4 , Cs need not exceed	=	0.035
" I " : Seismic Importance Factor	=	1.25	From Eq. 12.8-5 & 12.8-6, Cs not be less than	=	0.010

Cs : Seismic Response Coefficient = 0.0306

Seismic Base Shear — *ASCE 7-10 Section 12.8.1*

Cs = 0.0306 from 12.8.1.1

W (see Sum Wi below) = 14,000.00 k
Seismic Base Shear V = Cs * W = 428.96 k

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ASCE Seismic Base Shear

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Vertical Distribution of Seismic Forces

ASCE 7-10 Section 12.8.3

" k " : hx exponent based on Ta = 1.10

Table of building Weights by Floor Level...

Level #	Wi : Weight	Hi : Height	(Wi * Hi) ^k	Cvx	Fx=Cvx * V	Sum Story Shear	Sum Story Moment
7	2,000.00	10.50	26,566.74	0.1429	61.28	61.28	0.00
6	2,000.00	10.50	26,566.74	0.1429	61.28	122.56	0.00
5	2,000.00	10.50	26,566.74	0.1429	61.28	183.84	0.00
4	2,000.00	10.50	26,566.74	0.1429	61.28	245.12	0.00
3	2,000.00	10.50	26,566.74	0.1429	61.28	306.40	0.00
2	2,000.00	10.50	26,566.74	0.1429	61.28	367.68	0.00
1	2,000.00	10.50	26,566.74	0.1429	61.28	428.96	0.00

Sum Wi = 14,000.00 k Sum Wi * Hi = 185,967.16 k-ft Total Base Shear = 428.96 k

Base Moment = 4,504.1 k-ft

Diaphragm Forces : Seismic Design Category "B" to "F"

ASCE 7-10 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force
7	2,000.00	61.28	61.28	2,000.00	61.28	61.28	122.56	61.28	61.28
6	2,000.00	61.28	122.56	4,000.00	61.28	61.28	122.56	61.28	61.28
5	2,000.00	61.28	183.84	6,000.00	61.28	61.28	122.56	61.28	61.28
4	2,000.00	61.28	245.12	8,000.00	61.28	61.28	122.56	61.28	61.28
3	2,000.00	61.28	306.40	10,000.00	61.28	61.28	122.56	61.28	61.28
2	2,000.00	61.28	367.68	12,000.00	61.28	61.28	122.56	61.28	61.28
1	2,000.00	61.28	428.96	14,000.00	61.28	61.28	122.56	61.28	61.28

Wpx .... Weight at level of diaphragm and other structure elements attached to it.
Fi .... Design Lateral Force applied at the level.
Sum Fi .... Sum of "Lat. Force" of current level plus all levels above
MIN Req'd Force @ Level .... $0.20 * S_{DS} * I * Wpx$
MAX Req'd Force @ Level .... $0.40 * S_{DS} * I * Wpx$
Fpx : Design Force @ Level .... Wpx * SUM(x->n) Fi / SUM(x->n) wi, x = Current level, n = Top Level

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ASCE Seismic Base Shear

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Example for Jacksonville Area, Risk Cat III, Soil Class E

Risk Category

Calculations per ASCE 7-10

Risk Category of Building or Other Structure : "III" : Buildings and other structures that represent a substantial hazard to human life in the event of a failure. *ASCE 7-10, Page 2, Table 1.5-1*

Seismic Importance Factor = 1.25 *ASCE 7-10, Page 5, Table 1.5-2*

Gridded Ss & S1 values ASCE 7-10 Standard

ASCE 7-10 11.4.1

Max. Ground Motions, 5% Damping :

S_S = 0.1149 g, 0.2 sec response

S_1 = 0.06070 g, 1.0 sec response

Latitude = 30.389 deg North

Longitude = 81.681 deg West

Location : Jacksonville, FL 32201

Site Class, Site Coeff. and Design Category

Site Classification "E" : Shear Wave Velocity must be less than 600 ft/sec = E *ASCE 7-10 Table 20.3-1*

Site Coefficients Fa & Fv Fa = 2.50 *ASCE 7-10 Table 11.4-1 & 11.4-2*

(using straight-line interpolation from table values) Fv = 3.50

Maximum Considered Earthquake Acceleration S_{MS} = Fa * Ss = 0.287 *ASCE 7-10 Eq. 11.4-1*

S_{M1} = Fv * S1 = 0.212 *ASCE 7-10 Eq. 11.4-2*

Design Spectral Acceleration S_{DS} = S_{MS} * 2/3 = 0.192 *ASCE 7-10 Eq. 11.4-3*

S_{D1} = S_{M1} * 2/3 = 0.142 *ASCE 7-10 Eq. 11.4-4*

Seismic Design Category = C *ASCE 7-10 Table 11.6-1 & -2*

Resisting System

ASCE 7-10 Table 12.2-1

Basic Seismic Force Resisting System . . . **Moment Resisting Frame Systems**
Intermediate reinforced concrete moment frames

Response Modification Coefficient " R " = 5.00

System Overstrength Factor " Wo " = 3.00

Deflection Amplification Factor " Cd " = 4.50

NOTE! See ASCE 7-10 for all applicable footnotes.

Building height Limits :

Category "A & B" Limit:	No Limit
Category "C" Limit:	No Limit
Category "D" Limit:	Not Permitted
Category "E" Limit:	Not Permitted
Category "F" Limit:	Not Permitted

Lateral Force Procedure

ASCE 7-10 Section 12.8.2

Equivalent Lateral Force Procedure

The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-10 12.8

Determine Building Period

Use ASCE 12.8-8

--->> User acknowledged that "Story Height" is at least 10 feet

Number of Stories = 7.0 *(limited to 12)*

" Ta " Approximate fundemental period using Eq. 12.8-8 : Ta = 0.1 * Number of Stories = 0.700 sec

"TL" : Long period transition period per ASCE 7-10 Maps 22-15 -> 22-20 8.000 sec

Building Period " Ta " Calculated from Approximate Method selected = 0.700 sec

" Cs " Response Coefficient

ASCE 7-10 Section 12.8.1.1

S_{DS} : Short Period Design Spectral Response	=	0.192	From Eq. 12.8-2, Preliminary Cs	=	0.048
" R " : Response Modification Factor	=	5.00	From Eq. 12.8-3 & 12.8-4 , Cs need not exceed	=	0.051
" I " : Seismic Importance Factor	=	1.25	From Eq. 12.8-5 & 12.8-6, Cs not be less than	=	0.011

Cs : Seismic Response Coefficient = = **0.0479**

Seismic Base Shear

ASCE 7-10 Section 12.8.1

Cs = 0.0479 from 12.8.1.1

W (see Sum Wi below) = 14,000.00 k

Seismic Base Shear V = Cs * W = 670.25 k

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ASCE Seismic Base Shear

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Vertical Distribution of Seismic Forces

ASCE 7-10 Section 12.8.3

" k " : hx exponent based on Ta = 1.10

Table of building Weights by Floor Level...

Level #	Wi : Weight	Hi : Height	(Wi * Hi) ^k	Cvx	Fx=Cvx * V	Sum Story Shear	Sum Story Moment
7	2,000.00	10.50	26,566.74	0.1429	95.75	95.75	0.00
6	2,000.00	10.50	26,566.74	0.1429	95.75	191.50	0.00
5	2,000.00	10.50	26,566.74	0.1429	95.75	287.25	0.00
4	2,000.00	10.50	26,566.74	0.1429	95.75	383.00	0.00
3	2,000.00	10.50	26,566.74	0.1429	95.75	478.75	0.00
2	2,000.00	10.50	26,566.74	0.1429	95.75	574.50	0.00
1	2,000.00	10.50	26,566.74	0.1429	95.75	670.25	0.00

Sum Wi = 14,000.00 k   Sum Wi * Hi = 185,967.16 k-ft   Total Base Shear = 670.25 k
Base Moment = 7,037.6 k-ft

Diaphragm Forces : Seismic Design Category "B" to "F"

ASCE 7-10 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force
7	2,000.00	95.75	95.75	2,000.00	95.75	95.75	191.50	95.75	95.75
6	2,000.00	95.75	191.50	4,000.00	95.75	95.75	191.50	95.75	95.75
5	2,000.00	95.75	287.25	6,000.00	95.75	95.75	191.50	95.75	95.75
4	2,000.00	95.75	383.00	8,000.00	95.75	95.75	191.50	95.75	95.75
3	2,000.00	95.75	478.75	10,000.00	95.75	95.75	191.50	95.75	95.75
2	2,000.00	95.75	574.50	12,000.00	95.75	95.75	191.50	95.75	95.75
1	2,000.00	95.75	670.25	14,000.00	95.75	95.75	191.50	95.75	95.75

Wpx .... Weight at level of diaphragm and other structure elements attached to it.
Fi .... Design Lateral Force applied at the level.
Sum Fi .... Sum of "Lat. Force" of current level plus all levels above
MIN Req'd Force @ Level .... 0.20 * S_{DS} * I * Wpx
MAX Req'd Force @ Level .... 0.40 * S_{DS} * I * Wpx
Fpx : Design Force @ Level .... Wpx * SUM(x->n) Fi / SUM(x->n) wi, x = Current level, n = Top Level

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ASCE Seismic Base Shear

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Example for Jacksonville Area, Risk Cat II, Soil Class E

Risk Category

Calculations per ASCE 7-10

Risk Category of Building or Other Structure : "II" : All Buildings and other structures except those listed as Category I, III, and IV — *ASCE 7-10, Page 2, Table 1.5-1*

Seismic Importance Factor = 1 — *ASCE 7-10, Page 5, Table 1.5-2*

Gridded Ss & S1 values ASCE 7-10 Standard

ASCE 7-10 11.4.1

Max. Ground Motions, 5% Damping :

S_S =	0.1149 g, 0.2 sec response	Latitude =	30.389	deg North
S_1 =	0.06070 g, 1.0 sec response	Longitude =	81.681	deg West
		Location :	Jacksonville, FL 32201	

Site Class, Site Coeff. and Design Category

Site Classification "E" : Shear Wave Velocity must be less than 600 ft/sec = E — *ASCE 7-10 Table 20.3-1*

Site Coefficients Fa & Fv	Fa	=	2.50	*ASCE 7-10 Table 11.4-1 & 11.4-2*
(using straight-line interpolation from table values)	Fv	=	3.50	
Maximum Considered Earthquake Acceleration	S_{MS} = Fa * Ss	=	0.287	*ASCE 7-10 Eq. 11.4-1*
	S_{M1} = Fv * S1	=	0.212	*ASCE 7-10 Eq. 11.4-2*
Design Spectral Acceleration	S_{DS} = S_{MS} * 2/3	=	0.192	*ASCE 7-10 Eq. 11.4-3*
	S_{D1} = S_{M1} * 2/3	=	0.142	*ASCE 7-10 Eq. 11.4-4*
Seismic Design Category		=	C	*ASCE 7-10 Table 11.6-1 & -2*

Resisting System

ASCE 7-10 Table 12.2-1

Basic Seismic Force Resisting System . . **Moment Resisting Frame Systems**
Intermediate reinforced concrete moment frames

Response Modification Coefficient " R "	=	5.00	Building height Limits :	
System Overstrength Factor " Wo "	=	3.00	Category "A & B" Limit:	No Limit
Deflection Amplification Factor " Cd "	=	4.50	Category "C" Limit:	No Limit
			Category "D" Limit:	Not Permitted
NOTE! See ASCE 7-10 for all applicable footnotes.			Category "E" Limit:	Not Permitted
			Category "F" Limit:	Not Permitted

Lateral Force Procedure

ASCE 7-10 Section 12.8.2

Equivalent Lateral Force Procedure

The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-10 12.8

Determine Building Period

Use ASCE 12.8-8

--->> User acknowledged that 'Story Height' is at least 10 feet

Number of Stories = 7.0 *(limited to 12)*

" Ta " Approximate fundemental period using Eq. 12.8-8 : Ta = 0.1 * Number of Stories = 0.700 sec

"TL" : Long-period transition period per ASCE 7-10 Maps 22-15 -> 22-20 8.000 sec

Building Period " Ta " Calculated from Approximate Method selected = 0.700 sec

" Cs " Response Coefficient

ASCE 7-10 Section 12.8.1.1

S_{DS} : Short Period Design Spectral Response	=	0.192	From Eq. 12.8-2, Preliminary Cs	=	0.038
" R " : Response Modification Factor	=	5.00	From Eq. 12.8-3 & 12.8-4 , Cs need not exceed	=	0.040
" I " : Seismic Importance Factor	=	1	From Eq. 12.8-5 & 12.8-6, Cs not be less than	=	0.010

Cs : Seismic Response Coefficient = 0.0383

Seismic Base Shear

ASCE 7-10 Section 12.8.1

Cs = 0.0383 from 12.8.1.1

W (see Sum Wi below) = 14,000.00 k

Seismic Base Shear V = Cs * W = 536.20 k

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Vertical Distribution of Seismic Forces

ASCE 7-10 Section 12.8.3

" k " : hx exponent based on Ta = 1.10

Table of building Weights by Floor Level...

Level #	Wi : Weight	Hi : Height	(Wi * Hi) ^k	Cvx	Fx=Cvx * V	Sum Story Shear	Sum Story Moment
7	2,000.00	10.50	26,566.74	0.1429	76.60	76.60	0.00
6	2,000.00	10.50	26,566.74	0.1429	76.60	153.20	0.00
5	2,000.00	10.50	26,566.74	0.1429	76.60	229.80	0.00
4	2,000.00	10.50	26,566.74	0.1429	76.60	306.40	0.00
3	2,000.00	10.50	26,566.74	0.1429	76.60	383.00	0.00
2	2,000.00	10.50	26,566.74	0.1429	76.60	459.60	0.00
1	2,000.00	10.50	26,566.74	0.1429	76.60	536.20	0.00

Sum Wi = 14,000.00 k   Sum Wi * Hi = 185,967.16 k-ft   Total Base Shear = 536.20 k

Base Moment = 5,630.1 k-ft

Diaphragm Forces : Seismic Design Category "B" to "F"

ASCE 7-10 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force
7	2,000.00	76.60	76.60	2,000.00	76.60	76.60	153.20	76.60	76.60
6	2,000.00	76.60	153.20	4,000.00	76.60	76.60	153.20	76.60	76.60
5	2,000.00	76.60	229.80	6,000.00	76.60	76.60	153.20	76.60	76.60
4	2,000.00	76.60	306.40	8,000.00	76.60	76.60	153.20	76.60	76.60
3	2,000.00	76.60	383.00	10,000.00	76.60	76.60	153.20	76.60	76.60
2	2,000.00	76.60	459.60	12,000.00	76.60	76.60	153.20	76.60	76.60
1	2,000.00	76.60	536.20	14,000.00	76.60	76.60	153.20	76.60	76.60

Wpx .... Weight at level of diaphragm and other structure elements attached to it.

Fi .... Design Lateral Force applied at the level.

Sum Fi .... Sum of "Lat. Force" of current level plus all levels above

MIN Req'd Force @ Level .... $0.20 * S_{DS} * I * Wpx$

MAX Req'd Force @ Level .... $0.40 * S_{DS} * I * Wpx$

Fpx : Design Force @ Level .... Wpx * SUM(x->n) Fi / SUM(x->n) wi, x = Current level, n = Top Level

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ASCE Seismic Base Shear

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Example for Jacksonville Area, Risk Cat II, Soil Class D

Calculations per ASCE 7-10

Risk Category

Risk Category of Building or Other Structure : "II" : All Buildings and other structures except those listed as Category I, III, and IV — *ASCE 7-10, Page 2, Table 1.5-1*

Seismic Importance Factor = 1 — *ASCE 7-10, Page 5, Table 1.5-2*

Gridded Ss & S1 values ASCE 7-10 Standard

ASCE 7-10 11.4.1

Max. Ground Motions, 5% Damping :

S_S = 0.1149 g, 0.2 sec response		Latitude =	30.389	deg North
S_1 = 0.06070 g, 1.0 sec response		Longitude =	81.681	deg West
		Location :	Jacksonville, FL 32201	

Site Class, Site Coeff. and Design Category

Site Classification "D" : Shear Wave Velocity 600 to 1,200 ft/sec		=	D	*ASCE 7-10 Table 20.3-1*
Site Coefficients Fa & Fv	Fa	=	1.60	*ASCE 7-10 Table 11.4-1 & 11.4-2*
(using straight-line interpolation from table values)	Fv	=	2.40	
Maximum Considered Earthquake Acceleration	S_{MS} = Fa * Ss	=	0.184	*ASCE 7-10 Eq. 11.4-1*
	S_{M1} = Fv * S1	=	0.146	*ASCE 7-10 Eq. 11.4-2*
Design Spectral Acceleration	S_{DS} = S_{MS} * 2/3	=	0.123	*ASCE 7-10 Eq. 11.4-3*
	S_{D1} = S_{M1} * 2/3	=	0.097	*ASCE 7-10 Eq. 11.4-4*
Seismic Design Category		=	**B**	*ASCE 7-10 Table 11.6-1 & -2*

Resisting System

ASCE 7-10 Table 12.2-1

Basic Seismic Force Resisting System . . . **Moment Resisting Frame Systems**
Intermediate reinforced concrete moment frames

Response Modification Coefficient " R "	=	5.00	Building height Limits :	
System Overstrength Factor " Wo "	=	3.00	Category "A & B" Limit:	No Limit
Deflection Amplification Factor " Cd "	=	4.50	Category "C" Limit:	No Limit
			Category "D" Limit:	Not Permitted
			Category "E" Limit:	Not Permitted
			Category "F" Limit:	Not Permitted

NOTE! See ASCE 7-10 for all applicable footnotes.

Lateral Force Procedure

ASCE 7-10 Section 12.8.2

Equivalent Lateral Force Procedure

The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-10 12.8

Determine Building Period

Use ASCE 12.8-8

--->> User acknowledged that "Story Height" is at least 10 feet

Number of Stories = 7.0 *(limited to 12)*

" Ta " Approximate fundemental period using Eq. 12.8-8 : Ta = 0.1 * Number of Stories = 0.700 sec

"TL" : Long-period transition period per ASCE 7-10 Maps 22-15 -> 22-20 8.000 sec

Building Period " Ta " Calculated from Approximate Method selected = 0.700 sec

" Cs " Response Coefficient

ASCE 7-10 Section 12.8.1.1

S_{DS} : Short Period Design Spectral Response	=	0.123	From Eq. 12.8-2, Preliminary Cs	=	0.025
" R " : Response Modification Factor	=	5.00	From Eq. 12.8-3 & 12.8-4 , Cs need not exceed	=	0.028
" I " : Seismic Importance Factor	=	1	From Eq. 12.8-5 & 12.8-6, Cs not be less than	=	0.010

Cs : Seismic Response Coefficient = = **0.0245**

Seismic Base Shear

ASCE 7-10 Section 12.8.1

Cs = 0.0245 from 12.8.1.1

W (see Sum Wi below) = 14,000.00 k

Seismic Base Shear V = Cs * W = 343.17 k

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Vertical Distribution of Seismic Forces

ASCE 7-10 Section 12.8.3

" k " : hx exponent based on Ta = 1.10

Table of building Weights by Floor Level...

Level #	Wi : Weight	Hi : Height	(Wi * Hi) ^k	Cvx	Fx=Cvx * V	Sum Story Shear	Sum Story Moment
7	2,000.00	10.50	26,566.74	0.1429	49.02	49.02	0.00
6	2,000.00	10.50	26,566.74	0.1429	49.02	98.05	0.00
5	2,000.00	10.50	26,566.74	0.1429	49.02	147.07	0.00
4	2,000.00	10.50	26,566.74	0.1429	49.02	196.10	0.00
3	2,000.00	10.50	26,566.74	0.1429	49.02	245.12	0.00
2	2,000.00	10.50	26,566.74	0.1429	49.02	294.14	0.00
1	2,000.00	10.50	26,566.74	0.1429	49.02	343.17	0.00

Sum Wi = 14,000.00 k   Sum Wi * Hi = 185,967.16 k-ft   Total Base Shear = 343.17 k
Base Moment = 3,603.3 k-ft

Diaphragm Forces : Seismic Design Category "B" to "F"

ASCE 7-10 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force
7	2,000.00	49.02	49.02	2,000.00	49.02	49.02	98.05	49.02	49.02
6	2,000.00	49.02	98.05	4,000.00	49.02	49.02	98.05	49.02	49.02
5	2,000.00	49.02	147.07	6,000.00	49.02	49.02	98.05	49.02	49.02
4	2,000.00	49.02	196.10	8,000.00	49.02	49.02	98.05	49.02	49.02
3	2,000.00	49.02	245.12	10,000.00	49.02	49.02	98.05	49.02	49.02
2	2,000.00	49.02	294.14	12,000.00	49.02	49.02	98.05	49.02	49.02
1	2,000.00	49.02	343.17	14,000.00	49.02	49.02	98.05	49.02	49.02

Wpx .... Weight at level of diaphragm and other structure elements attached to it.
Fi .... Design Lateral Force applied at the level.
Sum Fi .... Sum of "Lat. Force" of current level plus all levels above
MIN Req'd Force @ Level .... 0.20 * S_{DS} * I * Wpx
MAX Req'd Force @ Level .... 0.40 * S_{DS} * I * Wpx
Fpx : Design Force @ Level .... Wpx * SUM(x->n) Fi / SUM(x->n) wi, x = Current level, n = Top Level

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ASCE 7-10 Wind Forces, Chapter 27, Part I

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Description : -None-

Example Building, 75 x 200, 130 mph, Exp C, Cat III

Basic Values

Risk Category	3 per ASCE 7-10 Table 1.5.1	
V : Basic Wind Speed	130.0	
Kd : Directionality Factor	0.850 per ASCE 7-10 Table 26.6-1	
Horizontal Dim. in North-South Direction (B or L)	=	75.0 ft
Horizontal Dim. in East-West Direction (B or L)	=	200.0 ft
h : Mean Roof height	=	75.0 ft

Exposure Category per ASCE 7-10 Section 26.7

North :	Exposure C	East :	Exposure C
South :	Exposure C	West :	Exposure C

Topographic Factor per ASCE 7-10 Sec 26.8 & Figure 26.8-1

North :	K1 =	K2 =	K3 =	Kzt = 1.000
South :	K1 =	K2 =	K3 =	Kzt = 1.000
East :	K1 =	K2 =	K3 =	Kzt = 1.000
West :	K1 =	K2 =	K3 =	Kzt = 1.000

Building Period & Flexibility Category

User has specified the building frequency is >= 1 Hz, therefore considered RIGID for both North South and East-West directions.

Building Story Data

Level Description	hi ft	Story Ht ft	E_R : X ft	E_R : X ft
7th Floor	75.00	10.50	0.000	0.000
6th Floor	64.50	10.75	0.000	0.000
5th Floor	53.75	10.75	0.000	0.000
4th Floor	43.00	10.75	0.000	0.000
3rd Floor	32.25	10.75	0.000	0.000
2nd Floor	21.50	10.75	0.000	0.000
1st Floor	10.75	10.75	0.000	0.000

Gust Factor

For wind coming from direction indicated

North =	0.850	South =	0.850
East =	0.850	West =	0.850

Enclosure

Check if Building Qualifies as "Open"

	North Wall	South Wall	East Wall	West Wall	Roof	Total
Agross	ft^2	ft^2	ft^2	ft^2	ft^2	0.0 ft^2
Aopenings	ft^2	ft^2	ft^2	ft^2	ft^2	0.0 ft^2
Aopenings >= 0.8 * Agross ?	Yes	Yes	Yes	Yes		

All four Agross values must be non-zero **Building qualifies as "Open"**

North Elevation : Determine Enclosure Classification per ASCE Section 26.10

Reference area = smaller of 4 sq. ft. or 1% of Agross	=	0.0 ft^2	Is Ao > 1.10 * Aoi ?	=	No
Aoi = Ao-total - Ac	=	0.0 ft^2	Is Ao > Reference Area ?	=	No
Agi = Ag-total - Ag	=	0.0 ft^2	Is Aoi / Agi >= 0.20 ?	=	Yes
Aoi / Agi	=	0.0			

Building is "Enclosed" when the North wall receives positive external pressure

South Elevation : Determine Enclosure Classification per ASCE Section 26.10

Reference area = smaller of 4 sq. ft. or 1% of Agross	=	0.0 ft^2	Is Ao > 1.10 * Aoi ?	=	No
Aoi = Ao-total - Ao	=	0.0 ft^2	Is Ao > Reference Area ?	=	No
Agi = Ag-total - Ag	=	0.0 ft^2	Is Aoi / Agi >= 0.20 ?	=	Yes
Ao / Ag	=	0.0			

Building is "Enclosed" when the South wall receives positive external pressure

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Description : --None--

East Elevation : Determine Enclosure Classification per ASCE Section 26.10

Reference area = smaller of 4 sq. ft. or 1% of Agross	=	0.0 ft^2	Is Ao > 1.10 * Aoi ?	=	No
Aoi = Ao-total - Ao	=	0.0 ft^2	Is Ao > Reference Area ?	=	No
Agi = Ag-total - Ag	=	0.0 ft^2	Is Aoi / Agi >= 0.20 ?	=	Yes
Aoi / Agi	=	0.0			

Building is "Enclosed" when the East wall receives positive external pressure

West Elevation : Determine Enclosure Classification per ASCE Section 26.10

Reference area = smaller of 4 sq. ft. or 1% of Agross	=	0.0 ft^2	Is Ao > 1.10 * Aoi ?	=	No
Aoi = Ao-total - Ao	=	0.0 ft^2	Is Ao > Reference Area ?	=	No
Agi = Ag-total - Ag	=	0.0 ft^2	Is Aoi / Agi >= 0.20 ?	=	Yes
Aoi / Agi	=	0.0			

Building is "Enclosed" when the West wall receives positive external pressure

Velocity Pressures

When the following walls experience leeward or sidewall pressures, the value of Kh shall be (per Table 27.3-1) :

North Wall = 1.191 psf South Wall = 1.191 psf East Wall = 1.191 psf West Wall = 1.191 psf

When the following walls experience leeward or sidewall pressures, the value of qh shall be (per Table 27.3-1) :

North Wall = 43.807 psf South Wall = 43.807 psf East Wall = 43.807 psf West Wall = 43.807 psf

qz : Windward Wall Velocity Pressures at various heights per Eq. 27.3-1

	North Elevation		South Elevation		East Elevation		West Elevation	
Height Above Base (ft)	Kz	qz	Kz	qz	Kz	qz	Kz	qz
0.00	0.849	31.22	0.849	31.22	0.849	31.22	0.849	31.22
5.00	0.849	31.22	0.849	31.22	0.849	31.22	0.849	31.22
10.00	0.849	31.22	0.849	31.22	0.849	31.22	0.849	31.22
15.00	0.849	31.22	0.849	31.22	0.849	31.22	0.849	31.22
20.00	0.902	33.17	0.902	33.17	0.902	33.17	0.902	33.17
25.00	0.945	34.76	0.945	34.76	0.945	34.76	0.945	34.76
30.00	0.982	36.12	0.982	36.12	0.982	36.12	0.982	36.12
35.00	1.015	37.31	1.015	37.31	1.015	37.31	1.015	37.31
40.00	1.044	38.38	1.044	38.38	1.044	38.38	1.044	38.38
45.00	1.070	39.34	1.070	39.34	1.070	39.34	1.070	39.34
50.00	1.094	40.22	1.094	40.22	1.094	40.22	1.094	40.22
55.00	1.116	41.04	1.116	41.04	1.116	41.04	1.116	41.04
60.00	1.137	41.80	1.137	41.80	1.137	41.80	1.137	41.80
65.00	1.156	42.51	1.156	42.51	1.156	42.51	1.156	42.51
70.00	1.174	43.18	1.174	43.18	1.174	43.18	1.174	43.18
75.00	1.191	43.81	1.191	43.81	1.191	43.81	1.191	43.81

Pressure Coefficients

GCpi Values when elevation receives positive external pressure

GCpi : Internal pressure coefficient, per sec. 26.11 and Table 26.11-1

	North		South		East		West
+/-	0.0	+/-	0.0	+/-	0.0	+/-	0.0

Specify Cp Values from Figure 27.4-1 for Windward, Leeward & Side Walls

Cp Values when elevation receives positive external pressure

	North	South	East	West
Windward Wall	0.80	0.80	0.80	0.80
Leeward Wall				
Side Walls	-0.70	-0.70	-0.70	-0.70

Wind Pressures

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ASCE 7-10 Wind Forces, Chapter 27, Part I

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Description : --None--

Wind Pressures when NORTH Elevation receives positive external wind pressure

	Positive Internal	Negative Internal
Leeward Wall Pressures	0.0 psf	0.0 psf
Side Wall Pressures	-26.065 psf	-26.065 psf

Windward Wall Pressures . . . Height Above Base (ft)	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
0.00	21.23	21.23
5.00	21.23	21.23
10.00	21.23	21.23
15.00	21.23	21.23
20.00	22.55	22.55
25.00	23.64	23.64
30.00	24.56	24.56
35.00	25.37	25.37
40.00	26.10	26.10
45.00	26.75	26.75
50.00	27.35	27.35
55.00	27.91	27.91
60.00	28.42	28.42
65.00	28.90	28.90
70.00	29.36	29.36
75.00	29.79	29.79

Wind Pressures when SOUTH Elevation receives positive external wind pressure

	Positive Internal	Negative Internal
Leeward Wall Pressures	0.0 psf	0.0 psf
Side Wall Pressures	-26.065 psf	-26.065 psf

Windward Wall Pressures . . . Height Above Base (ft)	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
0.00	21.23	21.23
5.00	21.23	21.23
10.00	21.23	21.23
15.00	21.23	21.23
20.00	22.55	22.55
25.00	23.64	23.64
30.00	24.56	24.56
35.00	25.37	25.37
40.00	26.10	26.10
45.00	26.75	26.75
50.00	27.35	27.35
55.00	27.91	27.91
60.00	28.42	28.42
65.00	28.90	28.90
70.00	29.36	29.36
75.00	29.79	29.79

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ASCE 7-10 Wind Forces, Chapter 27, Part I

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Description : --None--

Wind Pressures when EAST Elevation receives positive external wind pressure

	Positive Internal	Negative Internal
Leeward Wall Pressures	0.0 psf	0.0 psf
Side Wall Pressures	-26.065 psf	-26.065 psf

Windward Wall Pressures . . . Height Above Base (ft)	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
0.00	21.23	21.23
5.00	21.23	21.23
10.00	21.23	21.23
15.00	21.23	21.23
20.00	22.55	22.55
25.00	23.64	23.64
30.00	24.56	24.56
35.00	25.37	25.37
40.00	26.10	26.10
45.00	26.75	26.75
50.00	27.35	27.35
55.00	27.91	27.91
60.00	28.42	28.42
65.00	28.90	28.90
70.00	29.36	29.36
75.00	29.79	29.79

Wind Pressures when WEST Elevation receives positive external wind pressure

	Positive Internal	Negative Internal
Leeward Wall Pressures	0.0 psf	0.0 psf
Side Wall Pressures	-26.065 psf	-26.065 psf

Windward Wall Pressures . . . Height Above Base (ft)	Positive Internal Pressure (psf)	Negative Internal Pressure (psf)
0.00	21.23	21.23
5.00	21.23	21.23
10.00	21.23	21.23
15.00	21.23	21.23
20.00	22.55	22.55
25.00	23.64	23.64
30.00	24.56	24.56
35.00	25.37	25.37
40.00	26.10	26.10
45.00	26.75	26.75
50.00	27.35	27.35
55.00	27.91	27.91
60.00	28.42	28.42
65.00	28.90	28.90
70.00	29.36	29.36
75.00	29.79	29.79

Story Forces for Design Wind Load Cases

Values below are calculated based on a building with dimensions B x L x h as defined on the "Basic Values" tab.

Load Case	Windward Wall	Building level	Ht. Range	Trib. Height	Wind Shear Components (k) In "Y" Direction	In "X" Direction	Eccentricity for (ft) "Y" Shear	"X" Shear	Mt, (ft-k)

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ASCE 7-10 Wind Forces, Chapter 27, Part I

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Description : --None--

CASE 1	North	Level 7	69.75' -> 75.00'	5.25	-31.04	---	---	---	---
CASE 1	North	Level 6	59.13' -> 69.75'	10.63	-61.30	---	---	---	---
CASE 1	North	Level 5	48.38' -> 59.13'	10.75	-59.69	---	---	---	---
CASE 1	North	Level 4	37.63' -> 48.38'	10.75	-56.94	---	---	---	---
CASE 1	North	Level 3	26.88' -> 37.63'	10.75	-53.58	---	---	---	---
CASE 1	North	Level 2	16.13' -> 26.88'	10.75	-49.15	---	---	---	---
CASE 1	North	Level 1	5.38' -> 16.13'	10.75	-45.68	---	---	---	---
CASE 1	South	Level 7	69.75' -> 75.00'	5.25	31.04	---	---	---	---
CASE 1	South	Level 6	59.13' -> 69.75'	10.63	61.30	---	---	---	---
CASE 1	South	Level 5	48.38' -> 59.13'	10.75	59.69	---	---	---	---
CASE 1	South	Level 4	37.63' -> 48.38'	10.75	56.94	---	---	---	---
CASE 1	South	Level 3	26.88' -> 37.63'	10.75	53.58	---	---	---	---
CASE 1	South	Level 2	16.13' -> 26.88'	10.75	49.15	---	---	---	---
CASE 1	South	Level 1	5.38' -> 16.13'	10.75	45.68	---	---	---	---
CASE 1	East	Level 7	69.75' -> 75.00'	5.25	---	-11.64	---	---	---
CASE 1	East	Level 6	59.13' -> 69.75'	10.63	---	-22.99	---	---	---
CASE 1	East	Level 5	48.38' -> 59.13'	10.75	---	-22.38	---	---	---
CASE 1	East	Level 4	37.63' -> 48.38'	10.75	---	-21.35	---	---	---
CASE 1	East	Level 3	26.88' -> 37.63'	10.75	---	-20.09	---	---	---
CASE 1	East	Level 2	16.13' -> 26.88'	10.75	---	-18.43	---	---	---
CASE 1	East	Level 1	5.38' -> 16.13'	10.75	---	-17.13	---		---
CASE 1	West	Level 7	69.75' -> 75.00'	5.25	---	11.64	---	---	---
CASE 1	West	Level 6	59.13' -> 69.75'	10.63	---	22.99	---	---	---
CASE 1	West	Level 5	48.38' -> 59.13'	10.75	---	22.38	---	---	---
CASE 1	West	Level 4	37.63' -> 48.38'	10.75	---	21.35	---	---	---
CASE 1	West	Level 3	26.88' -> 37.63'	10.75	---	20.09	---	---	---
CASE 1	West	Level 2	16.13' -> 26.88'	10.75	---	18.43	---	---	---
CASE 1	West	Level 1	5.38' -> 16.13'	10.75	---	17.13	---	---	---
CASE 2	North	Level 7	69.75' -> 75.00'	5.25	-23.28	---	---	30.00 +/-	698.5
CASE 2	North	Level 6	59.13' -> 69.75'	10.63	-45.97	---	---	30.00 +/-	1,379.2
CASE 2	North	Level 5	48.38' -> 59.13'	10.75	-44.77	---	---	30.00 +/-	1,343.1
CASE 2	North	Level 4	37.63' -> 48.38'	10.75	-42.71	---	---	30.00 +/-	1,281.2
CASE 2	North	Level 3	26.88' -> 37.63'	10.75	-40.18	---	---	30.00 +/-	1,205.5
CASE 2	North	Level 2	16.13' -> 26.88'	10.75	-36.86	---	---	30.00 +/-	1,105.8
CASE 2	North	Level 1	5.38' -> 16.13'	10.75	-34.26	---	---	30.00 +/-	1,027.7
CASE 2	South	Level 7	69.75' -> 75.00'	5.25	23.28	---	---	30.00 +/-	698.5
CASE 2	South	Level 6	59.13' -> 69.75'	10.63	45.97	---	---	30.00 +/-	1,379.2
CASE 2	South	Level 5	48.38' -> 59.13'	10.75	44.77	---	---	30.00 +/-	1,343.1
CASE 2	South	Level 4	37.63' -> 48.38'	10.75	42.71	---	---	30.00 +/-	1,281.2
CASE 2	South	Level 3	26.88' -> 37.63'	10.75	40.18	---	---	30.00 +/-	1,205.5
CASE 2	South	Level 2	16.13' -> 26.88'	10.75	36.86	---	---	30.00 +/-	1,105.8
CASE 2	South	Level 1	5.38' -> 16.13'	10.75	34.26	---	---	30.00 +/-	1,027.7
CASE 2	East	Level 7	69.75' -> 75.00'	5.25	---	-8.73	10.55	--- +/-	92.1
CASE 2	East	Level 6	59.13' -> 69.75'	10.63	---	-17.24	10.55	--- +/-	181.8
CASE 2	East	Level 5	48.38' -> 59.13'	10.75	---	-16.79	10.55	--- +/-	177.1
CASE 2	East	Level 4	37.63' -> 48.38'	10.75	---	-16.02	10.55	--- +/-	168.9

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Description : --None--

CASE 2	East	Level 3	26.88' -> 37.63'	10.75	---	-15.07	10.55	--- +/-	158.9
CASE 2	East	Level 2	16.13' -> 26.88'	10.75	---	-13.82	10.55	--- +/-	145.8
CASE 2	East	Level 1	5.38' -> 16.13'	10.75	---	-12.85	10.55	--- +/-	135.5
CASE 2	West	Level 7	69.75' -> 75.00'	5.25	---	8.73	10.55	--- +/-	92.1
CASE 2	West	Level 6	59.13' -> 69.75'	10.63	---	17.24	10.55	--- +/-	181.8
CASE 2	West	Level 5	48.38' -> 59.13'	10.75	---	16.79	10.55	--- +/-	177.1
CASE 2	West	Level 4	37.63' -> 48.38'	10.75	---	16.02	10.55	--- +/-	168.9
CASE 2	West	Level 3	26.88' -> 37.63'	10.75	---	15.07	10.55	--- +/-	158.9
CASE 2	West	Level 2	16.13' -> 26.88'	10.75	---	13.82	10.55	--- +/-	145.8
CASE 2	West	Level 1	5.38' -> 16.13'	10.75	---	12.85	10.55	--- +/-	135.5
CASE 3	North & East	Level 7	69.75' -> 75.00'	5.25	-23.28	-8.73	---	---	---
CASE 3	North & East	Level 6	59.13' -> 69.75'	10.63	-45.97	-17.24	---	---	---
CASE 3	North & East	Level 5	48.38' -> 59.13'	10.75	-44.77	-16.79	---	---	---
CASE 3	North & East	Level 4	37.63' -> 48.38'	10.75	-42.71	-16.02	---	---	---
CASE 3	North & East	Level 3	26.88' -> 37.63'	10.75	-40.18	-15.07	---	---	---
CASE 3	North & East	Level 2	16.13' -> 26.88'	10.75	-36.86	-13.82	---	---	---
CASE 3	North & East	Level 1	5.38' -> 16.13'	10.75	-34.26	-12.85	---	---	---
CASE 3	North & West	Level 7	69.75' -> 75.00'	5.25	-23.28	8.73	---	---	---
CASE 3	North & West	Level 6	59.13' -> 69.75'	10.63	-45.97	17.24	---	---	---
CASE 3	North & West	Level 5	48.38' -> 59.13'	10.75	-44.77	16.79	---	---	---
CASE 3	North & West	Level 4	37.63' -> 48.38'	10.75	-42.71	16.02	---	---	---
CASE 3	North & West	Level 3	26.88' -> 37.63'	10.75	-40.18	15.07	---	---	---
CASE 3	North & West	Level 2	16.13' -> 26.88'	10.75	-36.86	13.82	---	---	---
CASE 3	North & West	Level 1	5.38' -> 16.13'	10.75	-34.26	12.85	---	---	---
CASE 3	South & West	Level 7	69.75' -> 75.00'	5.25	23.28	8.73	---	---	---
CASE 3	South & West	Level 6	59.13' -> 69.75'	10.63	45.97	17.24	---	---	---
CASE 3	South & West	Level 5	48.38' -> 59.13'	10.75	44.77	16.79	---	---	---
CASE 3	South & West	Level 4	37.63' -> 48.38'	10.75	42.71	16.02	---	---	---
CASE 3	South & West	Level 3	26.88' -> 37.63'	10.75	40.18	15.07	---	---	---
CASE 3	South & West	Level 2	16.13' -> 26.88'	10.75	36.86	13.82	---	---	---
CASE 3	South & West	Level 1	5.38' -> 16.13'	10.75	34.26	12.85	---	---	---
CASE 3	South & East	Level 7	69.75' -> 75.00'	5.25	23.28	-8.73	---	---	---
CASE 3	South & East	Level 6	59.13' -> 69.75'	10.63	45.97	-17.24	---	---	---
CASE 3	South & East	Level 5	48.38' -> 59.13'	10.75	44.77	-16.79	---	---	---
CASE 3	South & East	Level 4	37.63' -> 48.38'	10.75	42.71	-16.02	---	---	---
CASE 3	South & East	Level 3	26.88' -> 37.63'	10.75	40.18	-15.07	---	---	---
CASE 3	South & East	Level 2	16.13' -> 26.88'	10.75	36.86	-13.82	---	---	---
CASE 3	South & East	Level 1	5.38' -> 16.13'	10.75	34.26	-12.85	---	---	---
CASE 4	North & East	Level 7	69.75' -> 75.00'	5.25	-17.48	-6.55	10.55	30.00 +/-	593.5
CASE 4	North & East	Level 6	59.13' -> 69.75'	10.63	-34.51	-12.94	10.55	30.00 +/-	1,171.8
CASE 4	North & East	Level 5	48.38' -> 59.13'	10.75	-33.61	-12.60	10.55	30.00 +/-	1,141.1
CASE 4	North & East	Level 4	37.63' -> 48.38'	10.75	32.06	-12.02	10.55	30.00 +/-	1,088.6
CASE 4	North & East	Level 3	26.88' -> 37.63'	10.75	-30.16	-11.31	10.55	30.00 +/-	1,024.3
CASE 4	North & East	Level 2	16.13' -> 26.88'	10.75	-27.67	-10.38	10.55	30.00 +/-	939.5
CASE 4	North & East	Level 1	5.38' -> 16.13'	10.75	-25.72	-9.64	10.55	30.00 +/-	873.2
CASE 4	North & West	Level 7	69.75' -> 75.00'	5.25	-17.48	6.55	10.55	30.00 +/-	593.5

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Description : --None--

CASE 4	North & West	Level 6	59.13' -> 69.75'	10.63	-34.51	12.94	10.55	30.00	+/-	1,171.8
CASE 4	North & West	Level 5	48.38' -> 59.13'	10.75	-33.61	12.60	10.55	30.00	+/-	1,141.1
CASE 4	North & West	Level 4	37.63' -> 48.38'	10.75	-32.06	12.02	10.55	30.00	+/-	1,088.6
CASE 4	North & West	Level 3	26.88' -> 37.63'	10.75	-30.16	11.31	10.55	30.00	+/-	1,024.3
CASE 4	North & West	Level 2	16.13' -> 26.88'	10.75	-27.67	10.38	10.55	30.00	+/-	939.5
CASE 4	North & West	Level 1	5.38' -> 16.13'	10.75	-25.72	9.64	10.55	30.00	+/-	873.2
CASE 4	South & West	Level 7	69.75' -> 75.00'	5.25	17.48	6.55	10.55	30.00	+/-	593.5
CASE 4	South & West	Level 6	59.13' -> 69.75'	10.63	34.51	12.94	10.55	30.00	+/-	1,171.8
CASE 4	South & West	Level 5	48.38' -> 59.13'	10.75	33.61	12.60	10.55	30.00	+/-	1,141.1
CASE 4	South & West	Level 4	37.63' -> 48.38'	10.75	32.06	12.02	10.55	30.00	+/-	1,088.6
CASE 4	South & West	Level 3	26.88' -> 37.63'	10.75	30.16	11.31	10.55	30.00	+/-	1,024.3
CASE 4	South & West	Level 2	16.13' -> 26.88'	10.75	27.67	10.38	10.55	30.00	+/-	939.5
CASE 4	South & West	Level 1	5.38' -> 16.13'	10.75	25.72	9.64	10.55	30.00	+/-	873.2
CASE 4	South & East	Level 7	69.75' -> 75.00'	5.25	17.48	-6.55	10.55	30.00	+/-	593.5
CASE 4	South & East	Level 6	59.13' -> 69.75'	10.63	34.51	-12.94	10.55	30.00	+/-	1,171.8
CASE 4	South & East	Level 5	48.38' -> 59.13'	10.75	33.61	-12.60	10.55	30.00	+/-	1,141.1
CASE 4	South & East	Level 4	37.63' -> 48.38'	10.75	32.06	-12.02	10.55	30.00	+/-	1,088.6
CASE 4	South & East	Level 3	26.88' -> 37.63'	10.75	30.16	-11.31	10.55	30.00	+/-	1,024.3
CASE 4	South & East	Level 2	16.13' -> 26.88'	10.75	27.67	-10.38	10.55	30.00	+/-	939.5
CASE 4	South & East	Level 1	5.38' -> 16.13'	10.75	25.72	-9.64	10.55	30.00	+/-	873.2
Min per ASCE 27.4.7	North	Level 7	69.75' -> 75.00'	5.25	-16.80	---	---	---		---
Min per ASCE 27.4.7	North	Level 6	59.13' -> 69.75'	10.63	-34.00	---	---	---		---
Min per ASCE 27.4.7	North	Level 5	48.38' -> 59.13'	10.75	-34.40	---	---	---		---
Min per ASCE 27.4.7	North	Level 4	37.63' -> 48.38'	10.75	-34.40	---	---	---		---
Min per ASCE 27.4.7	North	Level 3	26.88' -> 37.63'	10.75	-34.40	---	---	---		---
Min per ASCE 27.4.7	North	Level 2	16.13' -> 26.88'	10.75	-34.40	---	---	---		---
Min per ASCE 27.4.7	North	Level 1	5.38' -> 16.13'	10.75	-34.40	---	---	---		---
Min per ASCE 27.4.7	South	Level 7	69.75' -> 75.00'	5.25	16.80	---	---	---		---
Min per ASCE 27.4.7	South	Level 6	59.13' -> 69.75'	10.63	34.00	---	---	---		---
Min per ASCE 27.4.7	South	Level 5	48.38' -> 59.13'	10.75	34.40	---	---	---		---
Min per ASCE 27.4.7	South	Level 4	37.63' -> 48.38'	10.75	34.40	---	---	---		---
Min per ASCE 27.4.7	South	Level 3	26.88' -> 37.63'	10.75	34.40	---	---	---		---
Min per ASCE 27.4.7	South	Level 2	16.13' -> 26.88'	10.75	34.40	---	---	---		---
Min per ASCE 27.4.7	South	Level 1	5.38' -> 16.13'	10.75	34.40	---	---	---		---
Min per ASCE 27.4.7	East	Level 7	69.75' -> 75.00'	5.25	---	-6.30	---	---		---
Min per ASCE 27.4.7	East	Level 6	59.13' -> 69.75'	10.63	---	-12.75	---	---		---
Min per ASCE 27.4.7	East	Level 5	48.38' -> 59.13'	10.75	---	-12.90	---	---		---
Min per ASCE 27.4.7	East	Level 4	37.63' -> 48.38'	10.75	---	-12.90	---	---		---
Min per ASCE 27.4.7	East	Level 3	26.88' -> 37.63'	10.75	---	-12.90	---	---		---
Min per ASCE 27.4.7	East	Level 2	16.13' -> 26.88'	10.75	---	-12.90	---	---		---
Min per ASCE 27.4.7	East	Level 1	5.38' -> 16.13'	10.75	---	-12.90	---	---		---
Min per ASCE 27.4.7	West	Level 7	69.75' -> 75.00'	5.25	---	6.30	---	---		---
Min per ASCE 27.4.7	West	Level 6	59.13' -> 69.75'	10.63	---	12.75	---	---		---
Min per ASCE 27.4.7	West	Level 5	48.38' -> 59.13'	10.75	---	12.90		---		---
Min per ASCE 27.4.7	West	Level 4	37.63' -> 48.38'	10.75	---	12.90	---	---		---
Min per ASCE 27.4.7	West	Level 3	26.88' -> 37.63'	10.75	---	12.90	---	---		---
Min per ASCE 27.4.7	West	Level 2	16.13' -> 26.88'	10.75	---	12.90	---	---		---

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ASCE 7-10 Wind Forces, Chapter 27, Part I

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Description : --None--

Min per ASCE 27.4.7	West	Level 1	5.38' -> 16.13'	10.75	---	12.90	---	---	---

Base Shear for Design Wind Load Cases

Values below are calculated based on a building with dimensions B x L x h as defined on the "General" tab.

North +Y, West, +X

Load Case	Windward Wall	Leeward Wall	Wind Base Shear Components (k) In "Y" Direction	In "X" Direction	Mt, (ft-k)
Case 1	North	South	-357.38	---	---
Case 1	South	North	357.38	---	---
Case 1	East	West	---	-134.02	---
Case 1	West	East	---	134.02	---
Case 2	North	South	-268.03	---	+/- 8,041.0
Case 2	South	North	268.03	---	+/- 8,041.0
Case 2	East	West	---	-100.51	+/- 1,060.2
Case 2	West	East	---	100.51	+/- 1,060.2
Case 3	North & East	South & West	-268.03	-100.51	---
Case 3	North & West	South & East	-268.03	100.51	---
Case 3	South & West	North & East	268.03	100.51	---
Case 3	South & East	North & West	268.03	-100.51	---
Case 4	North & East	South & West	-201.20	-75.45	+/- 6,832.0
Case 4	North & West	South & East	-201.20	75.45	+/- 6,832.0
Case 4	South & West	North & East	201.20	75.45	+/- 8,832.0
Case 4	South & East	North & West	201.20	-75.45	+/- 8,832.0
Min per ASCE 27.4.7	North	South	-222.80	---	---
Min per ASCE 27.4.7	South	North	222.80	---	---
Min per ASCE 27.4.7	East	West	---	-83.55	---
Min per ASCE 27.4.7	West	East	---	83.55	---

Table 2 Seismic Design Categories, Risk, and Seismic Design Criteria

FL.

SDC	Building Type and Expected MMI	Seismic Criteria
A	Buildings located in regions having a very small probability of experiencing damaging earthquake effects	No specific seismic design requirements but structures are required to have complete lateral-force-resisting systems and to meet basic structural integrity criteria.
B	Structures of ordinary occupancy that could experience moderate (MMI VI) intensity shaking	Structures must be designed to resist seismic forces.
C	Structures of ordinary occupancy that could experience strong (MMI VII) and important structures that could experience moderate (MMI VI) shaking	Structures must be designed to resist seismic forces. Critical nonstructural components must be provided with seismic restraint.
D	Structures of ordinary occupancy that could experience very strong shaking (MMI VIII) and important structures that could experience MMI VII shaking	Structures must be designed to resist seismic forces. Only structural systems capable of providing good performance are permitted. Nonstructural components that could cause injury must be provided with seismic restraint. Nonstructural systems required for life safety protection must be demonstrated to be capable of post-earthquake functionality. Special construction quality assurance measures are required.
E	Structures of ordinary occupancy located within a few kilometers of major active faults capable of producing MMI IX or more intense shaking	Structures must be designed to resist seismic forces. Only structural systems that are capable of providing superior performance permitted. Many types of irregularities are prohibited. Nonstructural components that could cause injury must be provided with seismic restraint. Nonstructural systems required for life safety protection must be demonstrated to be capable of post-earthquake functionality. Special construction quality assurance measures are required.
F	Critically important structures located within a few kilometers of major active faults capable of producing MMI IX or more intense shaking	Structures must be designed to resist seismic forces. Only structural systems capable of providing superior performance permitted are permitted. Many types of irregularities are prohibited. Nonstructural components that could cause injury must be provided with seismic restraint. Nonstructural systems required for facility function must be demonstrated to be capable of post-earthquake functionality Special construction quality assurance measures are required.

CA6462

Date Submitted 11/24/2015
Chapter 1
Section 1.1
Affects HVHZ Yes
Proponent James Schock
Attachments Yes
TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Comments

General Comments **Yes**
Alternate Language **No**

Related Modifications

Revise preface. I used chapter 1 section 1.1 to be allowed in the system

Summary of Modification

Revise Preface Removes the language related to not using snow and earthquake provisions. I have been advised that under certain situation in high rise building may need to be considered.

Rationale

I have been advised that in high rise construction in North Florida that earthquake loads may govern the design. General use of the code dictates that only applicable section of the code be considered in design and occupancy this would be no different.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Minimal because this change will only effect a small number of properties

Impact to industry relative to the cost of compliance with code

Minimal because this change will only effect a small number of properties

Impact to small business relative to the cost of compliance with code

Minimal because this change will only effect a small number of properties

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Prevents the under design of high rise structures

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Strengthens the code for specific design and locations of structures in florida

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exihibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

NO

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO

2nd Comment Period

CA6462-G3

Proponent	Joseph Belcher	**Submitted**	6/21/2016	**Attachments**	Yes

Comment:

CA6462/S6462 The Florida Home Builders Association (FHBA), the Builders Association of South Florida – High Rise Council (BASF-HRC) the Masonry Association of Florida (MAF), and the Florida Independent Concrete and Associated Products (FICAP) and request the Code Administration and Structural TAC recommend approval of modification contingent upon approval of Mod CA6430/S6430.Should Mod 6430 fail, the aforementioned groups oppose Mod 6462. Please see uploaded Comment File.

2nd Comment Period

CA6462-G4

Proponent	Joseph Belcher	**Submitted**	6/21/2016	**Attachments**	Yes

Comment:

CA6462/S6462 The Florida Home Builders Association (FHBA), the Builders Association of South Florida – High Rise Council (BASF-HRC) the Masonry Association of Florida (MAF), and the Florida Independent Concrete and Associated Products (FICAP) and request the Code Administration and Structural TAC recommend approval of modification contingent upon approval of Mod CA6430/S6430.Should Mod 6430 fail, the aforementioned groups oppose Mod 6462. Please see uploaded file.

1st Comment Period History

CA6462-G1

Proponent	Jerry Peck	**Submitted**	1/28/2016	**Attachments**	No

Comment:

The Florida Building Code should not exclude any code section which is in the base code, even if some may think that a code section is not applicable in Florida, such as snow load.

References to snow load in the Florida Building Code do not need to be removed, it snow loading is not applicable to a given project, snow loading is not applied to that project.

If something is in the code but is not applicable to any given project, then that code section is, like many other code sections most of the time, not applicable to the project in question and that code section is simply not applied to the project in question.

1st Comment Period History

CA6462-G2

Proponent	Randall Shackelford	**Submitted**	2/25/2016	**Attachments**	No

Comment:

I support this change. There is no need to tell designers not to use snow or seismic loads. They can tell by looking at the map. The code is designed such that earthquake loads are to be used no matter where a building is built. Just different levels of loads based on where you are building. Even in Seismic Design Category A, as Florida is, there may be some requirements and they should be considered.

Please see attached text

The *Florida Building Code* is based on national model building codes and national consensus standards which are amended where necessary for Florida's specific needs. ~~However, code requirements that address snow loads and earthquake protection are pervasive; they are left in place but should not be utilized or enforced because Florida has no snow load or earthquake threat.~~ The code incorporates all building construction-related regulations for public and private buildings in the State of Florida other than those specifically exempted by Section 553.73, *Florida Statutes*. It has been harmonized with the *Florida Fire Prevention Code*, which is developed and maintained by the Department of Financial Services, Office of the State Fire Marshal, to establish unified and consistent standards.

CA6462/S6462 The Florida Home Builders Association (FHBA), the Builders Association of South Florida – High Rise Council (BASF-HRC) the Masonry Association of Florida (MAF), and the Florida Independent Concrete and Associated Products (FICAP) and request the Code Administration and Structural TAC recommend approval of modification contingent upon approval of Mod CA6430/S6430.Should Mod 6430 fail, the aforementioned groups oppose Mod 6462.

RATIONALE: Mod 6462 removes the exception for considerations of snow and seismic load from the Preface of the code. The language in the Preface is at best ill located and is permissive language. The reason given for the proposal is that an engineer stated the seismic loads for high rise building under design prevailed over the wind loads. The building site is in the northeast portion of the state. In discussion the proponent indicated the engineer's design was not reviewed. If approved without the approval of Mod 6430, this proposal will have a major impact on the cost of the design of structures across the state for no proven need. A review of the seismic history of Florida indicates no damaging earthquakes have affected the state All national seismic sources, including the USGS, indicate Florida has an extremely low probability of suffering an earthquake. While there has been recorded seismic activity in the state, the lack of damage reported from earthquakes in Florida proves the wind design criteria results in more than adequate structural stability.

If to be seriously considered, the imposition of seismic design in Florida should at best be the subject of a study. At the very minimum, the design which prompted the proposal should be submitted for a peer review by engineers familiar with seismic design. Seismic design is considerably more complicated than wind design and requires a high degree of experience. Mod 6462 should be recommended for approval only if Mod 6430 is recommended for approval. If Mod 6430 is recommended for disapproval, Mod 6462 should be recommended for disapproval as well.

Mod 6430 places the exception to the snow and seismic loads of the code in the body of the code and makes the exception mandatory. Under this Mod the permissive language would remain in the Preface of the code, but mandatory language would be added to the administrative chapter of the code. Mod 6430 should be recommended for approval.

CA6462/S6462 The Florida Home Builders Association (FHBA), the Builders Association of South Florida – High Rise Council (BASF-HRC) the Masonry Association of Florida (MAF), and the Florida Independent Concrete and Associated Products (FICAP) and request the Code Administration and Structural TAC recommend approval of modification contingent upon approval of Mod CA6430/S6430.Should Mod 6430 fail, the aforementioned groups oppose Mod 6462.

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Mod 6430 places the exception to the snow and seismic loads of the code in the body of the code and makes the exception mandatory. Under this Mod the permissive language would remain in the Preface of the code, but mandatory language would be added to the administrative chapter of the code. Mod 6430 should be recommended for approval.

CA6498

Date Submitted	11/22/2015	**Section**	110.9	**Proponent**	Mo Madani
Chapter	1	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Comments

General Comments **No** **Alternate Language** **Yes**

Related Modifications

6491, 6492, 6493, 6494, 6496

Summary of Modification

The proposed code change requires as part of the close out inspection ensuring that the existing swimming pool bonding system is complete and terminated properly.

Rationale

The proposed code change provides for provisions necessary to prevent electrocution in swimming pools. Also, see upleaded files.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Further enforcement/inspections would be necessary by the enforcement agencies to implement this prevision.

Impact to building and property owners relative to cost of compliance with code

The proposed code change has the potential of adding cost to construction and at the same time reducing electrocution in swimming pools.

Impact to industry relative to the cost of compliance with code

The proposed code change has the potential of adding cost to construction and at the same time reducing electrocution in swimming pools.

Impact to small business relative to the cost of compliance with code

The proposed code change has the potential of adding cost to construction and at the same time reducing electrocution in swimming pools.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The proposed code change has the potential of reducing electrocution in swimming pools

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The proposed code change improves the code by providing provisions for reducing electrocution in swimming pools.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The proposed code change does not discriminate against materials or products.

Does not degrade the effectiveness of the code

The proposed code change improves the code by providing provisions for reducing electrocution in swimming pools.

Is the proposed code modification part of a prior code version? No

Alternate A3

Move the proposed modification from "110.9" to "110.3 Required Inspections, Electrical" and add the following:

4. Existing Swimming Pools. To be made after all repairs or alterations are complete, all required electrical equipment, GFCI protection, and equipotential bonding are in place.

(E6498-A3)

Alternate Language

2nd Comment Period

6498-A3

Proponent Jennifer Hatfield **Submitted** 6/21/2016 **Attachments** Yes

Rationale

The additional language would clarify that the purpose of this inspection is to determine these things are in place for what was actually altered or repaired and not beyond. Example, installing a new pump or heater would not require a pool built before the equipotential bonding grid was required to be installed, which would require pulling up the deck. Also may help address issues such as the 30-inch clearance in front of the electrical equipment because some older pools may not have the ability to comply with this "newer" requirement.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

May add an additional inspection to be added to permits.

Impact to building and property owners relative to cost of compliance with code

Increase in cost do to additional inspection and cost to comply.

Impact to industry relative to the cost of compliance with code

Increase in cost do to additional inspection and cost to comply.

Impact to Small Business relative to the cost of compliance with code

The proposed code change has the potential of adding cost to construction and at the same time reducing electrocution in swimming pools.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, increases safety on existing pools.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

Is the proposed code modification part of a prior code version? No

1st Comment Period History

CA6498-G1

Proponent Thomas Lasprogato **Submitted** 2/3/2016 **Attachments** No

Comment:

Neutral

1st Comment Period History

CA6498-G2

Proponent Jennifer Hatfield **Submitted** 2/25/2016 **Attachments** No

Comment:

On behalf of the Association of Pool & Spa Professionals' Technical Committee, which includes E.P. Hamilton III, Ph.D., who sits on Panel 17 of the National Electrical Code, the following is submitted:

1. In this proposal there is no specific text to review, so this proposal cannot be implemented or even properly addressed. There are no criteria as to nature of the inspection and/or tests, protocols, pass/fail criteria, enforcement and qualification strategies that are essential for effective implementation. The Committee needs to be aware that implementation of such a program can result in potentially significant costs for existing pools if demolition has to be done to allow the inspector access to pool and deck steel and other covered and inaccessible objects required to be inspected.

2. This proposal, if properly implemented, actually has the real potential of reducing risks. Pool shock incidents are associated with improper, poor defective, damaged or nonexistent bonding.

3. New Jersey has a bonding test program for non-residential pools. Effective implementation of such a program cannot be accomplished by a simple code proposal; a complete and comprehensive program must be developed.

Move the proposed modification from "110.9" to "110.3 Required Inspections, Electrical" and add the following:

4. Existing Swimming Pools. To be made after all repairs or alterations are complete, all required electrical equipment, GFCI protection, and equipotential bonding are in place.

Section 110 – Inspections

Section 110.9 Add to read as follows:

Section 110.9 Existing Swimming Pools – Electrical

FLORIDA BUILDING COMMISSION
SWIMMING POOL ELECTRICAL SAFETY PROJECT
CONCURRENT MEETING OF THE SWIMMING POOL TAC AND ELECTRICAL TAC
OCTOBER 14, 2015 MEETING SUMMARY REPORT

WEDNESDAY, OCTOBER 14, 2015

MEETING SUMMARY AND OVERVIEW

On Wednesday, October 14, 2015 the Swimming Pool TAC and Electrical TAC met concurrently in Daytona Beach to develop recommendations regarding swimming pool safety issues focused on the prevention of electrocution in swimming pools. At the initial scoping meeting held on September 28, 2015 the TACs agreed that the project scope was to focus on evaluation of whether to recommend a code amendment requiring low voltage lighting in residential pools for new construction (Phase I). In addition, it was agreed that additional electrical pool safety relevant topical issues including bonding, grounding, retrofitting of existing pools, and education would be considered as a second phase of the project (Phase II). At the October 14, 2015 meeting the TACs proposed and acceptability ranked options for low voltage lighting in residential pools for new construction. In addition, the TACs evaluated proposed options to address the other key topical issues, and ultimately developed a consensus package of recommendations for consideration by the Florida Building Commission. The TACs voted unanimously to recommend the Commission approve the consensus package of recommendations from the TACs. The TACs' specific recommendations are as follow:

Grounding

The Electrical TAC and the Swimming Pool TAC voted unanimously to recommend that the Commission charge staff to work with the TAC chairs and in consultation with stakeholders to formulate a code amendment requiring that all electrical circuits feeding equipment that could potentially energize a pool have GFCI protection for new residential and commercial swimming pools (the goal is to fill in any gaps in the current Code).

Education

The Electrical TAC and the Swimming Pool TAC voted unanimously to recommend that the Commission support a comprehensive educational effort to ensure there is a consistent message to enhance pool electrical safety issues for existing and new pools by working with existing resources including educational providers and associations. The effort should include defining the problems, identifying solutions and communicating a consistent message to stakeholders (contractors, consumers, home inspectors, pool maintenance providers, etc.) through training courses, flyers, brochures, websites, etc. Key issues for education messaging include lighting, bonding, grounding, GFCI, maintenance of existing pools, and monitoring devices to detect stray currents in the pool water, etc.

Existing Swimming Pools

The Electrical TAC voted 6-2 in favor (75%), to recommend the Commission charge staff to work with the TAC chair and in consultation with stakeholders to formulate a code amendment requiring existing commercial and residential swimming pools to have GFCI protection for replacement pool pump motors, if not already in place; to provide GFCI protection for the replacement of 120 volt pool lights when they are replaced; and, as part of the close out inspection ensuring that the existing bonding system is complete and terminated properly.

Note: The Swimming Pool TAC vote 5-3 (63%) in favor of the option.

PROJECT OVERVIEW

The 2015 Florida Legislature identified the need to evaluate the electrical aspects of swimming pool safety focusing on minimizing electrocution risks linked to swimming pools. In response, the Florida Building Commission approved a research project (technical enrichment) for a *Swimming Pool Electrocution Prevention Study*. In order to implement the project the Commission convened a process to develop recommendations for pool safety focused on the prevention of electrocution in swimming pools. The Commission determined that the project would be evaluated and recommendations developed by convening concurrent meetings of the Commission's Swimming Pool Technical Advisory Committee and Electrical Technical Advisory Committee (TAC). The objective of the project is to evaluate key topical issues, and as appropriate develop code amendment proposals designed to minimize electrocution risks linked to swimming pools.

In response to the Commission's direction the Swimming Pool TAC and Electrical TAC agreed that the initial Phase I scope of the project is to determine whether to recommend a proposed code amendment that would require low voltage lighting in residential swimming pools for new construction. Once the Swimming Pool TAC and the Electrical TAC conclude their evaluation of low voltage lighting they will evaluate additional project relevant topics in Phase II of the project: specifically bonding, grounding, retrofitting of existing pools, and education.

Agenda Item Outcomes

Opening and Meeting Attendance

The meeting was opened at 10:00 AM once a quorum was established for the Swimming Pool and Electrical TACs respectively, and the following members participated:

Swimming Pool TAC: James Batts (chair), Jordan Clarkson, Bill Dumbaugh, Kevin Flanagan, John O'Conner, Mark Pabst, Gordon Shepardson, Bob Vincent, and John Wahler. (9 of 11)

Absent Members:
Tom Allen, and Corky Williams.

Electrical TAC: Kevin Flanagan (chair), Neal Burdick, Ken Castronovo, Leonard Devine, Jr. (*Alternate: Nelson Montgomery*), Shane Gerwig, David Rice (*Alternate: Steve Mitchell*), Joe Territo, Clarence Tibbs, and Dwight Wilkes. (9 of 11)

Absent Members:
Oriol Haage, and Roy Van Wyk.

DBPR Staff Present

Norman Bellamy, Chris Burgwald, Jim Hammers, April Hammonds, Mo Madani, and Jim Richmond.

Commissioners Present

Fred Schilling, Jim Schock, and Jeff Stone.

Meeting Facilitation and Reporting

The TAC Chairs meeting was facilitated by Jeff Blair from the FCRC Consensus center at Florida State University. Information at: http://consensus.fsu.edu/

CONSENSUS CENTER

Background and Supporting Documents

The agenda and relevant background and supporting documents are linked to each agenda item. The Agenda URLs for the October 14, 2015 TAC meetings are as follows:

http://www.floridabuilding.org/fbc/commission/FBC_1015/Swimming_Pool_TAC/Swimming_Pool_TAC_Agenda_101415.htm

http://www.floridabuilding.org/fbc/commission/FBC_1015/Electrical_TAC/Electrical_Agenda_TAC_101415.htm

Agenda Review

The Swimming Pool TAC voted unanimously, 8 - 0 in favor, to approve the agenda for the October 24, 2015 meeting as posted/presented.

The Electrical TAC voted unanimously, 9 - 0 in favor, to approve the agenda for the October 14, 2015 meeting as posted/presented.

Following are the key agenda items approved for consideration:

- To Approve Regular Procedural Topics (Agenda and Meeting Summary Report)
- To Discuss and Approve Phase I Recommendations (Low Voltage Lighting in Residential Pools for New Construction)
- To Discuss Phase II Topics (Bonding, Grounding, Retrofitting of Existing Pools, and Education)
- To Adopt Consensus Recommendations for Submittal to the Commission
- To Consider Public Comment
- To Identify Needed Next Steps: Information, Assignments, and Agenda Items for Next Meeting

The complete Agenda is included as *"Attachment 1"* of this report.

(See Attachment 1—Agenda)

Approval of September 28, 2015 Meeting Summary Report

The Swimming Pool TAC voted unanimously, 8 - 0 in favor, to approve the Meeting Summary Report for the September 28, 2015 meeting as posted/presented.

Approval September 28, 2015 Meeting Summary Report

The Electrical TAC voted unanimously, 9 - 0 in favor, to approve the Meeting Summary Report for the September 28, 2015 meeting as posted/presented.

Identification, Discussion, and Acceptability Ranking of Phase I Options
Requirement for Low Voltage Lighting in Residential Pools for New Construction

At the September 28, 2015 meeting the Swimming Pool TAC and the Electrical TAC voted to approve in concept a code amendment proposal requiring low voltage lighting in residential pools for new construction, with the understanding that relevant safety data and other documentation would be evaluated prior to a final vote on any recommendation submitted to the Florida Building Commission.

At the October 14, 2015 meeting the TACs were asked to offer options regarding possible requirement for low voltage lighting in residential pools for new construction. In addition, the public was invited to comment on the options and/or suggest additional options prior to the TACs ranking them for acceptability. Jeff explained that members would be asked to rank each proposed option in turn utilizing a four-point acceptability ranking scale where 4 = acceptable, 3 = minor reservations, 2 = major reservations, and 1 = unacceptable. Following discussion and refinement of options, members may be asked to do additional rankings of proposed options if requested by a *TAC* member. Members should be prepared to offer specific refinements to address their reservations.

Once ranked, options with a 75% or greater number of 4's and 3's in proportion to 2's and 1's shall be considered consensus recommendations. The *TACs'* consensus recommendations will be submitted to the Commission for consideration.

Following the opportunity provided for questions and answers, public comment, and discussion, the TACs ranked a series of options regarding low voltage lighting in residential pools for new construction.

The complete Options Acceptability Ranking Results are included as *"Attachment 2"* of this report.

(See Attachment 2—Ranking Results)

Discussion and Evaluation of Phase II Topics in Turn

Identification of Issues and Options, and Acceptability Ranking of Options in Turn

Jeff explained that the TACs would address each of the four key issues in turn by topic, and that members would be invited to propose and comment on options before the TAC members ranked them. In addition, the public was invited to comment on the options and/or suggest additional options prior to the TACs ranking them for acceptability. The Phase II topics are Bonding, Grounding, Retrofitting of Existing Swimming Pools, and Education of Contractors and Consumers. Jeff explained that TAC members would be asked to rank each proposed option in turn utilizing a four-point acceptability ranking scale where 4 = acceptable, 3 = minor reservations, 2 = major reservations, and 1 = unacceptable. Following discussion and refinement of options, members may be asked to do additional rankings of proposed options if requested by a *TAC* member. Members should be prepared to offer specific refinements to address their reservations. Once ranked, options with a 75% or greater number of 4's and 3's in proportion to 2's and 1's shall be considered consensus recommendations. The *TACs'* consensus recommendations will be submitted to the Commission for consideration.

Following the opportunity provided for questions and answers, public comment, and discussion, the TACs ranked the proposed options for acceptability. All of the options proposed are included in the ranking results. Following are the option(s) ranked that achieved a consensus level of support (≥ 75% in favor):

Grounding

The Electrical TAC and the Swimming Pool TAC voted unanimously to recommend that the Commission charge staff to work with the TAC chairs and in consultation with stakeholders to formulate a code amendment requiring that all electrical circuits feeding equipment that could potentially energize a pool have GFCI protection for new residential and commercial swimming pools (the goal is to fill in any gaps in the current Code).

Education

The Electrical TAC and the Swimming Pool TAC voted unanimously to recommend that the Commission support a comprehensive educational effort to ensure there is a consistent message to enhance pool electrical safety issues for existing and new pools by working with existing resources including educational providers and associations. The effort should include defining the problems, identifying solutions and communicating a consistent message to stakeholders (contractors, consumers, home inspectors, pool maintenance providers, etc.) through training courses, flyers, brochures, websites, etc. Key issues for education messaging include lighting, bonding, grounding, GFCI, maintenance of existing pools, and monitoring devices to detect stray currents in the pool water, etc.

Existing Swimming Pools
The Electrical TAC voted 6-2 in favor (75%), to recommend the Commission charge staff to work with the TAC chair and in consultation with stakeholders to formulate a code amendment requiring existing commercial and residential swimming pools to have GFCI protection for replacement pool pump motors, if not already in place; to provide GFCI protection for the replacement of 120 volt pool lights when they are replaced; and, as part of the close out inspection ensuring that the existing bonding system is complete and terminated properly.

Note: The Swimming Pool TAC vote 5-3 (63%) in favor of the option.
The complete Options Acceptability Ranking Results are included as *"Attachment 2"* of this report.

(See Attachment 2—Ranking Results)

TAC Actions

Following the opportunity provided for questions and answers, public comment and discussion, the TACs took the following actions:

MOTION—The Swimming Pool TAC voted unanimously, 8 - 0 in favor, to recommend the Commission approve the TACs' package of consensus recommendations.

MOTION—The Electrical Pool TAC voted unanimously, 8 - 0 in favor, to recommend the Commission approve the TACs' package of consensus recommendation.

Next Steps

Following are the next steps for the Swimming Pool Electrical Safety Project:

- The Commission will evaluate the TACs' (Swimming Pool TAC and Electrical TAC) consensus package of recommendations at the October 15, 2015 meeting.
- The Commission will take the lead with ensuring Code amendments are proposed consistent with any recommendations approved by the Commission regarding swimming pool electrical safety requirements.

Adjournment

After a determination that a quorum was still present the Swimming Pool TAC voted unanimously, 8 – 0 in favor, to adjourn the meeting at 3:30 PM on Wednesday, October 14, 2015.

After a determination that a quorum was still present the Electrical TAC voted unanimously, 8 – 0 in favor, to adjourn the meeting at 3:30 PM on Wednesday, October 14, 2015.

ATTACHMENT 1
OCTOBER 14, 2015 MEETING AGENDAS

FLORIDA BUILDING COMMISSION
SWIMMING POOL TECHNICAL ADVISORY COMMITTEE (TAC)
CONCURRENTLY WITH THE ELECTRICAL TAC
OCTOBER 14, 2015—MEETING II

PLAZA HISTORIC BEACH RESORT AND SPA
600 NORTH ATLANTIC BOULEVARD—DAYTONA BEACH, FLORIDA 33706

MEETING OBJECTIVES

- ➢ To Approve Regular Procedural Topics (Agenda and Meeting Summary Report)
- ➢ To Discuss and Approve Phase I Recommendations (Low Voltage Lighting in Residential Pools for New Construction)
- ➢ To Discuss Phase II Topics (Bonding, Grounding, Retrofitting of Existing Pools, and Education)
- ➢ To Adopt Consensus Recommendations for Submittal to the Commission
- ➢ To Consider Public Comment
- ✓ To Identify Needed Next Steps: Information, Assignments, and Agenda Items for Next Meeting

MEETING AGENDA—WEDNESDAY, OCTOBER 14, 2015

All Agenda Times—Including Adjournment—Are Approximate and Subject to Change

10:00 AM	**A.)**	**WELCOME AND INTRODUCTIONS**
	B.)	**AGENDA REVIEW AND APPROVAL (October 14, 2015)**
	C.)	**REVIEW AND APPROVAL OF FACILITATOR'S SUMMARY REPORT (September 28, 2015)**
	D.)	**IDENTIFICATION, DISCUSSION, AND ACCEPTABILITY RANKING OF PHASE I OPTIONS** Requirement for Low Voltage Lighting in Residential Pools for New Construction • Identification, Discussion and Acceptability Ranking of Options In Turn
	E.)	**ADOPTION OF PHASE I CONSENSUS RECOMMENDATIONS FOR SUBMITTAL TO THE COMMISSION**
12:00 PM	*LUNCH*	
1:00 PM	**F.**	**DISCUSSION AND EVALUATION OF PHASE II TOPICS IN TURN** Identification of Issues and Options, and Acceptability Ranking of Options in Turn • Bonding • Grounding • Retrofitting of Existing Swimming Pools • Education of Contractors and Consumers
3:00 PM	*BREAK*	
3:15 PM	**F.**	**DISCUSSION AND EVALUATION OF PHASE II TOPICS IN TURN CONTINUED**
	G.)	**ADOPTION OF ANY PHASE II CONSENSUS RECOMMENDATIONS FOR SUBMITTAL TO THE COMMISSION**
	H.)	**GENERAL PUBLIC COMMENT**
	I.)	**NEXT STEPS: AGENDA ITEMS, NEEDED INFORMATION, ASSIGNMENTS, DATE AND LOCATION IF NEEDED**
~5:00 PM	*J.)*	*ADJOURN*

FLORIDA BUILDING COMMISSION
ELECTRICAL TECHNICAL ADVISORY COMMITTEE (TAC)
CONCURRENTLY WITH THE SWIMMING POOL TAC
OCTOBER 14, 2015—MEETING II

PLAZA HISTORIC BEACH RESORT AND SPA
600 NORTH ATLANTIC BOULEVARD—DAYTONA BEACH, FLORIDA 33706

MEETING OBJECTIVES

- ➢ To Approve Regular Procedural Topics (Agenda and Meeting Summary Report)
- ➢ To Discuss and Approve Phase I Recommendations (Low Voltage Lighting in Residential Pools for New Construction)
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MEETING AGENDA—WEDNESDAY, OCTOBER 14, 2015

All Agenda Times—Including Adjournment—Are Approximate and Subject to Change

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1:00 PM	**F.**	**DISCUSSION AND EVALUATION OF PHASE II TOPICS IN TURN** Identification of Issues and Options, and Acceptability Ranking of Options in Turn • Bonding • Grounding • Retrofitting of Existing Swimming Pools • Education of Contractors and Consumers
3:00 PM	*BREAK*	
3:15 PM	**F.**	**DISCUSSION AND EVALUATION OF PHASE II TOPICS IN TURN CONTINUED**
	G.)	**ADOPTION OF ANY PHASE II CONSENSUS RECOMMENDATIONS FOR SUBMITTAL TO THE COMMISSION**
	H.)	**GENERAL PUBLIC COMMENT**
	I.)	**NEXT STEPS: AGENDA ITEMS, NEEDED INFORMATION, ASSIGNMENTS, DATE AND LOCATION IF NEEDED**
~5:00 PM	*J.)*	*ADJOURN*

ATTACHMENT 2
OPTIONS ACCEPTABILITY RANKING RESULTS

I. PHASE I RECOMMENDATIONS

LOW VOLTAGE LIGHTING IN RESIDENTIAL SWIMMING POOLS FOR NEW CONSTRUCTION

Low Voltage *October 14, 2015*	*4=acceptable*	*3= minor reservations*	*2=major reservations*	*1= not acceptable*
Option A: **Require low voltage lighting in residential pools for new construction (Miami-Dade requirements).**				
Swimming Pool TAC (6-3) 67%	**5**	**1**	**1**	**2**
Electrical TAC (5-4) 56%	**4**	**1**	**1**	**3**
Option B: **Maintain NEC requirements for new residential pools**				
Swimming Pool TAC (7-2) 78%	**6**	**1**	**1**	**1**
Swimming Pool TAC (6-3) 67%	**5**	**1**	**1**	**2**
Revised Ranking *Electrical TAC* (5-4) 56%	**4**	**1**	**3**	**1**
Option C: **Require low voltage lighting in residential pools for new construction (Miami-Dade requirements) for energy conservation purposes.**				
Swimming Pool TAC (7-2) 78%	**5**	**2**	**1**	**1**
Swimming Pool TAC (4-5) 44%	**2**	**2**	**2**	**3**
Revised Ranking *Electrical TAC* (6-3) 67%	**2**	**4**	**0**	**3**
Revised Ranking *Electrical TAC* (5-4) 56%	**3**	**2**	**1**	**3**
Option D: **Require LED pool lights with plastic niches or without niches in new construction.**				
Swimming Pool TAC (3-6) 33%	**2**	**1**	**3**	**3**
Electrical TAC (2-7) 22%	**1**	**1**	**4**	**3**

Option E: **All residential pools shall meet the requirements of code and shall be require a monitoring device to detect stray currents in the water.**				
Swimming Pool TAC (2-7) 22%	**0**	**2**	**5**	**2**
Electrical TAC (3-6) 33%	**1**	**2**	**6**	**0**

II. Phase II Recommendations

1. Bonding

No specific options were evaluated for bonding.

2. Grounding

Grounding *October 14, 2015*	*4=acceptable*	*3= minor reservations*	*2=major reservations*	*1= not acceptable*
Option A: **Require that all electrical circuits feeding equipment that could potentially energize a pool have GFCI protection for new residential and commercial swimming pools (the goal is to fill in any gaps in the current Code).**				
Swimming Pool TAC **(9-0) 100%**	**4**	**5**	**0**	**0**
Electrical TAC **(9-0) 100%**	**5**	**4**	**0**	**0**

3. Retrofitting of Existing Pools

Retrofitting *October 14, 2015*	*4=acceptable*	*3= minor reservations*	*2=major reservations*	*1= not acceptable*
Option A: **Require existing commercial and residential swimming pools to have GFCI protection for replacement pool pump motors, if not already in place; to provide GFCI protection for the replacement of 120 volt pool lights when they are replaced; and, as part of the close out inspection ensuring that the existing bonding system is complete and terminated properly.**				
Swimming Pool TAC (5-3) 63%	**2**	**3**	**3**	**0**
Electrical TAC **(6-2) 75%**	**4**	**2**	**2**	**0**

4. Education Initiatives for Contractors and Consumers

Education *October 14, 2015*	*4=acceptable*	*3= minor reservations*	*2=major reservations*	*1= not acceptable*
Option A: **Initiate a comprehensive educational effort to ensure there is a consistent message to enhance pool electrical safety issues for existing and new pools by working with existing resources including educational providers and associations. The effort should include defining the problems, identifying solutions and communicating a consistent message to stakeholders (contractors, consumers, home inspectors, pool maintenance providers, etc.) through training courses, flyers, brochures, websites, etc. Key issues for education messaging include lighting, bonding, grounding, GFCI, maintenance of existing pools, and monitoring devices to detect stray currents in the pool water, etc.**				
Swimming Pool TAC **(9-0) 100%**	**9**	**0**	**0**	**0**
Electrical TAC **(9-0) 100%**	**8**	**0**	**0**	**0**

FLORIDA BUILDING COMMISSION
SWIMMING POOL ELECTRICAL SAFETY PROJECT
CONCURRENT MEETING OF THE SWIMMING POOL TAC AND ELECTRICAL TAC
OCTOBER 14, 2015
RECOMMENDATIONS TO THE FLORIDA BUILDING COMMISSION

MONDAY, OCTOBER 14, 2015

MEETING SUMMARY AND OVERVIEW

On Wednesday, October 14, 2015 the Swimming Pool TAC and Electrical TAC met concurrently in Daytona Beach to develop recommendations regarding pool safety issues focused on the prevention of electrocution in swimming pools. At the initial scoping meeting held on September 28, 2015 the TACs agreed that the project scope was to focus on evaluation of whether to recommend a code amendment requiring low voltage lighting in residential pools for new construction (Phase I). In addition, it was agreed that additional electrical pool safety relevant topical issues including bonding, grounding, retrofitting of existing pools, and education would be considered as a second phase of the project (Phase II). At the October 14, 2015 meeting the TACs proposed and acceptability ranked options for low voltage lighting in residential pools for new construction. In addition, the TACs evaluated proposed options to address the other key topical issues, and ultimately developed a consensus package of recommendations for consideration by the Florida Building Commission. The TACs specific recommendations are as follow:

Grounding
The Electrical TAC and the Swimming Pool TAC voted unanimously to recommend that the Commission charge staff to work with the TAC chairs and in consultation with stakeholders to formulate a code amendment requiring that all electrical circuits feeding equipment that could potentially energize a pool have GFCI protection for new residential and commercial swimming pools (the goal is to fill in any gaps in the current Code).

Education
The Electrical TAC and the Swimming Pool TAC voted unanimously to recommend that the Commission support a comprehensive educational effort to ensure there is a consistent message to enhance pool electrical safety issues for existing and new pools by working with existing resources including educational providers and associations. The effort should include defining the problems, identifying solutions and communicating a consistent message to stakeholders (contractors, consumers, home inspectors, pool maintenance providers, etc.) through training courses, flyers, brochures, websites, etc. Key issues for education messaging include lighting, bonding, grounding, GFCI, maintenance of existing pools, and monitoring devices to detect stray currents in the pool water, etc.

Existing Swimming Pools

The Electrical TAC voted 6-2 in favor (75%), to recommend the Commission charge staff to work with the TAC chair and in consultation with stakeholders to formulate a code amendment requiring existing commercial and residential swimming pools to have GFCI protection for replacement pool pump motors, if not already in place; to provide GFCI protection for the replacement of 120 volt pool lights when they are replaced; and, as part of the close out inspection ensuring that the existing bonding system is complete and terminated properly.

TAC ACTIONS

MOTION—The Swimming Pool TAC voted unanimously, 8 - 0 in favor, to recommend the Commission approve the 2 consensus recommendations from the TAC (grounding and education).

MOTION—The Electrical Pool TAC voted unanimously, 8 - 0 in favor, to recommend the Commission approve the 3 consensus recommendations from the TAC (grounding, education, and existing swimming pools).

Alternate Language

1st Comment Period History 01/13/2016 - 02/25/2016

6498-A3

Proponent Bryan Holland **Submitted** 2/22/2016 **Attachments** Yes

Rationale

I believe this clarifies the intent of the proposed modification to ensure the electrical safety requirements are installed or reconnected when an existing swimming pool is repaired or altered.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposed modification may require an additional inspection to be added to permits for swimming pool repair and alterations.

Impact to building and property owners relative to cost of compliance with code

The proposed modification could increase the cost of compliance with the code while providing an additional level of safety following repairs and alterations to swimming pools.

Impact to industry relative to the cost of compliance with code

The proposed modification could increase the cost of compliance with the code while providing an additional level of safety following repairs and alterations to swimming pools.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes. The proposed modification increases the health, safety, and welfare of the general public.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes. The proposed modification strengthens and improves the code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No.

Does not degrade the effectiveness of the code

No.