

SLS Consulting, Inc.

Los Angeles | Miami | New York

© 2021 SLS Consulting, Inc. All Rights Reserved

**FIRE PROTECTION AND LIFE SAFETY CODE REPORT**

PNAME

PADDRESS

PCITY, PSTATE PZIPCODE

Prepared For:

ARCH

ARCHADD

ARCHZIP

**Draft** - **DATE**

SLS # **PUMBER**

**TABLE OF CONTENTS**

[I. Introduction 5](#_Toc63066777)

[A. Project Description 5](#_Toc63066778)

[B. Applicable Codes 6](#_Toc63066779)

[II. Fire Protection and Life Safety Concepts 7](#_Toc63066780)

[A. Occupancy Classifications 7](#_Toc63066781)

[B. Building Classification Approach & Mixed-Use Approach 8](#_Toc63066782)

[C. Construction Type 9](#_Toc63066783)

[i. Fire-Resistance Rating Based on Building Elements (FBC Table 601) 9](#_Toc63066784)

[ii. High-Rise Building Construction Type Reduction 10](#_Toc63066785)

[iii. Open Parking Garage Specific Requirements 10](#_Toc63066786)

[iv. Enclosed Parking Garage Specific Requirements 11](#_Toc63066787)

[v. Exterior Wall Ratings and Allowable Openings (FBC Table 602 & Table 705.8) 11](#_Toc63066788)

[D. Fire Separation Requirements 13](#_Toc63066789)

[i. Fire Separation Marking 15](#_Toc63066790)

[ii. Fire Barriers 15](#_Toc63066791)

[iii. Fire Partitions 16](#_Toc63066792)

[iv. Horizontal Assemblies 16](#_Toc63066793)

[v. Smoke Barriers 16](#_Toc63066794)

[vi. Smoke Partitions 17](#_Toc63066795)

[vii. Opening Protection 17](#_Toc63066796)

[viii. Penetrations 17](#_Toc63066797)

[E. Vertical Opening Code Compliance Approach 18](#_Toc63066798)

[i. Shafts 18](#_Toc63066799)

[ii. Elevators 18](#_Toc63066800)

[iii. Escalators 20](#_Toc63066801)

[iv. Stairs 20](#_Toc63066802)

[v. Trash/Linen Chutes 20](#_Toc63066803)

[vi. Occupancy-Specific Vertical Opening Requirements 21](#_Toc63066804)

[vii. Atria 21](#_Toc63066805)

[viii. Convenience Openings 22](#_Toc63066806)

[ix. Exit Access Stairway Enclosures 23](#_Toc63066807)

[x. Communicating Space 24](#_Toc63066808)

[xi. Two-Story Openings with Partial Enclosure 25](#_Toc63066809)

[F. Interior Finish Requirements 25](#_Toc63066810)

[G. Mezzanine Requirements 27](#_Toc63066811)

[H. Stage and Platform Requirements 28](#_Toc63066812)

[I. General Means of Egress Requirements 30](#_Toc63066813)

[i. Maximum Allowable Travel Distances: 30](#_Toc63066814)

[ii. Number of Required Exits Per Floor 31](#_Toc63066815)

[iii. Unit Exit Access 32](#_Toc63066816)

[iv. Additional Exit Stair 32](#_Toc63066817)

[v. Electrical Room Exit: 32](#_Toc63066818)

[vi. Boiler Rooms or Furnace Rooms: 32](#_Toc63066819)

[vii. Mechanical Equipment Rooms: 33](#_Toc63066820)

[viii. Elevator Lobby Exit: 33](#_Toc63066821)

[ix. Exit Access Remoteness Requirements: 33](#_Toc63066822)

[x. Physical Exit Separation Requirements: 33](#_Toc63066823)

[xi. Exit Discharge Configurations: 33](#_Toc63066824)

[xii. Street Floor Requirements: 34](#_Toc63066825)

[xiii. Stair Re-Entry: 34](#_Toc63066826)

[xiv. Door hardware requirements: 34](#_Toc63066827)

[xv. Occupant Load Factors: 35](#_Toc63066828)

[xvi. Spaces with One Means of Egress Requirements: 36](#_Toc63066829)

[xvii. Means of Escape: 37](#_Toc63066830)

[xviii. Egress Capacity Factors: 37](#_Toc63066831)

[xix. Stair Width Requirements: 38](#_Toc63066832)

[xx. Corridor Width: 39](#_Toc63066833)

[xxi. Assembly Seating Arrangement: 39](#_Toc63066834)

[xxii. One Exit Unavailable Analysis: 39](#_Toc63066835)

[xxiii. Pool Barriers: 39](#_Toc63066836)

[xxiv. Exterior Doors (NOA): 39](#_Toc63066837)

[xxv. Exit Signage: 40](#_Toc63066838)

[xxvi. Luminous Egress Markings: 40](#_Toc63066839)

[xxvii. Roof Top Occupancy: 40](#_Toc63066840)

[xxviii. Means of Egress Lighting: 40](#_Toc63066841)

[J. Major Life Safety Accessibility Requirements Overview 41](#_Toc63066842)

[i. Accessible Means of Egress 41](#_Toc63066843)

[ii. Elevators 42](#_Toc63066844)

[iii. Area of Refuge 42](#_Toc63066845)

[iv. Area of Refuge: Communication 43](#_Toc63066846)

[v. Exit Door Signage 43](#_Toc63066847)

[K. Fire Protection and Life Safety Systems Overview 43](#_Toc63066848)

[i. Equipment Locations / Flood Zone 43](#_Toc63066849)

[ii. Fire Command Center 43](#_Toc63066850)

[iii. Sprinkler Systems 45](#_Toc63066851)

[iv. Fire Pump: 47](#_Toc63066852)

[v. Fire Department Connections: 48](#_Toc63066853)

[vi. Special Suppression Systems: 48](#_Toc63066854)

[vii. Fire Extinguishers: 48](#_Toc63066855)

[L. Fire Alarm & Emergency Responder Radio Systems 50](#_Toc63066856)

[i. Fire Alarm Systems 50](#_Toc63066857)

[ii. Remote Annunciator Panel 51](#_Toc63066858)

[iii. Fire Alarm Monitoring: 51](#_Toc63066859)

[iv. Fire Fighter Telephone Jacks: 51](#_Toc63066860)

[v. Emergency Responder Radio System: 51](#_Toc63066861)

[vi. Carbon Monoxide Alarms: 52](#_Toc63066862)

[vii. Smoke Alarms: 52](#_Toc63066863)

[viii. Smoke Detection System: 52](#_Toc63066864)

[ix. Smoke Detection System: 52](#_Toc63066865)

[M. Emergency](#_Toc63066866)

[and Standby Power Systems 53](#_Toc63066866)

[i. Emergency Power Systems: 53](#_Toc63066867)

[N. Smoke Control Systems Overview 54](#_Toc63066868)

[i. Stairs 54](#_Toc63066869)

[ii. Elevators 54](#_Toc63066870)

[iii. Floor-to-Floor/Zoned System 54](#_Toc63066871)

[iv. Parking Garage 55](#_Toc63066872)

[v. Vertical Openings: 55](#_Toc63066873)

[vi. Smoke Removal System 55](#_Toc63066874)

[O. Hazardous Materials Approach 55](#_Toc63066875)

[P. Fire Department Access 56](#_Toc63066876)

[i. Site Access/Set-Up Sites: 56](#_Toc63066877)

[ii. Elevator – Emergency Medical Services 57](#_Toc63066878)

[iii. Fire Service Access Elevator 57](#_Toc63066879)

[iv. New 2018 IBC Requirements 59](#_Toc63066880)

[III. Summary and Conclusion 59](#_Toc63066881)

1. Introduction

SLS Consulting, Inc. (SLS) has prepared this Fire Protection/Life Safety Narrative report for the PNAME project located in PCITY, PSTATE. The Fire Protection/Life Safety Narrative report is intended to address the following major requirements as they relate to the proposed project:

* Construction Type.
* Means of Egress (e.g., occupant loading, number of exits, egress capacity, etc.).
* High Rise Requirements.
* Fire Protection Systems (e.g., sprinkler protection, fire alarm, smoke control, firefighter communication, etc.).
* Means of Egress Lighting and Markings.
* Emergency Power Requirements.

It is noted that this report is not intended to be “all inclusive” of fire protection/life safety requirements, but rather is intended to address major code compliance requirements. This *Fire Protection/Life Safety Narrative* report has been prepared based on the architectural drawings dated PLANSDATE and discussions with the project team regarding fire protection/life safety systems. This Narrative is intended to serve as a design validation tool and will be updated as the project design progresses to final design.

This report is primarily intended to address all life safety and building code related issues, however, requirements of each code listed in Section B relevant to life safety will also be evaluated. Mechanical, Plumbing, Electrical, and Fire Protection system designs are assumed to be in accordance with relevant installation standards. It is not the intent of this report to outline installation requirements, but rather to identify what systems are required as part of the referenced project.

* 1. Project Description

The proposed PNAME project will be a mixed used building composed of #-stories. The building has a primary use of [r-2], Residential (Levels # thru #) along with [S-2] ….

The building will be protected throughout by automatic sprinklers designed in accordance with NFPA 13, Standard for the Installation of Sprinklers and an emergency-voice alarm communication system designed in accordance with NFPA 72, National Fire Alarm and Signaling Code.

Figure 1: Conceptual Rendering

* 1. Applicable Codes

The major applicable codes for the project include, but are not limited to, the following:

**Building Code**

* FBC: Florida Building Code, Seventh Edition.

**Fire Prevention/Life Safety Code**

* FFPC: Florida Fire Prevention Code, Seventh Edition.

**Electrical Code**

* NFPA 70: National Electrical Code® (NEC), 2017 Edition.

**Mechanical Code**

* FBC-M: Florida Building Code - Mechanical, Seventh Edition.

**Plumbing Code**

* FBC-P: Florida Building Code – Plumbing, Seventh Edition.

**Major NFPA Standards**

* NFPA 10: Standard for Portable Fire Extinguishers, 2018 Edition.
* NFPA 13: Standard for the Installation of Sprinkler Systems, 2016 Edition
* NFPA 14: Standard for the Installation of Standpipe and Hose Systems, 2016 Edition.
* NFPA 20: Standard for Installation of Stationary Fire Pumps for Fire Protection, 2016 Edition.
* NFPA 72: National Fire Alarm and Signaling Code®, 2016 Edition.
* NFPA 88A: Standard for Parking Garage Structures, 2015 Edition.
* NFPA 90A: Standard for the Installation of Air-Conditioning and Ventilating Systems, 2015 Edition.
* NFPA 92: Standard for Smoke Control Systems, 2015 Edition.
* NFPA 110: Standard for Emergency and Standby Power Systems, 2016 Edition.

1. Fire Protection and Life Safety Concepts
   1. Occupancy Classifications

The PNAME Project is designed as a *mixed-use* facility. As such, there will be several different *occupancies and uses* within the building, as summarized by the table below.

Table 1: Occupancy Classifications

|  |  |  |
| --- | --- | --- |
| Occupancy Group Classifications (FBC) | Occupancy Classifications (FFPC) | Specific Use / Location |
| Use Group A-1, *Assembly* occupancies (FBC §303.2) | *Assembly*  (Chapter 12 - LSC) | Cinema |
| Use Group A-2, *Assembly* occupancies (FBC §303.3) | *Assembly*  (Chapter 12 - LSC) | Restaurant/Dining/Commercial Kitchen |
| Use Group A-3, *Assembly* occupancies (FBC §303.4) | *Assembly*  (Chapter 12 - LSC) | Gym, Pool and Pool Decks,  Lobbies, Meeting Rooms > 750 ft2 |
| Use Group B, *Business* occupancies (FBC §304.1) | *Business*  (Chapter 38 - LSC) | Offices |
| Use Group M, *Mercantile* occupancies (FBC §309.1) | *Mercantile*  *(Chapter 36 - LSC)* | Retail Commercial spaces |
| Use Group R-1, *Residential* occupancies (FBC §310.3) | *Hotel*  (Chapter 28 - LSC) | Hotel Units |
| Use Group R-2, *Residential* occupancies (FBC §310.4) | *Apartment*  (Chapter 30 - LSC) | Apartment/Condominium |
| Use Group I-1, *Institutional* occupancies (FBC §308.3) | *Residential Board and Care*  *(Chapter 32 - LSC)* | Residential Care Units |
| Use Group I-3, *Institutional* occupancies (FBC §308.5) | *Detention and Correctional*  *(Chapter 22 - LSC)* | Cells, Day Rooms |
| Use Group S-1, *Moderate Hazard Storage* occupancies (FBC §311.2) | *Storage*  (Chapter 42 - LSC) | Loading Dock |
| Use Group S-2, *Low Hazard Storage* occupancies (FBC §311.3) | *Storage*  (Chapter 42 - LSC) | Parking, General Storage and M/E/P Support Spaces |

* 1. Building Classification Approach & Mixed-Use Approach

As stated above, the PNAME project will consist of multiple occupancies. The design approach is non-separated *mixed- use occupancy* in accordance with FBC Section 508.3. Therefore, fire rated separation is not required between the occupancies except as indicated below.

The parking garage must be separated from all other occupancies by a 2-hour fire barrier in accordance with NFPA 88A Section 5.2.1.

Retail tenant separation in a covered mall must be separated by 1-hour fire partitions. FBC Section 708. Even if retail is not considered a covered mall, the tenant separation is recommended to facilitate renovation of vacant spaces and occupied tenants.

Townhomes must be separated by a 2-hour fire wall in accordance with FBC Section 706.4.1.2.

Occupancies serving the detention and correctional facility, but not classified as detention/correctional use must be separated from the detention/correctional facility by 2-hour fire barriers per FFPC Section 22.1.3.4.

* 1. Construction Type
     1. Fire-Resistance Rating Based on Building Elements (FBC Table 601)

Due to the proposed occupancies classifications, building height, and number of stories in the PNAME project, the construction type for the building has to be BUILDTYPE Construction in accordance with FBC Tables 504.3, 504.4 and 506.2. The fire resistance rating requirements shown below for BUILDTYPE Construction are obtained from Table 601 of FBC.

Table 2: Fire-Resistance Ratings of Building Elements (Hours)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Building Element | Type IA | Type IB | Type IIA | Type IIB |
| Primary Structural Frame | 31 | 21 | 1 | 0 |
| Primary Column | 3 | 2 | 1 | 0 |
| Bearing Walls  Exterior5.6  Interior | 3  31 | 2  21 | 1  1 | 0  0 |
| Nonbearing Walls and Partitions  Exterior  Interior4 | (Table 602)  0 | (Table 602)  0 | (Table 602)  0 | (Table 602)  0 |
| Floor Construction and Secondary Members | 2 | 2 | 1 | 0 |
| Roof Construction and Secondary Members | 1 ½2 | 12,3 | 12,3 | 03 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Building Element | Type IIIA | Type IIIB | Type IV | Type VA | Type VB |
| Primary Structural Frame | 1 | 0 | HT | 1 | 0 |
| Bearing Walls  Exterior5.6  Interior | 2  1 | 2  0 | 2  1/HT | 1  1 | 0  0 |
| Nonbearing Walls and Partitions  Exterior  Interior4 | (Table 602)  0 | (Table 602)  0 | (Table 602)  (See Section 2304.11.2) | (Table 602)  0 | (Table 602)  0 |
| Floor Construction and Secondary Members | 1 | 0 | HT | 1 | 0 |
| Roof Construction and Secondary Members | 12,3 | 0 | HT | 12,3 | 0 |

1Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

2Except in Group F-1, H, M and S-1 occupancies, fire protection of primary structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

3In all occupancies, heavy timber complying with Section 2304.11  shall be allowed where a 1-hour or less fire-resistance rating is required.

4Not less than the fire-resistance rating required by other sections of the FBC.

5Not less than required by Table 602 of the FBC based on the fire separation distances (FSDs).

6Not less than the rating as referenced in FBC Section 704.10

* + 1. High-Rise Building Construction Type Reduction

FBC Section 403.2.1.1 allows Type IA construction if building height is under 420 ft. to be reduced to Type IB Construction except the required fire resistance rating of columns supporting floors cannot be reduced.

In other than Group F-1, M and S-1 occupancies, Type IB construction is permitted to be reduced to Type IIA.

The construction reduction above is allowed for buildings that have sprinkler control valves equipped with supervisory initiating devices and waterflow initiating devices for each floor.

Based on the type of construction, Type IA Reduced, Tables 504.3 and 506.2 permit unlimited building height and area. The reduced fire resistance rating of the building elements does not change the building height and building area limitations for the same building without such reductions.

NOTE: IF BLDG IS greater than 420 ft, then cannot take construction reduction in 403.2.1.1.

Check limits height and number of stories and area for the type of construction

CHECK NFPA 101 IF ANY CONSTRUCTION LIMITATIONS

Have to convert NFPA 220 types to FBC types, but still have to make sure that construction meets limitation in 101. Very few occupancies have restrictions but need to check and state it here.

* + 1. Open Parking Garage Specific Requirements

FBC Section 406.5.1 states that open parking garage shall be of Type I, II, or IV construction. The exterior side of the structure shall have uniformly distributed openings on two or more sides. The area of such openings in exterior walls on a tier shall be not less than 20 percent of the total perimeter wall area of each tier. The aggregate length of the openings considered to be providing natural ventilation shall be not less than 40 percent of the perimeter of the tier. Interior walls shall be not less than 20 percent open with uniformly distributed openings. However, openings are not required to be distributed over 40 percent of the building perimeter where the required openings are uniformly distributed over two opposing sides of the building.

In addition, FFPC, NFPA 101 Section 42.8.1.3 states that each parking level of an open parking structure shall have wall openings open to the atmosphere for an area of not less than 1.4 ft2 for each linear foot of its exterior perimeter.

The openings shall be distributed over 40 percent of the building perimeter or uniformly over two opposing sides. Interior wall lines and columns shall be at least 20 percent open with openings distributed to provide ventilation.

* + 1. Enclosed Parking Garage Specific Requirements

Enclosed vehicle parking garages and portions thereof that do not meet the definition of open parking garages shall be provided with a mechanical ventilation system in accordance with the Florida Mechanical Building Code per FBC Section 406.6.2. It shall also be equipped with an automatic sprinkler system per FBC Section 406.6.3.

* + 1. Exterior Wall Ratings and Allowable Openings (FBC Table 602 & Table 705.8)

The fire separation distance (FSD) is the distance measured from the building face to the closest interior lot line; centerline of a street, an alley or public way; or to an imaginary line between two buildings on the lot. The distance shall be measured at right angles from the face of the wall. If several buildings are located on the same lot, then an imaginary line shall be provided between the buildings to establish the fire separation distance.

Table 3, below, illustrates the exterior wall ratings and allowable openings based on the FSD and occupancy for all constructions types.

Table 3: Exterior Wall1,2 Ratings and Allowable Openings

|  |  |  |  |
| --- | --- | --- | --- |
| **Fire Separation Distance = X (feet)** | **Allowable Opening Area** | **Fire-Resistance Rating (Group F-1, M, S-1)** | **Fire-Resistance Rating (Group A, B, E, F-2, I, R, S-2, U)** |
| 0 < X < 3 | Not Permitted | 2 | 1 |
| 3 ≤ X < 5 | 15% | 2 | 1 |
| 5 ≤ X < 10 | 25% | 2(IA), 1(All others) | 1 |
| 10 ≤ X < 15 | 45% | 0 (IIB, VB), 1 (All others) | 0 (IIB, VB), 1 (All others) |
| 15 ≤ X < 20 | 75% | 0 (IIB, VB), 1 (All others) | 0 (IIB, VB), 1 (All others) |
| X≥20 | No Limit | 0 | 0 |

1Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

2Nonbearing.

Table 4: North Exterior Wall Ratings & Openings Limitations

|  |  |
| --- | --- |
| Requirement | Allowed/Required  North Exterior Wall |
| Construction Classification | BUILDTYPE |
| Fire Separation Distance | NFSD |
| Exterior Wall Fire Resistance Rating  (Table 602) | NFSDRating |
| Exterior Wall Opening Protection  (FBC Table 705.8) | NFSDOpening |

Figure 2: North Wall Separation

Table 5: South Exterior Wall Ratings & Opening Limitations

|  |  |
| --- | --- |
| Requirement | Allowed/Required  South Exterior Wall |
| Construction Classification | BUILDTYPE |
| Fire Separation Distance | SFSD |
| Exterior Wall Fire Resistance Rating  (Table 602) | SFSDRating |
| Exterior Wall Opening Protection  (FBC Table 705.8) | SFSDOpening |

\*Open parking garages complying with FBC §406.5 shall not be required to have a fire-resistance rating.

Figure 3: South Wall Separation

Table 6: East Exterior Wall Ratings & Opening Limitations

|  |  |
| --- | --- |
| Requirement | Allowed/Required  East Exterior Wall |
| Construction Classification | BUILDTYPE |
| Fire Separation Distance | EFSD |
| Exterior Wall Fire Resistance Rating  (Table 602) | EFSDRating |
| Exterior Wall Opening Protection  (FBC Table 705.8) | EFSDOpening |

Figure 4: East Wall Separation

Table 7: West Exterior Wall Ratings & Opening Limitations

|  |  |
| --- | --- |
| Requirement | Allowed/Required  West Exterior Wall |
| Construction Classification | BUILDTYPE |
| Fire Separation Distance | WFSD |
| Exterior Wall Fire Resistance Rating  (Table 602) | WFSDRating |
| Exterior Wall Opening Protection  (FBC Table 705.8) | WFSDOpening |

Figure 5: West Wall Separation

* 1. Fire Separation Requirements

The following table indicates the spaces within the PNAME project where fire resistance rated separations should be provided. This includes incidental accessory occupancies.

Table 8: Required Fire-Resistance Rated Spaces

| Spaces | Required Rating1 | Reference |
| --- | --- | --- |
| Information technology  equipment - Critical | 1-hour *fire barrier* | NFPA 75 §5.1.3 |
| Fire Alarm equipment | 2-hour *fire barrier* | NFPA 72 Chapter 12 |
| Electrical Rooms with dry-type Transformers > 112.5 kVa | 2-hour *fire barrier (\*)* | NFPA 70 §450.21 |
| Transformer Vaults (oil-insulated) | 3-hour *fire barrier* | NFPA 70 §450.42 |
| Mechanical Shafts | 2-hour fire/smoke *barrier* | FBC §713, FFPC §8.6.5 |
| Stair Shafts2,4 | 2-hour fire/smoke *barriers* | FBC §713.4, FFPC §7.1.3.2.1 |
| Interior Residential Corridors | ½-hour *fire barrier* | FBC T-1020.1  FFPC §28.3.6, 30.3.6 |
| Fire Service Access Elevator/Occupant Evacuation Elevator Lobby | 1-hour *fire barrier* | FBC §3007 and §3008 |
| Elevator Lobby (other than above) | 1-hour *smoke partition* | FBC §3006.3 |
| Dwelling Unit Separations | 1-hour *fire barrier* | FBC §420, FFPC §28.3.7.2, 30.3.7.2 |
| Soiled Linen Rooms, Storage Rooms > 100 sq.ft. | 1-hour *fire barrier* | FFPC T-32.3.3.2.2 |
| Storage Rooms  50 sq.ft < A < 100 sq.ft. | 1-hour *smoke partition* | FFPC T-32.3.3.2.2 |
| Boiler and fuel-fired heater rooms more than a single guestroom or guest suite | 1-hour *fire barrier* | FFPC T-28.3.2.2.2, T-30.3.2.1.1 |
| Fire Command Center | 1-hour *fire barrier(\*)* | FBC §911.1.2 |
| Maintenance Shops | 1-hour *fire barrier* | FFPC T-28.3.2.2.2 T-30.3.2.1.1 |
| Trash Collection Rooms | 1-hour *fire barrier* | FBC T-509, FFPC T-28.3.2.2.2 T-30.3.2.1.1 |
| Emergency Switchgear Room | 2-hour *fire barrier* | NFPA 110 §7.2.1.1 |
| Battery Storage Rooms | 1-hour *fire barrier* | FBC T-509 |
| Fire Pump Room | 2-hour *fire barrier* | FBC §913.2, NFPA 20 §4.12.1 |
| Elevator Machine Rooms and Shafts (*connecting 4 stories or more*) 2,4 | 2-hour *fire barrier* | FBC §713 |
| Generator rooms (*inside bldgs*.)3 | 2-hour *fire barrier* | FBC §403, NFPA 110 §7.2.1.1 |
| Laundry rooms > 100 sq.ft. outside dwelling units | 1-hour *fire barrier* | FBC T-509, FFPC T-28.3.2.2.2 T-30.3.2.1.1 |
| Parking Garage | 2-hour *fire barrier* | NFPA 88A §5.2.1 |

Note 1: Fire Barriers are rated walls that are continuous from floor slab to slab above. Fire partitions are rated walls that are continuous from floor to underside of the rated floor/ceiling assembly.

Note 2: All smoke control equipment (e.g., fans, VFDs, etc.) associated with stair and elevator pressurization is required to be enclosed in dedicated two (2) hour fire rated enclosures.

Note 3: Per NFPA 110, Section 7.11.4 Generators outside or on roof need lightning protection designed and installed in accordance with NFPA 780, Standard for the Installation of Lightning Protection Systems.

Note 4: In accordance with FBC 713.4, the shaft enclosure rating must not be less than the floor rating for the construction type.

(\*) Code requires 1-hour, however 2-hours recommended by SLS to meet survivability requirements for cabling/equipment associated with FA or BDA systems.

For Assembly occupancies, FFPC, NFPA 101 Section 12.3.2 and Hotel occupancies, FFPC, NFPA 101 Section 28.3.2 states that rooms containing high-pressure boilers, large transformers, or other service equipment subject to explosion shall not be located directly under or abutting required exits.

FFPC, NFPA 101 Section 6.1.14 requires walls separating incidental uses to be smoke resistant whenever FBC Section 509 allows sprinkler protection instead of fire barriers.

Hotel units must be separated from adjacent hotel units by ½-hr fire barriers in accordance with FFPC, NFPA 101 Section 28.3.7. The hotel unit separation in FBC Section 708 is 1-hour fire partition.

Dwelling units must be separated from adjacent dwelling units by ½-hr fire barriers in accordance with FFPC, NFPA 101 Section 30.3.7. The dwelling unit separation in Section FBC Section 708 is 1-hour fire partition.

* + 1. Fire Separation Marking

Each new fire wall, fire barrier, fire partition, smoke barrier, smoke partition, or any other new wall required to have protected openings shall be permanently identified with signs or stenciling above any decorative ceiling and in concealed spaces with the wording, “FIRE AND/OR SMOKE BARRIER – PROTECT ALL OPENINGS”. Such signs or stenciling shall be in 3-inch-high letters, 3/8-inch stroke in a contrasting color and be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet measured horizontally along the wall or partition. This requirement is mandated by both FFPC, NFPA 101 Section 8.2.2.5 and FBC Section 703.7.

* + 1. Fire Barriers

Fire barriers shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab, or deck above and be securely attached. Shafts, interior exit stairways, and ramps that do not extend to the underside of the roof sheathing, deck or slab of the building shall be permitted to be enclosed at the top with construction of the same fire-resistance rating as the topmost floor penetrated by the shaft, but not less than the fire-resistance rating required for the shaft enclosure.

In accordance with FBC Section 707.5.1, the supporting construction for a fire barrier shall be rated at least as much as the fire barrier it is supporting.

In accordance with FBC Section 707.6, openings in a fire barrier shall be protected in accordance with FBC Section 716 and FFPC, NFPA 101 Section 8.3. Openings shall be limited to a maximum aggregate width of 25% of the length of the wall, and the maximum area of any single opening shall not exceed 156 sq.ft.

* Single opening limit of 156 sq.ft. does not apply, where adjoining floors are protected by an automatic sprinkler system.
* Single opening limit of 156 sq.ft. does not apply, where the opening protective is a fire door serving exit stairs, exit ramps, exit access stairs, or exit access ramps.
* Single opening limit of 156 sq.ft. does not apply, where the opening protective has been tested in accordance with ASTM E 119 or UL 263. The fire resistance rating of the opening must be equal to or more than the fire resistance rating of the wall.
* The 25% limit of the fire barrier does not apply, where the opening protective is a fire door serving exit stairs, exit ramps, exit access stairs, or exit access ramps.
* The 25% limit of the fire barrier does not apply, where the opening protective has been tested in accordance with ASTM E 119 or UL 263.
  + 1. Fire Partitions

Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above, or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above and must be securely attached.

* + 1. Horizontal Assemblies

In accordance with FBC Section 711.2.4, horizontal assemblies and supporting structures require 1-hour fire-resistance rating as the building is Type BUILDTYPE construction. The roof construction and supporting assemblies are required to be 1-hour fire-resistance rated.

In accordance with FBC Section 711.2.4.3, horizontal assemblies serving as dwelling or sleeping unit separations in accordance with Section 420.3 shall be not less than 1-hour fire-resistance-rated construction. This rating is permitted to be reduced to ½-hour in fully sprinklered buildings of Type IIB, IIIB, and VB construction.

* + 1. Smoke Barriers

Smoke barrier construction is required to form an effective membrane continuous from the top of the foundation of floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as above suspended ceiling. The supporting construction is required to be protected to afford the required fire-resistance-rating of the wall supported.

Every story shall be divided into not less than two smoke compartments (FBC §420.4, FFPC, NFPA 101 FBC §32.3.3.7). Each smoke compartment shall have an area not exceeding 22,500 square feet and the maximum travel distance from any point to reach a door in the smoke barrier shall not exceed 200 feet.

Smoke barriers shall be constructed in accordance with FFPC, NFPA 101 §8.5 and shall have a minimum 1-hour fire resistance rating (FFPC, NFPA 101 §32.3.3.7.8). Smoke barrier doors shall be at least 1 ¼ in. thick, solid-bonded wood-core doors, or shall be fire rated for at least 20 minutes (FFPC, NFPA 101 §32.3.3.7.13). At least 15 net square feet per resident shall be provided within the aggregate area of corridors, lounge or dining areas, and other low hazard areas on each side of the smoke barrier (FBC §420.4.1, FFPC, NFPA 101 §32.3.3.7.11), and not less than 6 net square feet for other occupants.

* + 1. Smoke Partitions

Smoke partitions are required to extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke.

* + 1. Opening Protection

All openings and penetrations on fire/smoke rated walls described above must be protected in accordance with FBC, Chapter 7, *Fire and Smoke Protection Features*, FFPC, NFPA 1, Chapter 12, *Features of Fire Protection*, and FFPC, NFPA 101 Chapter 8, *Features of Fire Protection*.

* + 1. Penetrations

The following sections of this report are applicable to penetrations through fire barriers, fire partitions, and horizontal assemblies.

* + - 1. Through Penetrations

Penetrations shall be installed as tested in an approved fire-resistance-rated assembly, or in an approved penetration firestop system tested in accordance with ASTME 814 or UL 1479. Where the penetrating items are steel, ferrous, or copper pipes, tubes or conduits, the annular space between the penetrating item and the fire-resistance-rated wall is permitted to be protected via the following two scenarios:

* Holes with a maximum 6 in. diameter and 144 in² area are permitted to be protected with grout or mortar.
* The material used to protect the opening must pass ASTM E 119 or UL 263 test conditions.
  + - 1. Membrane Penetrations in Fire-Resistance-Rated Walls

Membrane penetrations must comply with FBC Section 714.4.2 where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

* + - 1. Horizontal Assemblies

Penetrations of a fire-resistance-rated floor, ceiling assembly, or ceiling membrane must comply with FBC Sections 714.5.1.1 through 714.5.1.3.

Though penetrations must be installed as tested in the approved fire-resistance-rated assembly, or they must be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E814 or UL 1479 with an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Membrane penetrations must comply with FBC Section 714.5.1.1 or 714.5.2.

Penetrations of non-fire-resistance-rated floor or floor/ceiling assemblies or the ceiling membrane of a non-fire-resistance-rated roof/ceiling assembly shall meet the requirements of FBC Section 713 or shall comply with FBC Section 714.6.1 or 7.14.6.2.

* Noncombustible penetrating items, connecting not more than five stories are permitted, provided that the annular space is filled to resist the free passage of flame and the products of combustion with an approved noncombustible material or with a fill, void or cavity material that is tested and classified for use in through-penetration firestop systems.
* Penetrating items that connect not more than two stories are permitted, provided that the annular space is filled with an approved material to resist the free passage of flame and the products of combustion.
  1. Vertical Opening Code Compliance Approach

Vertical openings within the PNAME project must be protected by fire-resistance rated construction in accordance with FBC Section 712 and FFPC, NFPA 101 Section 8.6 or classified accordingly.

* + 1. Shafts

Shaft enclosures in the project must be designed in compliance with Section 713 of the FBC. The shaft enclosures shall have a fire resistance rating of not less than 2 hours and not less than the floor assembly penetrated but need not exceed 2 hours. The construction shall be as fire barriers in accordance with Section 707 of the FBC.

* + 1. Elevators

Per FBC Section 3006.2, elevator hoistway door openings must be protected where the elevator hoistway connects more than three stories, is required to be located in a shaft enclosure, and any of the following conditions apply:

The building is not provided with a sprinkler system

The building contains an I-1, Condition 2 occupancy, or an I-2 or I-3 occupancy

The building is a high-rise and the elevator hoistway is more than 75 feet in height. The height of the hoistway must be measured from the lowest floor to the highest floor of the floors served by the hoistway.

Exceptions:

1. Protection of elevator hoistway door openings is not required where the elevator serves only open parking garages in accordance with FBC 406.5
2. Protection of elevator hoistway door openings is not required at the level of exit discharge, provided with level of exit discharge is equipped with an automatic sprinkler system
3. Enclosed elevator lobbies and protection of elevator hoistway door openings are not required on levels where the elevator hoistway opens to the exterior

Hoistway openings protection must be provided using one of the four options listed in FBC Section 3006.3, as listed below:

1. An enclosed elevator lobby at each required floor to separate the hoistway doors from the floor by fire partitions in accordance with FBC Section 708 where the building is not equipped throughout with a sprinkler system. Doors protecting the openings in the fire partitions shall comply with FBC Sections 716.5.3 as required for corridor walls. Penetrations of the elevator lobby by ducts and air transfer openings shall be protected as required for corridors by FBC Section 717.5.4.1.
2. An enclosed elevator lobby at each required floor to separate the hoistway doors from the floor by smoke partitions in accordance with FBC Section 710 where the building is equipped throughout with a sprinkler system. Doors protecting the openings in the smoke partitions shall comply with FBC Sections 710.5.2.2, 710.5.2.3, and 716.5.9. Penetrations of the elevator lobby by ducts and air transfer openings shall be protected as required for corridors by FBC Section 717.5.4.1.
3. Additional doors provided at each elevator hoistway door. These doors shall comply with the smoke and draft control assembly requirements in accordance with FBC Section 716.5.3.1 when tested in accordance with UL 1784.
4. The elevator hoistway shall be pressurized in accordance with FBC [Section 909.21](https://up.codes/viewer/florida/fl-building-code-2017/chapter/9/fire-protection-systems#909.21).

**NOTE:** The Terminal Building is less than four (4) stories, therefore, the lobbies are not required. However, elevators used as part of the accessible means of egress may still require the lobby as indicated in the Accessibility Section of this report.

**NOTE:** The parking garage is more than four stories, but there is an exception for open parking garage as indicated in Exception 1 of Section 3006.2. However, elevators used as part of the accessible means of egress may still require the lobby as indicated in the Accessibility Section of this report.

**NOTE:** Refer to the Major Life Safety Accessibility Requirements Overview Section of this report for additional for additional requirements for elevators used as an accessible means of egress.

* + 1. Escalators

There are five (5) escalator groups creating vertical openings in the building. These openings must be protected in accordance with FBC Section 712 and FFPC, NFPA 101 Section 8.6.9.7.

Per FBC Section 712.1.3.1, the escalators shall be protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13 where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the escalator. This is limited to openings that do not connect more than four stories in a Group A building. In other than Groups B and M, this application is limited to openings that do not connect more than four stories. The sprinkler protection around the vertical opening must comply with NFPA 13 Section 8.15.4. Draft stops (18-inch deep) shall be located immediately adjacent to the opening made of noncombustible material that will stay in place before and during sprinkler operation. In addition, sprinkler heads are spaced 6 feet apart and placed 6-12 inches from drafts top on side away from opening.

Another option is to protect the vertical opening by approved shutters at every penetrated floor shall be permitted. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with FBC Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from (FBC Section 712.1.3.2).

* + 1. Stairs

For buildings that are more than 420 ft. in height or that of Risk Category III or IV, the construction of the stair and elevator hoistway enclosures shall comply with FBC Sections 403.2.3.1 through 403.2.3.4.

* + 1. Trash/Linen Chutes

Trash/Linen Chutes must be installed in a 2-hour fire rated enclosure in accordance with FBC Section 713.13, FFPC, NFPA 101 Section 9.5, and NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment.*

* + 1. Occupancy-Specific Vertical Opening Requirements

Per FFPC, NFPA 101 §12.3.1(3), assembly occupancies protected by an approved, supervised automatic sprinkler system in accordance with §9.7 shall be permitted to have unprotected vertical openings between two adjacent floors, provided that such openings are separated from unprotected vertical openings serving other floors by a barrier complying with §8.6.5.

Any double-height spaces (other than within dwelling units) shall be protected/separated from other floors by rated construction to match the required level of protection of the floor construction.

* + 1. Atria

The atrium must comply with FBC Section 404 and FFPC, NFPA 101 Section 8.6.7. The FDPT Fire Department may consider a double-height ceiling as an atrium.

* The atrium requirements in FFPC and FBC are as follows:
* The atrium must be separated from the adjacent spaces by fire barriers with not less than a 1-hour fire resistance rating. Any number of levels shall be permitted to open directly to the atrium without enclosure based on a smoke control engineering analysis.
* Glass walls and inoperable windows shall be permitted in lieu of the fire barriers where all the following are met:
  + Automatic sprinklers are spaced on both sides of the glass wall at 6-ft. intervals.
  + The sprinklers are located between 4 inches to 12 inches away from the glass.
  + The glass wall is of tempered, wired, or laminated glass held in place by a gasket framing system to deflect without breaking the glass before sprinklers operate.
  + The sprinkler heads are not required on the atrium side of the glass wall where there is no walkway or other floor area on the atrium side above main floor level.
  + Doors in the glass walls are of glass or other material that resists the passage of smoke.
  + Doors in the glass walls are self-closing or automatic-closing upon detection of smoke.
  + The glass is continuous vertically, without horizontal mullions, window treatments, or other obstructions that would interfere with the wetting of the entire glass surface.
* Access to exits is permitted to be within the atrium. Exit discharge is permitted to be within the atrium.
* The occupancy within the atrium meets the specification for classification as low or ordinary hazard contents.
* The entire building is protected by approved, supervised automatic sprinkler system.
* An engineering analysis is performed that demonstrates that the building is designed to keep the smoke layer 6 ft. above the highest floor level of exit access open to the atrium for a period of 20 minutes or 1.5 times the calculated egress time, whichever is greater.
* The smoke control system described above is activated by sprinkler system and manual controls accessible to the fire department.
* Smoke control system is required and shall be connected to standby power
* The interior finish of walls and ceiling of the atrium shall not be less than Class B with no reduction in class for sprinkler protection (FBC).
* In floors above the lowest level, the portion of exit access travel distance within the atrium space shall be not greater than 200 feet (FBC).
  + 1. Convenience Openings

If vertical openings are designed as “*convenience openings”*, they shall bein accordance with all criteria in FBC Section 712.1.9 and FFPC, NFPA 101 Section 8.6.9.1.

Table 9: FBC and FFPC Convenience Opening Requirements

| FBC - Section 712.1.9  Summary of Requirements/Analysis | FFPC - Section 8.6.9.1  Summary of Requirements/Analysis |
| --- | --- |
| (1) Does not connect more than two (2) stories. | (1) Such openings shall connect not more than two adjacent stories (one floor pierced only). |
| (2) Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments. | (2) Such openings shall be separated from unprotected vertical openings serving other floors by a barrier complying with 8.6.5. |
| (3) Is not concealed within the construction of a wall or a floor/ceiling assembly. | (3) Such openings shall be separated from corridors. |
| (4) Is not open to a corridor in Group I and R occupancies. | (4) Such openings shall be separated from other fire or smoke compartments on the same floor. |
| (5) Is not open to a corridor on non-sprinklered floors | (5) Convenience opening shall be separated from the corridor referenced in 8.6.9.1(3) by a *smoke partition*, unless Chapters 11 through 43 require the corridor to have a fire resistance rating. |
| (6) Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures. | (6) Such opening shall not serve as a required means of egress. |

* + 1. Exit Access Stairway Enclosures

Exit access stairways and ramps serving as an exit access component in a means of egress system shall comply with the requirements of this section. The number of stories connected by exit access stairways and ramps shall include basements, but not mezzanines. (FBC Section 1019.1)

According to FBC Section 1019.1, in other than Group I-2 and I-3 occupancies  floor openings containing exit access stairways or ramps that do not comply with one of the conditions listed in this section shall be enclosed with a shaft enclosure constructed in accordance with FBC Section 713.

Exit access stairways and ramps that serve or atmospherically communicate between only two stories. Such interconnected stories shall not be open to other stories.

In Group R-1, R-2 or R-3 occupancies, exit access stairways and ramps connecting four stories or less serving and contained within an individual dwelling unit or sleeping unit or live/work unit.

Exit access stairways and ramps in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or ramp and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.

Exit access stairways and ramps in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or ramp and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.

Exit access stairways and ramps within an atrium complying with the provisions of Section 404.

Exit access stairways and ramps in open parking garages that serve only the parking garage.

Exit access stairways and ramps serving open-air seating complying with the exit access travel distance requirements of Section 1029.7.

Exit access stairways and ramps serving the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums, and sports facilities.

According to FBC Section 1019.4, in Group I-2 and I-3 occupancies, floor openings between stories containing exit access stairways or ramps are required to be enclosed with a shaft enclosure constructed in accordance with Section 713. An exception states that in Group I-3 occupancies, exit access stairways or ramps constructed in accordance with Section 408 are not required to be enclosed.

* + 1. Communicating Space

Unenclosed floor openings forming a communicating space between floor levels must comply with FFPC, NFPA 101 Section 8.6.6. The following requirements must be met for a communicating space:

1. The communicating space does not connect more than three contiguous stories.
2. The lowest or next-to-lowest story within the communicating space is a street floor.
3. Entire floor area of the communicating space is open and unobstructed, such that a fire in any part of the space will be readily obvious to the occupants of the space prior to the time it becomes an occupant hazard.
4. The communicating space is separated from the remainder of the building by fire barriers with not less than 1-hour fire resistance rating, unless one of the following is met:
   1. In buildings protected throughout by an approved automatic sprinkler system in accordance with FFPC, NPFA Section 9.7, a smoke barrier in accordance with FFPC, NFPA Section 8.5 shall be permitted to serve as the separation required by requirement above, v.4.
   2. The requirement of v.4 shall not apply to fully sprinklered residential housing units of detention and correctional occupancies in accordance with 22.3.1 (2) and 23.3.1.1(2).
5. The communicating space has ordinary hazard contents protected throughout by an approved automatic sprinkler system in accordance with Section 9.7 or has only low hazard contents.
6. Egress capacity is sufficient to allow all the occupants of all levels to simultaneously egress the communicating space by considering it as a single floor area in determining the required egress capacity.
7. Each occupant within the communicating space has access to not less than one exit without having to traverse another story with the communicating space.
8. Each occupant not in the communicating space has access to not less than one exit without having to traverse another story with the communicating space.
   * 1. Two-Story Openings with Partial Enclosure

Vertical openings in the project serving as other than an exit enclosure, connecting only two adjacent stories and piercing only one floor must be designed in compliance with FFPC, NFPA Section 8.6.8.

* 1. Interior Finish Requirements

Interior finishes within the PNAME project are designed to comply with the requirements of the FBC and the FFPC. The major interior finish requirements for the project are summarized in the table below (FBC T-803.11 and FFPC, NFPA 101 T-A10.2.2). The sprinkler system reduction allowed by code has been applied.

Table 10: Interior Finish Requirements

| Occupancy Classifications | Floor Finish Requirement | Interior Wall and Ceiling Finish Requirements (FBC and FFPC) |
| --- | --- | --- |
| Assembly (A) | Exits: **Class II**  Corridors: **Class II**  Spaces not separated from corridor: **Class II** | Exit Enclosure: **Class B**  Corridors & Exit access stairs: **Class B**  Rooms & Enclosed Spaces: **Class C**  Lobbies: **Class B**  Assembly Rooms: **Class C**  Screens: **Class B**  **See Note 1** |
| *Business (B)* | Exits: **Class I or II** | Exit Enclosure: **Class B**  Corridors & Exit access stairs: **Class C**  Rooms & Enclosed Spaces: **Class C**  Other Spaces: **Class C**  **See Note 2** |
| *Institutional*  *(I-1)* | Exit: **Class II**  Corridors: **Class II**  Spaces not separated from corridor: **Class II** | * Exit Enclosure: **Class B** * Corridors & Exit access stairs: **Class C** * Rooms & Enclosed Spaces: **Class C** * Lobbies: **Class C** * Other Spaces: **Class C**   **See Note 1** |
| *Detention and Correctional*  *(I-3)* | Exit: **Class I**  Corridors: **Class I**  Spaces not separated from corridor: **Class I** | Exit Enclosure: **Class A**  Corridors & Exit access stairs: **Class A**  Rooms & Enclosed Spaces: **Class C**  Other Spaces: **Class C**  **See Note 2** |
| *Apartments*  *(R-2)* | Exit: **Class II**  Corridors: **Class II**  Spaces not separated from corridor: **Class II** | Exit Enclosure: **Class B**  Corridors & Exit access stairs: **Class C**  Rooms & Enclosed Spaces: **Class C**  Lobbies: **Class C**  Other Spaces: **Class C**  **See Note 2** |
| *Hotel (R-1)* | Exit: **Class II**  Corridors: **Class II**  Spaces not separated from corridor: **Class II** | Exit Enclosure: **Class B**  Corridors & Exit access stairs: **Class C**  Rooms & Enclosed Spaces: **Class C**  Lobbies: **Class C**  Other Spaces: **Class C** |
| *Mercantile (M)* | Exit: **Class I or II** | Exit Enclosure: **Class B**  Corridors & Exit access stairs: **Class C**  Rooms & Enclosed Spaces: **Class C**  Other spaces: **Class C** |
| *Storage (S)* | Exit: **Class II** | Exit Enclosure: **Class C**  Corridors & Exit access stairs: **Class C**  Rooms & Enclosed Spaces: **Class C**  Other Spaces: **Class C** |

**Note 1**: The ratings shown are from FBC, which has the most stringent requirements

**Note 2**: The ratings shown are from FFPC, which has the most stringent requirements

* All combustible materials used as interior wall, ceiling, and floor finishes must have proper documentation indicating that the finishes comply with the requirements above.
* It is recommended that the design for unique or custom interior finishes (e.g., wood finishes, textile wall coverings, foam finishes, material applied to fire doors, etc.) within the project be identified early in the design/construction process. Interior finishes consisting of unique materials or assembly of different materials will have to be tested by a nationally recognized laboratory.
* Interior wall and ceiling trim and incidental finishes must be identified by the project team and must be included for assessment. Interior floor trim material used as wall base or decorative border would also be included and tested as a wall finish or floor finish.
* Interior wall and ceiling finishes are normally tested as a single layer on noncombustible substrate. If the material is installed in any other manner, then the assembly of all materials must be tested in accordance with the standards above.
* Wood interior finish (e.g., millwork, wood lockers, etc.) must be tested as an assembly of all the components exactly how it will be installed including the adhesives, lacquers, glazings, etc.
* It is noted that normally the authority having jurisdiction will not accept the application of a flame-retardant treatment or coating to achieve the proper rating for new interior finishes.
* Depending on the occupancy classification, the furnishings in common areas, such as upholstered furniture, must also be evaluated before the furniture is installed in the facility.
* The fire department may require a Third (3rd) Party Evaluation of the interior finishes to ascertain compliance with above rating.
  1. Mezzanine Requirements

Mezzanines within the PNAME project are designed to comply with the requirements of the FBC and the FFPC. Currently there is a mezzanine located on \_\_\_\_\_\_. A mezzanine or mezzanines must comply with FBC Section 505.2.  and shall be considered a portion of the story below. Such mezzanines shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the mezzanine shall be included in determining the fire area. The clear height above and below the mezzanine floor construction shall be not less than 7 feet.

The aggregate area of a mezzanine or mezzanines within a room shall be not greater than one-third of the floor area of that room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the mezzanine is located. In determining the allowable mezzanine area, the area of the mezzanine shall not be included in the floor area of the room. (FBC Section 505.2.1).

The floor area of a mezzanine, or the aggregate floor area of multiple mezzanines, shall not exceed one-half of the floor area of the room or story in which the mezzanines are located; otherwise, such mezzanine or aggregated mezzanines shall be treated as floors (FFPC, NFPA 101 Section 37.1.2.2.3)

The means of egress for mezzanines shall comply with FBC Section 505.2.2 and FFPC, NFPA 101 Section 12.2.4.5.

* 1. Stage and Platform Requirements

Currently, there is a stage/platform area located on the Ground Floor. Stages and platforms must comply with FBC Section 410.3 and 410.4 and FFPC, NFPA 101 Section 12.4.6. It is assumed the stage area will be less than 1,000 square feet.

Where the stage height is greater than 50 feet, all portions of the stage shall be separated from the seating area by a proscenium wall with not less than a 2-hour fire-resistance rating extending continuously from the foundation to the roof (FBC 410.3.4).

Emergency ventilation shall be provided for stages larger than 1,000 square feet in floor area, or with a stage height greater than 50 feet. Such ventilation shall comply with Section 410.3.7.1 or 410.3.7.2 (FBC 410.3.7).

Permanent platforms shall be constructed of materials as required for the type of construction of the building in which the permanent platform is located. Permanent platforms are permitted to be constructed of fire-retardant-treated wood for Types I and II construction where the platforms are not more than 30 inches above the main floor, and not more than one-third of the room floor area, and not more than 3,000 square feet in area. Where the space beneath the permanent platform is used for storage or any purpose other than equipment, wiring or plumbing, the floor assembly shall be not less than 1-hour fire-resistance-rated construction. Where the space beneath the permanent platform is used only for equipment, wiring or plumbing, the underside of the permanent platform need not be protected (FBC Section 410.4).

Combustible materials used in sets and scenery shall meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701, in accordance with FFPC Section 806. Foam plastics and materials containing foam plastics shall comply with FBC Section 2603 (FBC Section 410.3.6).

The stage shall be separated from dressing rooms, scene docks, property rooms, workshops, storerooms, and compartments appurtenant to the stage and other parts of the building by fire barriers constructed in accordance with FBC Section 707 or Section 711, or both. The fire-resistance rating shall be not less than 1 hour for stage heights of 50 feet or less (FBC Section 410.5.1).

For technical production areas, the exit access travel distance shall be not greater than 400 feet for buildings equipped throughout with an automatic sprinkler system. Where two means of egress are required, the common path of travel shall be not greater than 100 feet (FBC Section 410.6.3) and the egress width shall be not less than 22 inches (FBC Section 410.6.3.5).

Exit access stairways and ramps serving a stage or platform are not required to be enclosed. Exit access stairways and ramps serving technical production areas are not required to be enclosed (FBC Section 410.6.2).

Stages shall be equipped with an automatic sprinkler system in accordance with FBC Section 903.3.1.1. Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops, and storerooms accessory to such stages.

Sprinklers are not required under stage areas less than 4 feet in clear height that are utilized exclusively for storage of tables and chairs, provided the concealed space is separated from the adjacent spaces by Type X gypsum board not less than 5/8-inch in thickness.

Sprinklers are not required for stages 1,000 square feet or less in area and 50 feet or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs, and a single backdrop (FBC Section 410.7).

* 1. General Means of Egress Requirements
     1. Maximum Allowable Travel Distances:

As a building protected throughout by automatic sprinklers, the following maximum allowable travel distances are applicable to the PNAME project as required by FBC T-1006.2.1, Section 1020.4, T-1017.2 , and FFPC, NFPA 101 T-A.7.6.

Table 11: Travel Distance Requirements

| Occupancy Group Classifications (FBC) | Occupancy Classifications (FFPC) | Distances |
| --- | --- | --- |
| Use Group A,  *Assembly* occupancies | *Assembly* | **Max Travel Distance:** 250 feet  **Max Dead End Distance**: 20 feet  **Max Common Path Distance**: 20/75 feet1 |
| Use Group B,  *Business* occupancies | *Business* | **Max Travel Distance**: 300 feet  **Max Dead End Distance:** 50 feet  **Max Common Path Distance:** 100 feet |
| Use Group I-1,  Institutionaloccupancies | *Residential Board and Care* | * **Max Travel Distance:** 250 feet * **Max Dead End Distance:** 30 feet (FFPC) * **Max Common Path Distance:** 75 feet |
| Use Group I-3, *Detention and Correctional* occupancies | *Detention and Correctional* | **Max Travel Distance:**   * To an Exit: 200 feet (FBC) * To exit Access: 150 feet (FFPC) * Within sleeping unit: 50 feet (FFPC)   **Max Dead End Distance:** 50 feet  **Max Common Path Distance**: 100 feet |
| Use Group M *Mercantile* occupancies | *Mercantile* | **Max Travel Distance:** 250 feet  **Max Dead End Distance:** 50 feet  **Max Common Path Distance**: 75 feet (FBC) |
| Use Group R-1, *Residential* occupancies | *Hotel* | **Max Travel Distance:**   * Unit door to exit: 200 feet (FFPC) * Total travel from remote point inside unit to exit: 250 feet (FBC)   **Max Dead End Distance:** 50 feet  **Max Common Path Distance:** (FFPC)   * Common Path Within Unit: 125 feet * Common Path Outside Unit: 50 feet   **Max Common Path Distance:** (FBC)   * Common Path Including travel within Unit and corridor is 75 feet total |
| Use Group R-2, *Residential* occupancies | *Apartment* | **Max Travel Distance:**   * Unit door to exit: 200 feet (FFPC) * Total travel from remote point inside unit to exit: 250 feet (FBC)   **Max Dead End Distance:** 50 feet  **Max Common Path Distance**: (FFPC)   * Common Path In (Unit & Corridor): 125 feet * Common Path Outside Unit: 50 feet   **Max Common Path Distance:** (FBC)   * Common Path Including travel within Unit and corridor is 125 feet total |
| Use Group S-1, *Moderate Hazard Storage* occupancies | *Storage - Ordinary* | **Max Travel Distance**: 250 feet (FBC)  **Max Dead End Distance:** 50 feet (FBC)  **Max Common Path Distance:** 100 feet |
| Use Group S-2, *Low Hazard Storage* occupancies | *Storage - Low* | **Max Travel Distance**   * *Enclosed Parking:* 200 feet * *Open Parking:* 400 feet * *Storage:* 400 feet (FBC)   **Max Dead End Distance**   * *Enclosed Parking:* 50 feet * *Open Parking:* 50 feet * *Storage:* 50 feet (FBC)   **Max Common Path Distance**   * *Enclosed Parking:* 50 feet * *Open Parking:* 50 feet * *Storage:* 100 feet (FBC) |

1Assembly use spaces with an occupant load of 50 or more, shall have its common path of travel distance limited at 20-feet. If the occupant load is less than 50, then the common path of travel distance shall be limited at 75-feet.

* + 1. Number of Required Exits Per Floor

Each floor of the building is provided with the following minimum number of exits as required by FBC T-1006.3.1 and FFPC, NFPA 101 Section 7.4.1.2.

Describe the stairs serving floors, transfers, exit passageway

Table 12: Number of Exits Requirements

|  |  |
| --- | --- |
| Floor Occupant Load | Number of Exits Required |
| 0-500 occupants | 2 Exits |
| 501-1,000 occupants | 3 Exits |
| >1,000 occupants | 4 Exits |

* + 1. Unit Exit Access

For Hotel Group R-1 occupancies and Res B/C, the FFPC requires two exit access doors from the unit when the guest room or guest suite is over 2,000 sq.ft. The exit access doors must be located remotely from each other (FFPC, NFPA 101 Section 28.2.5.7). If limits shown in Table 12 are exceeded, then additional exits must be provided.

* + 1. Additional Exit Stair

For buildings greater than 420 ft. in building height, other than R-2 buildings, one additional stairway must be provided in addition to above exit stairs per FBC Section 403.5.2. There is an alternate provision to the additional stair, which states that an occupant evacuation elevator can be provided in lieu of the stair. The occupant evacuation elevator, separate from fire service access elevator, must comply with FBC Section 3008 and FFPC, NFPA 101 Section 7.14.

**NOTE:** If the building is divided into R-1 lower floors and R-2 upper floors where it exceeds 420 ft. in height, then the exception can be applied, and the extra stair is not required since the upper occupancy is R-2.

* + 1. Electrical Room Exit:

Electrical rooms with equipment rated 1200 Amps or more, and 6 feet wide that contain overcurrent devices, switching devices or control devices shall have two (2) exit access doors (one at each end of the working space). The doors must swing in the direction of egress and must be equipped with panic hardware or fire exit hardware.

Electrical rooms with equipment rated 800 Amps or more that contain overcurrent devices, switching devices or control devices, and the exit door is less than 25 feet from the working space, the door shall swing in the direction of egress and must be equipped with panic hardware or fire exit hardware (FBC Section 1010.1.10, FFPC, NFPA 101 Section 7.4.2, and NFPA 70, Article 110.26.(C)(2)).

Electrical rooms with equipment used in circuits over 600 volts with switchgear and control panels exceeding 6 feet in width shall have two (2) exit access doors (one at each end of the working space). The doors must swing in the direction of egress and must be equipped with panic hardware or fire exit hardware (FFPC, NFPA 101 Section 7.4.2 and NFPA 70, Article 110.33(A)).

* + 1. Boiler Rooms or Furnace Rooms:

Two (2) exits are required in boiler rooms where the area is over 500 sq.ft. and any fuel-fired equipment exceeds 400,000 Btu. The two exit doors must be remotely separated by a distance equal to one-half the diagonal dimension of the room (FBC Section 1006.2.2.1).

* + 1. Mechanical Equipment Rooms:

Mechanical equipment rooms including boiler rooms, furnace rooms, and similar spaces shall be arranged to limit common path of travel to a distance not exceeding 100 feet for building protected by sprinkler system. Stories used for mechanical equipment rooms (including the roof) shall be permitted to have a single means of egress where the travel distance to an exit on that story does not exceed the common path of travel (FFPC, NFPA 101 Section 7.13.2). If the room has only open equipment area and no rooms, then the travel distance is not regulated.

* + 1. Elevator Lobby Exit:

Each elevator lobby must have access to at least one door leading to an exit per FBC Section 3007.6.1 and FFPC, NFPA 101 Section 7.4.1.6. In addition, occupants cannot pass through an elevator lobby to reach both exits. The occupants of a single unit cannot pass through their private elevator lobby to reach the corridor. A way to avoid this is to pressurize elevator shaft and now there is no lobby. However, cannot avoid this with FSA lobby.

* + 1. Exit Access Remoteness Requirements:

Where two (2) exit doors or exit access doors are required to be provided, the exits must be designed in order to be remote from one another in accordance with FBC Section 1007.1.1 *Exception 2* and FFPC, NFPA 101 Section 7.5.1.3.3. The exits must be separated by more than one-third of the maximum diagonal distance of the floor, space, or area served.

For R-2 and R-1 occupancies, the distance between exits is not applicable to common nonlooped exit access corridors in a building that has corridor doors from the guestroom or guest suite or dwelling unit, which are arranged so that the exits are located in opposite directions from such doors (FBC Section 1007.1.1 Exception 3). The exit discharge must also meet the remoteness requirement.

* + 1. Physical Exit Separation Requirements:

In the high-rise buildings, the exit stairs within the project must be designed to be physically separated from one another by 30-feet or one-fourth of the maximum diagonal of the area served (whichever is less) in accordance with FBC Section 403.5.1. The distance is measured in a straight line between the nearest points of the stair enclosures.

* + 1. Exit Discharge Configurations:

All the exits must discharge to the outside in accordance with FBC Section 1028.1 and FFPC, NFPA 101 Section 7.7.1. The exit discharge must comply with remoteness requirements of one-third of the maximum diagonal distance of the building. However, the Codes allow for a maximum of 50% of the number and 50% of the capacity of exits to discharge through the interior of the building provided that the following criteria are met: Describe how exits discharge – inside outside and show path to the public way – site plan Check occupancy chapter for distance from stair door to outside door for hotel is 100 ft

* *Exterior Exit Visibility:* The exit enclosure discharges to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the exit enclosure in accordance with FBC Section 1028.1 *Exception 1.1* and FFPC, NFPA 101 Section 7.7.2.
* *Floor Separation:*The entire area of the level of exit discharge is separated from areas below by construction having a two (2) hour fire resistance rating (FBC Section1028.1 *Exception 1.2* and FFPC, NFPA 101 Section 7.7.2).
* *Sprinkler Protection:* The egress path is protected throughout by automatic sprinklers (FBC Section 1028.1 *Exception 1.3* and FFPC, NFPA 101 Section 7.7.2).

**NOTE:** The exit discharge for this building must comply with the remoteness requirement (1/3 diagonal of the building) all along the discharge. Exit discharge cannot be to vehicular driveways without dedicated walkway. Further review is required.

* + 1. Street Floor Requirements:

For Business (FFPC, NFPA 101 Section 38.2.3.3), Hotel (FFPC, NFPA 101 Section 28.2.3.2) and Res B/C,(check others), the code requires that street floor exits must accommodate the occupant load of street floor plus stair discharging onto street floor.

* + 1. Stair Re-Entry:

Interior exit stairway doors must be designed to allow re-entry into the building at each floor in accordance with FFPC, NFPA 101 Section 7.2.1.5.8. If the doors are normally locked to prevent access into the floors, then the doors must automatically unlock upon initiation of the fire alarm system in accordance with FFPC, NFPA 101 Section 7.2.1.5.8.

In a high-rise building, if the doors are locked from the stair side, then there must be a two-way communication system provided in the stairway on at least every 5th floor. The system must be connected to an approved constantly attended station. In addition, the doors must be capable of being unlocked simultaneously, but remain latched, upon signal from FCC (FBC Section 403.5.3).

* + 1. Door hardware requirements:

Door locking arrangements shall be permitted where clinical needs of residents require specialized security measures or where residents pose a security threat provided the staff can always readily unlock doors and the building is protected with an approved automatic sprinkler system (FFPC §32.3.2.2.2(6)). Doors in the means of egress permitted to be locked must have provisions for the rapid removal of occupants by means of remote-control locks from within the locked building, keying of all locks to keys always carried by staff, or other reliable means. Only one locking device shall always be permitted (FFPC §32.3.2.2.2 (7)(8)).

Panic hardware (*or fire exit hardware for fire doors*) must be installed in all doors serving rooms or spaces with an occupant load of 50 persons or more in a Group A or E occupancy per FBC Section 1010.1.10. The FFPC, Section 12.2.2.2.3, has a similar requirement for assembly occupancies where the occupancy load is 100 or more. Therefore, the FBC has the more stringent requirement and must be implemented. Panic hardware must be installed in electrical rooms as stated in other section of this report. Check occupancy chapter for special hardware

* + 1. Occupant Load Factors:

The following occupant load factors have been used to calculate the occupant load of the spaces within the PNAME project as required by FBC T-1004.5 and FFPC T-7.3.1.2.

Table 13: Occupant Load Factors

| Use of Space | Occupant Load Factors [ft²/occupant] |
| --- | --- |
| Assembly –Standing | 5 net |
| Assembly –Concentrated | 7 net |
| Assembly –Unconcentrated Tables & Chairs | 15 net |
| Commercial Kitchen | 100 gross (FFPC) |
| Detention and Correctional | 120 gross |
| Exercise Room/Gym | With Equipment – 50 gross  Without Equipment – 15 gross |
| Institutional Inpatient Treatment | 240 gross |
| Institutional Outpatient / Ambulatory | 100 gross (FBC), 150 gross (FFPC) |
| Institutional Sleeping | 120 gross |
| Locker Rooms | 50 gross |
| Library Reading Rooms | 50 net |
| Library Stacking | 100 gross |
| Mercantile | 60 gross (FBC)  300 gross (storage, stock, shipping area)  30 gross (grade floor)1,2 (FFPC)  60 gross (upper floors)2 (FFPC) |
| Mechanical Spaces | 300 gross (FBC) |
| Offices | 150 gross |
| Pool Decks / Pools | Pool Deck – 30 gross (FFPC)  Pool Deck – 15 gross (FBC)  Water Surface of Pool – 50 gross |
| Parking Garage | 200 gross (FBC) |
| Residential Board and Care (Sleeping) | 200 gross ft2 per occupant (FFPC)  120 gross ft2 per occupant (FBC) |
| Residential Lobby | 15 net |
| Residential Floors Apartment (R-2) /Hotel (R-1) | 200 gross3,4 |
| Stages and Platforms | 15 net |
| Storage Areas | 300 gross (FBC) |
| Warehouses | 500 gross |

1Occupant load in mercantile occupancies where, a difference in finished ground level of the streets on different sides with two or more floors are accessible from the streets, each floor is permitted to be a street floor. The occupant load factor is then 40 ft2 of gross per occupant.

2Mercantile occupancies with no street floor, but with direct access to the street with stairs or escalators, the floor with the point of entrance to the mercantile is considered the street floor.

3For private pool decks, use the occupant load factor 200 ft²/occupant, including water surface

4Include balcony square footage in hotel unit occupant load

* + 1. Spaces with One Means of Egress Requirements:

Spaces with one (1) means of egress within the PNAME project shall comply with the following means of egress requirements as required by FBC T-1006.2.1 and FFPC, NFPA 101 Section 7.4.1.1.

Table 14: One Means of Egress

| Occupancy | Maximum Occupant Load | Maximum Exit Access/Common Path of Travel Distance (feet) |
| --- | --- | --- |
| Assembly | 49 | 75 feet |
| Business | 49 | 100 feet |
| Mercantile | 49 | 75 feet |
| Storage and Mechanical | 29 | 100 feet |
| Residential  (Apartment R-2) | 49 | 125 feet |
| Residential  (Hotel R-1) | 10 | 75 feet |
| Institutional (I-1, I-2, I-4) | 10 | 75 feet |
| Institutional/Detention and Correctional (I-3) | 10 | 100 feet |

The number of *accessible means of egress* from a space shall equal the number required for the means of egress or two (*whichever is less*), in accordance with Section FFPC, NFPA 101 Section 7.5.4 and FBC-Accessibility Section 207.

* + 1. Means of Escape:

Secondary means of escape windows are not required in dwelling units [hotel units] when the building is protected by an automatic sprinkler system per FFPC, NFPA 101. Emergency escape/rescue windows are required by FBC Section 1030 for only for R-2 occupancies in buildings that have only one exit. The rescue windows are required even if the building is protected by an automatic sprinkler system.

* + 1. Egress Capacity Factors:

The egress capacity for the means of egress must be designed using the capacity factors indicated in the table below. In addition, the minimum width of the means of egress components must also be considered in the design. The minimum width is specified for each occupancy classification as stated in FBC Section 1005.3 and FFPC, NFPA 101 Section 7.3.3.

Table 15: Egress Capacity

|  |  |  |  |
| --- | --- | --- | --- |
| Occupancy | Egress Component | Egress Capacity Factor [inches/occupant] | |
| FFPC | FBC |
| Residential Board and Care | Stairways | 0.4 | 0.3 |
| Level Components | 0.2 | 0.2 |
| Healthcare, sprinklered | Stairways < 44 inches | 0.3 | 0.3 |
| Stairways > 44 inches | Refer to Note 1 | 0.3 |
| Level Components | 0.2 | 0.2 |
| Healthcare, non-sprinklered | Stairways | 0.6 | 0.3 |
| Level Components | 0.5 | 0.2 |
| High hazard contents | Stairways | 0.7 | 0.3 |
| Level Components | 0.4 | 0.2 |
| All others | Stairways < 44 inches | 0.3 | 0.3 |
| Stairways > 44 inches | Refer to Note 1 | 0.3 |
| Level Components | 0.2 | 0.2 |

1For stairways in the referenced occupancies that are wider than 44 in., the capacity is permitted to be increased using the following equation:

C =

Where:

C = capacity, in persons, rounded to the nearest integer

*Wn =* nominal width of the stair [inches]

If the building is provided with an automatic sprinkler system and emergency/voice communication system, the following table applies.

Table 16: Egress Capacity

|  |  |  |  |
| --- | --- | --- | --- |
| Occupancy | Egress Component | Egress Capacity Factor [inches/occupant] | |
| FFPC | FBC |
| Residential Board and Care | Stairways | 0.4 | 0.2 |
| Level Components | 0.2 | 0.15 |
| Healthcare, sprinklered | Stairways < 44 inches | 0.3 | 0.3 |
| Stairways > 44 inches | Refer to Note 1 | 0.3 |
| Level Components | 0.2 | 0.2 |
| Healthcare, non-sprinklered | Stairways | 0.6 | 0.3 |
| Level Components | 0.5 | 0.2 |
| High hazard contents | Stairways | 0.7 | 0.3 |
| Level Components | 0.4 | 0.2 |
| All others | Stairways < 44 inches | 0.3 | 0.2 |
| Stairways > 44 inches | Refer to Note 1 | 0.2 |
| Level Components | 0.2 | 0.15 |

1For stairways in the referenced occupancies that are wider than 44 in., the capacity is permitted to be increased using the following equation:

C =

Where:

C = capacity, in persons, rounded to the nearest integer

*Wn =* nominal width of the stair [inches]

* + 1. Stair Width Requirements:

Stairs must have a minimum width of 44 inches. If the cumulative occupant load assigned to a stair is over 2,000 persons, the stair must have a minimum width of 56 inches per FFPC, NFPA 101 Table 7.2.2.2.1.2(B).

* + 1. Corridor Width:

The minimum clear width is 44 inches and must be increased to accommodate the occupant load (FBC Table 1020.2).

* + 1. Assembly Seating Arrangement:

Furniture layout in meeting rooms and ballrooms must comply with aisle width and aisle accessway width requirements as stated in FFPC, Sections 12.2.5.7 and 12.2.5.8. Seating NOT at tables must comply with Sections 12.2.5.5 and 12.2.5.6. Seating at tables must comply with Section 12.2.5.7.

FFPC, NFPA 101 Section 12.7.9 states that seats accommodating more than 200 persons shall be securely fastened to the floor, except where fastened together in groups of not less than three.

* + 1. One Exit Unavailable Analysis:

The means of egress must be designed with adequate width and capacity such that the loss of one exit leaves the other exits available to handle at least 50% of the occupant load. Analysis and calculation must be shown on plans (FBC Section 1005.5 and FFPC, NFPA 101 Section 7.3.1.1.2).

In addition, the main entrance/exit shall have a width to accommodate ½ of the total occupant load (FBC Section 1029.2, FFPC, NFPA 101 Section 12.2.3.6).

* + 1. Pool Barriers:

FBC Section 454.1.3.1.9 requires that pool barriers be provided to prevent unsupervised access by children to the swimming pool(s). Pool barrier gates and other child-access control devices must be designed for the project, such that they do not interfere or obstruct the required means of egress in an emergency.

* + 1. Exterior Doors (NOA):

All exterior windows and doors must comply with the requirements of FBC Section 1709. The designer must consider the potential conflict between the manufacturer’s notice of approval (NOA) and the required swing of exit doors. The conflict may occur in assembly areas located outdoors that require occupants to egress through the building. All exit doors serving an occupant load of 50 or more people must swing in the direction of egress travel. The doors equipped with panic hardware would swing into the building or into the stairwells. These exit doors must have the proper NOA as required by the FBC.

* + 1. Exit Signage:

Exit signs are required at all exit doors and directional signs are required within the means of egress where the path of egress is not apparent. Exit sign placement shall be such that no point in the exit access corridor is more than 100 feet from the nearest exit sign (FBC Section 1013.1).

**NOTE:**  FBC Section 1013.2 requires floor-level exit signs in all R-1 (Hotel) Occupancies. The bottom of the sign shall not be less than 10 inches and no more than 12 inches above the floor. The sign shall be flush mounted to the door or wall. The edge of the sign shall be within 4 inches of the door frame on the latch side.

* + 1. Luminous Egress Markings:

As a *high-rise* building, FBC §403.5.5 states that approved luminous egress path markings delineating the exit path must be provided in Group A, B, E, I, M and R-1 occupancies in accordance with FBC §1025. Since this building has an Assembly occupancy on the top level, then this requirement is applicable for all floors. Markings within the exit enclosures are required to be provided on steps, landings, handrails, perimeter demarcation lines, and discharge doors from the exit enclosure. Materials should comply with either UL 1994 *or* ASTM E2072.

* + 1. Roof Top Occupancy:

The PNAME Project has been designed with occupancy on the roof tops. The proposed use for the roof top is for amenities, garden areas, sun deck, etc. The roof top must be designed to comply with all means of egress requirements for assembly occupancy. Refer to image below for roof top occupancies.

Figure 6: Rooftop Occupancy

* + 1. Means of Egress Lighting:

Normal lighting must be designed to provide a minimum of 1 ft-candle measured at the floor within exit access routes, exits, and the exit discharge routes. In the stairs, the minimum illumination shall be at least 10 ft-candle measured at the walking surface. The elevator code requires adequate lighting of 10 ft-candle at the landing sill of elevators measured with doors open/closed (FBC Section 1008, FFPC, NFPA 101 Sections 7.8 and 7.9, ASME A17.1 Section 2.11.10.2).

Additionally, lighting is required to be arranged such that the failure of a single lighting unit does not reduce illumination levels to less than 0.2 ft-candle as required by FFPC, NFPA 101 Section 7.8.1.4 and FBC Section 1008.3.

Emergency lighting is required for this occupancy per FFPC, NFPA 101 Section 28.2.9, Section 30.2.9. The emergency lighting must provide an average of 1 ft-candle measured at the floor throughout the means of egress with a minimum of 0.1 ft-candle at any point. The illumination of 10 ft-candle for the elevator threshold is still required under emergency lighting conditions.

It is noted that the FDPT Fire Department and BDPT Building Department strictly enforce the reliability of emergency lighting and require that the system be arranged to provide the required illumination automatically in the event of interruption of normal lighting due to any of the following as required by FFPC, NFPA 101 Section 7.9.2.3:

* Failure of a public utility or outside electrical power supply.
* Opening of a circuit breaker or a fuse.
* Manual acts including accidental opening of a switch controlling normal lighting.

As per standard practice, it is recommended that the project team ensure that battery back-up lighting is provided in the following locations: emergency generator room, fire command centers, fire pump room, and the emergency responder radio coverage room (if provided).

Emergency lighting must be provided in mechanical rooms and electrical rooms as required in NFPA 70, Articles 110.26(D) and 700.16.

Emergency lighting is required on the egress side of delayed egress door and access control doors when provided in the building in accordance with FFPC, NFPA 101 Section 7.2.1.6.

* 1. Major Life Safety Accessibility Requirements Overview

Accessibility requirements are indicated in FBC-Accessibility Code (FBC-A) Seventh Edition. The PNAME Project must comply with all the applicable accessibility requirements mandated for each occupancy. The complete review of accessibility code compliance is outside the scope of this Narrative Report and outside the expertise of SLS Consulting, Inc. The items listed below are not all inclusive of the requirements in FBC and FFPC. However, the list below provides a quick reference of some basic requirements related to fire and life safety that may be missed during the design.

* + 1. Accessible Means of Egress

Per Section 207.1 of the FBC-Accessibility Code, accessible means of egress shall comply with Section 1007 of the 2003 Edition of the *International Building Code* (IBC). In addition to this, accessible means of egress shall also comply with the requirements of FFPC, NFPA 101 Section 7.5.4. Two accessible means of egress must be provided whenever two exits are required from the space, floor, or building. If one means of egress is permitted by the Code, then only one accessible means of egress needs to be provided. Travel distance and common path of travel limits must be followed equal to the required means of egress. Each accessible means of egress shall be continuous from each accessible occupied space to a public way or area of refuge. Required portions of an area of refuge shall have access to a public way via *a) an exit or b) an elevator* without requiring return to the building spaces through which travel to the area of refuge occurred.

a) Exit stair must comply with clear width of landings and stair of 48 inches measured between handrails.

**NOTE to a):** The clear width above is not required in buildings protected by an automatic sprinkler system.

b) Elevators must comply with firefighters’ emergency operations, power supply shall be protected against interruption, and must be located in a smokeproof enclosure (FFPC, NFPA 101 Sections 7.5.4 and 7.2.12.2).

**NOTE to b):** The smokeproof enclosure is not required in buildings protected by an automatic sprinkler system.

* + 1. Elevators

In buildings where a required accessible floor is four or more stories above the level of exit discharge (5-story building), then at least one required accessible means of egress shall be an elevator. The elevator must comply with the emergency operation and signaling requirements of ASME A17.1 Section 2.27. Standby power shall be provided (FBC-Accessibility Section 207).

* + 1. Area of Refuge

An area of refuge as part of the accessible means of egress in a building protected by an automatic sprinkler system may consist of each story with or without two accessible rooms in accordance with FFPC, NFPA 101 Section 7.2.12. The story can serve for Area of Refuge for both exits. The two accessible rooms must be separated from each other by smoke partitions. In an open floor plan, an enclosed elevator lobby with smoke partitions can serve as the two accessible rooms. The requirement for accessible rooms is exempted for most of the occupancies, but not for occupancies such as Assembly, Storage, Educational , Health Care, Res Board and Care, Industrial, and Day Care Occupancies.

**NOTE:** Florida Statute 633.202(19) was adopted, and it changed the requirements pertaining to an area of refuge as stated in FFPC. An area of refuge and related requirements in FFPC, NFPA 101 Section 7.2.12 will not be applicable to this project since the FBC does not require an area of refuge in a building protected by an automatic sprinkler system.

* + 1. Area of Refuge: Communication

Each story as mentioned above must comply with the following requirements for a two-way communication in accordance with FFPC, NFPA 101 Section 7.2.12.1:

* Each elevator landing shall be provided with a two-way communication system to communicate between the elevator landing and the fire command center, or a central point approved by the fire department.
* Directions for the use of the two-way communication system; instructions for summoning assistance; and written identification of the location shall be posted adjacent to the two-way communication system.
* The two-way communication system shall include both audible and visible signals.

**NOTE:** Florida Statute 633.202(19) was adopted, and changed the requirements pertaining to an area of refuge as stated in FFPC. The two-way communication mentioned above will not be applicable to this project since the FBC does not require an area of refuge in a building protected by an automatic sprinkler system.

* + 1. Exit Door Signage

Tactile signage shall be provided to meet all the following criteria in accordance with FFPC, NFPA 101 Section 7.10.1.3: a) tactile signs shall be located at each exit door requiring an exit sign; b) tactile sign shall read EXIT; and c) tactile signs shall comply with ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities*.

* 1. Fire Protection and Life Safety Systems Overview
     1. Equipment Locations / Flood Zone

All fire protection and life safety equipment are required to be located 1 ft. above the base flood elevation (FBC Section 1612). Equipment cannot be located below flood level even if the story is protected with flood proofing systems. The Architect of Record shall verify this condition.

* + 1. Fire Command Center

The building will have a fire command center as required for high-rise buildings. The fire command center must be located near the entry point and must be at least 200 sq. ft. in size with a minimum dimension of 10 ft. (FBC Section 911.1.3). The fire command center must be constructed of at least 1-hour fire barrier enclosure (FBC Section 911.1.2). The location and accessibility of the fire command center shall be approved by the fire chief (FBC Section 911.1.1).

**Miami Dade County and City of Miami** Fire Department requires a door opening into the lobby and additional door opening to the outside to provide direct access without entering the lobby. The fire command center shall be located on the address side/main entrance of the building and shall be within proximity to the fire service access elevators and stairs that have a standpipe available for fire operations.

Figure 7: Fire Command Center Location

It is noted that the lighting and HVAC system in the fire command center must be tied into emergency power. The following items must be provided in the fire command center:

* The emergency/voice alarm communications system.
* The fire department communication systems; two-way telephone communication service panels and controls.
* Fire detection and alarm system annunciator.
* Annunciator unit visually indicating the location of the elevators and whether they are operational.
* Status indicators and controls for air distribution systems.
* The fire-fighter’s control panel required by Section 909.16 for smoke control systems installed in the building.
* Controls for unlocking *stairway* doors simultaneously.
* Sprinkler valve and water flow detector display panels.
* Emergency and standby power status indicators.
* A telephone for fire department use with controlled access to the public telephone system.
* Fire pump status indicators.
* Schematic building plans indicating the typical floor plan and detailing the building core, fire protection systems, fire-fighting equipment and fire department access and the location of *fire walls, fire barriers, fire partitions, smoke barriers* and smoke partitions.
* Worktable.
* Generator supervision devices, manual start and transfer features.
* Public address system, where specifically required by other sections of this code.
* Elevator fire recall switch in accordance with ASME A17.1.
* Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
  + 1. Sprinkler Systems

Per FBC Section 903.2.1, FBC Section 903.2.6, FBC Section 903.2.7 and FFPC Section 11.8.3.1, sprinkler protection designed in accordance with NFPA 13 shall be installed throughout the buildings. This building will have the protection system connected to the city water supply. NOTE: If the building is greater than 420 ft then add bldg. shall be supplied by a minimum of two risers Each riser shall supply sprinkler on alternate floors. If more than two risers are provided for a zone, then sprinklers on adjacent floors shall not be supplied from the same riser (FBC Section 403.3).

Miami Dade Fire Department will require sprinkler protection in all balconies with a depth of four (4) feet. The fire department has accepted alternative solutions if sprinkler head installation in the balcony is not feasible. Further discussion on this item required.

Other jurisdiction add..

The fire department will require sprinkler protection in terraces that are four (4) feet or more in depth. A terrace is usually recessed within footprint of the building and has living space on three walls. Open balconies (cantilevered) will not require sprinkler protection even if there is a privacy partition between balconies.

Add note about car lifts….require Extra Hazard Group 2 design density

* + - 1. Sprinkler Supervision and Alarms

The following water supply control valves are required to be electrically supervised by a listed fire alarm control unit per FBC Section 903.4:

* Automatic sprinkler systems
* Pumps
* Tanks
* Water levels and temperatures
* Critical air pressures
* Water-flow switches on all sprinkler systems
* Exception: Jockey pump control valves sealed and locked in the open position, control valves to commercial kitchen hoods, valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position

One exterior approved audible alarm located on the exterior of the building shall be connected to each sprinkler system. They should activate upon flow through the sprinkler system equivalent to the smallest orifice sprinkler head installed in the system being discharged (FBC Section 903.4.2).

* + - 1. Monitoring

Alarm supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved supervising station, or, where approved by the fire code official, shall sound an audible signal at a constantly attended location (FBC Section 903.4.1).

For high-rise buildings with a fire service elevator, the sprinkler system shall have a sprinkler control valve supervisory switch and water-flow-initiating device provided for each floor that is monitored by the buildings fire alarm system in accordance with FBC Section 3007.2.2.

* + - 1. Site Water Supply Systems

The site water supply for fire protection systems shall be provided in accordance with the requirements of Chapter 23 of NFPA 13. For buildings greater than 420 ft, the water supply must be designed so that there are separate connections to a minimum of two public mains on different streets (FBC Section 403.3).

Fire hydrants must be installed within 100 feet of the fire department connections in accordance with NFPA 14. Backflow preventer must be designed and installed as required by the local water department jurisdiction.

**NOTE:** Further review and discussion would be required with the Civil Engineer and Fire Protection Design Engineer to provide the most cost-effective and code-compliant system.

* + - 1. Secondary Water Supply

For high-rise buildings assigned to Seismic Design Category C, D, E, or F as determined by FBC Section 1613, an automatic secondary water supply is required per FBC Section 403.3.3. This secondary water supply must have a capacity not less than the hydraulically calculated sprinkler demand, including hose stream requirement. The water supply duration must not be less than 30 minutes.

An additional fire pump shall not be required for the secondary water supply unless needed to provide the minimum design intake pressure at the suction side of the fire pump supplying the automatic sprinkler system.

* + - 1. Standpipe Systems

Per FBC Section 905.3.1 and FFPC, NFPA 101 Section 11.8.3.2, Class I automatic standpipes shall be provided within the PNAME project since the building is fully sprinklered. The installation of standpipes shall be designed and installed in accordance with NFPA 14, *Standard for the Installation of Standpipe and Hose Systems.*

Standpipe hose connections are to be provided in the following locations in accordance with FBC Section 905.4:

* In every required stairway on each floor level above and below grade. Hose connections shall be located at an intermediate landing between stories unless otherwise approved by the fire code official.
* On each side of the wall adjacent to the exit opening of a horizontal exit, except where floor areas adjacent to a horizontal exit are reachable from an interior exit stairway hose connection by a nozzle attached to 100 feet of hose as measured along the path of travel.
* In every exit passageway at the entrance from the passageway to other areas of the building.
* In the highest landing of a stairway with access to the roof or on the roof
* Where the most remote portion of a story is more than 150 feet from a hose connection, the fire code official is authorized to require additional hose connections be provided in approved locations. The distances from a hose connection shall be measured along the path of travel.

Buildings with more than one standpipe shall have interconnected standpipes in accordance with NFPA 14 and FBC Section 905.4.2.

The standpipe located in an exit enclosure shall have access to the floor without passing through the fire service elevator lobby (FBC Section 3007.9.1). However, in a high-rise R-2 or R-1 occupancy building, standpipes must be located in stairwells and are subject to only the requirements of the FFPC and NFPA 14, adopted by the State Fire Marshal.

* + 1. Fire Pump:

This building will have a fire pump to supply the sprinkler and standpipe systems. The installation of the fire pump shall be designed and installed in accordance with NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*.

The fire pump room must be accessed directly from the exterior. The fire pump rooms that are not directly accessible from the outside shall be accessible through an enclosed passageway from an enclosed stairway or exterior exit. The enclosed passageway shall have a fire-resistance rating not less than the fire-resistance rating of the fire pump room (2-hours) (NFPA 20 Section 4.12.2.1).

For a high zone fire pump, there must be a redundant fire pump, which can be in the same room as the high zone fire pump and supplied by the same supply line.

In high-rise buildings, the two independent water lines mentioned above include extending the piping to the fire pump room.

Figure 8: Fire Pump Room Location

* + 1. Fire Department Connections:

A high-rise building is required to have two fire department connections located at remote points of the property. At least one of the fire department connections must be located within 100 ft. of a fire hydrant. The fire department connections must be visible, accessible, and clearly marked for fire department use.

* + 1. Special Suppression Systems:

At this time, the only special fire suppression systems anticipated within the PNAME project will be for commercial kitchen hood suppression systems. This system must be designed and installed in accordance with NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*.

* + 1. Fire Extinguishers:

Fire extinguishers must be provided throughout the building as required by FFPC, NFPA 1 and FBC Section 906. The fire extinguishers must be installed in accordance with NFPA 10, *Standard for Portable Fire Extinguishers.* The table below provides a brief overview of the installation requirements.

Table 17: Fire Extinguishers

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hazard Area | Minimum Size and Type | Maximum Travel Distance to Extinguisher [ft] | Maximum Floor Area per Unit of A [ft²] | Maximum Floor Area per Extinguisher [ft²] |
| Low Hazard  (Residential floors, Assembly areas, Office spaces) | 2A:10B:C  Increase rating based on limits | 75 | 3,000 | 11,250 |
| Moderate Hazard  (Parking Garage, Storage) | 2A:20B:C  Increase rating based on limits | 50 | 1,500 | 11,250 |
| Commercial Kitchen | Class K | 30 ft.  to cooking appliance | N/A | N/A |

* 1. Fire Alarm & Emergency Responder Radio Systems
     1. Fire Alarm Systems

As a *high-rise* building, and in accordance with FBC Section 403.4.4 and FFPC, NFPA 101 Section 11.8.4.1, an emergency voice communication fire alarm system shall be provided. The design of the fire alarm system must take into consideration that floors connect across buildings (i.e., parking garage) and coordinate proper annunciation signals. The fire alarm system must be designed and installed in accordance with NFPA 72. Audible and visual appliances must be installed in accordance with FBC and FFPC. Selective evacuation signal is permitted where general evacuation is impractical due to building configuration per FFPC, NFPA 101 Section 9.6.3.6.2.

The fire alarm system must be designed to interface or monitor other life safety systems in the building such as automatic sprinkler system, fire pump, smoke control system, generator, etc.

In Hotel (R-1)occupancies, a certain number of rooms must be provided with visible alarms depending on the total number of sleeping rooms in the hotel in accordance with FBC Table 907.5.2.3.2.

Table 18: Dwelling Unit Visible Alarms

|  |  |
| --- | --- |
| Number of sleeping units | Sleeping accommodations with visible alarms |
| 6 to 25 | 2 |
| 26 to 50 | 4 |
| 51 to 75 | 7 |
| 76 to 100 | 9 |
| 101 to 150 | 12 |
| 151 to 200 | 14 |
| 201 to 300 | 17 |
| 301 to 400 | 20 |
| 401 to 500 | 22 |
| 501 to 1,000 | 5% of total |
| 1,001 and over | 50 plus 3 for each 100 over 1,000 |

In Apartment (R-2) occupancies, all dwellings units and sleeping rooms shall be provided with the capability to support visible alarm notification appliances in accordance with ICC A117.1 (FBC Section 907.5.2.3.3).

In Miami Beach, interconnecting rooms must have same notification appliances and annunciate to both rooms.

**NOTE:** Further review and discussion would be required with the Fire Protection Design Engineer to provide a code-compliant system that would target appropriate areas for annunciation.

* + 1. Remote Annunciator Panel

As per usual practice with the Fire Department, a remote fire alarm annunciator panel and remote generator annunciator panel should be provided at the lobby reception desk.

* + 1. Fire Alarm Monitoring:

The fire alarm system of the PNAME shall be monitored by a central station in accordance with Section 13.7.1.4.11.1 of the FFPC (NFPA 1).

* + 1. Fire Fighter Telephone Jacks:

It is the understanding of SLS Consulting, that the Fire Department will require that fire fighter telephone jacks be provided in accordance with FBC Section 907.2.13.2 despite consideration that the building shall also be provided with an emergency response radio coverage system.

* + 1. Emergency Responder Radio System:

In addition to fire-fighter telephone jacks provided as required by NFPA 72, the building shall be provided with emergency responder radio coverage as required by FBC Section 403.4.5 and NFPA 1, Section 11.10. The requirements of the Emergency Responder Radio System are listed in NFPA 72 Section 24.5. The Fire Department will also have specific requirements for their radio system in addition to the basic items below.

* *Radio Signal Strength:* Signal strength measurements in 95% of all areas of each floor of the building should the following minimum signal strengths:
  + *-*95 dBm minimum signal strength within the building;
  + -95 dBm minimum signal strength should be received by the agency’s radio system when transmitted from within the building.
* *Secondary Power:* The emergency responder radio coverage system shall be provided with an approved secondary source of power capable of providing an 8-hour supply.

**NOTE:** New buildings shall comply with “In Building Public Safety Radio Enhancement System”. Per Miami-Dade County policy, every new building shall be provided with a 2-hour fire-rated room protected with emergency power and air conditioning for equipment installation at the top level preferably, or in the fire command center, AND a 2-hour fire- rated vertical shaft through the entire building with an access panel at each level for future use.

* + 1. Carbon Monoxide Alarms:

Carbon monoxide detection shall be provided in accordance with the requirements of the FBC, Section 915 and FFPC, NFPA 101 Sections 28.3.4.6 and 30.3.4.6. Carbon monoxide detectors are required in buildings having fuel burning appliances, a fireplace, an attached garage, or other element that emits carbon monoxide as a byproduct of combustion. The FBC requires that carbon monoxide alarms be located within 10 feet from sleeping rooms. Carbon Monoxide detection shall be installed in accordance with NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*.

* + 1. Smoke Alarms:

FBC Section 907.2.11 and FFPC, NFPA 101 Section 28.3.4.5 and Section 30.3.4.5 require that single- or multiple-station smoke alarms be installed and maintained in Residential Apartment (R-2) and Hotel Occupancy (R-1) in all of the following locations:

* On the ceiling or wall - located outside of each separate sleeping area in the immediate vicinity of bedrooms.
* In each room used for sleeping purposes.
* In each story within a *dwelling unit*.

Where more than one (1) smoke alarm is required to be installed within an individual *dwelling unit* the smoke alarms should be interconnected in a manner such that the activation of one (1) alarm will activate all of the alarms within the individual unit. The alarm should be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

In Miami Beach, interconnecting rooms must have smoke alarms interconnected to annunciate in both rooms.

* + 1. Smoke Detection System:

Check occupancy chapter to see if detection is required in corridor or anywhere else. In Group I-1 occupancies, an automatic smoke detection system shall be installed in *corridors*, areas open to *corridors* and *habitable spaces* other than *sleeping units* and kitchens (FBC §907.2.6.1 and FFPC §32.3.3.4.8.1). The system shall be activated to initiate an alarm that is audible in all sleeping areas.

* + 1. Smoke Detection System:

FBC Section 907.2.13.1 states that smoke detection shall be provided in the following spaces that are not protected by sprinkler system: mechanical equipment, electrical transformer, telephone equipment, or similar room. In addition, smoke detection must be provided in each elevator machine room and in elevator lobbies.

A corridor smoke detection system is normally required for hotel occupancies in accordance with FBC and FFPC, but it may be omitted for buildings with sprinkler system protection. However, a smoke detection system would be required to initiate the smoke control system.

* 1. Emergency and Standby Power Systems
     1. Emergency Power Systems:

The emergency power systems shall be designed in accordance with the following (FBC Section 2702 and FFPC, NFPA 101 Section 7.9.2.2):

* NFPA 70, National Electrical Code (NEC).
* NFPA 110, Standard for Emergency and Standby Power Systems.
* NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems.

The standby system shall have the capacity to supply the following:

* Fire Command Center lighting and HVAC (FBC §911.1 and NFPA 101 §11.8.5).
* Elevators used as accessible means of egress elevators (FBC §1009 and FAC 207).
* Electrical generator and main switchgear room lighting circuits (NFPA 110).
* Essential floor, sewage ejector and sump pumps.
* Fire pump room lighting circuit (NFPA 20).
* Jockey pump (NFPA 101 §11.8.5.4.4).
* Electric fire pumps (NFPA 101 §11.8.5).
* Smoke control systems (FBC §2702.2.16).
* Stair Pressurization Systems and Controls (FBC §2702.2.16 and NFPA 101 §11.8.5).
* Horizontal sliding doors (FBC §2702.2.10).
* Emergency voice communication systems (FBC §2702.2.4).
* Elevators (FBC §3003.1).

The emergency system should have the capacity to supply the following:

* Exit Signs (FBC §2702.2.6).
* Means of Egress Lighting (FBC §2702.2.12).
* Elevator Car Lighting (FBC §403.4.8.4).
* Automatic detection systems (FBC §403.4.8.4).
* Fire Alarm and Communication systems (FBC §403.4.8.4).

Elevator machine room ventilation and/or air conditioning should be connected to the Building’s standby power source. Where more than one (1) elevator is provided, all elevators should be provided with standby power and return to the designated level. After this point, one (1) elevator should remain operable from the standby power source (FBC Section 3003.1.3).

(Residential ONLY)

An 8-hour fuel supply shall be provided on life safety equipment within the building. It is noted that it is common practice to include the following systems: domestic water pumps; jockey pumps; telephone and security systems.

In the City of Miami, the fire department will require a 24-hour fuel supply for emergency power.

* 1. Smoke Control Systems Overview

The building will have a smoke control system designed in accordance with FBC Section 909. The design of the smoke control system for the PNAME Project can incorporate active and passive protection. The building components that will require smoke control system protection are listed below. All smoke control equipment (e.g., fans, VFDs, etc.) is required to be enclosed in a dedicated 2-hour fire rated enclosure. The smoke control system interfaces with the fire alarm system for activation (i.e., automatic or manual) and for supervision (e.g., monitoring of the disconnect switches for voltage and current loss).

* + 1. Stairs

Stairs serving floors more than 75-feet above the lowest level of fire department vehicle access will be designed as *smoke-proof enclosures* in accordance with FBC Section 909.20.5 and Section 1023. The stairways in the high-rise building must be pressurized to comply with the requirements in FBC.

* + 1. Elevators

The elevator hoist-ways and associated elevator machine rooms must be protected in accordance with the requirements of FBC Section 713, Section 3006.2 and 3006.3. The elevator hoist-ways must be protected by lobby enclosure or by pressurization when the elevator shaft connects more than three (3) floors.

* + 1. Floor-to-Floor/Zoned System

The corridors on each floor of the high-rise building must be provided with the ability to be either exhausted or pressurized by mechanical systems designed in accordance with the FBC. It is noted that each floor within the building is considered a dedicated *smoke zone* and, as such, shall be separated by passive smoke barriers constructed in accordance with the requirements of FBC Table 601 and FBC Section 909.5.

* + 1. Parking Garage

The parking garage including basement and upper levels is designed to be an enclosed parking garage. It must be provided with mechanical ventilation and exhaust as required by the FBC-Mechanical and NFPA 88A, *Standard for Parking Structures*.

* + 1. Vertical Openings:

The plans reviewed do not show any unprotected vertical openings requiring smoke control system protection.

* + 1. Smoke Removal System

A smoke removal system is required for high-rise buildings as indicated in FBC Section 403.4.7. Natural or mechanical ventilation must be provided for this project to facilitate smoke removal in post-fire salvage and overhaul operations in accordance with Section 403.4.7. Natural ventilation involves manually operable windows or panels distributed around the perimeter of each floor based on the criteria in FBC Section 403.4.7(1). If natural means is not feasible, then mechanical ventilation must be provided to achieve one exhaust air change every 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.

The Smoke Control Rational Analysis for this project will provide more detailed design criteria for the required smoke control systems.

* 1. Hazardous Materials Approach

The quantities of hazardous materials will be below the exempt amounts/maximum allowable quantities (MAQ’s) and no Use Group H, High Hazard occupancies are proposed. It is noted that the fuel located within vehicles are exempted by the Florida Building Code, the FFPC and NFPA 30. All rooms containing hazardous materials within the PNAME project (e.g. fuel storage room/emergency generator room, pool chemical rooms, etc.) should be provided with an NFPA 704 Hazmat placard.

* 1. Fire Department Access
     1. Site Access/Set-Up Sites:

The site must comply with FFPC, NFPA 1, Chapter 18 for the minimum fire department site access requirements as follows:

* Fire department access road shall extend to within 50-ft of at least one exterior door that can be opened from the outside and provides access to the interior of the building (FFPC 18.2.3.2.1).
* Fire department access road dead ends more than 150-ft shall be provided with approved provisions for fire apparatus to turn around (FFPC 18.2.3.5.4).
* Fire department access roads shall have an unobstructed width of 20 feet and a vertical clearance of 13 ft 6 inches (FFPC 18.2.3.5.1.1 & 18.2.3.5.1.2).
* When required by AHJ, roads or parking lots providing access to the main entrance doors shall be considered access roads and shall comply with the requirements of FFPC, Sections 18.2.3.4.1.1 AND 18.2.3.4.1.2 (FFPC 18.2.3.2.1.2).
* Fire department access roads shall be designed and maintained to support a minimum of 32 tons and shall be provided with a surface suitable for all-weather driving capabilities (FFPC 18.2.3.5.2).
* Fire department access roads shall be provided such that any portion of an exterior wall of the first story of the building shall be located no more than 150-ft or 450-ft for sprinklered buildings from a fire department access road as measured from an approved route around the exterior of the building (FFPC 18.2.3.2.2.1).

Describe the site access.

Include drawings

Figure 9: Site Access

Miami-Dade Fire Department requires set-up sites located at a minimum on two sides of the building at the approximate center of each side for firefighting and rescue operations. Depending upon the building configuration, additional set-up sites may be required by the AHJ.  Sites shall be no closer than 10 feet and no further than 30 feet from any building. Each site shall be a minimum of 21 feet wide and 47 feet long with a cross slope no greater than 5 percent. Sites shall comply with the requirements of the emergency vehicle support capabilities above and also capable of withstanding any point forces resulting from outriggers. Set-up sites, fire lanes, and slopes in a project must be able to accommodate a truck with dimensions as follows: 47 feet overall length, 36 feet bumper to bump, and 256 inches wheelbase length.

* + 1. Elevator – Emergency Medical Services

Any building that is more than three stories or where the vertical distance to the top landing exceeds 25 feet, must contain at least one passenger elevator that is operational for building occupants and fire department access to all floors. The elevator car shall be able to accommodate an ambulance stretcher (24 inches x 76 inches) with 5 inches radius corners. The elevator car must be identified by the international symbol for emergency medical services (star of life). The symbol must be at least 3 inches high and located inside on both sides of the hoist-way door frame (FBC Section 3002.4).

* + 1. Fire Service Access Elevator

The highest occupied floor in the PNAME building is located more than 120-feet above the lowest level of fire department vehicle access. Therefore, two fire service access elevators in accordance with FBC Section 403.6.1 shall be provided. The fire service access elevator is required to include the following:

* *Floors:* The elevator must serve every floor.
* *Phase I Recall*: Actuation of any building fire alarm initiating device shall initiate Phase I Recall for the fire service access elevators.
* *Hoist-way Lighting:* FBC Section 3007.5.2 requires that the entire height of the fire-fighter service elevator hoist-way be illuminated at not less than one (1) foot-candle as measured from the top of the elevator car.
* *Fire Service Access Elevator Lobby:*

*Option #1(lobby approach):* FBC Section 3007.6.4 requires that a 150 ft2 lobby with a minimum dimension of 8-feet and with a direct connection to a stair be provided on all floors except the street floor. The stair enclosure must have access to the floor without passing through the lobby. The lobby must be constructed as a smoke barrier having a minimum 1-hour fire resistance rating. Doorways must be protected with a 45-minute fire door assembly that also comply with smoke and draft control requirements (UL 1784).

*Option #2 (6-ft corridor exception)****:*** FBC Section 3007.6 Exception 2 permits the designer to substitute the lobby requirements above with a corridor that is 6 feet wide throughout. The corridor must have a 1-hour fire resistance rating with 45-minute fire doors. The corridor must be protected with a smoke control system***.***

Option #3 (protected path): FBC 3007.6.1 exception permits the designer to provide a protected path from the lobby to the stair, provided that the level of fire protection is not less than the elevator lobby enclosure. The protected path shall be separated from the enclosed elevator lobby through an opening protected by a smoke draft control assembly in accordance with FBC section 7.16.5.3.

**NOTE:** The Fire Marshal will not approve utility rooms, electrical rooms, trash rooms, or any other similar rooms opening into the FSA elevator lobby.

Figure 10: Fire Service Elevator Configuration

* *Elevator Monitoring System:* FBC Section 3007.7 requires that the fire service access elevator be continuously monitored at the fire command center by a standard emergency service interface system meeting the requirements of NFPA 72.
* *Protection of Wiring or Cables:* FBC Section 3007.8 requires that wires or cables located outside the hoist-way/machine room that provide normal and standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation, and fire detection systems to the fire service access elevator shall be protected by 2-hour fire resistance rated construction or by circuit integrity cable with a minimum rating of 2 hours.
* *Elevator Size:*FBC Section 3002.4 requires that the elevator car be of such a size to accommodate an ambulance stretcher 24” x 76” with not less than 5-inch radius corners, in the horizontal, open position.
* *Sprinkler System:*Sprinkler heads shall not be installed in the machine room, elevator machine spaces, and hoist-way of the fire service access elevator. An approved method shall be installed that prevents water from infiltrating into the hoist-way due to operation of the sprinkler heads outside the lobby.
* *Signage:* A pictorial symbol designating which elevators are fire service access elevators shall be installed in the hoist-way door frame as detailed in FBC Section 3007.6.5.
* *Electrical Power:*The following features shall be supplied by both normal and standby power (Type 60/Class2/Level1):
  + Elevator equipment
  + Elevator hoist-way lighting
  + Elevator machine room ventilation and cooling equipment
  + Elevator controller cooling equipment
* **NOTE:** FBC Section 3007.6 Exception 2 permits the designer to substitute the lobby requirements above with a corridor that is 6 feet wide throughout. The corridor must have a 1-hour fire resistance rating with 45-minute fire doors. The corridor must be protected with a smoke control system.
  + 1. New 2018 IBC Requirements

The elevator department reviews plans based on the applicable code at date of review and not the applicable code on the date of submittal. This may cause sections of the new 2020 FBC to be applicable, regarding the following:

IBC Section 3001.2 “Emergency elevator communication systems for the deaf, hard of hearing and speech impaired. An emergency two-way communication system shall be provided that:

Is visual and text-based and a video-based 24/7 live interactive system.

Is fully accessible by the deaf hard of hearing and speech impaired and shall include voice-only options for hearing individuals.

Has the ability to communicate with emergency personnel utilizing existing video conferencing technology, chat/text software or other approved technology.”

(applicable to Miami Dade county projects, please check if this is applicable to all other jurisdictions)

1. Summary and Conclusion

This report provides an outline of building and fire code related requirements for this project and information associated with the general approach to fire protection, life safety and building code compliance. As a living document, this report will be revised, modified, and amended as the project progresses. To ensure accuracy of this report, close coordination, review, and concurrence from design team members is required.

In case of conflict, it should be noted that the requirements of the applicable codes take precedent over this report.

Prepared by:

**SLS Consulting, Inc.**

Signature

Title

Reviewed by:

Signature

Title

**REPEATER**

Project Name: PNAME

Project Name (Italic): ***PNAME***

Project Name (CAPS): **PNAMECAP**

Project Number: **PUMBER**

Date: **DATE**

City: PCITY

State: PSTATE

Address: PADDRESS

Zip Code: PZIPCODE

Fire Department: FDPT

Building Department: BDPT

Architect: ARCH

Architect Address: ARCHADD

Architect Zip Code(CITY, STATE ZIP): ARCHZIP

EOR: EOR

EOR Address: EORADD

EOR Zip Code(CITY, STATE ZIP): EORZIP

Owner: OWN

Owner Address: OWNADD

Owner Zip Code(CITY, STATE ZIP): OWNZIP

Plans Date: PLANSDATE

Building Type(exceptions addressed in report): BUILDTYPE