FIRE AND LIFE SAFETY CODE REVIEW AND ANALYSIS

<u>Project Description:</u>
The Project consists of 90,000 s.f. of interior alternation/ fit-up in a newly constructed 4story commercial building in Downtown Portland. The tenant space will serve as the world headquarters for WEX Inc. The building occupancy is for business purposes and the program consists of open office spaces, closed office spaces, conference rooms, meeting spaces, toilets, and showers.

Applicable Codes and Standards: Building Code: International Building Code, (IBC), 2009 Edition

Fire: National Fire Protection Association, (NFPA), Life Safety Code 101, 2009 Edition Accessibility: 2010 ADA Standards for Accessible Design, Department of Justice, September 10, 2010 **Mechanical:** International Mechanical Code, 2009 Plumbing: Uniform Plumbing Code, 2009

Electrical: National Electric Code, **Energy:** International Energy Conservation Code, 2009 ASHRAE Standard 62.1 Ventilation for Acceptable Air Quality ASHRAE Standard 90.1 Energy Standard for Buildings Except for Low-Rise

NFPA: Chapter 22 – New Detention and Correctional Occupancies – Use

Building Use: Office **Sprinklered:** Fully throughout in accordance with IBC 903 and NFPA 13

Use Group Classification: IBC: I-3, Condition 1 (Free Egress is permitted) – Primary Use B – Business for remainder of building with two accessory assembly spaces

Specific Occupancy Areas/Hazardous Area Protection: IBC: Chapter 5, Table 508.2 NFPA Chapter 22

Residential Buildings

Type of Construction: IBC: Type IIB NFPA 101: Type II 000

Square Footages: 1st Floor ~ 20,624 SF 2nd Floor ~ 30,353 SF 3rd Floor ~ 30,353 SF 4th Floor ~ 9,336 SF

TOTAL ~ 90,666 SF CODE SUMMARY:

Cbapter 3 - Use and Occupancy Classification Mixed Use

303.1 Assembly Group A-3 Rooftop Assembly Space 304.1 Business Group B Office at Levels 1-4

Chapter 5 - General Building Heights and Area

Table 503 Allowable Heights and Areas Business Group B Type 2A Construction - 3 Stories , 65 feet, 37,000 SF Mercantile Group M Type 2A Construction - 4 Stories, 65 feet, 21,5000 SF Assembly Group A-3 Type 2A Construction - 3 Stories , 65 feet, 15,500 SF

504.2 Automatic Sprinkler System Increase (Building Height) In buildings equipped with an NFPA 13 automatic sprinkler system, the maximum building height is increased by 20 feet and the maximum number of stories is increased by one.

Construction Type 2A Group B (Business) Group M (Mercantile) 5 stories Group A-3 (Assembly) 4 stories 506.0 Building Area Modifications

506.1 General Equation 5-1 $Aa = \{At + [At \times If] + [At \times Is]\}$ Table 503 for Type 2A Construction, B Business Use Aa = 37,000 sf + 0 + (37,000 x 2)

Aa = 111,000 s f allowable building area per story 506.3 Automatic Sprinkler System Increase Approved Automatic Sprinkler System in accordance with Section 903.3.1. More than onestory above grade = 200% increase above Table 503 tabular area allowed: Group B: Type 2A: 37,000 + (2 x 37,000) = 111,000 allowable sf

Group M: Type 2A: $21,5000 + (2 \times 21,500) = 64,500$ allowable sf Group A-3: Type 2A: 15,500 + (2 x 15,500) = 46,500 allowable sf **506.5.2 Mixed Occupancy Area Determination** For building with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by

the allowable area of such stories based on the applicable provisions of Section 508.1 shall not exceed 3. First Floor: 30,625 / 46,500 = 31.353 / 46.500 = 0.674258 Second Floor: Third Floor: 31,353 / 46,500 = 0.674258 Fourth Floor: 31,353 / 46,500 = 0.674258 Total = 2.681376

508 Mixed Use and Occupancy 508.3 Non-Separated Occupancies Buildings or portions of buildings that comply with the provisions of this section shall be considered non-separated occupancies.

508.3.1 Occupancy Classification Non-separated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the building of portion thereof in which the non separated occupancies are located.

713 Penetrations

The allowable building area and height of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type **713.1.1** Penetrations of fire resistance rated walls by ducts (not protected by dampers): of construction of the building in accordance with Section 503.1 Sleeves through walls, in cavity construction, shall be securely fastened (a fire stop assembly is required between sleeve and pipe/duct).

> **713.3.2** Membrane penetrations shall be limited to 16 square inches each and an aggregate of 100 square inches/100 sf of wall. Offset boxes by 24" on opposite sides of wall Not required at sprinklers with escutcheon plate

714 Fire-Resistant Joint Systems

713.1.1 General Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roof or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system matching the required fire resistance rating.

708.4 Openings Openings in a shaft enclosure shall be protected in accordance with 715 as required for fire barriers. Doors shall be self or automatic-closing by smoke detection in accordance with 715.4.8.3

Chapter 8 - Interior Finishes

Table 803.9 Interior Wall and Ceiling Finish Requirements By Occupancy Sprinklered

NOTE: ALL FINISH MATERIALS TO BE CLASS A FIRE RATED

Rooms and Enclosed Spaces Group A-3 Exit Enclosures **Corridors** Class B Class B Class C Class C Class B Class C Class C

Chapter 9 - Fire Protection Systems

903.3.1.1 NFPA 13 Sprinkler Systems The building will be equipped throughout with an automatic sprinkler system in accordance with NFPA 13.

903.4 Actuation Valve controlling water supply for automatic sprinkler system shall be electronically supervised by a fire alarm control unit.

905 Standpipe Systems

905.2 Standpipe Systems will be provided in accordance with NFPA 14

905.3.1 Height Class 1 Standpipes are allowed in buildings equipped throughout with an automatic

On each side of the wall adjacent to exit opening of horizontal exit (not required where

906 Portable Fire Extinguishers Required in Group A, B, and M Occupancies: provided

• Exception: In Group A and B Occupancies extinguishers only required on each floor

• Exception 2: Automatic heat detection is not required in buildings with automatic

907.2.1 Group A: Manual fire alarm system with occupant notification system required in

907.2.9.2 Smoke alarms shall be installed per Section 907.2.11 (within sleeping units)

912.2.1 Fire Department Connections: Locations as approved by fire chief so vehicles and

hose lines will not interfere with building access (visible location on street side of building).

15 net sf. Un-concentrated

Grade Floor Area = 30 gross sf

100 gross sf

sprinkler system

approved by the fire code official

907 Fire Alarm and Detection Systems

907.2 Where Required-New Buildings and Structures

907.2.2 Group B: Manual fire alarm system required.

907.2.7 Group M: Manual fire alarm system required.

Means of Egress, (IBC Chapter 10, NFPA Chapter 22)

Table 1004.1 Maximum Floor Area Allowances Per Occupant

hose stream is reachable)

in accordance with NFPA 10

sprinkler system

areas over 50 occupants

Chapter 10 - Means of Egress

1004 Occupant Load

Assembly

Business

Mercantile

1005 Egress Width

Clear Width 48": Not required in buildings with automatic sprinkler system. Exception No. **905.4** Class I Standpipe Hose Connections shall be provided in the following locations: In every stairway at an intermediate floor level between floors, unless otherwise **Area of Refuge:** Not required in buildings with automatic sprinkler system. Exception No.

• Where roof slope is less than 4:12 each standpipe shall be provided with a hose connection etiher on the roof or the highest landing of a stairway with stair access to

1007 Accessible Means of Egress

1007.4 Elevators Exception 2: Area of Refuge not required if building equipped with

automatic sprinkler system **1007.8** Two-way communication system shall be provided at each elevator landing.

1007.10 Directional signage shall be provided at elevator landings 1008 Doors, Gates, and Turnstiles **1008.1.1 Size of Doors-** Minimum clear width = 32", maximum leaf width = 48"

1008.1.5 Provide a level landing on each side of door, except at exterior locations with 2%

1008.1.8 48" plus door width required minimum space between doors in series

1008.1.9.10 Interior stairway means of egress doors shall be openable from both sides Exception 1: Stairway discharge doors shall only be locked from the opposite side

1008.1.10 Doors serving an occupancy load of 50 or more in Group A shall be provided with panic hardware. Electrical rooms with equipment rated at 1200 amps or more will also require panic hardware.

1015 Exit and Exit Access Doorways

1015.1 Two exits required from any space except as permitted by Table 1015.1 1015.2.1 Exit doors shall be placed not less than 1/3 (exception #2) the length of the

<u>Actual</u> 144'-4" 30,624 sf 338'-11" 112'-11" 2nd Floor 31,353 sf 144'-4" 338'-11" 112'-11" 144'-4" 3rd Floor 31,353 sf 4th Floor 9,336 sf 163'-7" 54'-6" 55'-1"

1016 Exit Access Travel Distance Table 1016.1 Exit Access Travel Distance

maximum overall diagonal dimension.

<u>Occupancy</u>	Max. Distance Sprinklered	Actual Distance	
A3 - Assembly	250'	110'-8"	
B-Business (Level 1)	300'	84'-0"	
B-Business (Level 2-3)	300'	126'-6"	
B-Business (Level 4)	200'	84'-0"	
M-Retail `	250'	TBD	

1021 Number of Exits and Continuity Table 1021.1 Minimum Number of Exits for Occupant Load

	Occupant Load	Min Number of Exits			
1st Floor (B)	207	2			
1st Floor (M)	334	2			
2nd Floor	314	2			
3rd Floor	314	2			
4th Floor (B)	94	2			
4th Floor (A-3)	900	3			

1022.1 Exit Enclosures Required 2 hour rated fire barriers/enclosures provided.

1022.6 Exit Enclosures Exterior Walls Exterior exit walls comply with Section 705

1022.8 Floor Identification Signs Floor level identification signs required at each floor landing within stair (tactile).

1023 Exit Passageways

1023.1 Exit Passageway Exit passageway used to connect stairway enclosure to an exterior door

 44" min. width Wells, floor, and ceilings shall be of not less than 1 hour fire resistance rated construction and constructed as fire barriers in accordance with Section 707.

1027 Exit Discharge

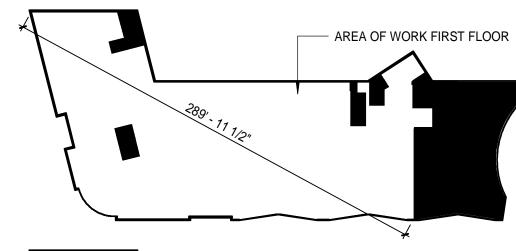
1027.1 General Exits shall discharge directly to the exterior of the building. Exit Stair is allowed to egress through the Main Lobby per the following: Exceptions: 1. A maximum of 50 percent of the number and capacity of the exit enclosure is

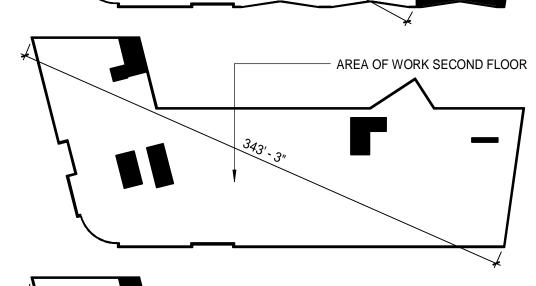
permitted to egress through areas on the level of discharge provided all of the

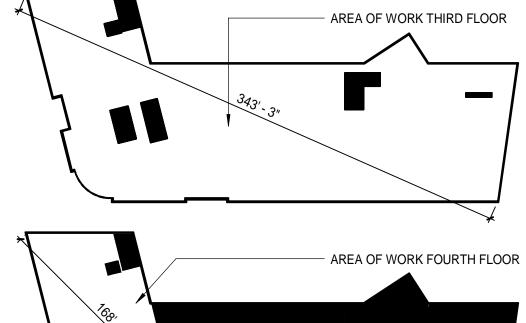
1.1 Such exit enclosures egress to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the exit enclosure.

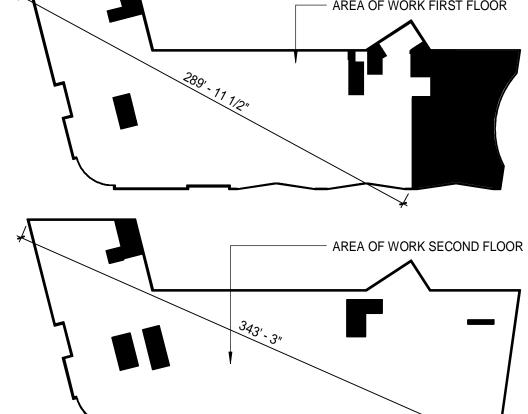
1.2 The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit 1.3 The egress path from the exit enclosure on the level of exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system

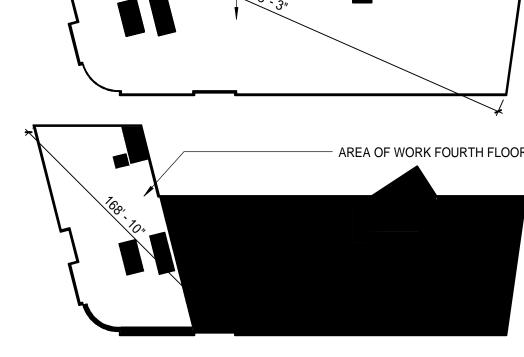
> installed in accordance with Section 903.3.1.1, or separated from the egress path in accordance with the requirements for the enclosure of











THE PROPOSED BUILDING IS AN UNSEPARATED MIXED USE CONSTRUCTION TYPE II (111) BASED ON 4TH FLOOR ASSEMBLY NFPA 13 SPRINKLER SYSTEM

Type 2A

1 hour

1 hour

1 hour

(See Table 602)

1ST FLOOR **BUSINESS USE**

2ND-3RD FLOOR **BUSINESS USE**

4TH FLOOR (INTERIOR) BUSINESS USE

508.3.2 Allowable Building Area and Height

Chapter 6 - Types of Construction

Rating of Building Elements, IBC Table 601

No separation is required between nonseparated occupancies.

Table 601 - Fire Resistance Ratings for Building Elements

Floor Construction and secondary members: 1 hour

Noncombustible materials, Fire Retardant Treated Wood (FRTW) is permitted in

limited uses. Other combustible materials are permitted as outlined in Section

Openings in a shaft enclosure shall be protected in accordance with Section 715 as

required for fire barriers. Doors shall be self or automatic-closing by smoke

Penetrations other than those necessary for the purpose of the shaft shall not be

Not required per Exception No. 4 "...building is protected by an automatic sprinkler

Roof Construction and secondary members: 1 hour

Chapter 7 - Fire and Smoke Protection Features

detection in accordance with 715.4.8.3

708.14.1 Elevator Lobby Enclosure

system in accordance with Section 903.3.1.1"

708.8.1 Penetration

508.3.3 Separation

Building Element

Bearing Walls

Exterior:

Interior:

Exterior:

Interior:

Primary Structural Frame:

602.2 Type II Construction

Nonbearing Walls and Partitions:

	•				•	
OCCUPANCY LOAD	wc		LAVATORIES		DRINKING FOUNTAIN	
	REQ	PROVIDED	REQ	PROVIDED	REQ	PROVIDED
1ST FLOOR 20,634 SF/ 100 SF = 207	6	13	6	9	2	2
2ND - 3RD FLOOR 30,353 SF/ 100 SF = 314	8	16	8	8	3	4
4TH FLOOR 9,336 SF/ 100 SF = 94	3	9	3	5	1	2

2015 International Plumbing Code - SECTION 403, TABLE 403.1

KEY PLAN /

SCOPE

NOT IN SCOPE

DESCRIPTION **ISSUED FOR PERMITTING** 02-05-2017 **CURRENT ISSUE STATUS:**

PROJECT NORTH:

SMRT Architects and Engineers 144 Fore Street/P.O. Box 618 Portland, Maine 04104

ARCHITECTURE ENGINEERING PLANNING INTERIORS ENERGY

CORPORATE HEADQUARTERS PORTLAND, ME

CODE SUMMARY AND KEY PLAN

0" 1/4" 1/2" 1" 2"

PROJECT MANAGER: GWV PROJECT NO:

SHEET TITLE:

SMRT FILE: A-001-17120-01 SHEET No.

NOT FOR CONSTRUCTION