

**FIRE AND LIFE SAFETY CODE REVIEW AND ANALYSIS**

**Project Description:**  
The Project consists of 90,000 s.f. of interior alteration/fit-up in a newly constructed 4-story 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, tables, 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, 2008  
**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 Residential Buildings

**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  
NFPA: Chapter 22 - New Detention and Correctional Occupancies - Use Condition 1

**Specific Occupancy Areas/Hazardous Area Protection:**

IBC: Chapter 5, Table 508.2  
NFPA Chapter 22

**Type of Construction:**  
IBC: Type II A  
NFPA 101: Type II (111)

**Roof Type:**  
IBC: 503.2.1  
NFPA 101: 503.2.1

**1st Floor:** 30,625 SF

**2nd Floor:** 31,353 SF

**3rd Floor:** 31,353 SF

**4th Floor:** 9,336 SF

**TOTAL:** 95,666 SF

**CODE SUMMARY:**

Chapter 3 - Use and Occupancy Classification Mixed Use  
303.1 Assembly Group A-3  
304.1 Business Group B  
Roofop Assembly Space  
Office at Levels 1-4

**Chapter 5 - General Building Heights and Area**

**Table 503 Allowable Building 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, 21,500 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) 4 stories  
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 x R]) + [At x Is]

Table 503 for Type 2A Construction, B Business Use  
Aa = 37,000 sf + 0 + (37,000 x 2)  
Aa = 111,000 sf allowable building area per story

**506.3 Automatic Sprinkler System Increase**

Approved Automatic Sprinkler System in accordance with Section 903.3.1. More than one-story 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: 21,500 + (2 x 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 = 0.658602  
Second Floor: 31,353 / 46,500 = 0.674258  
Third Floor: 31,353 / 46,500 = 0.674258  
Fourth Floor: 9,336 / 46,500 = 0.200774

**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.

**508.3.2 Allowable Building Area and Height**

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 of construction of the building in accordance with Section 503.1

**508.3.3 Separation**

No separation is required between non-separated occupancies.

**Chapter 6 - Types of Construction**

**Table 601 - Fire Resistance Ratings for Building Elements**  
Rating of Building Elements, IBC Table 601

**Building Element Type 2A**

**Primary Structural Frame:** 1 hour  
**Bearing Walls:** 1 hour  
**Exterior:** 1 hour  
**Interior:** 1 hour  
**Nonbearing Walls and Partitions:** (See Table 602)  
**Exterior:** 0 hour  
**Interior:** 0 hour  
**Floor Construction and secondary members:** 1 hour  
**Roof Construction and secondary members:** 1 hour

**602.2 Type II Construction**

**Noncombustible materials, Fire Retardant Treated Wood (FRTW) is permitted in limited uses. Other combustible materials are permitted as outlined in Section 603.1.**

**Chapter 7 - Fire and Smoke Protection Features**

**708.4 Openings**

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 detection in accordance with 715.4.8.3

**708.8.1 Penetration**

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

**708.14.1 Elevator Lobby Enclosure**

Not required per Exception No. 4.1, building is protected by an automatic sprinkler system in accordance with Section 903.3.1.1

**713 Penetrations**

**713.1.1 Penetrations of fire resistance rated walls by ducts (not protected by dampers):** 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**

**714.1.1 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-resistance 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**

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

NOTE: ALL FINISH MATERIALS TO BE CLASS A FIRE RATED

**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 sprinkler system

**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 approved by the fire code official.  
• Where roof slope is less than 4:12 each standpipe shall be provided with a hose connection either on the roof or the highest landing of a stairway with stair access to roof  
• On each side of the wall adjacent to exit opening of horizontal exit (not required where hose stream is reachable)

**906 Portable Fire Extinguishers** Required in Group A, B, and M Occupancies: provided in accordance with NFPA 10  
• Exception: In Group A and B Occupancies extinguishers only required on each floor areas over 50 occupants

**907.1 Group A:** Manual fire alarm system with occupant notification system required in areas over 50 occupants

**907.2.2 Group B:** Manual fire alarm system required.

**907.2.7 Group M:** Manual fire alarm system required.

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

**912.1.1 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).

**Chapter 10 - Means of Egress**

**1004 Occupant Load**

Means of Egress, (IBC Chapter 10, NFPA Chapter 22)  
**Table 1004.1 Maximum Floor Area Allowances Per Occupant**

Occupancy	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

**1005 Egress Width**

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

**1021 Number of Exits and Continuity**

**Table 1021.1 Minimum Number of Exits for Occupant Load**

Floor	Occupant Load	Min Number of Exits
1st Floor (B)	257	2
1st Floor (M)	334	2
2nd Floor	314	2
3rd Floor	314	2
4th Floor (B)	314	2
4th Floor (A-3)	506	3

**1022 Exit Enclosures**

**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

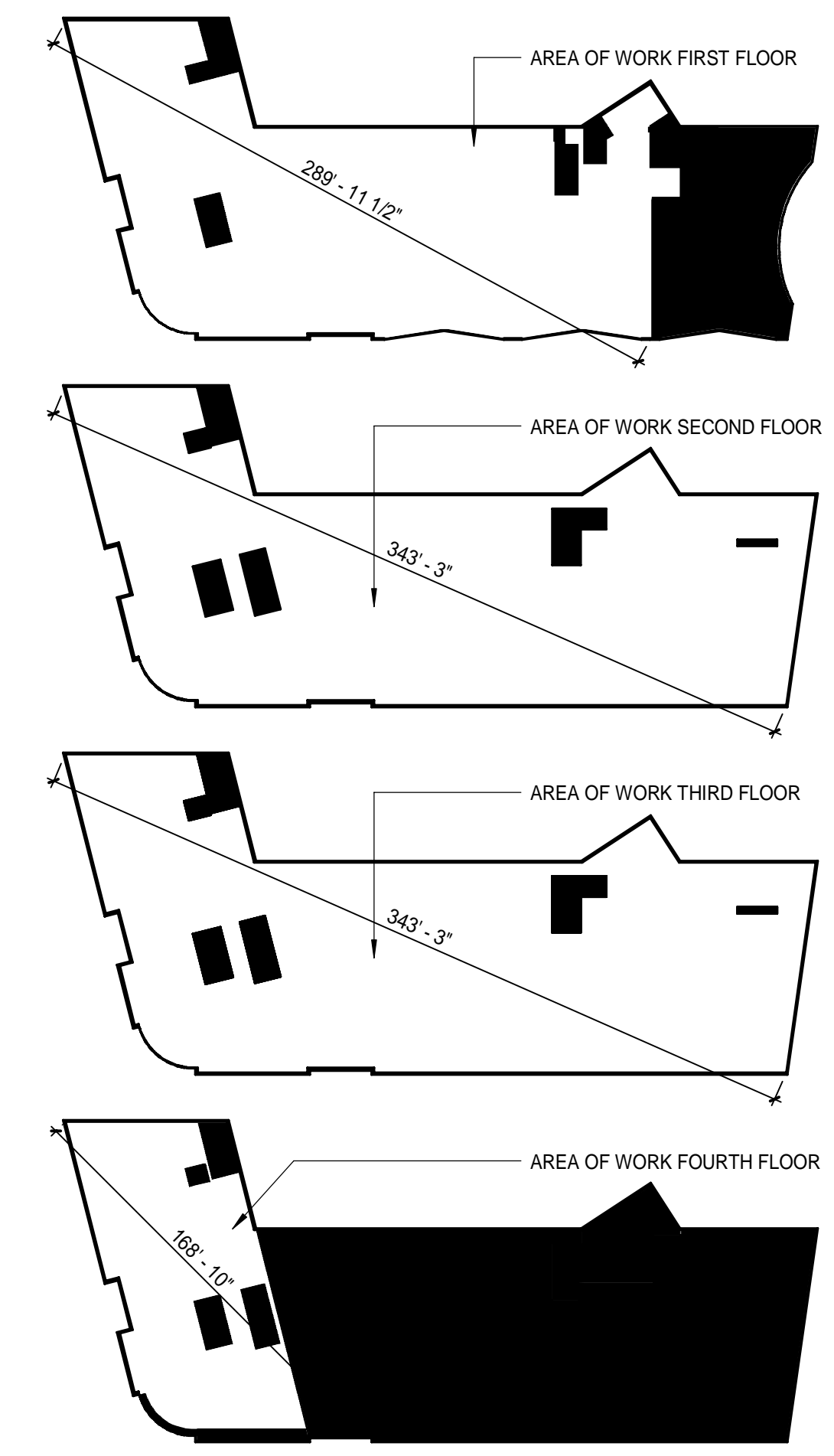
• 44" min. width  
• Walls, floor, and ceilings shall be of not less than 1 hour fire resistance rated construction and constructed as fire barriers in accordance with Section 707.

**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 following are met:

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 enclosure.  
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 exits.



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

1ST FLOOR BUSINESS USE  
2ND-3RD FLOOR BUSINESS USE  
4TH FLOOR (INTERIOR) BUSINESS USE

	WC		URINALS		LAVATORIES		DRINKING FOUNTAIN			
	REQ	PROVIDED	REQ	PROVIDED	REQ	PROVIDED	REQ	PROVIDED		
1ST FLOOR 25,624 SF/ 100 SF = 257 M 120 F 127	3	8	4	8	2	3	4	5	2	2
2ND - 3RD FLOOR 30,353 SF/ 100 SF = 314 M 157 F 157	3	8	4	8	2	4	4	4	3	4
4TH FLOOR 9,336 SF/ 100 SF = 94 M 47 F 47	1	3	2	5	1	2	1	1	2	3

2015 Uniform Plumbing Code - TABLE 422.1

**CODE SUMMARY**

12" = 1'-0"

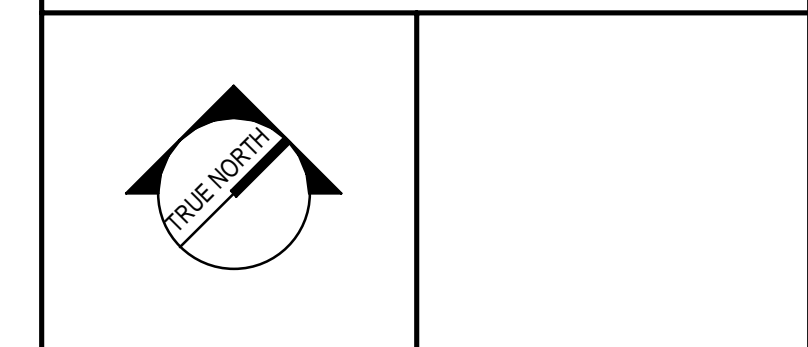
**KEY PLAN**

1/84" = 1'-0"

REV	DESCRIPTION	DATE
1	PERMITTING ADDENDUM NO. 1	03-15-18

PERMITTING ADD. 1  
03-15-2018

CURRENT ISSUE STATUS:



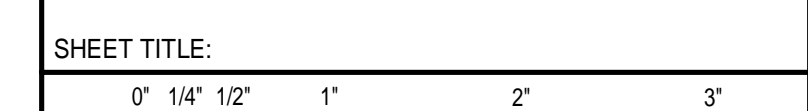
PROJECT NORTH:  
SMRT Architects and Engineers  
144 Fore Street/P.O. Box 618  
Portland, Maine 04104

ARCHITECTURE | ENGINEERING | PLANNING | INTERIORS | ENERGY  
**SMRT**

**WEX**  
CORPORATE HEADQUARTERS

PORTLAND, ME  
**CODE SUMMARY AND KEY PLAN**

SHEET TITLE:



SCALE: AS NOTED

PROJECT MANAGER: GWV PROJECT NO: 17120-01

A/E OF RECORD: GWV

JOB CAPTAIN: CBM

DRAWN BY: CBM

SMRT FILE: A-001-17120-01 SHEET NO. **A-001**

NOT FOR CONSTRUCTION