

**Code Review:**

Applicable Building Codes: BOCA National Building Code, 1999  
Architectural Access Board Regulations 521 CMR  
NFPA 101 Life Safety Code 1997 Edition  
(All code section references to BOCA, 1999, unless noted otherwise.)

**Notes:** The proposed work consists primarily of an addition to the existing building, at the third, fourth, and fifth floor levels only. The addition will be supported by existing structure that was designed in 2000 to carry the addition. Alterations to the existing construction are limited to:

- Preparation of the hoistway for installation of an elevator, and the elevator machinery and cab.
- Mechanics and electrical system alterations.
- Installation of new handrails and handrails on Stair #6 for its entire height for code performance.

**A. USE GROUP CLASSIFICATION:**

- CATEGORY OF USE: Business
- USE GROUP: (302) B (304.0) (Laboratories - testing and research)
- Specific Occupancy Areas (Table 302.1.1)  
(None applicable to the proposed construction.)
- OCCUPANCY SEPARATION:  
New areas to be proposed construction as no mixed use groups proposed.  
Adjustments for sprinklers 2 hrs (313.1.2)  
Adjustments for sprinklers 1 hr w/ Sprinkler (313.1.2)

**B. CONSTRUCTION CLASSIFICATION**

- TYPE OF CONSTRUCTION:  
Existing to Remain: 2B (Protected non-combustible)  
New Construction: 2B (Protected non-combustible)

**C. FIRE RESISTANCE RATINGS:**

- Fire Resistance Ratings as follows: (602)
- Exterior Wall, with fire separation, Non-load-bearing (Table 705.2)  
Greater than 5-10 feet w/ sprinklers  
Greater than 10 feet w/ sprinklers
  - Fire Separation Assemblies (per 705.1, see also 602, 617.0.3 and 1014.11)
  - Shells (Table 710.3)
  - Exit
  - Exit Stairways (1014.11)
  - Exit Access Corridors (Table 1011.4) w/ sprinklers
  - Smoke Barriers and tenant separations
  - Load Bearing Partitions & Columns
  - Non-Bearing Partitions
  - Floor Construction (including beams)
  - Roof Construction (less than 15' a.f.f.)  
(w/ roof structure 15 to 20' a.f.f.)  
(w/ roof structure 20' or more a.f.f.)

**D. SPECIAL USES AND OCCUPANCIES (Article 4)**

- HAZARDOUS MATERIALS (417.0)  
a. Specific requirements for hazardous materials will be developed with interior construction to be permitted separately. The following requirements will apply.  
b. Interior construction and operations shall comply with section 417.0 as applicable to use group B.  
c. Amounts of hazardous materials per control area shall not exceed exempt amounts per Tables 307.5(1) and 307.8(2). Number of control areas, fire-resistance ratings of control areas, and percentage of exempt amounts per control area shall comply with Table 417.2.

**E. BUILDING LIMITATIONS**

- Allowable Height Calculation:  
a. Height limitation from Table 503 for Use group B = 5 stories, 65 feet.  
b. Height increase for sprinkler (504.2) 1 story, 20 feet.  
c. Modified height limitation = 6 stories, 85 feet.

**F. Allowable Area Calculation:**

- Area limitation from Table 503 for Use group B = 22,500 SF per floor  
Retain for height (Table 506.4) for 5 stories = 30%  
Increase for sprinklers (506.3) = 100%  
Increase for street frontage (506.2) = 60%  
Modified area limitation = 91,850 SF per floor

**G. EXTERIOR WALL FIRE RESISTANCE REQUIREMENTS (TABLE 705.2):**

Allowable	Existing to remain	Proposed Addition	Proposed Total
Height (stories)	5	5	NA
Height (feet)	85	76	69
Area (footprint)	51,850 SF	27,848 SF*	9,327 SF

- \* Maximum horizontally projected area of building (ie. footprint).
- \*\* The vertical addition above existing floor area will not increase maximum projected area of the building.

**H. CATEGORY OF USE:**

- FIRE SEPARATION DISTANCE:  
Hours Table 705.2, as modified by 705.2.3:  
a. Fire separation distance 0 to 5 feet 2 1  
b. Fire separation distance 5 to 10 feet 1 0  
c. Fire separation distance 10 to 15 feet 0 0

**I. FIRE RESISTANCE RATING OF STRUCTURAL MEMBERS (716.0):**

- Requirements: The fire-resistance rating of structural members and assemblies shall not be less than the rating required for the assemblies supported.
- Protection of Structural Members: Columns, beams or other structural members which are required to have a fire resistive rating and support more than two floors shall be individually protected on all sides for the full length and height with materials having the required fire resistance rating. All other structural members shall be protected by individual encasement, or by membrane or ceiling protection.

**G. EGRESS REQUIREMENTS:**

- Notes:  
a. Basement, Ground Floor, and Second Floor are existing to remain without modification and thus are not calculated.  
b. Calculations for Third Floor include existing space which connects to the addition, but not existing space which to remain and does not share egress paths.  
c. Calculations for Fourth and Fifth floors do not include existing occupiable space as none is adjacent to the addition.
- Calculations based on 100 sq. ft. per occupant (Table 1005.1.2)

Third Floor	Area	Occupancy
Existing area	8,547 SF	86
New area (addition)	9,273 SF	92
Third Floor TOTAL	17,820 SF	178

Fourth Floor	Area	Occupancy
New area (addition)	9,273 SF	92

Fifth Floor	Area	Occupancy
New area (addition)	9,273 SF	92

- EGRESS WIDTH (MSBC Table 1009.2)  
Egress width per occupant (with sprinklers) 0.2 inches at stairways  
Egress width per occupant (with sprinklers) 0.15 inches at doors, ramps and corridors

- EGRESS WIDTH (for stairs)
- | Occupants    | Total required | Total Provided         |
|--------------|----------------|------------------------|
| Third floor  | 35.6 in.       | 135" (in three stairs) |
| Fourth floor | 15.4           | 96 in. (in two stairs) |
| Fifth floor  | 18.4           | 96 in. (in two stairs) |

- EGRESS WIDTH (for doors)
- | Occupants | Required         | Provided      |
|-----------|------------------|---------------|
| New area  | 13.8 (all doors) | 36 (per door) |

- NUMBER OF EXITS REQUIRED: (Table 1010.2)

Occupancy Load	50 or less	51 to 500
Minimum No. Exits	1	2

Third floor	Number required	Number Provided
Occupants	2	3

Fourth floor	Number required	Number Provided
Occupants	2	2

Fifth floor	Number required	Number Provided
Occupants	2	2

- MAXIMUM LENGTH OF EXIT ACCESS TRAVEL: 250 ft. with sprinklers (Table 1006.5)

- MINIMUM EXIT SEPARATION DISTANCE (With sprinklers): One-fourth of the maximum overall diagonal dimension of area served. (1006.4.1)

- DEAD END CORRIDOR  
Maximum Dead-End Corridor Length (1011.2) = 20 ft. (or 2.5 times the min. corridor width)

- EGRESS PASSAGEWAY  
Minimum Egress Passage/Corridor Width (1011.3)  
Occupancy Served Width (in.)  
50 or less 36 min.  
50 or more 44 min.

- EXIT PASSAGEWAYS (1011.3)  
Minimum Width = 44 inches or minimum by 1009.0

- EXIT DOORS  
a. Door Opening width:  
Minimum Clear Width: 32" (1014.8.1.1)  
All doors to be min. 36" wide

- Door swing in direction of travel for occupant load of 50 or more (616.1)  
(Egress doors shall swing in direction of egress)
- Panic hardware. Required for doors serving area with occupant load of 100 or more.  
(Corridor doors, and doors at exits to have panic hardware)

- STAIRWAYS (1014.0):  
a. Minimum egress width: 44 inches  
b. Minimum landing width not less than required stair width, need not exceed 4'-0" when stair has straight flight

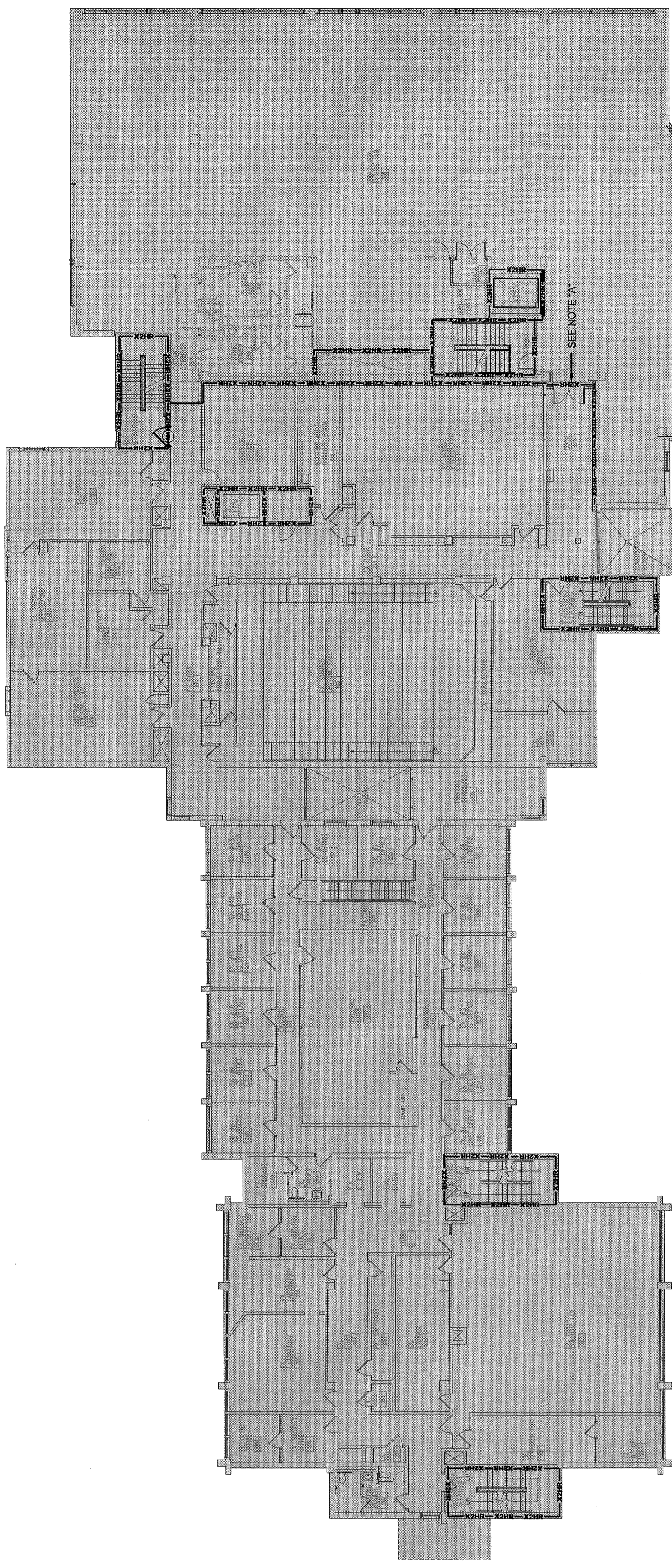
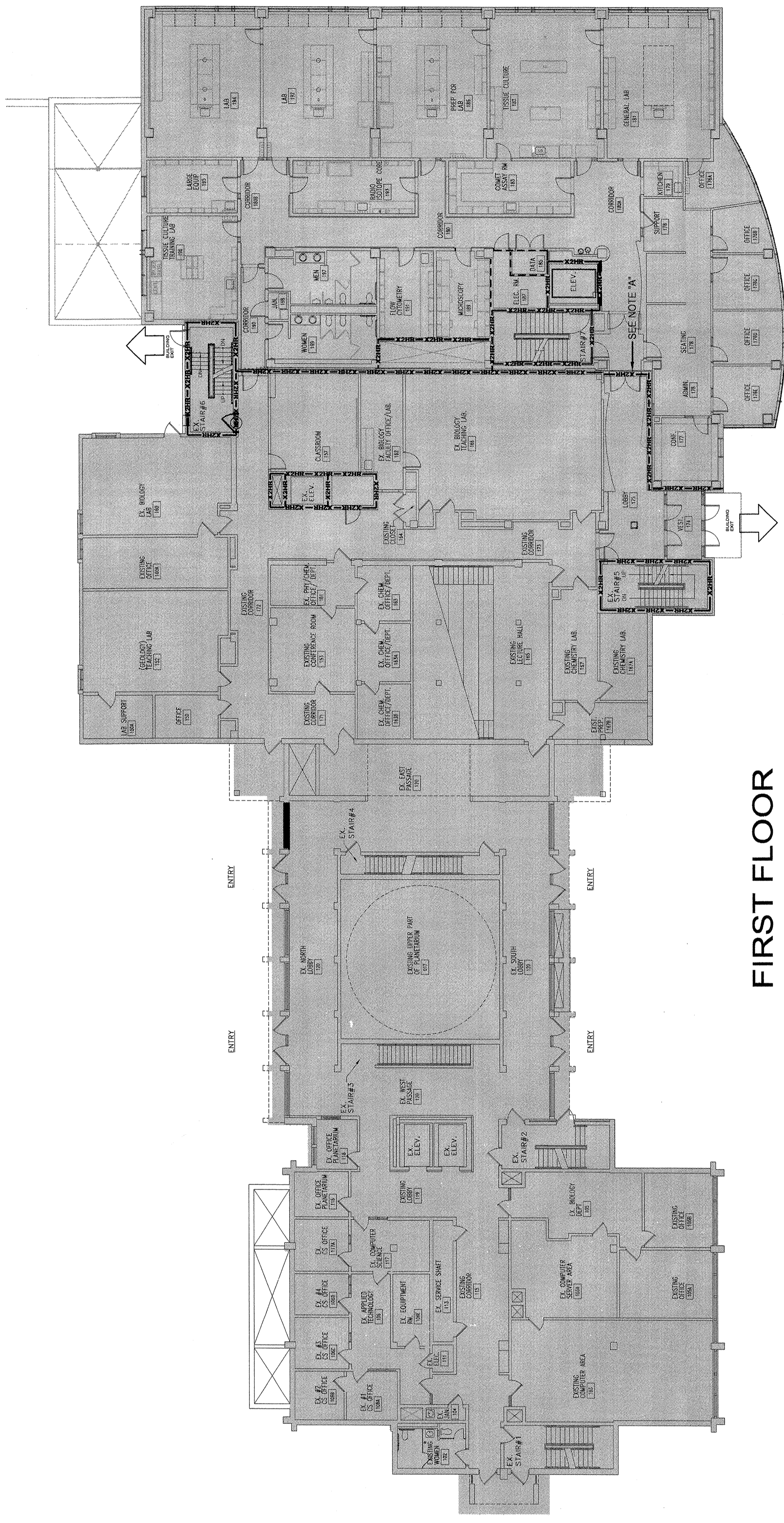
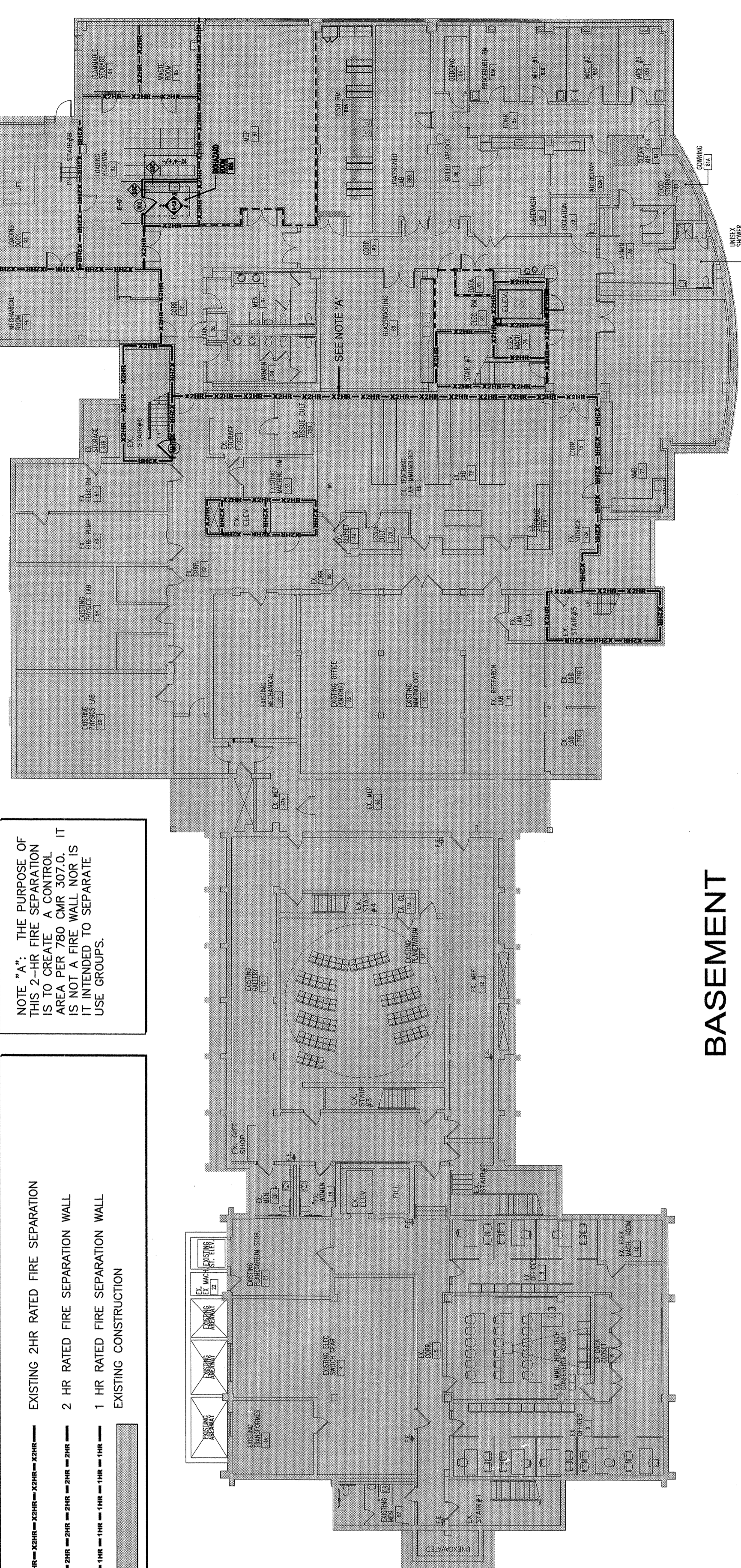
- Headroom: 6'-8" minimum  
c. Vertical rise per run: 12'-0" maximum  
d. Riser height: 7" maximum  
e. Tread depth: 11" minimum  
f. Dimensional variation: 3/16" maximum between adjacent risers/heads  
g. Handrails and guards: 36" See Section 9 & 10 below  
h. Egress doors: 24" min. clear width @ 90 per ADA-JFAS 4.13.5, MSBC  
i. Egress doors: 24" min. clear width @ 90 per ADA-JFAS 4.13.5, MSBC  
(Door swing cannot encroach egress width more than one-half when opening)  
j. Roof access from stair (1027) is required in buildings greater than 3 stories in height

- HANDRAILS (1022.0):  
a. Maximum Handrail Projection 3/8 inches into allowable egress width  
b. Handrail Height 34"  
c. Handrail Length at Landing: 12" horizontally beyond top riser  
(Continue to slope for depth of one tread beyond bottom riser)

- STAIRWAY HANDRAIL GRIP: 1 1/2" diameter minimum  
2" diameter maximum

- GUARDRAILS (1021.0):  
a. Height: 42" minimum to top of rail  
b. Opening Limits: 4" sphere not to pass thru any opening  
c. sphere not to pass through triangular opening at stair riser, tread and bottom rail.

- PLUMBING FIXTURES  
1. The minimum fixtures per floor shall be provided according to interior construction drawings to be permitted separately.

**SECOND FLOOR****FIRST FLOOR****BASEMENT**

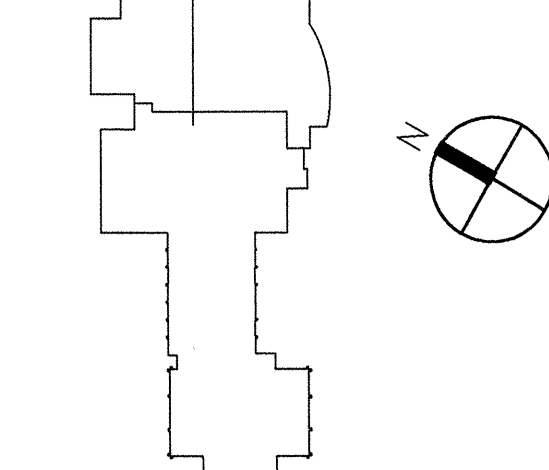
**NOTE: "A": THE PURPOSE OF THIS 2-HR FIRE SEPARATION AREA PER 784.0 OR 307.0. IT IS NOT A FIRE WALL NOR IS IT TO BE SEPARATE USE GROUPS.**

**LEGEND**  
 --- EXISTING 2HR RATED FIRE SEPARATION  
 --- 2 HR RATED FIRE SEPARATION WALL  
 --- 1 HR RATED FIRE SEPARATION WALL  
 --- EXISTING CONSTRUCTION

SCALE: 1/16"=1'-0"  
 DRAWN BY: JJ  
 CHECKED BY: PROJ. ARCH. ENGR. EAP  
 PROJ. MGR. RCH  
 JOB NO. 034610  
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**A0.1**

**SMMA**  
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OWNER REVIEW  
 NAME \_\_\_\_\_ DATE \_\_\_\_\_

ISSUE LOG  
 NO. 0 DATE 02.20.04 CONSTRUCTION  
 DESCRIPTION

UNIVERSITY OF SOUTHERN MAINE  
 SCIENCE CENTER FOR FORECASTING  
 FORECASTING MAINE  
 LEONARD ARCHITECT  
 EDWARD R. ARCH. ENGR.  
 REG. NO. 10003

**LIFE SAFETY PLAN/SUMMARY**