

Life Safety Egress Compliance Study for Montague County Courthouse

Prepared by BYSP Architects
January 20, 2017



Introduction:

Following meeting and tour of the Montague County Courthouse by representatives of the Texas State Fire Marshal's Office (SFMO), The Texas Historical Commission (THC), County Commissioners, the County Judge and BYSP Architects on January 5, 2017, it was concluded that a Code Compliance Study and Equivalency Evaluation per the currently adopted 2012 Edition of NFPA 101 Life Safety Code should be performed. This study would assist in the determination of a solution to the fire egress issues noted in the SFMO's report dated July 13, 2016. The SFMO will use this study in determining if the means of egress modifications discussed in the tour will adequately solve the current deficiency.

This study is not intended to be an exhaustive code study and is limited to the general egress requirements of the 2012 NFPA 101 Life Safety Code as needed to determine the number of required exits. Evaluation is based on Chapter 39, Existing Business Occupancy, and Section 43.10, Historic Buildings.

Building Description:

The Montague County Courthouse is a Classical Revival Courthouse consisting of a four story load-bearing concrete and masonry structure constructed in 1913 with partial wood-framing at the sloped Mansard roofs. In 1986, an elevator was added in-filling the central atrium, mechanical systems were modernized, and various renovations were made to meet accessibility requirements. Automatic fire and smoke alarm detection systems are currently being installed along with means of egress lighting.

Gross Area:

(area within the exterior walls)
First Floor – 8,025 sf
Second Floor – 7,725 sf
Third Floor – 7,725 sf
Fourth Floor – 5,925 sf
Total Area – 29,400 sf

Floor Heights:

First Floor – 4'-6" Below Grade
Second Floor – 5'-2" Above Grade
Third Floor – 18'-2" Above Grade
Fourth Floor – 31' Above Grade
Attic – 41'-10" Above Grade
Dog House – 51'-10" Above Grade

Occupancy Type:

Business

Occupant Load:

(Business Use – 100sf/occupant)
First Floor – 80 occupants
Second Floor – 77 occupants
Third Floor – 77 occupants
Fourth Floor – Authorized personnel only
Total Occupant Load – 237 Occupants

Construction Type:

Type III (200) – Exterior walls and structural elements are non-combustible, roof is wood framed.
No minimum construction type required for existing buildings (39.1.6).

Egress:

Exit Access Corridors: No required fire resistance rating in existing buildings (7.1.3.1).
Exit Stair Enclosures: Stairways in historic buildings serving more than two adjacent stories shall be enclosed (43.10.4.7.1). Enclosed stairways require 1 hour fire resistance rating (7.1.3.2). The existing unenclosed stairway serves four stories.
Number of Exits Required: No less than two separate exits shall be provided on every story (39.2.4.1 (2)).
Number of Exits Currently Provided:
First Floor: 2 Exits
Second Floor – 4 Exits
Third Floor – 1 Exit
Fourth Floor – 1 Exit

Travel Distance to Exits:

Allowed Common path of travel is 75' (100' for sprinklered building).
Maximum Allowed Travel Distance is 200' (300' for sprinklered building).

Approximate Actual Travel Distances (refer to attached drawings):

| | |
|--------------------------|---------|
| Fourth Floor | |
| To open stairwell | 162'-8" |
| Vertical to second floor | 60'-0" |
| Second Floor to exit | 41'-8" |
| Total: | 264'-4" |
| Third Floor | |
| To open stairwell | 96'-3" |
| Vertical to second floor | 16'-6" |
| Second floor to exit | 41'-8" |
| Total: | 154'-5" |
| Second Floor | 90'-0" |
| First Floor | 129'-0" |

Summary Evaluation:

There are several components of the courthouse that do not meet the intent of life safety requirements for an existing historical building. The most notable items are the lack of an exit stairway enclosure and no provision for a second means of egress from the third and fourth floors. In order to provide for an increased level of life safety, a second means of egress should be added at the Third Floor. To better preserve the historic character of the courthouse, a freestanding exterior fire escape stair could be built serving as a path of egress from the third floor (refer to attached drawings). The Fourth Floor could be limited to authorized personnel only and an area of refuge be added at the entrance to the fire escape stair on the Third Floor. The openings adjacent to the exterior fire escape stair should be protected to ensure safe passage along the means of egress. It is also noted that as recommended in the Preservation Maintenance Masterplan dated February 2000 by Komatsu Architecture, ultimately the installation of a fire suppression system is recommended.

Proposed Modifications:

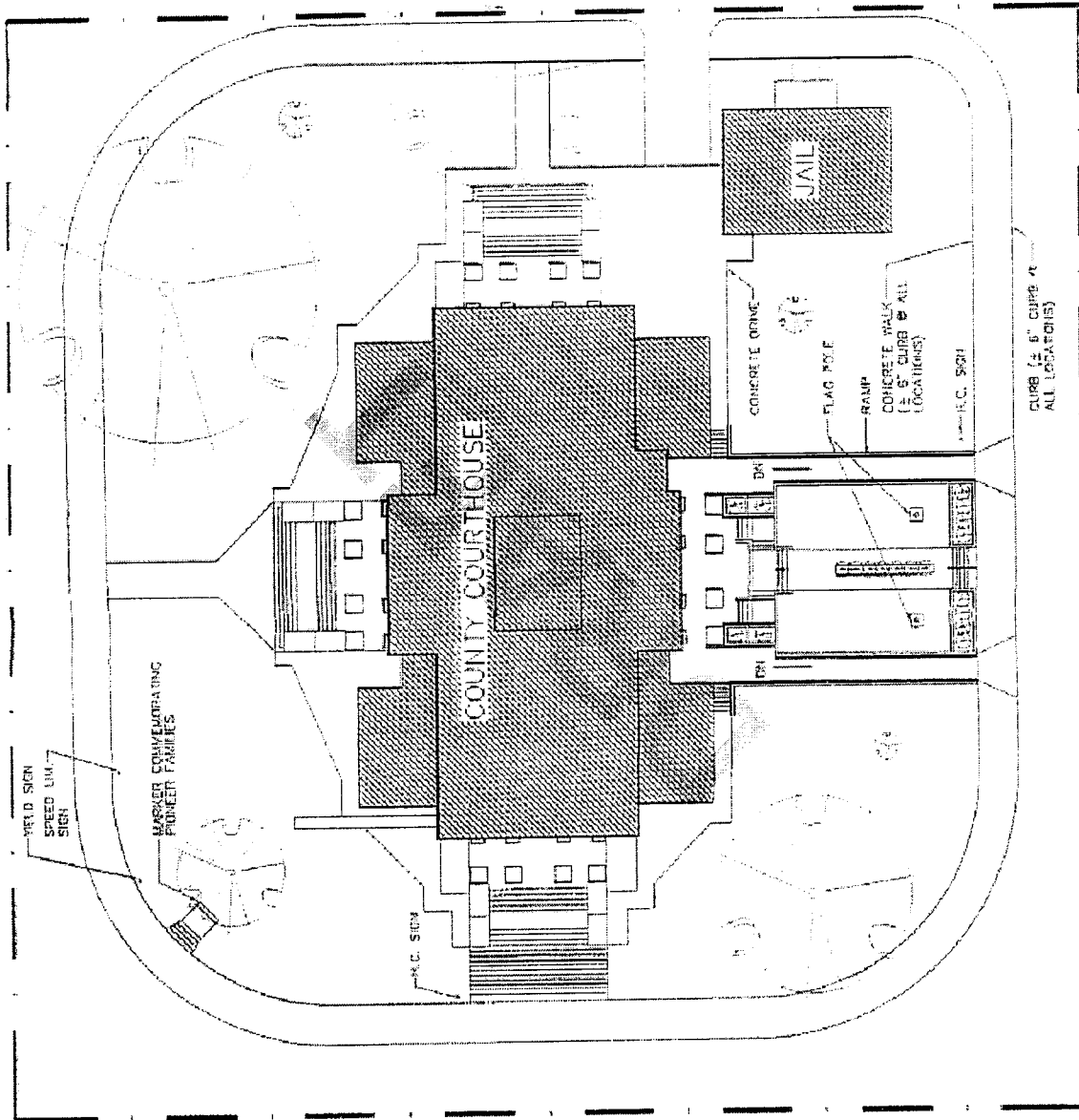
Third Floor

As discussed by all parties at the meeting January 5, 2017 the existing Parole Office (noted as Jury Room 316 on attached drawing) would be dedicated as an exit way and Area of Refuge for the 3rd and 4th Floors. The existing west fire slide would be removed from the building and replaced with an exterior fire escape stair down to the finished grade. Exterior windows adjacent to the new stair would be protected with fire glass or fire shutters.

Fourth Floor

This partial floor accessed currently by the elevator, was originally used to house jail prisoners, and will be limited to authorized personnel only and officially posted thusly. Egress from this floor will be provided through Office 400 down to the third floor where it meets the common path of egress. The distance from the bottom of the 4th floor stair to the Area of Refuge on the 3rd Floor will not exceed 75' (see attached). All doors from the 4th floor along the path of egress will remain unlocked at all times from the exit side and shall open in the direction of exit.

WASHINGTON STREET
3-WAY TRAFFIC



FRANKLIN STREET
2-WAY TRAFFIC



SITE PLAN
SCALE = 1"=30'-0"

FIRE PROTECTION LEGEND

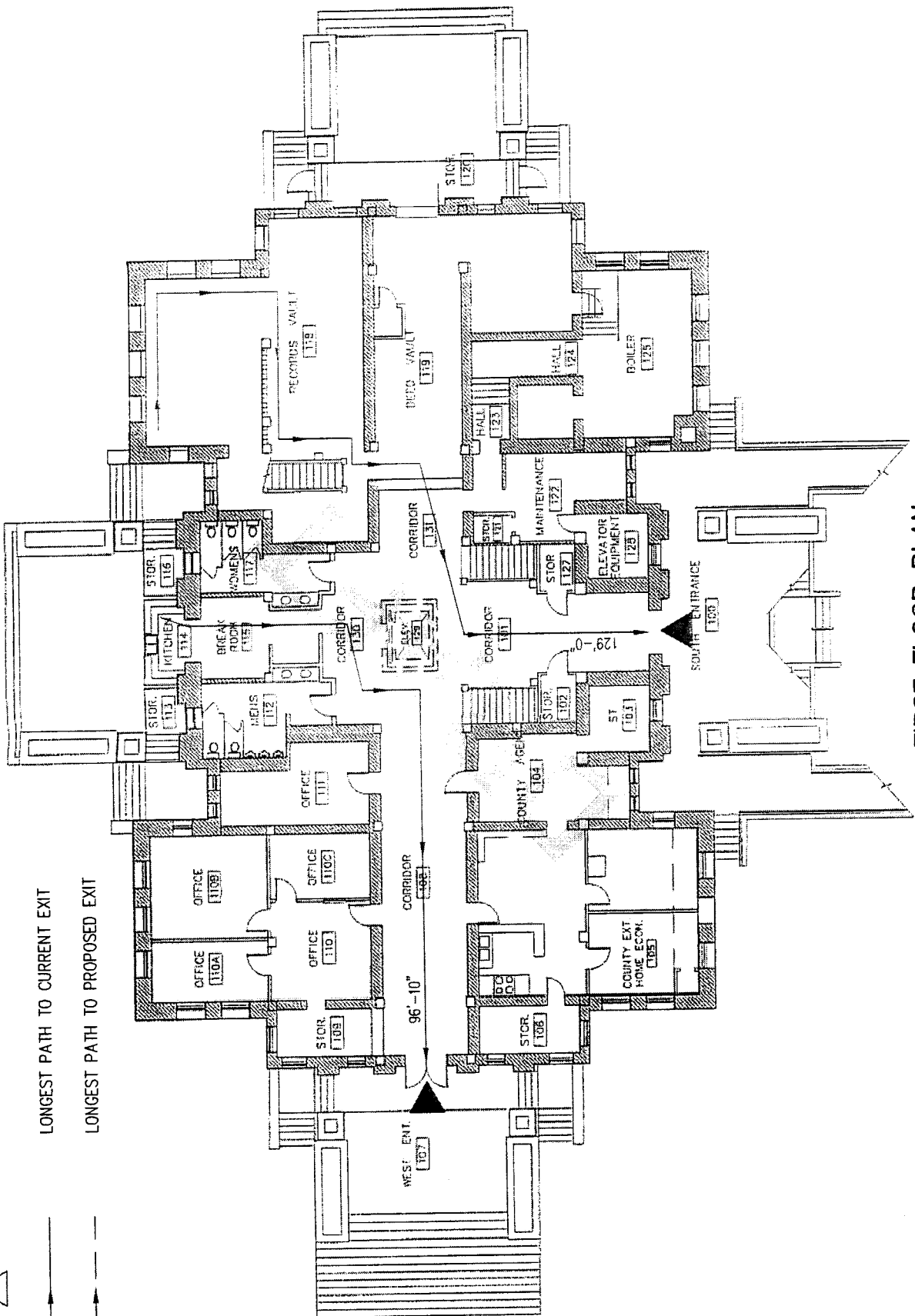


EXIT LOCATION

PROPOSED NEW EXIT

LONGEST PATH TO CURRENT EXIT

LONGEST PATH TO PROPOSED EXIT



FIRST FLOOR PLAN

SCALE = 1"=20'-0"

FIRE PROTECTION LEGEND



EXIT LOCATION



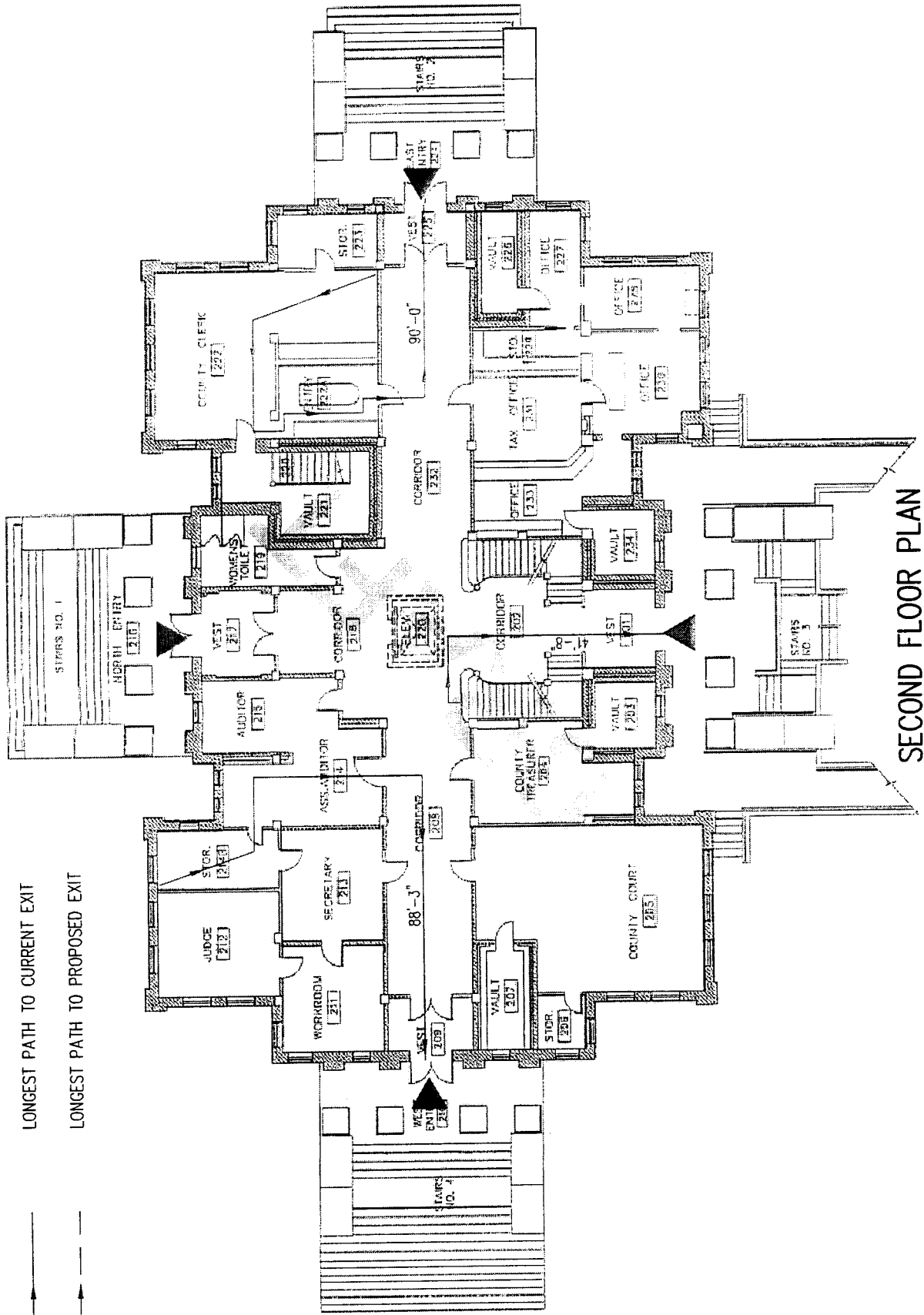
PROPOSED NEW EXIT



LONGEST PATH TO CURRENT EXIT



LONGEST PATH TO PROPOSED EXIT



SECOND FLOOR PLAN

SCALE = 1"=20'-0"

FIRE PROTECTION LEGEND



EXIT LOCATION



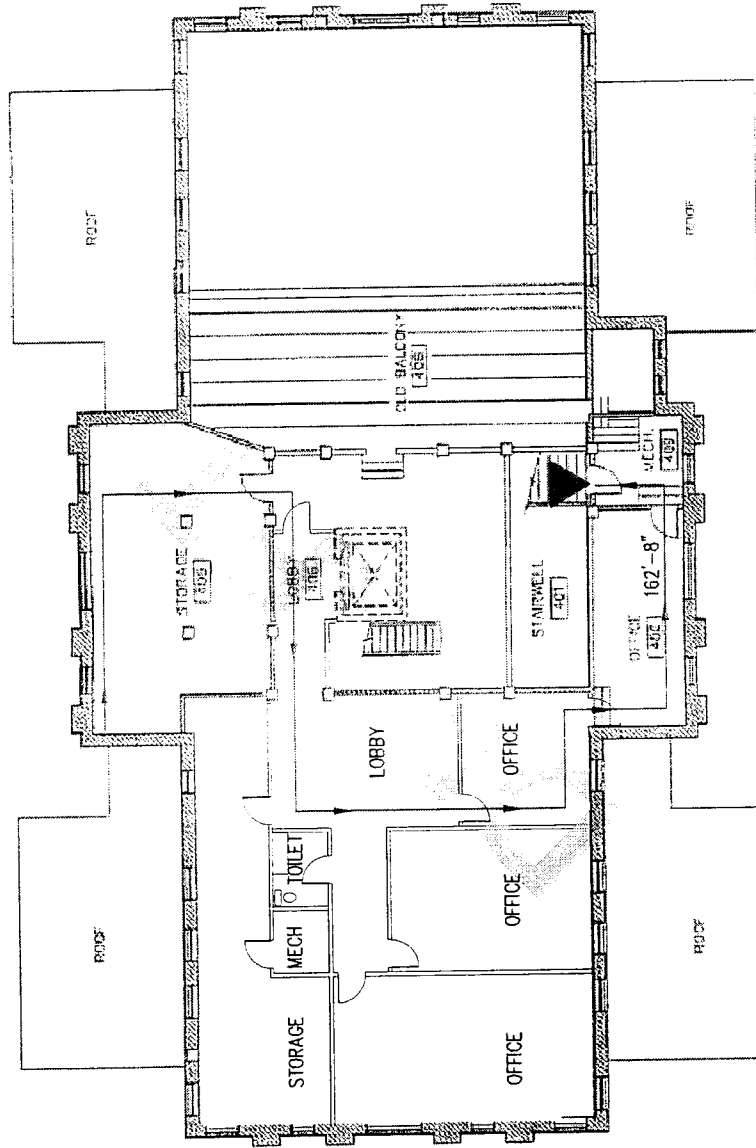
PROPOSED NEW EXIT



LONGEST PATH TO CURRENT EXIT

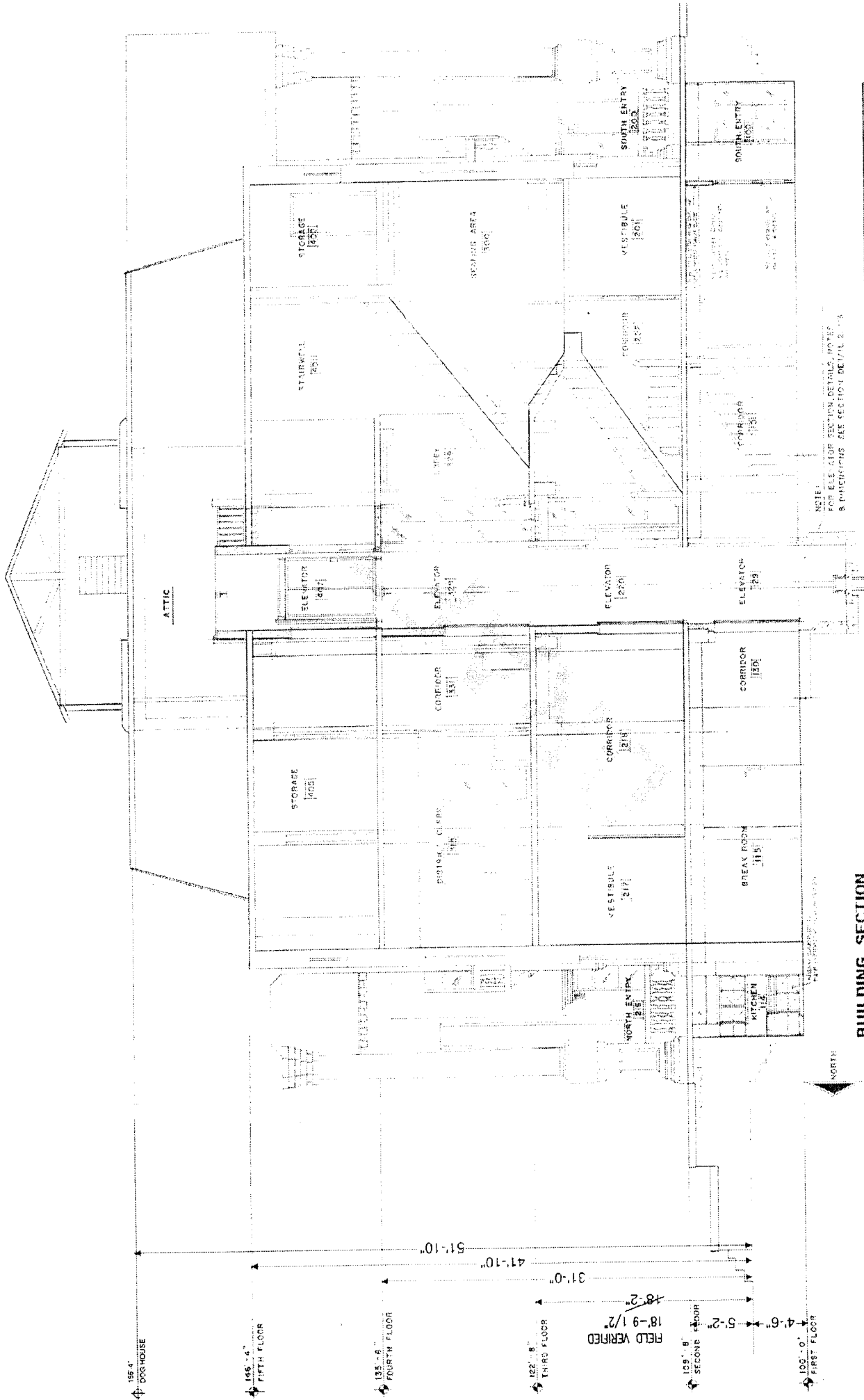


LONGEST PATH TO PROPOSED EXIT



FOURTH FLOOR PLAN

SCALE = 1" = 20'-0"



NOTE:
FOR ELEVATION SECTION DETAILS REFER
TO ARCHITECTURAL SECTION DETAIL 2.1.1.8

BUILDING SECTION

VERTICAL TRAVEL DISTANCE:
 FOURTH FLOOR TO SECOND FLOOR: 60'-0"
 FOURTH FLOOR TO THIRD FLOOR: 16'-6"
 THIRD FLOOR TO SECOND FLOOR: 34'-6"

BUILDING SECTION

SCALE = 3/32"=1'-0"