

5/12/2019 9:07:59 AM

A

B

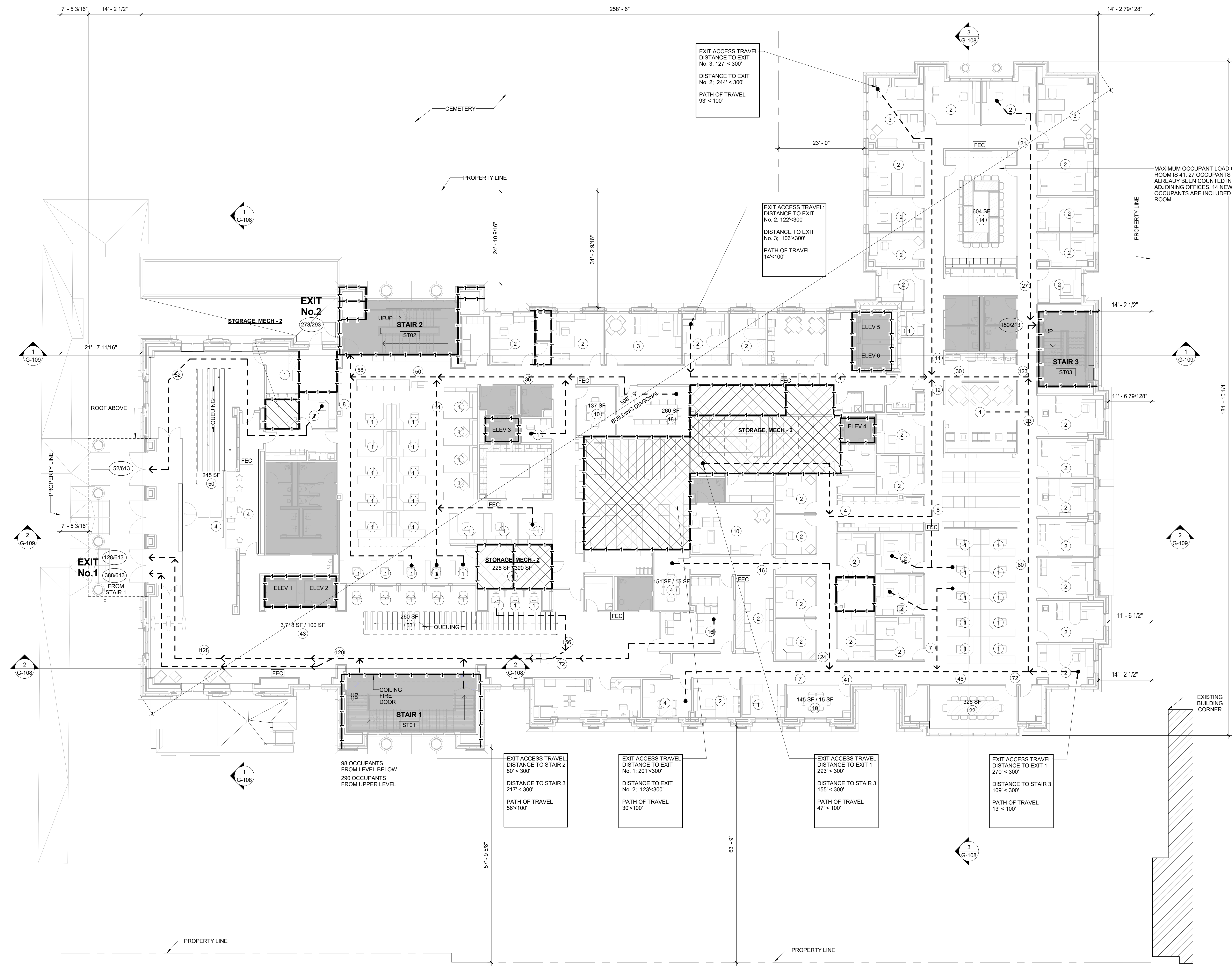
C

D

E

F

G



1 FIRST FLOOR - LIFE SAFETY PLAN
Scale: 3/32" = 1'-0"

USE GROUPS LEGEND

NOTE 1	A-3L	A-3U	I-3
A-3F	A-3N	B	S-2

- NOTES:
- AREA NOT INCLUDED IN BUILDING OCCUPANCY CALCULATIONS
 - IN ASSEMBLY ROOMS MAXIMUM OCCUPANCY SIGNS SHALL BE POSTED FOR MAXIMUM LOAD.
 - FIRE EXTINGUISHERS SHALL BE PROVIDED IN THE FOLLOWING AREAS: ELEVATOR MACHINE ROOMS MECHANICAL ROOMS LOW VOLTAGE DATA COMM ROOMS.

SYMBOL LEGEND

TRAVEL DISTANCE, PATH OF TRAVEL	EXIT PATH	2 HR RATED BARRIER WALL	1 HR RATED BARRIER WALL	0 HR SMOKE TIGHT PARTITION	DIRECTION OF TRAVEL	MAXIMUM DOOR EXIT CAPACITY (ACTUAL / CAPACITY)	FIRE EXTINGUISHER CABINET
Calculating...	EXIT PATH	2 HR RATED BARRIER WALL	1 HR RATED BARRIER WALL	0 HR SMOKE TIGHT PARTITION	DIRECTION OF TRAVEL	MAXIMUM DOOR EXIT CAPACITY (ACTUAL / CAPACITY)	FIRE EXTINGUISHER CABINET

Occupancy	WC-M & WC-F	Lav-M & Lav-F	DF	SS
125 for first 50 then 150	140 for first 80 then 180			
WC 14				
LAV 9				
DF 1				
SS 1				
Occupancy	WC-M & WC-F	Lav-M & Lav-F	DF	SS
Based on 37+12= 49 occupants:				
WC 4				
LAV 4				
DF 1				
SS 1				
Occupancy	WC-M & WC-F	Lav-M & Lav-F	DF	SS
A-3	17/25 & 165	1/200	1500	1
LAV 3				
DF 1				
SS 1				
Occupancy	WC-M & WC-F	Lav-M & Lav-F	DF	SS
Based on 22+8+1= 31 occupants:				
WC 1				
LAV 1				
DF 1				
SS 1				
Total Required: WC 26	Lav 17	DF 1155.4		
Total Provided: WC 43	Lav 39	DF 1212.5		

Section 1018.4 Dead End Corridor	Required: 50 feet max.	PROVIDED: 12
Section 1021.1 MIN. NUMBER OF EXITS (PER STORY)	<1000 OCCUPANTS: 3 REQUIRED, 3 PROVIDED	
Section 1027.1 Protected path of travel	For Stair #1 exception one applies requiring the floor and structure below the public lobby to be one hour rated.	
ACCESSIBILITY ROUTE:	MIN. 1 REQUIRED - 1 PROVIDED	
ACCESSIBILITY ENTRANCE:	MIN. 1 REQUIRED - 1 PROVIDED	
ACCESSIBILITY FACILITY:	YES	
FIRE ALARM SYSTEM:	MANUAL TYPE	
HVAC SYSTEM:	FORCED AIR, CONSTANT VOLUME	

GENERAL INFORMATION

PROJECT NAME: NEW COURTHOUSE
BUILDING LOCATION: 2 CHURCH STREET, LEEBSBURG, VA 20176
OCCUPANCY: SEPARATED MIXED USE
CONSTRUCTION: YR. 2017

APPLICABLE CODES & CRITERIA

VIRGINIA CONSTRUCTION CODE (USBC)	2012
INTERNATIONAL BUILDING CODE	2012
INTERNATIONAL MECHANICAL CODE	2012
INTERNATIONAL PLUMBING CODE	2012
INTERNATIONAL ELECTRICAL CODE	2012
INTERNATIONAL ENERGY CONSERVATION CODE	2012
INTERNATIONAL FUEL GAS CODE	2012
ICC A117.1 ACCESSIBILITY	2010
ASHRAE 90.1	2007

BUILDING DESCRIPTION: COURTHOUSE, MIXED USE
OCCUPANCY - ASSEMBLY, BUSINESS, INSTITUTIONAL
STORAGE, CONSTRUCTION, MASONRY WALLS, CURTAIN WALLS, STEEL COLUMNS, COMPOSITE METAL DECKING

CODE SUMMARY

Chapter 3 - Use and Occupancy Classification
Separated Mixed Use (Section 508.4)

Primary Use and Occupancy Group:
Business Group B Office, Professional Services, Storage of Records (Section 304)
Other Use and Occupancy Groups:
Assembly Group A-3 Courtroom non-seating (Section 303)
Institutional Group I-3 Detention Center (Section 308)
(Use Condition 5)
Storage Group S-2 Low-Hazard Storage, Storage of Non-combustible Materials, Parking Garage (Section 311)

Chapter 5 - General Building Heights and Areas

Allowable Height and Building Areas [Table 503]
Type IIB Construction w/automatic sprinkler system:

ALLOWED FLOOR AREA:
B=23,000 + 46,000 = 69,000
Largest Floor Area: First Floor 24,726+69,000 Complies
A=5,500+19,000= 24,500
Largest Floor Area: Second Floor 7,123+28,500 Complies
I=10,000+20,000=30,000
Largest Floor Area: Ground Floor 4,375+30,000 Complies
S=26,000+52,000=78,000
Largest Floor Area: Ground Floor 6,503+72,000 Complies

ALLOWABLE BUILDING HEIGHT AND STORIES:
Allowable Building Height All Occupancies: 55'-0" + 20'-0" = 75'-0"
Proposed Building Height: 46'-0" < 75'-0" Complies
Proposed Building Has 3 Stories
B=3 Stories+1 Story+2 Stories Complies
A=3+2 Stories+1 Story+3 Stories Complies
I=1 Story+1 Story+2 Stories (See letter and Memo on Sheet????)
S=2+3 Stories+1 Story+2 Stories Complies

Area: Actual square footage / Allowable area

Main Building	GL	L1	L2
Accessory Storage	6,503/78,000	2,118/78,000	151/78,000
Mechanical Room			
Parking Garage	0	511/28,500	7,183/28,500
Business Areas	19,708/69,000	24,726/69,000	12,800/69,000
Institutional	4,375/30,000		1,313/30,000
Total Area(SF):	30,586/177,000	27,355/175,500	21,447/135,300
Sum of ratios:	.173	.156	.156

Table 508.4 Required Separation of Occupancies

Ground Floor	1 Hour
I-3 to B	1 Hour
I-3 to S-2	1 Hour
B to S-2	1 Hour
First Floor	1 Hour
B to S-2	1 Hour
Second Floor	1 Hour
A-3 to B	1 Hour
I-3 to A	1 Hour
S-2 to I-3	1 Hour
S-2 to B	1 Hour

Chapter 6 - Types of Construction

Type IIB
Fire-Resistance Rating Requirements for Building Elements (hours) (Table 601)

Structural Frame	Exterior	0
Bearing Walls:	Interior	0
Nonbearing Walls and Partitions:	Exterior	Per Table 602 @ +30 ft = 0
Fire Separation Distance:		
< 5		1
< 5 < 10		1
< 30		0
Nonbearing Walls and Partitions:	Interior	0
Floor Construction		0
Roof Construction		0

Chapter 10 - Means of Egress

1003.2 Ceiling Height 7'-0" min.
1003.1.1 Headroom - 8' Min. (Doors and Closers 78")
1003.3.2 Post-mounted Objects - 4" max. (low point at 27" and high point below 80")

1004 Occupant Load
Table 1004.1.1 Maximum Floor Area Allowances per Occupant

Main Building	GL	L1	L2
Accessory Storage Areas, 1,000 GSF	23	23	2
Mechanical Equipment Room			
Parking Garage			
Assembly A-3n (CR non-seating), 140 NSF	0	0	84
Assembly A-3n (CR food-seating), 1,166 NSF	0	0	461
Assembly A-3n (Unconcentrated), 1,115 NSF	0	0	0
Assembly A-3n (Standing space), 1/5 NSF	0	103	0
Business Areas, 1,100 GSF	247	351	230
Institutional, 1/120 GSF	37	0	12

Ground Floor 307 occupants
First Floor 402 occupants
Second Floor 808 occupants
TOTAL 1,578 occupants

1005 Egress Width
Table 1005.1 Egress Width per Occupant served in inches

Stairways	0.2 w/exception USBC 1005.3.1
Other Egress Components	0.15 w/exception USBC 1005.3.2

Stairways: 44" min. clear IBC 1007.3(Exemption #1)
Other Egress Components: 32" min. clear IBC 1008.1.1

Ground Level
Stairways: 1/2 of floor on exit level
(2612 x 0.2) = 26.1" < 44" Min. Clear

See Section 1004.1.4 which requires accessible entrance to secure area.

SW#1
Stairways (SW#1) @ 70" (44" min) = 70" PROVIDED

SW#2
SW#2 is secure. Therefore, it cannot support all occupants.
(59 x 0.2) + 7.2" < 44" Min. Clear

Stairways (SW#2) @ 56" (44" min) = 56" PROVIDED

Other Egress Components (261 x 0.15) = 39.2" > 32" Min. Clear
39.2" REQUIRED

Level One
Stairways: 1/2 of floor on exit level with egress convergence
(2682 x 0.2) = 26.8" < 44" Min. Clear = 44" REQUIRED
Stairways (SW#2) @ 56" (44" min) = 56" PROVIDED
Other Egress Components (268 x 0.15) = 40.2" REQUIRED

Section 1005.6 - Egress Convergence from Level Two and Ground Floors
L2 (671) @ SW #2 x 0.15 = 100.65"
G (261) @ SW #2 x 0.15 = 39.15"
L2(100.65) + L1(44.0") + G(39.15") = 183.8" REQUIRED

4 doors @ 48" = 225.5" PROVIDED
+ 1 door @ 33.5" = 225.5" PROVIDED

Level Two
Stairways (SW#1) @ 70" (44" min) = 70" REQUIRED
+ Stairways (SW#2) @ 56" (44" min) = 56" PROVIDED
+ Stairways (SW#3) @ 48" (44" min) = 172" PROVIDED
Other Egress Components (687 x 0.15) = 103.5" REQUIRED

Section 1015 Exit Access Downways w/sprinkler system
1015.1.1 REQUIRED: 3
PROVIDED: 3

1015.2.2 Exemption 2. The separation distance REQUIRED:
311 F.L.S. = 103.6 Ft
Three exit access downways arrangements comply with requirement:
Stair 1 - Stair 3 = 85.6 Ft
Stair 2 - Stair 3 = 187.6 Ft

Section 1014 Exit Access, Common path of egress travel
Table 1014.3 w/sprinkler system
Table 1016.1 Required Provided
Group B 100 feet 45
Group A 33 feet 19
Group I 100 feet 94
Group S-2 100 feet 50

Section 1016 Exit Travel Distance w/sprinkler system
Table 1016.1 Required Provided
Group B 300 feet 194
Group A 250 feet 156
Group I 200 feet 69
Group S-2 400 feet 80

Section 1016.3 Stair 1 is not an access stair, so it must be closed.

REVISIONS

No.	Description	Date
1		

DRAWN BY: SW.MC.KK
APPROVED BY: MS
CHECKED BY: RDW
DATE: APRIL 08, 2019

TITLE: FIRST FLOOR LIFE SAFETY PLAN

PROJECT NO. 50062915

SHEET NO. G-102

Dewberry

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LOUDOUN COUNTY

Loudoun County Phase III Expansion - New Courthouse

2 Church Street
Leesburg, VA 20176

ISSUED FOR BID - VOLUME I