



CODE STUDY

Project: Jewish Community Alliance of Southern Maine, Jewish Community Center Location: Portland, Maine		Date: 4/11/2016 Project No. 15309
Building Area: 19,700 Square Feet		
Scope: New Construction	Protection: Fully Sprinkled	
No. of Stories: 1 Story	Total Building Height: 28'-0"	
Occupancy Classification: IBC <ul style="list-style-type: none"> • Education Group E – Day Care • Institutional Group I4 (Infant Room) • Assembly Group A3 • Business Group B Non-Separated Mixed Occupancy (508.1) NFPA <ul style="list-style-type: none"> • Day Care • Assembly • Business Mixed Occupancy (6.1.14.3)		Construction Type: IBC IIB NFPA II (000)



SECTION	IBC, 2009	SECTION	NFPA 101, 2009																				
Chapter 3: Use and Occupancy Classification		Chapter 6: Classification of Occupancy																					
Section 305	303 Group A(3) Assembly (Assembly Hall) 304 Group B Business 306 Group E Education 308 Group I(4) Day Care (Infant Room)	Section 6.1	6.1.2 Assembly Chapter 12 6.1.4 Day Care Chapter 16 6.1.11 Business Chapter 38																				
Chapter 5: General Building Heights and Areas																							
Section 503	General Height and Area Limitations Shall not exceed the limits of Table 503 for: Type IIB Construction <table border="1"> <thead> <tr> <th>Group</th> <th>Type</th> <th>Height/Stories</th> <th>Area</th> </tr> </thead> <tbody> <tr> <td>A(3)</td> <td>IIB</td> <td>55'(75')/2(3)</td> <td>9,500</td> </tr> <tr> <td>B</td> <td>IIB</td> <td>55'(75')/2(3)</td> <td>23,000</td> </tr> <tr> <td>E</td> <td>IIB</td> <td>55'(75')/2(3)</td> <td>14,500</td> </tr> <tr> <td>I(4)</td> <td>IIB</td> <td>55'(75')/2(3)</td> <td>13,000</td> </tr> </tbody> </table>	Group	Type	Height/Stories	Area	A(3)	IIB	55'(75')/2(3)	9,500	B	IIB	55'(75')/2(3)	23,000	E	IIB	55'(75')/2(3)	14,500	I(4)	IIB	55'(75')/2(3)	13,000		
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I(4)	IIB	55'(75')/2(3)	13,000																				
Section 504.2	Automatic Sprinkler Height Increase Increase base height by one story and 20'																						
Section 506.1	Increase Base Area due to frontage (506.2) and automatic sprinkler (506.3) using equation 5-1 Base area plus 375% 9,500 SF + 35,625 SF for most restrictive (A) Allowable area: 45,125 SF Actual area: 19,789 SF																						
Section 506.2	Frontage Area Increase Increase base area in accordance with formula: $I_f = (F/P - 0.25)W/30 = .75$ (when $W/30 = 1$ max) I_f = area increase due to frontage F = building perimeter which fronts on open space of 20' min P = entire perimeter of building W = width of public way Frontage Area Increase: 75%																						
Section 506.3	Automatic Sprinkler Area Increase Increase base area by 300% Single story, fully sprinkled																						



Section 508.1	<p>Mixed Use and Occupancy Comply with:</p> <ol style="list-style-type: none"> 1. Accessory Occupancy 2. Separated Mixed Occupancy 3. Nonseparated Mixed Occupancy <p>Building will be Non-separated Mixed Occupancy</p>	Section 6.1.14.3 Section 16.1.2.2.1	<p>6.1.14.3 Mixed Occupancies: Comply with the most restrictive requirements of Means of Egress, Construction Type, Protection.</p> <p>Day Care Occupancies shall be separated from other occupancies by not less than 1-hour fire resistant rated barriers (8.3)</p>
Section 508.2.1	<p>Accessory Occupancy Area Limitations Aggregate accessory occupancies shall not occupy more than 10% of the building area of the story in which they are located.</p>		
Section 508.2.3	<p>Accessory Occupancy Allowable Height and Area The height and area of each occupancy shall not exceed the values in Table 503 and shall be based on the allowable building area and height for the main occupancy.</p>		
Section 508.2.5	Non fire rated separation for incidental accessory occupancies(smoke barrier)		
Section 508.4.4	<p>Separated Occupancies Individual occupancies shall be separated from adjacent occupancies in accordance with table 508.4</p> <p>Using Nonseparated Occupancies</p>		See Below
Section 508.3	<p>Nonseparated Occupancies Classify individual areas by Use Group per 305 Apply most restrictive requirements of 403 (High Rise Building) and Chapter 9 (Fire Protection Systems) to entire building.</p> <p>Height/Area limitation – See above Fire Protection: Sprinkler required for Assembly, Education, Institutional</p>	Section 6.1.14.3 Section 16.1.2.2.1	<p>6.1.14.3 Mixed Occupancies: Comply with the most restrictive requirements of Means of Egress, Construction Type, Protection.</p> <p>Day Care Occupancies shall be separated from other occupancies by not less than 1-hour fire resistant rated barriers (8.3)</p>
Section 509	<p>Separation of Incidental Occupancies Table 509</p>		



Chapter 6: Types of Construction		Chapter 8: Construction and Compartmentations	
Section 602.1	Construction Classification(s) Type IIB	Section 8.2	Construction Classification(s) Type IIB,000
	Table 601 Type IIB Structural Frame Rating 0/NA hrs Bearing Walls Rating Exterior 0/NA hrs Interior 0/NA hrs Nonbearing Walls and Partitions Rating Exterior 0/NA hrs Interior 0/NA hrs Floor Construction Rating 0/NA hrs Roof Construction Rating 0/HT hrs	Section 8.2.1.1	Table A.8.2.1.1 Type II,000 / IV,2HH Structural Frame Rating 0/NA hrs Bearing Walls Rating Exterior 0/NA hrs Interior 0/NA hrs Nonbearing Walls and Partitions Rating Exterior 0/NA hrs Interior 0/NA hrs Floor Construction Rating 0/NA hrs Roof Construction Rating 0/H hrs
Chapter 7: Fire-Resistance-Rated Construction			
Section 704	Fire Resistance Rating of Structural Members 704.1 Rating as determined from table 601		
Section 707	Fire Barrier Walls Separates Shaft enclosures, exit enclosures, exit passageways, horizontal exit and incidental accessory spaces: 707.3.1 Shaft enclosures per section 713 707.3.4 Exit passageway per 1023 707.3.6 Atrium per 404 707.3.7 Incidental use per 509 707.3.9 Separated occupancies per 508 707.5 Continuity per 707 None applicable. Single story, nonseparated mixed use, sprinkled incidental use areas (smoke partition)		
Section 708	Shaft Enclosures Shaft enclosures shall be constructed as fire barriers in accordance with 707. Interior exit stairways, refuse/linen chutes, elevator hoistways. Not applicable.		



Section 709	<p>Fire Partitions Corridor walls as required by 1018.1</p> <p>Not required to be rated per Table 1018.1.</p>	Section 38.3.6 Section 16.3.6	<p>38.3.6 Corridors in Business not required to be rated in sprinkled building.</p> <p>12.3.6 Corridor and Lobby protection not required in sprinkled buildings</p> <p>16.3.6 Corridors in Day Care not required to be rated in sprinkled building, but must form smoke partitions in accordance with 8.4</p>
Section 710	<p>Smoke Barrier Smoke Barriers require a 1-hour fire resistance rating. Penetrations through smoke barriers shall comply with Section 713.</p> <p>Not applicable.</p>		
Section 711	<p>Smoke Partitions Unless required elsewhere, smoke partitions are not required to carry a fire resistance rating. The walls shall be constructed with materials consistent with rated construction for the building type.</p> <p>Not applicable.</p>		
Section 713	<p>Penetrations Penetrating items through floor and wall assemblies are permitted with the use of fire/ smoke dampers. Penetrations through floor and wall assemblies are permitted for not more than 2 stories provided the annular space is filled with an approved material to resist the passage of fire and smoke.</p>		
Section 716.5	<p>Fire Door Assemblies - Table 715.4 2 hr Fire Walls & Fire Barriers – 1 ½ hr door rating 2 hr Shaft Enclosures – 1 ½ hr door rating 1 hr Fire Barriers – ¾ hr door rating 1 hr Fire Partitions (corridors) – 20 min door rating</p>	Section 8.3.4	Minimum Fire Protection Ratings for Opening Protectives in Fire Resistance-Rated Assemblies - Table 8.3.4.2



Section 715.5	Fire Protection Rated Glazing - Table 716.6 (fire window) Any Fire Walls - Not Permitted Any Fire Barriers - Not Permitted 1 hr Incidental Use – ¾ hour rating 1 hr Smoke Barriers –¾ hour rating 1 hr Fire Partitions –¾ hour rating																		
Section 716.5.6	Fire Door Frames with Transoms and Sidelights Permitted where ¾ hour rating or less is required. May be permitted where rating exceeds ¾ hour when installed in a tested assembly.																		
Section 717	Ducts and Air Transfer Openings Fire Dampers shall have a minimum rating as specified in Table 717.3.2.1 for fire rated assemblies. 3 hour rated or less - Min 1 ½ hour rated damper.																		
Chapter 8: Interior Finishes																			
Section 803.9	Interior Finish Requirements Interior Wall and ceiling finish requirements for a sprinkled building: <table border="0"> <thead> <tr> <th><u>Group</u></th> <th><u>Vertical Exits</u></th> <th><u>Corridors</u></th> <th><u>Rooms</u></th> </tr> </thead> <tbody> <tr> <td>A3</td> <td>Class A</td> <td>Class A</td> <td>Class C</td> </tr> <tr> <td>B,E</td> <td>Class A</td> <td>Class B</td> <td>Class C</td> </tr> <tr> <td>I4</td> <td>Class B</td> <td>Class B</td> <td>Class B</td> </tr> </tbody> </table>	<u>Group</u>	<u>Vertical Exits</u>	<u>Corridors</u>	<u>Rooms</u>	A3	Class A	Class A	Class C	B,E	Class A	Class B	Class C	I4	Class B	Class B	Class B	Section 12.3.3	Corridors, Lobbies in Assembly occupancies interior wall and ceiling finish shall comply with Class A or B. Projection screens shall comply with Class A or B.
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A3	Class A	Class A	Class C																
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Section 804.4	Interior Floor Finish Classification Interior floor finish for vertical exits, exit enclosures, exit passageways, and corridors: Not less than Class II	Section 12.3.3.5	Interior floor finish in exit access corridors shall be not less than Level II.																
Section 806	Decorations and Trim Curtains, draperies, hangings and other decorative materials suspended from walls and ceilings shall be flame resistant.		16.7.4 Clothing and personal effects shall not be stored in corridors unless otherwise permitted: requirement shall not apply to corridors protected by sprinkler system.																



Chapter 9: Fire Protection Systems			
Section 903.2	Sprinklers Required per Table 903.2 A3 Required I4 Required		
Section 906.1	Portable Fire Extinguishers Portable fire extinguishers required per items 1 through 6 Within 30' of commercial cooking equipment Max Travel distance to extinguisher: 75 FT		38.3.5 Required in Business
Section 907	Manual Fire Alarm System Required per 907.2 A3 Required with OL>300 E Required with OL>50 I4 Required Automatic Smoke Detection Required: Not required		12.3.4 Assemblies greater than 300 comply with 9.6.1 and 12.3.4 Initiation: 16.3.4 Fire Alarm system is required in Day Care occupancies. Initiation is by manual means, smoke detectors and sprinkler system. A smoke detection system shall be installed with detectors in corridors, lounges, recreation areas and sleeping rooms. Private operation mode (NFPA72) shall be permitted in occupied rooms and corridors.
Section 907.4.2	Manual Fire Alarm Boxes: Located not more than 5 feet from the entrance to each exit. Additional manual fire alarm boxes shall be located so that travel distance to the nearest box does not exceed 200 feet.		
		Section 12.7.2	Food Service Operations Food preparation facilities shall be protected in accordance with 9.2.3 and shall not be required to have opening protectives to dining areas 9.2.3 Comply with NFPA 96 for Commercial Cooking Operations.
Chapter 10: Means of Egress		Chapter 7: Means of Egress	
Section 1003.2	Ceiling Height Min. ceiling height in a means of egress is 7'-6"		



Section 1003.3.1	Protruding Objects Protruding objects below the min ceiling height = 80"														
Section 1003.3.3	Horizontal Projections Elements shall not project horizontally more than 4" over any walking surface between the heights of 27" and 80".														
Section 1003.4	Floor Surface Walking surfaces in means of egress shall be slip resistant and securely attached.														
Section 1003.5	Elevation Change Use sloped surfaces where changes in elevation of less than 12" occur. Use a ramp where the slope is greater than 1:20. Provide handrails or floor material contrast if the elevation change is less than 6".														
Section 1004.1.1	Maximum Floor Area Allowances Per Person Table 1004.1.2 Assembly w/o fixed seats <table style="margin-left: 40px;"> <tr><td>Concentrated</td><td>7 net</td></tr> <tr><td>Unconcentrated</td><td>15 net</td></tr> </table> Business (Offices) 100 gross Day-Care 35 net Education <table style="margin-left: 40px;"> <tr><td>Classrooms</td><td>20 net</td></tr> </table> Kitchen 200 gross Library 50 net Storage/Mechanical 300 gross	Concentrated	7 net	Unconcentrated	15 net	Classrooms	20 net	Section 7.3	Capacity of Means of Egress Occupant Load Factor Table 7.3.1.2 Assembly w/o fixed seats <table style="margin-left: 40px;"> <tr><td>Concentrated</td><td>7 net</td></tr> <tr><td>Unconcentrated</td><td>15 net</td></tr> </table> Business (Offices) 100 gross Day-Care 35 net Education <table style="margin-left: 40px;"> <tr><td>Classrooms</td><td>20 net</td></tr> </table> Kitchen 100 gross Library 50 net Storage/Mechanical 300 gross	Concentrated	7 net	Unconcentrated	15 net	Classrooms	20 net
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Section 1005.3.1+2	Egress Width Per Occupant Served (with sprinkler system) <table style="margin-left: 40px;"> <tr><td>Stairways</td><td>0.3"/occupant</td></tr> <tr><td>Other Egress Components</td><td>0.2"/occupant</td></tr> </table>	Stairways	0.3"/occupant	Other Egress Components	0.2"/occupant	Section 7.3.3	Egress Capacity <table style="margin-left: 40px;"> <tr><td>Stairways</td><td>0.3"/occupant</td></tr> <tr><td>Other Egress Components</td><td>0.2"/occupant</td></tr> </table>	Stairways	0.3"/occupant	Other Egress Components	0.2"/occupant				
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Section 1005.7.1	Door Encroachment Doors when fully opened shall not reduce the required means of egress by more than 7". Doors in any position shall not reduce the required width by more than a half.	Section 7.2.1.4.3	Door Leaf Encroachment												



Section 1006.1	<p>Illumination Required The means of egress, including the exit discharge, shall be illuminated at all times the building is occupied.</p>	Section 7.8.1.3	
Section 1006.2	<p>Illumination Level The means of egress illumination level shall not be less than 1 foot-candle at the floor level.</p>	Section 7.8.1.3	
Section 1006.3	<p>Illumination Emergency Power An emergency electrical system shall automatically illuminate the following areas: - Exit access corridors, passageways and aisles in rooms and spaces which require two or more means of egress. -Exit access corridors and exit stairways located in buildings required to have two or more exits. -Exterior egress components at other than the level of exit discharge until exit discharge is accomplished for buildings required to have two or more exits. -Interior exit discharge elements, as permitted in Section 1023.1, in buildings required to have two or more exits. -The portion of the exterior exit discharge immediately adjacent to exit discharge doorways in buildings required to have two or more exits. Duration of not less than 90 min.</p>	Section 7.9	Emergency Lighting
Section 1006.3.1	<p>Performance of System At least an average of 1 foot-candle and a minimum at any point of 0.1 foot-candle measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 foot-candle average and a minimum at any point of 0.06 foot-candle at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.</p>	Section 7.9.2	<p>Performance of System Provided for a minimum of 90 minutes Initial average illumination of not less than 1 fc, no minimum less than 0.1 fc</p>
Section 1008.1.1	<p>Size of Doors Min. clear width of door: 32", max. width: 48"</p>	Section 7.2.1.2.3	Minimum Door Leaf Width



Section 1008.1.1.1	Projections Into Required Clear Width Below 32" no projections From 32"-80" only 4" max	Section 7.2.1.2	Door Leaf Width Not more than 4" between 34" and 48" and projection accommodates egress hardware								
Section 1008.1.2	Swing Direction Doors to swing in direction of travel when occupant load exceeds 50 persons.	Section 7.2.1.4.2	Door Leaf Swing Direction In direction of egress in room serving more than 50 occupants.								
Section 1008.1.5	Floor Elevation There shall be a level floor landing on each side of the door at the same elevation of the door.										
Section 1008.1.8	Door Arrangement Space between two doors in a series shall be not less than 48".										
Section 1011.2	Illumination Exit signs shall be internally or externally illuminated	Section 7.10.5	Illumination of Signs								
Section 1011.3	Tactile Exit Signs Shall be provided adjacent to each door to an egress stairway, an exit passageway and the exit discharge.	Section 7.10.1.3	Exit Door Tactile Sign								
Section 1011.5.3	Power Source Not less than 90 minutes in case of primary power loss										
Section 1014.2	Exiting Through Intervening Rooms Permitted if adjoining rooms are accessory to main area, not high hazard, have discernable path to exit, do not pass through storage rooms, kitchens, etc., and cannot be locked to prevent passage.										
Section 1014.3	Common Path of Egress Travel A3 30 FT (In Assembly space) B 100 FT E 75 FT I4 75 FT	Section 7.6	Table A.7.6 <table border="1"> <thead> <tr> <th><u>Group</u></th> <th><u>Distance(sprinkled)</u></th> </tr> </thead> <tbody> <tr> <td>Assembly</td> <td>20 FT</td> </tr> <tr> <td>Business</td> <td>100 FT</td> </tr> <tr> <td>Day Care</td> <td>100 FT</td> </tr> </tbody> </table>	<u>Group</u>	<u>Distance(sprinkled)</u>	Assembly	20 FT	Business	100 FT	Day Care	100 FT
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Section 1015.1	Number of Exits Required Two exits required from any space where the occupant load exceeds 50 persons. Three exits required from any space where the occupant load is 501 – 1,000 persons. Four exits required from any space where the occupant load exceeds 1,000 persons.																				
Section 1015.1	Separation of Exits Separation of exits required with sprinkler system is one-third the max diagonal dimension Section 1015.2.1.	Section 7.5.1.3.3																			
Section 1016.1	Maximum Exit Access Travel Distance <table border="0"> <tr> <td><u>Group</u></td> <td><u>Distance(sprinkled)</u></td> </tr> <tr> <td>Assembly</td> <td>250 FT</td> </tr> <tr> <td>Business</td> <td>300 FT</td> </tr> <tr> <td>Educational</td> <td>250 FT</td> </tr> <tr> <td>Institutional</td> <td>200 FT</td> </tr> </table>	<u>Group</u>	<u>Distance(sprinkled)</u>	Assembly	250 FT	Business	300 FT	Educational	250 FT	Institutional	200 FT	Section 7.6	Table A.7.6 <table border="0"> <tr> <td><u>Group</u></td> <td><u>Distance(sprinkled)</u></td> </tr> <tr> <td>Assembly</td> <td>250 FT</td> </tr> <tr> <td>Business</td> <td>300 FT</td> </tr> <tr> <td>Day Care</td> <td>200 FT</td> </tr> </table>	<u>Group</u>	<u>Distance(sprinkled)</u>	Assembly	250 FT	Business	300 FT	Day Care	200 FT
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Section 1018.1	Corridor Fire-Resistance Rating (with sprinkler system): 0 hours																				
Section 1018.2	Minimum Corridor Width 44"	Section 12.2.3.8 Section 16.2.3.2 Section 38.2.3.2	Minimum Corridor Width Business (OL>50) 44" Assembly (OL>50) 44" Day Care – Comply with 7.3																		
Section 1018.4	Dead End Corridors <table border="0"> <tr> <td><u>Group</u></td> <td><u>Distance(sprinkled)</u></td> </tr> <tr> <td>Assembly</td> <td>20 FT</td> </tr> <tr> <td>Business</td> <td>50 FT</td> </tr> <tr> <td>Educational</td> <td>50 FT</td> </tr> <tr> <td>Institutional</td> <td>20 FT</td> </tr> </table>	<u>Group</u>	<u>Distance(sprinkled)</u>	Assembly	20 FT	Business	50 FT	Educational	50 FT	Institutional	20 FT	Section 7.6	Table A.7.6 <table border="0"> <tr> <td><u>Group</u></td> <td><u>Distance(sprinkled)</u></td> </tr> <tr> <td>Assembly</td> <td>20 FT</td> </tr> <tr> <td>Business</td> <td>50 FT</td> </tr> <tr> <td>Day Care</td> <td>50 FT</td> </tr> </table>	<u>Group</u>	<u>Distance(sprinkled)</u>	Assembly	20 FT	Business	50 FT	Day Care	50 FT
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Section 1021.1	Minimum Number of Exits Required <table border="0"> <tr> <td><u>Occupant Load</u></td> <td><u>Number of Exits</u></td> </tr> <tr> <td>1-500</td> <td>2</td> </tr> <tr> <td>501-1,000</td> <td>3</td> </tr> <tr> <td>>1,000</td> <td>4</td> </tr> </table>	<u>Occupant Load</u>	<u>Number of Exits</u>	1-500	2	501-1,000	3	>1,000	4	Section 7.2.4 Section 12.2.4	Number of Exits In accordance with 7.4 <table border="0"> <tr> <td><u>Occupant Load</u></td> <td><u>Number of Exits</u></td> </tr> <tr> <td>1-500</td> <td>2</td> </tr> <tr> <td>501-1,000</td> <td>3</td> </tr> <tr> <td>>1,000</td> <td>4</td> </tr> </table>	<u>Occupant Load</u>	<u>Number of Exits</u>	1-500	2	501-1,000	3	>1,000	4		
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Chapter 11: Accessibility																					
Section 1101	Accessibility The building to be fully accessible per 2010 ADA																				



Chapter 12: Interior Environment			
Section 1203.1	General Building shall be provided with mechanical ventilation in accordance with the <i>International Mechanical Code</i> .		
Section 1204	Temperature Control Interior spaces intended for human occupancy shall be provided with active space-heating systems capable of maintaining a minimum indoor temperature of 68°F at a point 3 feet above the floor on a design heating day.		
Section 1205.3	Artificial Light Artificial light shall be provided that is adequate to provide an average illumination of 10 foot-candles (107 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.		