

2015 ECCCNY for Commercial Buildings



Chapter 2 Exercises

Exercise #1

You receive a set of plans for a retail site in Albany. You see that half of the windows on the plan have U-factors of 0.36, while the other half have U-factors of 0.40. All windows are fixed and all window dimensions are the same. The plans identify an area-weighted average U-factor of 0.38. No other information is provided.

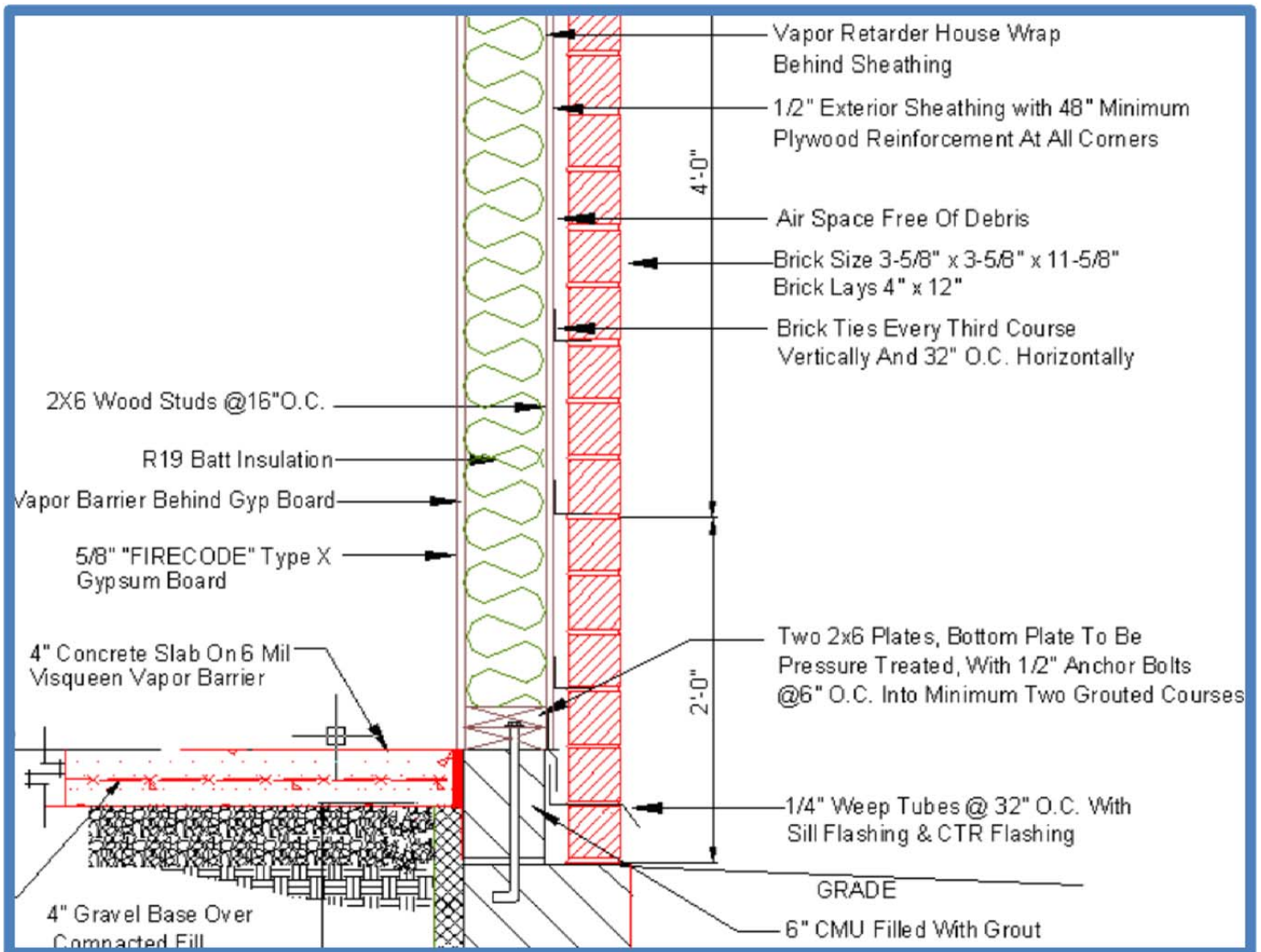
What Section(s) of the Energy Code are applicable?

Do these window specifications comply with the energy code?

What other information is needed?

Exercises

Exercise #2



Exercise 1, Figure 1

List missing or incorrect information in the wall and slab detail above:

(Exercise #1 continued on next page.)

FURNACE SCHEDULE

TAG	LOCATION	TYPE	INPUT (BTUH)	CFM	OA (CFM)	ESP (IN WG)	ELECTRICAL DATA				REMARKS PROVIDE TRANE HIGH EFFICIENCY FURNACES
							MCA	FUSE	VOLT	Ø	
F-1	BASEMENT	GAS FIRED, UPFLOW CONDENSING	120,000	1870	195	0.5"	15.2	20	115	1	TRANE TUH2D120
F-2	BASEMENT	GAS FIRED, UPFLOW CONDENSING	120,000	1750	155	0.5"	15.2	20	115	1	TRANE TUH2D120
F-3	BASEMENT	GAS FIRED, UPFLOW CONDENSING	120,000	1855	600	0.5"	15.2	20	115	1	TRANE TUH2D120
F-4	BASEMENT	GAS FIRED, UPFLOW CONDENSING	120,000	1900	1150	0.5"	15.2	20	115	1	TRANE TUH2D120
F-5	BASEMENT	GAS FIRED, UPFLOW CONDENSING	120,000	1595	105	0.5"	15.2	20	115	1	TRANE TUH2D120

NOTES:

1. PROVIDE 7-DAY PROGRAMMABLE THERMOSTAT WITH HEAT/COOL AUTOMATIC CHANGEOVER

COOLING COIL AND CONDENSING UNIT SCHEDULE

COOLING COIL							CONDENSING UNIT								REMARKS: PROVIDE TRANE: COOLING COILS (CC) AIR COOLED CONDENSER (ACC)
UNIT NO.	SERVICE	TYPE	CFM	COOLING (BTU)	REF LINE SIZES		UNIT NO.	CAPACITY (BTU)	MIN. SEER	FAN (HP)	TOTAL MCA	ELEC. SUPPLY			
					LIQUID	SUCTION						VOLTS	PHASE	HZ	
CC-1	F-1	CASED COIL UPFLOW	1870	60,000	3/8"	3/8"	ACCU-1	60,000	11.5	3/8	21	208	3	60	TRANE MODEL# 4TXCD060BS3-UAA (CC) TRANE MODEL# 4TTA3060D3 (ACCU)
CC-2	F-2	CASED COIL UPFLOW	1750	60,000	3/8"	3/8"	ACCU-1	60,000	11.5	3/8	21	208	3	60	TRANE MODEL# 4TXCD060BS3-UAA (CC) TRANE MODEL# 4TTA3060D3 (ACCU)
CC-3	F-3	CASED COIL UPFLOW	1855	60,000	3/8"	3/8"	ACCU-1	60,000	11.5	3/8	21	208	3	60	TRANE MODEL# 4TXCD060BS3-UAA (CC) TRANE MODEL# 4TTA3060D3 (ACCU)
CC-4	F-4	CASED COIL UPFLOW	1900	60,000	3/8"	3/8"	ACCU-1	60,000	11.5	3/8	21	208	3	60	TRANE MODEL# 4TXCD060BS3-UAA (CC) TRANE MODEL# 4TTA3060D3 (ACCU)
CC-5	F-5	CASED COIL UPFLOW	1595	60,000	3/8"	3/8"	ACCU-1	60,000	11.5	3/8	21	208	3	60	TRANE MODEL# 4TXCD060BS3-UAA (CC) TRANE MODEL# 4TTA3060D3 (ACCU)

ENERGY RECOVERY UNIT SCHEDULE

TAG	LOCATION	TYPE	SUPPLY FAN				EXHAUST FAN				ENERGY RECOVERY - SUMMER OPERATION						
			CFM	ESP (IN)	FAN (HP)	FLA	CFM	ESP (IN)	FAN (HP)	FLA	RETURN DB (F)/% RH	OUTSIDE AIR DB (F)/WB (F)	SUPPLY DB (F)/WB (F)	SENSIBLE LOAD RECOVERED (BTUH)	LATENT LOAD RECOVERED (BTUH)	TOTAL RECOVERY EFFECTIVENESS(%)	RETURN DB (F)/% RH
ERU-1	ATTIC	HORIZ STATIC PLATE	2185	1.5	5.0	14.5	1985	1.5	5.0	14.5	75/50	86/70	78.6/66.2	17,389	12,133	53	70/35

Exercise 2, Figure 2

PACKAGED ROOFTOP AIR HANDLING UNIT SCHEDULE - DX/GAS

UNIT NO.	LOCATION	SERVICE	CFM STD AIR	MIN O.A. CFM	E.S.P. IN WG	MOTOR		MAX ALLOWABLE FAN HP	COOLING COIL				TOTAL TONS	COOLING STAGES	EER	HEATING		OUTPUT MBH	MIN. GAS PRESS BEFORE REG	ELECTRICAL			DESIGN EQUIPMENT
						RPM	HP		E.A.T. DEG F	L.A.T. DEG F	DB	WB				DB	WB			E.A.T. DEG F	L.A.T. DEG F	VOLTS	
RTU-1	ROOF	CORE	2120	1040	1.5	984	2	2.3	82	67	59	57	6	1	12.6	31	80	120	4.5	208	3	33.9	TRANE YHC072
RTU-2	ROOF	NORTH	4405	1325	1.5	798	3	4.8	80	65	56	53	12.5	2	12.0	39	83	203	2.5	208	3	65.0	TRANE YFD151
RTU-3	ROOF	SOUTH	4535	1360	1.5	814	5	4.9	80	64	57	55	12.5	2	12.0	39	78	203	2.5	208	3	71.0	TRANE YFD151

FAN SCHEDULE

UNIT NO.	LOCATION	SERVICE	TYPE	CFM	S.P.	BLADE TYPE	FAN RPM	OUTLET VEL FPM	SONES	DRIVE	MOTOR					DESIGN EQUIPMENT							
											RPM	HP	VOLTS	PHASE	STARTER								
EF-1	NOT USED	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
EF-2	ROOF	TOILET EXHAUST	DNBLAST	1805	1.5	B.I.	1140	1075	12.5	DIRECT	1140	3/4	208	3	COMB	COOK ACE-D							
EF-3	ROOF	TOILET EXHAUST	DNBLAST	630	0.6	B.I.	1278	663	7.4	DIRECT	1550	1/4	115	1	MAN	COOK ACE-D							

NOTE: PROVIDE FANS WITH LOW-VOLTAGE MOTORIZED DAMPERS.

UNIT HEATER SCHEDULE - GAS

UNIT NO.	LOCATION	TYPE	CFM	OUTPUT MBH	MIN. GAS PRESS BEFORE REGULATOR	MIN EFF ANSI Z21.47	E.A.T. DEG F	L.A.T. DEG F	FAN MOTOR				DESIGN EQUIPMENT
									RPM	HP	VOLTS	PHASE	
UH-1	ATTIC	PROPELLER	456	24.6	3.5 IN. WG.	80%	45	95	1550	1/50	115	1	REZNOR UDAS30
UH-2	ATTIC	PROPELLER	456	24.6	3.5 IN. WG.	80%	45	95	1550	1/50	115	1	REZNOR UDAS30
UH-3	ATTIC	PROPELLER	456	24.6	3.5 IN. WG.	80%	45	95	1550	1/50	115	1	REZNOR UDAS30
UH-4	ATTIC	PROPELLER	456	24.6	3.5 IN. WG.	80%	45	95	1550	1/50	115	1	REZNOR UDAS30

NOTES: PROVIDE ALL UNITS WITH OSHA-APPROVED FAN GUARD.

UNIT HEATER SCHEDULE - ELECTRIC

UNIT NO.	LOCATION	TYPE	CFM	CAPACITY MBH	KW	VOLTS	PHASE	E.A.T. DEG F	L.A.T. DEG F	FAN MOTOR				DESIGN EQUIPMENT
										RPM	HP	VOLTS	PHASE	
EUH-1	PUMP RM	HORIZ	350	10.2	3.0	208	1	50	77	1600	1/100	208	1	QMARK MUH03-81
EUH-2	HVAC RM	HORIZ	350	10.2	3.0	208	1	50	77	1600	1/100	208	1	QMARK MUH03-81
EUH-3	BASEMENT STORAGE	HORIZ	350	10.2	3.0	208	1	50	77	1600	1/100	208	1	QMARK MUH03-81
EUH-4	BASEMENT STORAGE	HORIZ	350	10.2	3.0	208	1	50	77	1600	1/100	208	1	QMARK MUH03-81
EUH-5	BASEMENT LINK	HORIZ	350	10.2	3.0	208	1	50	77	1600	1/100	208	1	QMARK MUH03-81

SNOWMELT SCHEDULE

SYSTEM NO.	AREA SERVED	SUPPLY WATER TEMP DEG F	GPM	P.D. FT HD	MBH	TUBING SIZE	MAX TUBING SPACING	NO. OF CIRCUITS	CIRCUIT LENGTH FT	DESIGN EQUIPMENT
SM-1	1100 SF	96	19	31	165	3/4"	9"	6	300	WATTS RADIANTPEX+

Exercise 2, Figure 3

(Exercise #1 continued from previous page.)

Looking at the two figures on the previous page showing information about the HVAC equipment for two different buildings, what information is missing in each?

Figure 2:

Figure 3:

What additional information or documentation do you need to approve the plans with respect to the HVAC system?

1. About the building?

2. About the space heating and cooling system?

WINDOW SCHEDULE										
PARADIGM WINDOWS										
MARK	QTY	CATALOG #	ROUGH OPNG.	GLASS AREA (FT ²)	VENT AREA (FT ²)	R	SGHC	CLEAR OPENING (FT ²)	WIDTH (IN)	HEIGHT (IN)
	1	28" X 28" AWNING	28" x 28"	3.5	3.4	4.0	.22			
	2	C3639-2 CASEMENT	72" x 39"	13.9	13.6	4.0	.22/.20			
	1	C3660-2 CASEMENT	72" X 60" (EGRESS)	22.7	21.9	4.0	.22	10.97	30.18	54.19
	3	28" X 28" CASEMENT	28" x 28"	14.02	8.04	5.3	.20			
	2	36" X 36" CASEMENT	36" X 36"	6.3	6.18	5.3	.20			
	1	72" X 60" GLIDING	72" X 60"	24.2	11.8	4.0	.24			
	2	36" X 48" CASEMENT	36" X 48" (EGRESS)	8.8	8.6	5.3	.20	8.58	28.75	43
	4	28" X 28" HOPPER	112" x 28"	3.5	3.4	4.5	.23			
	1	60" X 36" AWNING	60" X 36"	13.7	14.0	4.0	.22			
	1	C3639 CASEMENT	36" x 39" (EGRESS)	6.8	6.8	2.65	.20			

Exercise 2, Figure 4

Do these windows meet the prescriptive requirements of the code in Climate Zone 5?

Chapter 4 Exercises

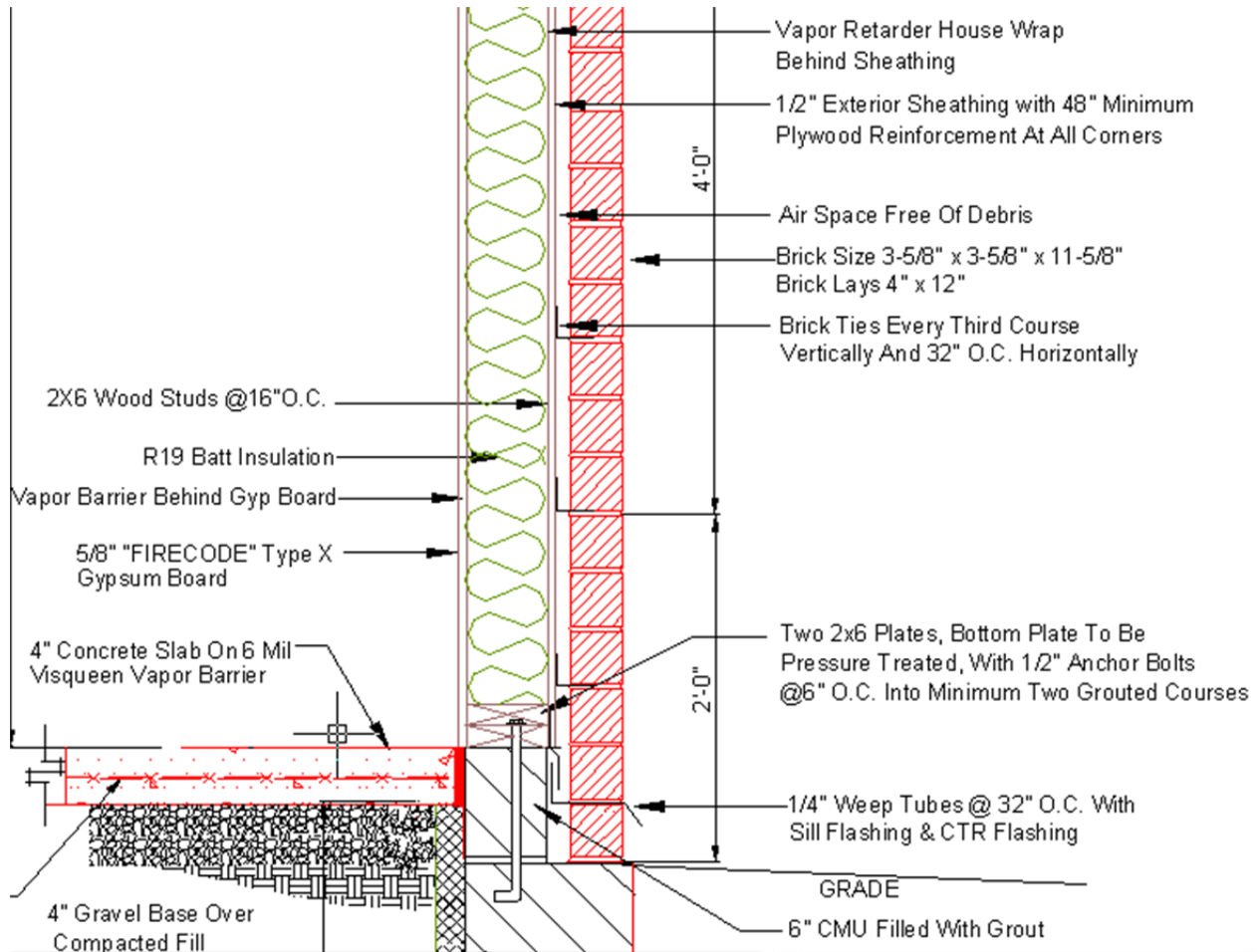
Exercise #3

True or False?

1. Radiant panels installed between floor framing must be insulated. _____
2. The NYS Energy Code does not have any code requirements for fireplaces in commercial buildings. _____
3. In CZ 5, a maximum of 40% fenestration is allowed. _____

(Exercise #3 continued on next page.)

Exercise #3



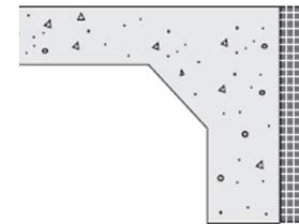
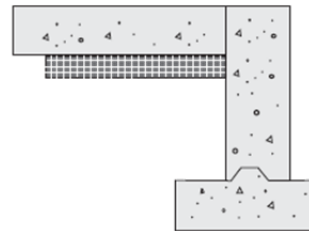
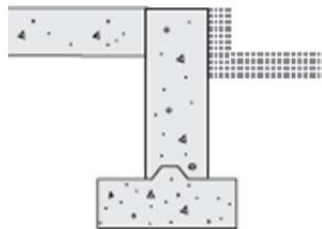
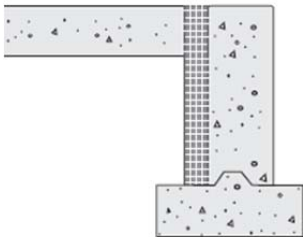
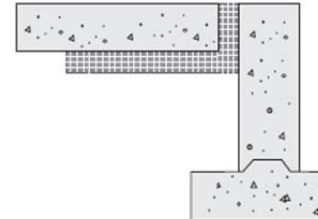
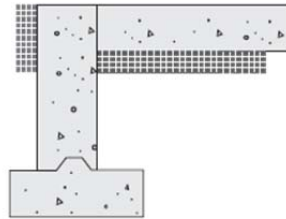
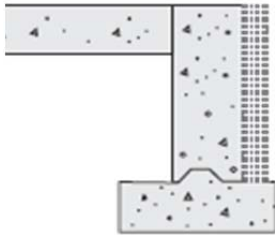
**Does this wall
comply
In CZ 5?**

(Exercise #3 continued on next page.)

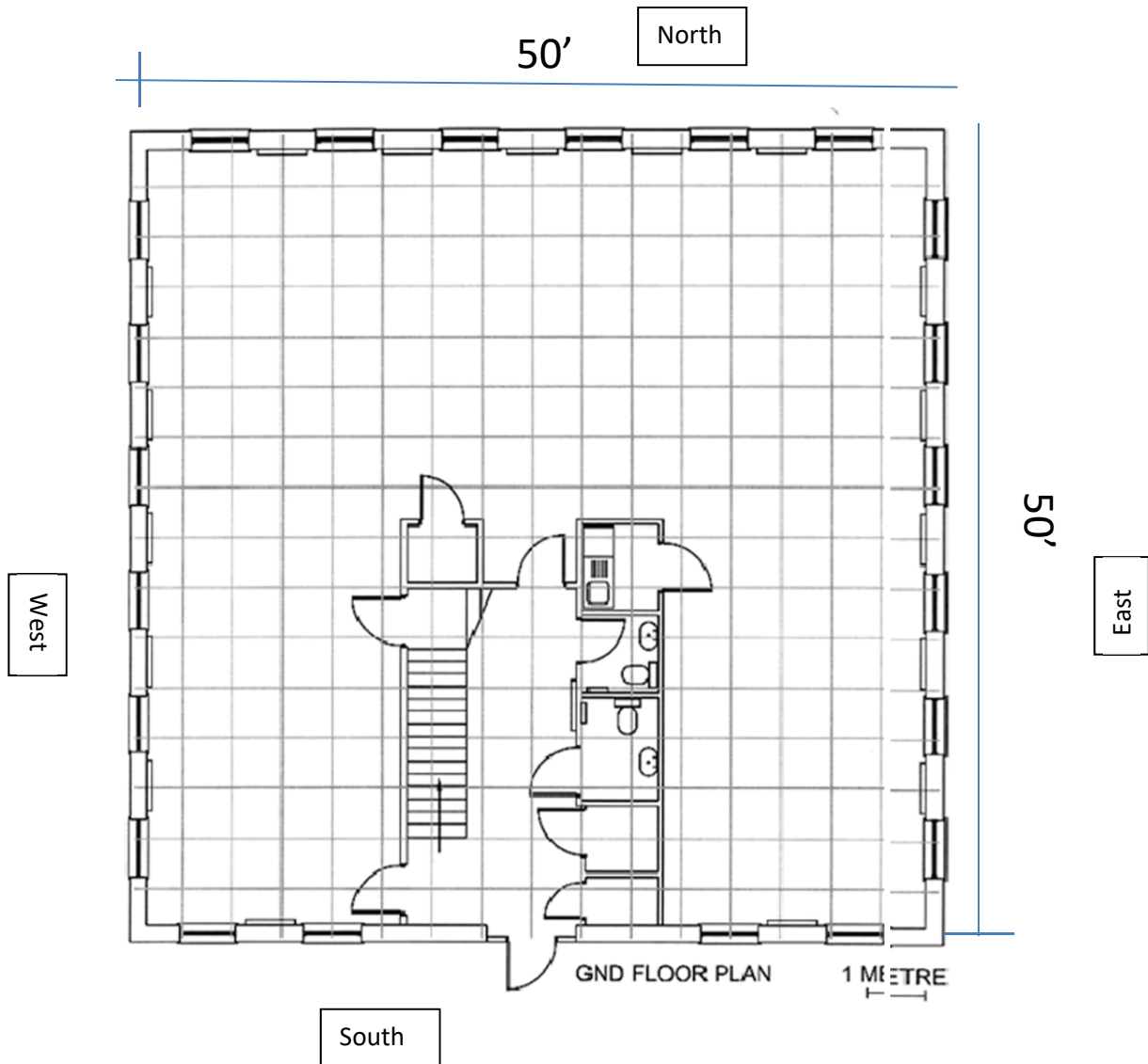
Exercise #3

Building Envelope – Slab Edge Conditions

Which of the following slab edge conditions are compliant?
(Mark each with ✓ or X accordingly)



Chapter 4: Exercise #4



Building Envelope - Allowable Glazing

Windows: 4' W x 4' H, Bldg Hgt: 4 stories

Ceiling Hgt.: 10', Window Hgt: 9'

What is the maximum allowable percentage of window glazing on each wall?

North:

South:

East:

West:

Chapter 4 Exercises

Exercise #5

Additional Efficiency Package

Could this library use its PV system to comply with the Additional Efficiency Package Option Requirements of Section C406?

- Building: 30,000 sqft ; annual mechanical, service hot water, and lighting energy use are expected to use 1400 MMBtu
- Solar PV system: 14 kW; 13,000 kWh/yr
- Hint: 1 MMBtu = 293 kWh



Resources

Additional Services/Resources

NYSERDA Energy Code Training and Support Website

<https://nyserdacodetraining.com/>

- REScheck Basics
 - <https://nyserdacodetraining.com/crs.php?S=7&L=14&C=14>
- Building Techniques for Code Compliance
 - <https://nyserdacodetraining.com/crs.php?S=7&L=16&C=26>

Plan Review and Inspection Services

- Call 585-377-9410 or e-mail energyservices@newportventures.net

Energy Code Hotline

- Call (518) 377-9410 or e-mail codecoach@newportventures.net

DOS Technical Bulletins: <https://www.dos.ny.gov/DCEA/tech.html>

In addition to training on the Energy Code, code officials, architects, planners, engineers, inspectors and others can access NYSERDA-sponsored training for technologies that include photovoltaics (solar electricity), solar heating and biomass. Many of the trainings provide continuing education units from AIA, BPI, IAEl and others.

For more information, visit the links below. Both the solar heating and biomass courses also are offered online and can earn CEUs.

- For the NY-Sun PV Trainers Network (training for PV):
 - <http://ny-sun.ny.gov/For-Local-Government/Local-Government-Training>
- For solar heating inspection:
 - <http://www.solarenergy.org/inspecting-solar-heating-systems-new-york-state/>
- For biomass:
 - <http://www.nyserda.ny.gov/Contractors/Become-a-Contractor/Renewable-Heat-NY-Contractors>