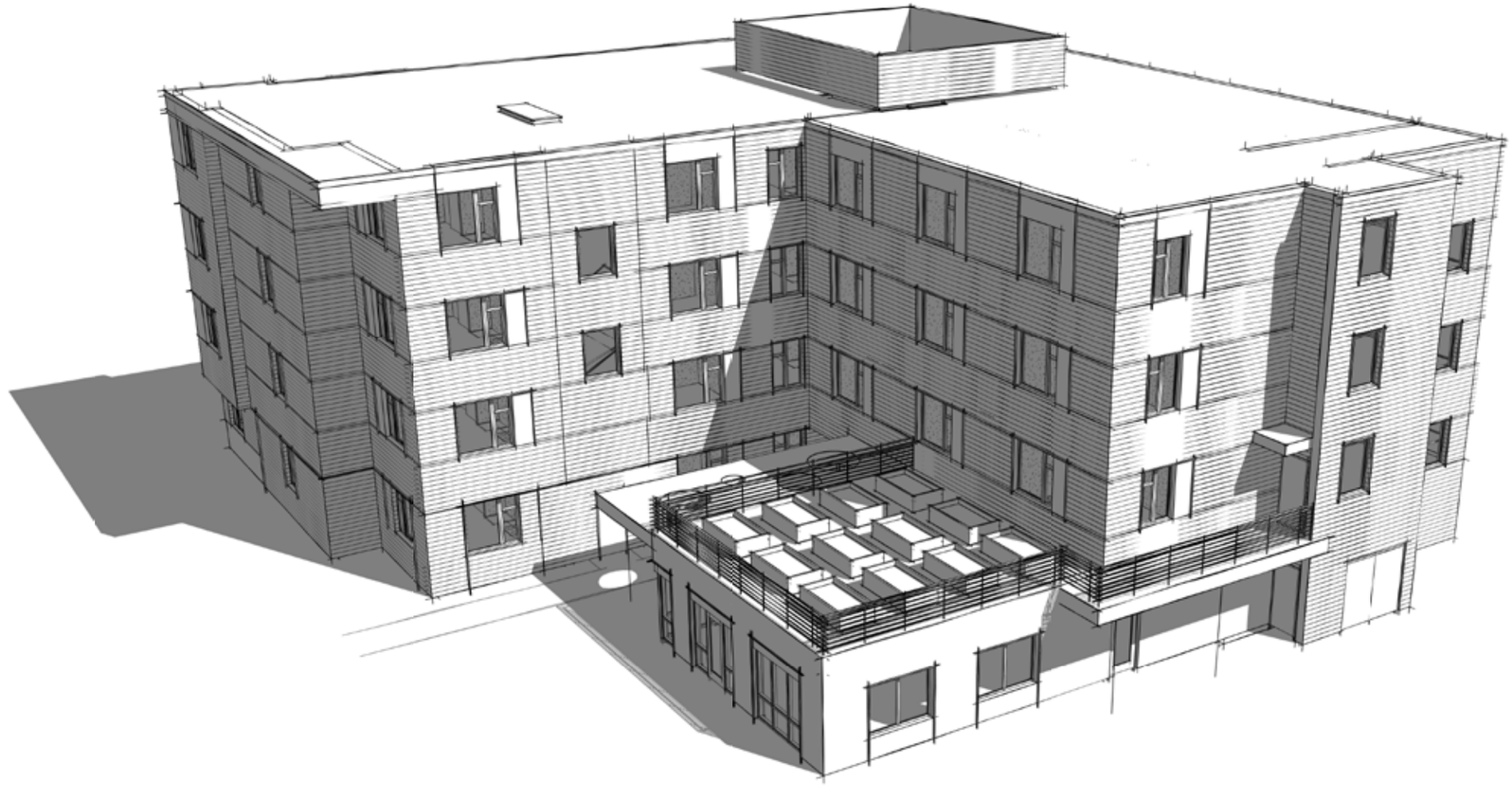
HEARTLAND
ALLIANCE
HOUSING

MADISON SUPPORTIVE HOUSING



STATISTICS

37,500 GSF

4 STORIES

60 STUDIO UNITS (325NSF)

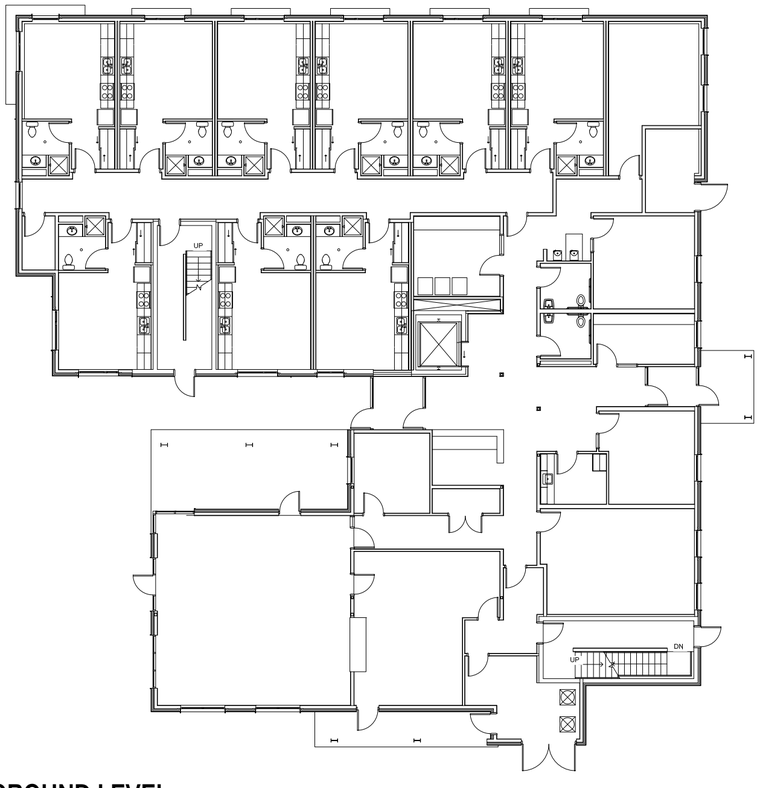
- SUPPORTIVE HOUSING SERVING THE FORMERLY HOMELESS OR THOSE AT RISK OF HOMELESSNESS
- SINGLE OCCUPANT UNITS

5,000 GSF COMMON SPACE

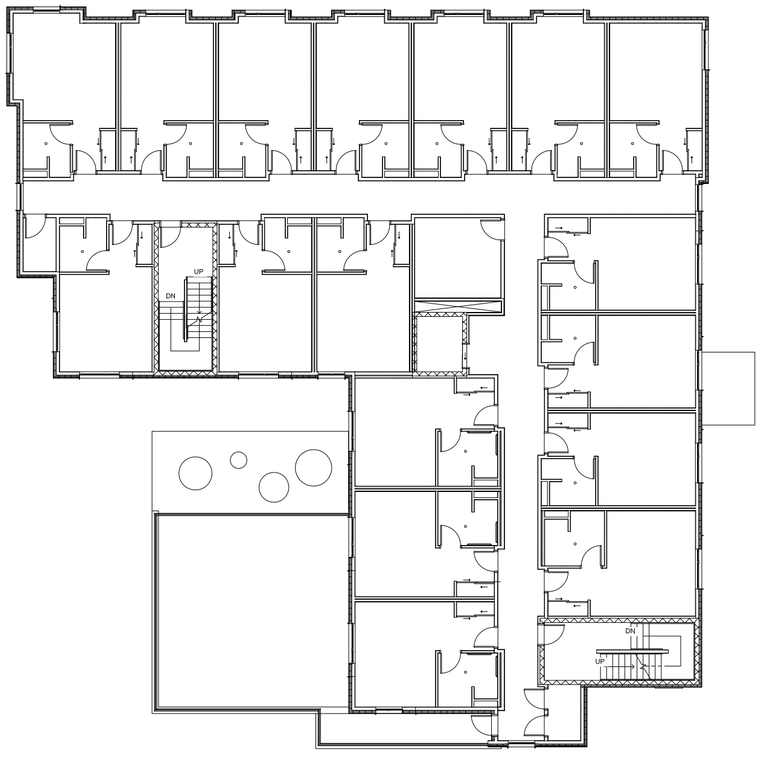
- OFFICE SPACE FOR ON SITE PROPERTY MANAGEMENT AND FOUR CASE WORKERS
- ASSEMBLY SPACE FOR RESIDENTS AND NEIGHBORHOOD
- COMMERCIAL KITCHEN FOR RESIDENTS AND NEIGHBORHOOD
- COMPUTER ROOM
- LIBRARY/QUIET ROOM
- FITNESS ROOM

GARDENS AND PERMACULTURE

- ROOF TOP GARDEN FOR INDIVIDUAL FOOD PRODUCTION
- MANAGED GARDEN FOR BUILDING FOOD PRODUCTION
- PERMACULTURE INCLUDING FORAGE GARDEN, BERRY GARDEN AND FOOD FOREST



GROUND LEVEL



2ND - 4TH FLOORS

1 RAINWATER CISTERNS

2 BIKE RACKS

3 EDIBLE SHRUBS

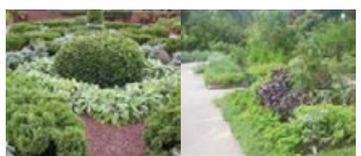
4 PORCH

5 BERRY GARDEN

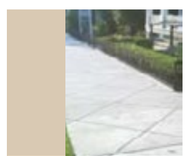
6 TEA GARDEN

7 ROOFTOP COMMUNITY GARDEN

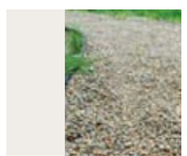
8 FENCE



9 HERB GARDEN



CONCRETE WALK

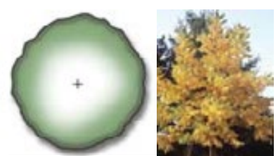


PEA GRAVEL

NATIVE LAWN

WILDFLOWERS

FRUIT TREES



NUT TREES

10 COVERED BIKE PARKING

11 CHICKEN COOP & RUN

12 GRAPE ARBOR

13 PLANK PAVER WALKWAY

14 FORAGE GARDEN

15 BLUEBERRY PLAZA

16 RAIN GARDEN & BIOSWALE

17 APIARY

18 VEGETABLE GARDEN

SAA DESIGN GROUP

0 8 16 FT N

14_0711

MADISON CDA - LANDSCAPE CONCEPT PLAN

SAA Design Group, Inc. | 101 East Badger Road Madison WI 53713 | t 608.255.0800 | f 608.255.7750 | www.saa-madison.com | # M4574

GETTING TO PASSIVE HOUSE AND NET ZERO ENERGY

CONSIDERATIONS

REDUCE LOSSES THROUGH
- WALL ASSEMBLY
- ROOF ASSEMBLY
- WINDOWS
- AIR LEAKAGE
- VENTILATION

INCREASE HEATING AND COOLING EFFICIENCY
- AIR SOURCE HEAT PUMP
- VARIABLE REFRIGERANT FLOW
- BACK UP ELECTRIC RESISTANCE HEAT
- RANGE LIMITING CONTROLS

INCREASE DOMESTIC HOT WATER EFFICIENCY
- CENTRALIZED CONDENSING BOILERS
- DRAIN HEAT RECOVERY
- HEAT TRACE TAPE INSTEAD OF RECIRCULATION

EQUIPMENT, PLUG AND LIGHT LOAD REDUCTION
- LED AND T5 LIGHTING
- SIMPLE TRACTIONLESS ELEVATOR
- RIGHT SIZED REFRIDGERATORS

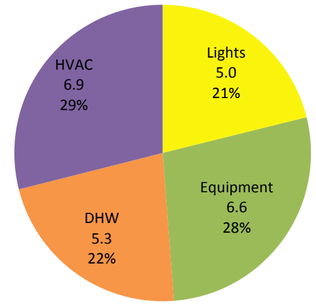
RENEWABLES
- GETTING TO NET ZERO

KEY METRIC

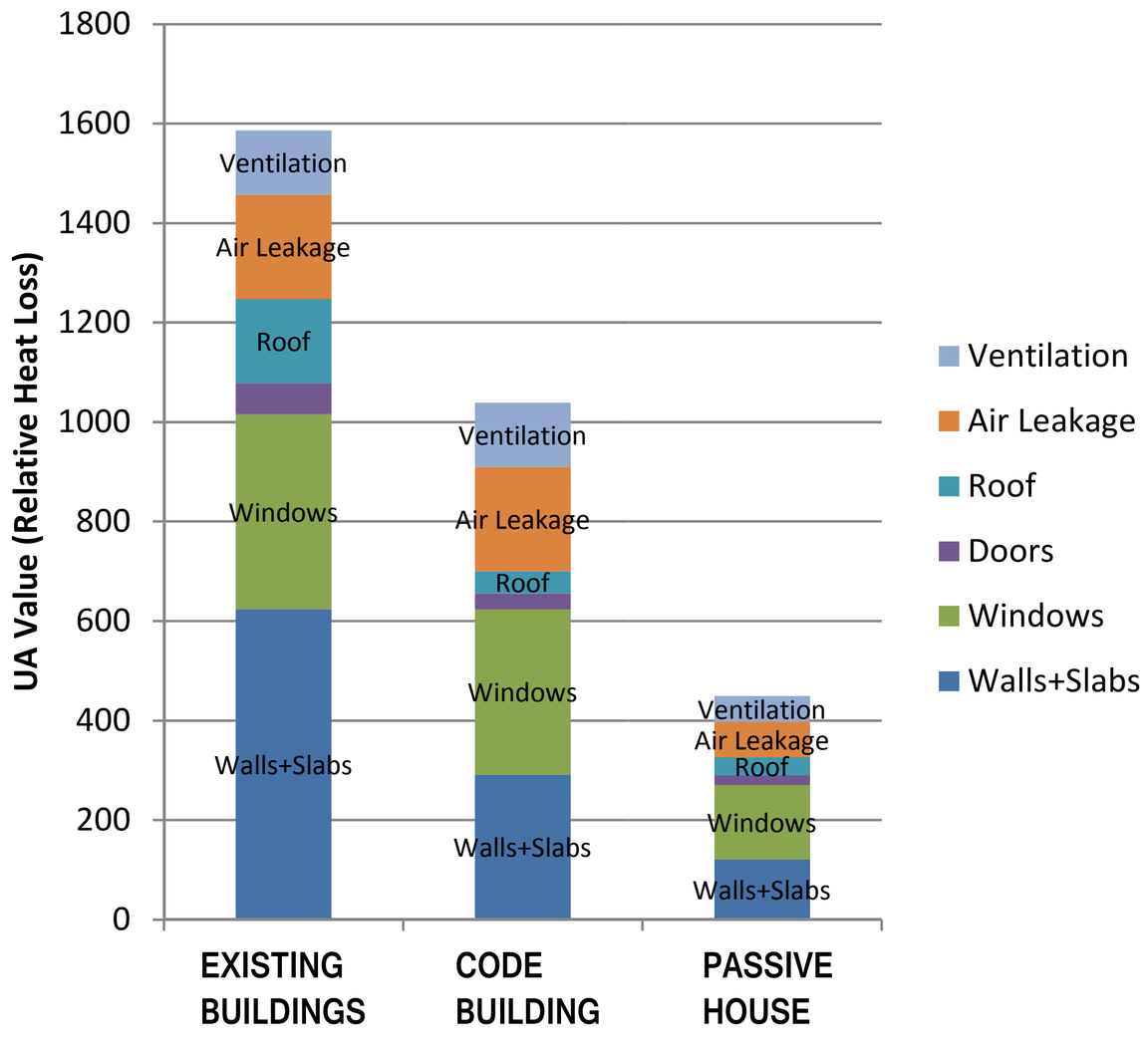
ENERGY USE INTENSITY (EUI)

EUI = 1KBTU/SF/YR

NET ZERO/PASSIVE HOUSE 20-30 EUI
GOOD NEW CONSTRUCTION 40-60 EUI
BAD NEW CONSTRUCTION AND EXISTING 60-100 EUI



MADISON EUI = 24



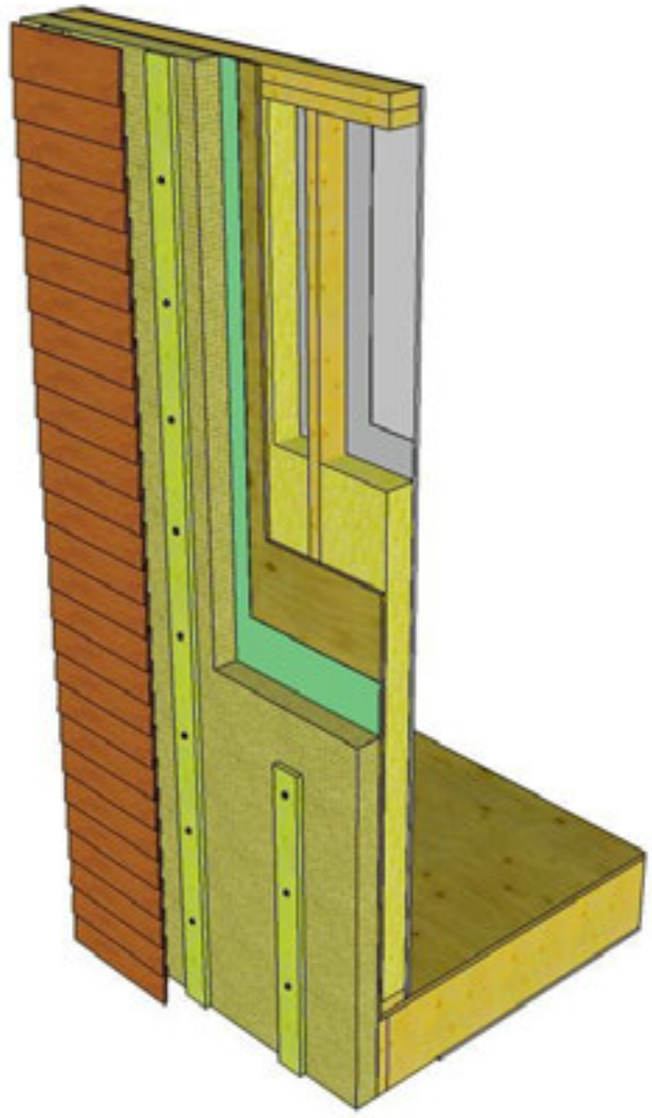
WALL ASSEMBLY

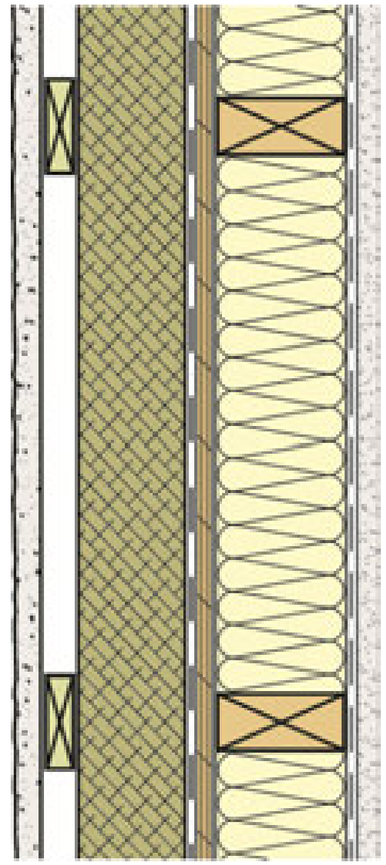
EXTERIOR

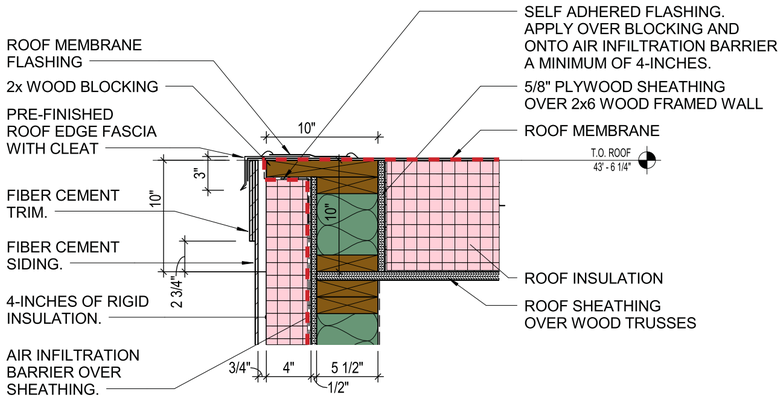
- FIBERCEMENT CLADDING
- AIRSPACE (VENTILATED)
- 1” X 3” WOOD STRAPPING SCREWED THROUGH INSULATION
- 4” POLYISOCYANURATE INSULATION
- VAPOR PERMEABLE LIQUID APPLIED WATER AND AIR BARRIER
- PLYWOOD SHEATHING
- 2 X 6 WOOD FRAMING @ 24” O.C.
- BLOWN IN INSULATION
- GYPSUM BOARD AND LATEX PAINT (CLASS 3 VAPOR RETARDER)

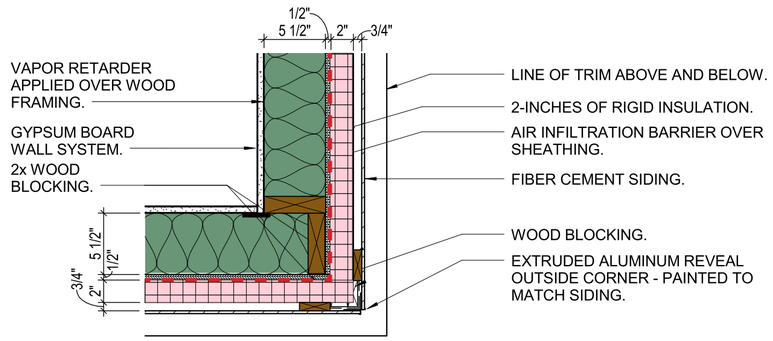
INTERIOR

ADVANCED FRAMING DETAILS AND EXTERIOR FRAMING @ 24” O.C. REDUCE FRAMING FACTOR TO 17% VS 25% FOR TYPICAL CONSTRUCTION.









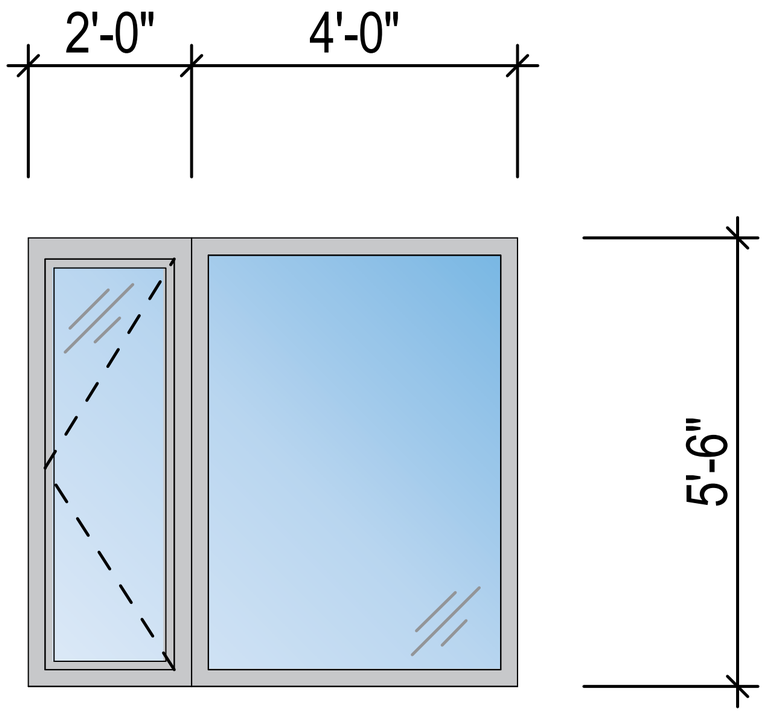
WINDOW CONSIDERATIONS

HIGH GLAZING FACTOR REQUIRED

- 25% FOR ZONING ON ALL SIDES
- WOULD HAVE PREFERRED 15%-25% DEPENDING ON ORIENTATION

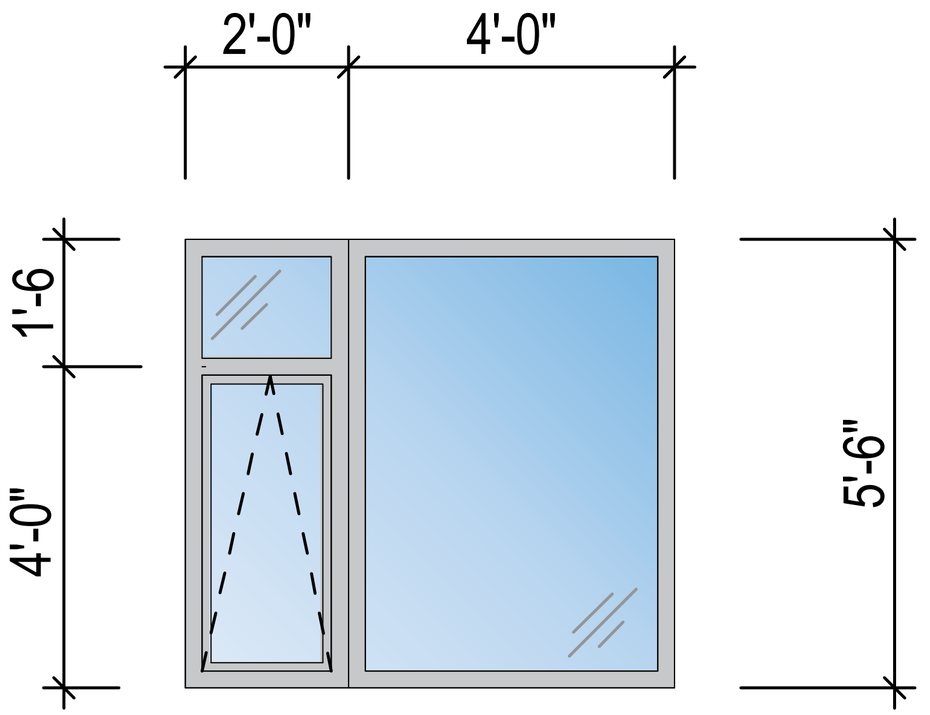
LARGE FIXED COMPONENT (>75%)

- LESS FRAME
- NO AIR INFILTRATION
- NO BREAKAGE OR SCREENS



CASEMENT/AWNING

- HIGHEST TOTAL U-VALUE (FRAME U-VALUE HIGHER THAN GLASS)
- LOWEST AIR INFILTRATION RATE (3X LESS THAN DOUBLE HUNG)
- BEST FOR ACCESSIBILITY
- HIGHER SILL HEIGHT ALLOWED
- AWNING HAS HIGHEST DURABILITY
- CASEMENT CHEAPER

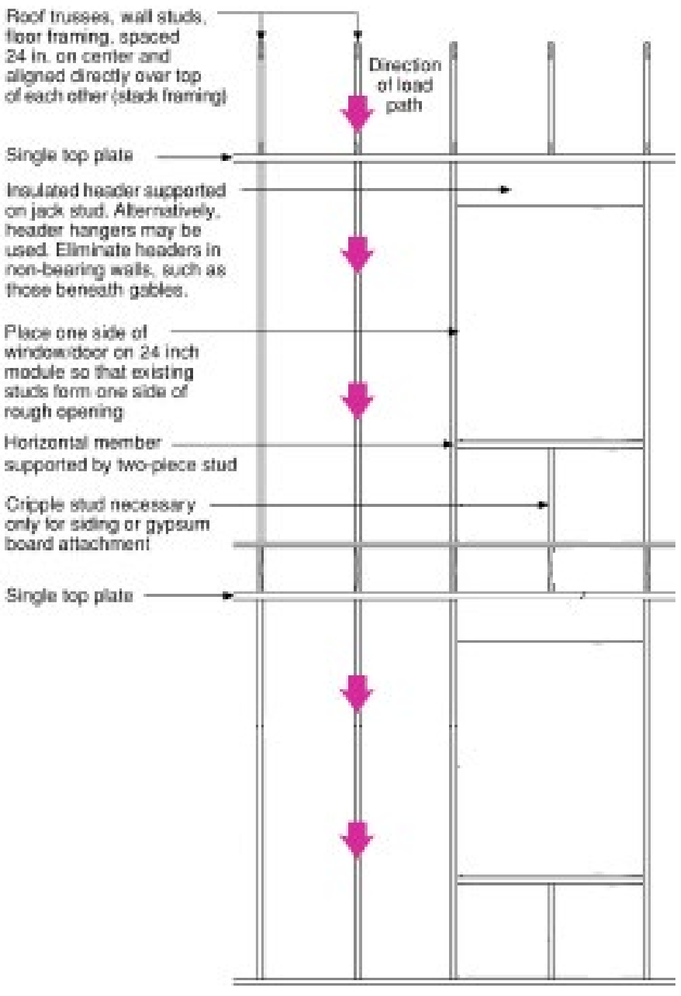


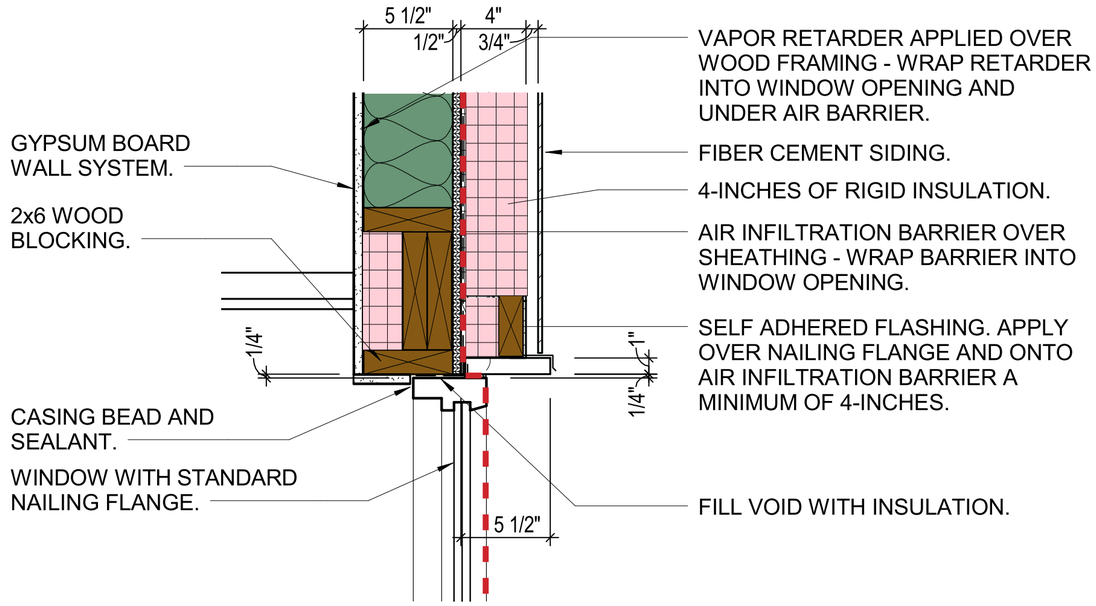
WINDOW CONSIDERATIONS

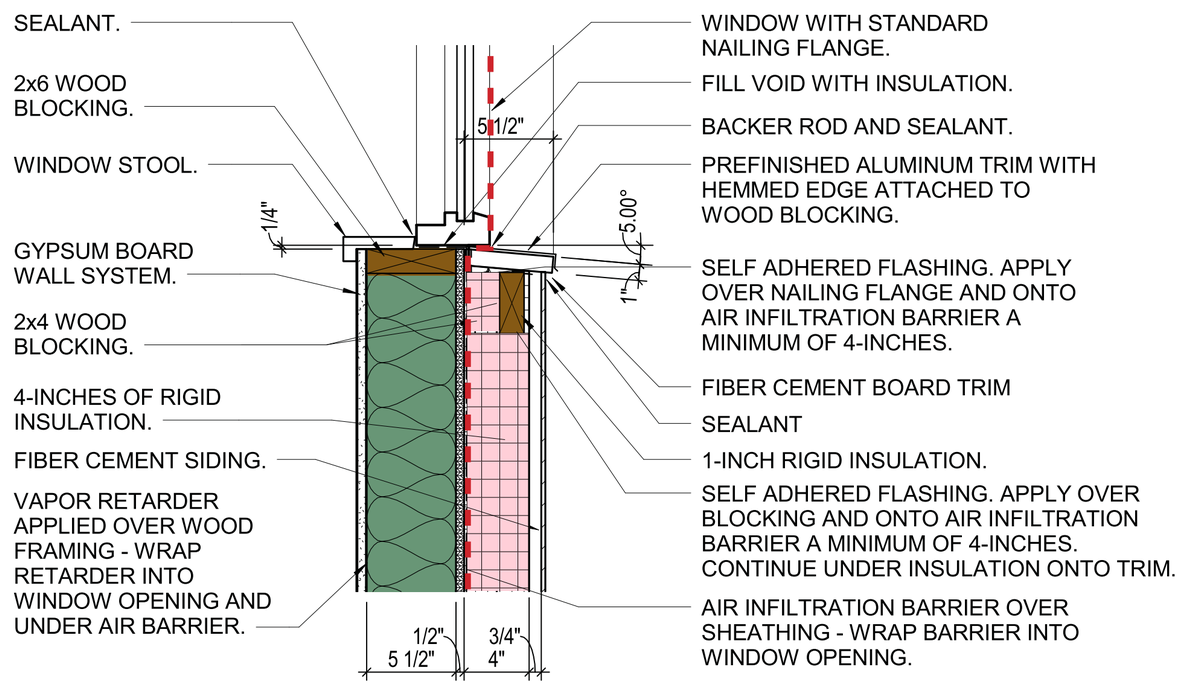
INSTALLATION WITH NAILING FLANGE

- JUST LIKE NORMAL
- TRIM MORE COMPLICATED

ADVANCED FRAMING DETAILS AND EXTERIOR FRAMING @ 24” O.C. REDUCE FRAMING FACTOR TO 17% VS 25% FOR TYPICAL CONSTRUCTION.







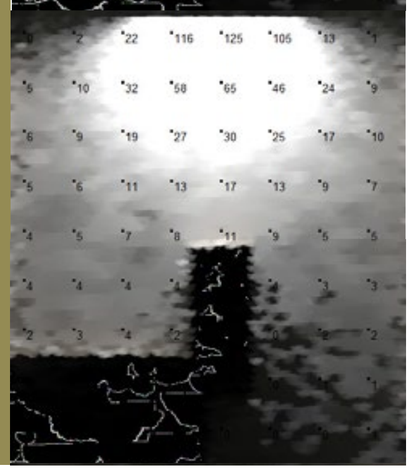
WINDOW CONSIDERATIONS

INTERIOR LIGHT LEVELS

- HIGHER WINDOW HEIGHT = MORE DAYLIGHT
- HIGHER WINDOW SILL DOES NOT AFFECT DAYLIGHT ONLY ADA REQUIREMENTS

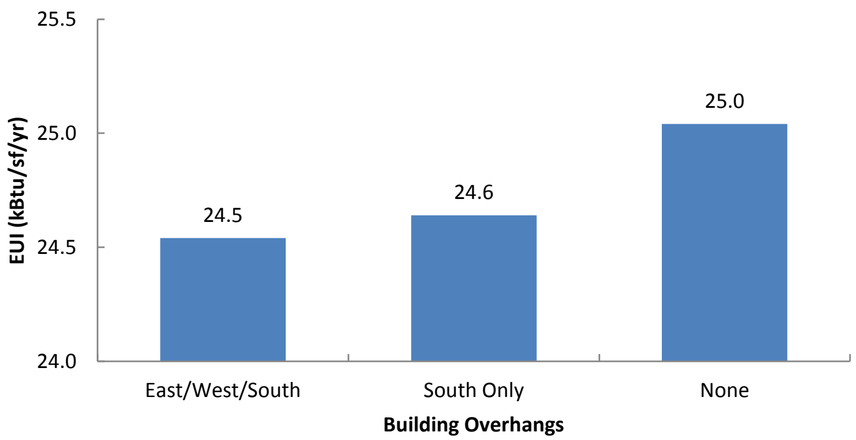
EXTERIOR SHADING AND SOLAR HEAT GAIN

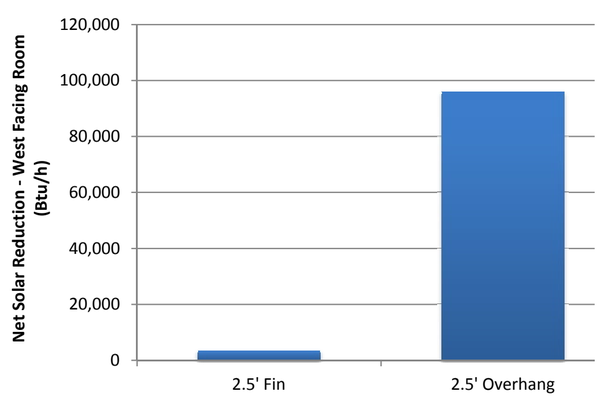
- VERTICAL LOUVERS ON E/W DO NOTHING
- HORIZONTAL ON E/W AT 2.5’ HELP BUT NOT ENOUGH TO JUSTIFY COST
- HORIZONTAL ON SOUTH HELP MOST BUT STILL NOT ENOUGH TO JUSTIFY COST

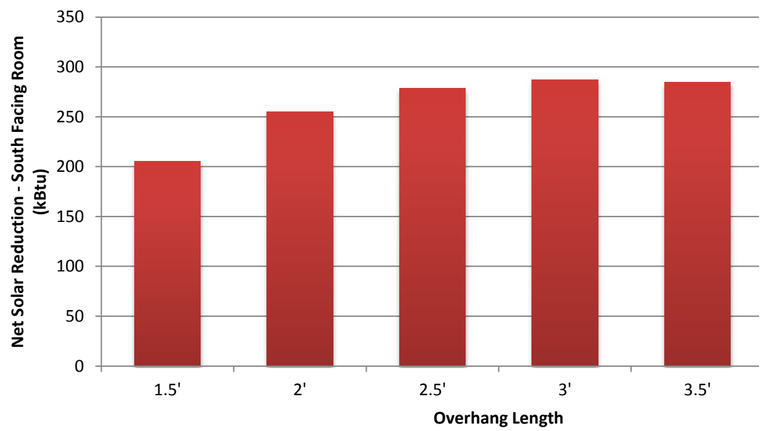
Window Size	2.5'	3'
5' x 4'		
6' x 5'		

Overview

The pictures presented here represent the impact of different window sizes and sill heights on the daylighting of a typical apartment. Each picture shows the illuminance in footcandles at a 3' height. The selected sample apartment is a centrally located North facing unit with solar conditions on September 21st at noon with an overcast sky. This represents a condition during which there is no direct solar and a low outdoor daylight level. Most other daytime conditions will produce higher illuminance levels.







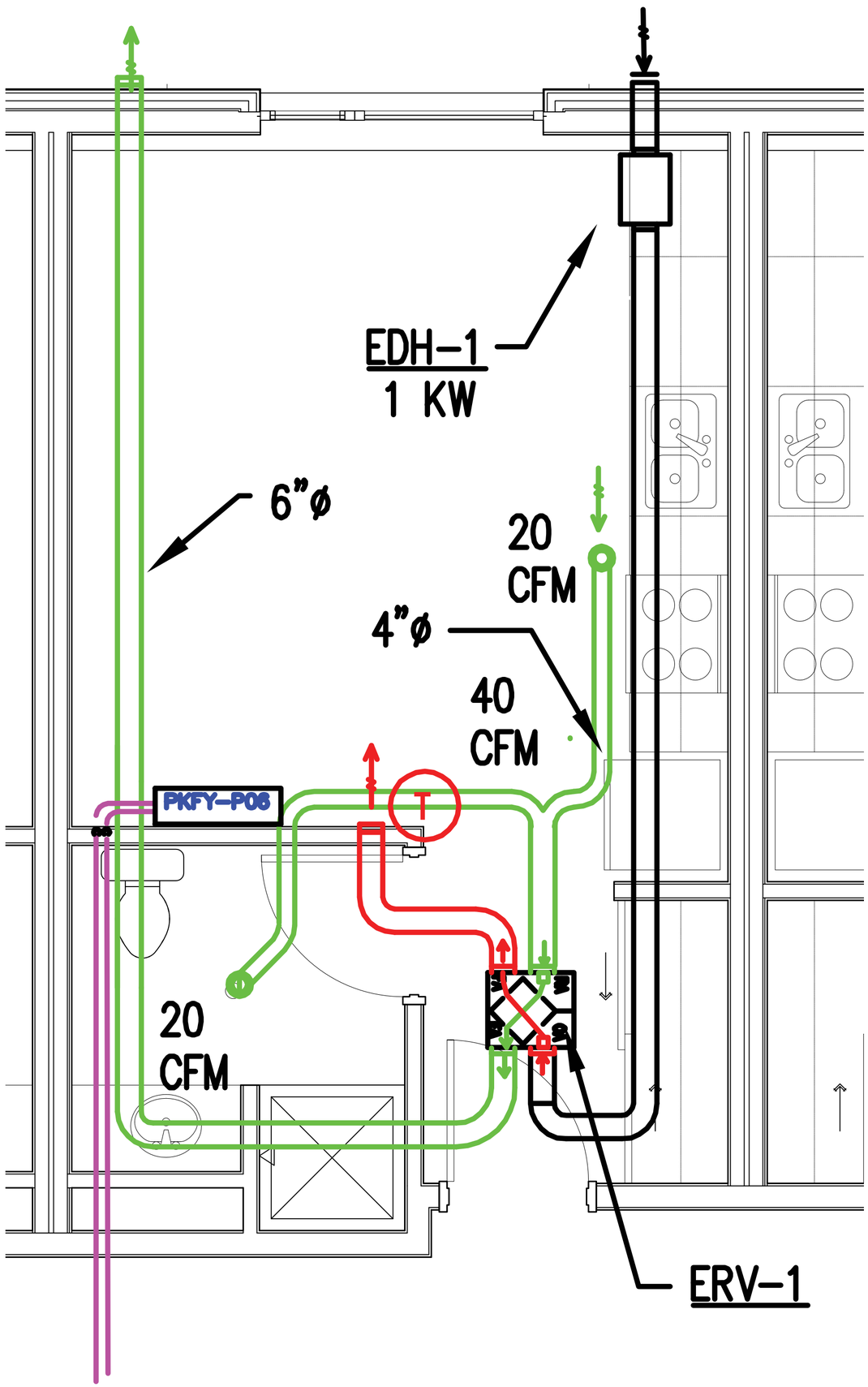
MECHANICAL VENTILATION

GREEN CERTIFICATIONS AND ASHRAE 62.2 2007

- REQUIRE EXTERIOR VENTILATION FOR BOTH BATHROOMS AND KITCHENS
- CONTINUOUS IS EASIER THAN ON DEMAND
- SMALL AREAS OF EFFICIENCIES UNITS ALLOW FOR LOW CFM REQUIREMENTS
- CONTINUOUS 20 CFM KITCHEN AND 20 CFM BATHROOM REQUIRED
- CENTRALIZED ERV'S COST EFFECTIVE AND WORK WELL AT LOW FLOW RATES
- 70%+ HEAT RECOVERY

DECENTRALIZED

- 2 - 6" PENETRATIONS IN ENVELOPE PER UNIT
- 2 FIRE RATED ACCESS PANELS PER UNIT
- NO SMOKE OR FIRE DAMPERS REQUIRED
- LOTS OF FILTERS TO CLEAN
- MUCH LESS DUCTING AND CAN LOWER FLOOR TO FLOOR HEIGHT
- UNIT ACCESS REQUIRED FOR MAINTENANCE
- ELECTRIC RESISTANCE PREHEAT
- LOWER UNIT COSTS ($1,750) BUT HIGHER ADDITIONAL COSTS (ELECTRIC, GWB)



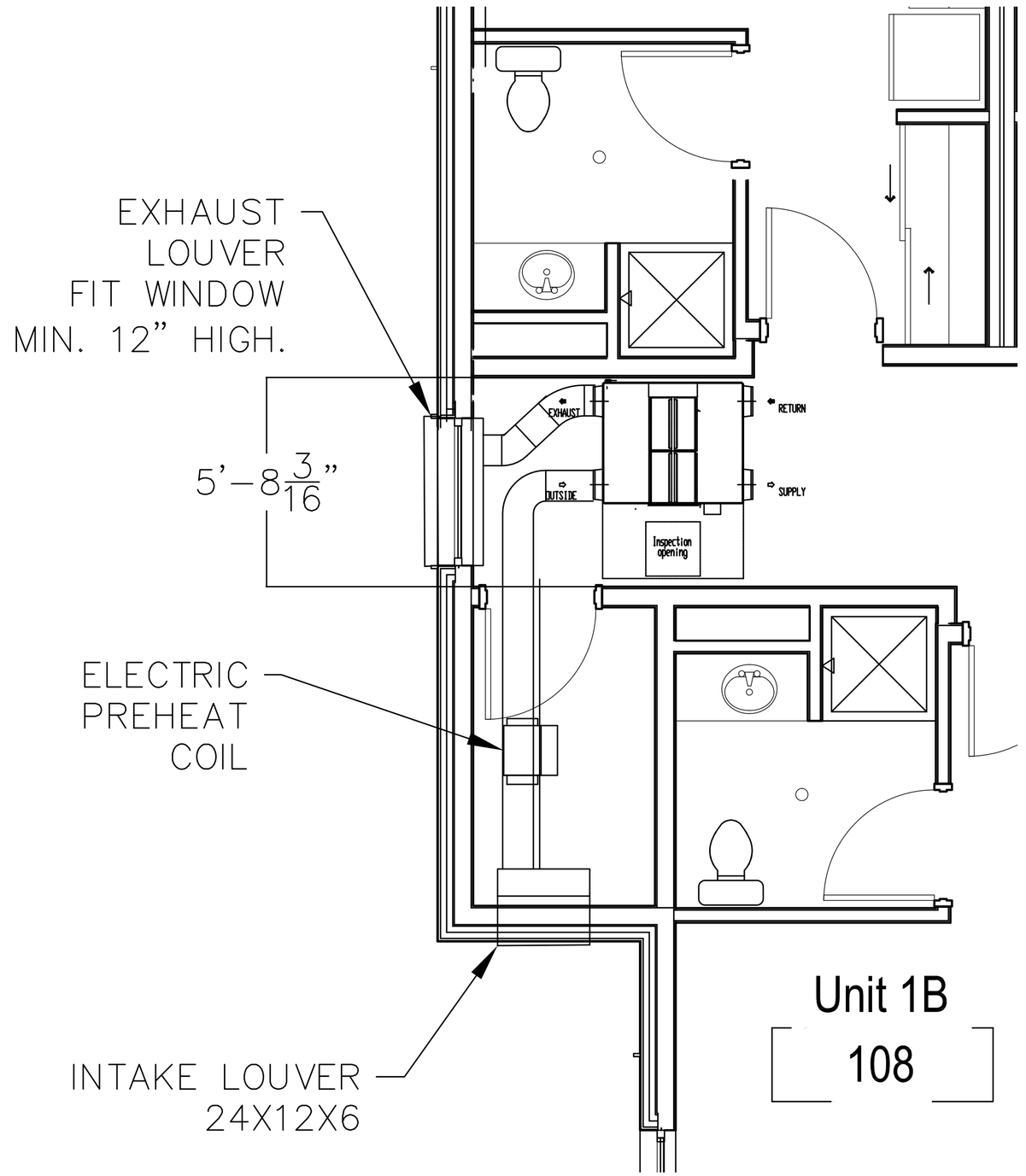
MECHANICAL VENTILATION

CENTRALIZED FOR BUILDING

- ROOF TOP OR PENTHOUSE DOAS UNIT
- ONE SET OF FILTER PER BUILDING
- LARGE TRUNK DUCTING AND VERTICAL SHAFT
- HIGHER FLOOR TO FLOOR HEIGHT
- NO FIRE OR SMOKE DAMPERS IF UNDER 4”
- NO ENVELOPE PENETRATIONS
- UNIT ACCESS NOT REQUIRED FOR MAINTENANCE
- NATURAL GAS PREHEAT
- EXPENSIVE ($2,500/UNIT)

CENTRALIZED BY FLOOR

- 2 CEILING HUNG ERV’S PER FLOOR
- 4 LARGE PENETRATIONS PER FLOOR
- NO FIRE OR SMOKE DAMPERS IF UNDER 4”
- 8 FILTERS TO CLEAN
- LESS DUCTING AND CAN LOWER FLOOR TO FLOOR HEIGHT
- UNIT ACCESS NOT REQUIRED FOR MAINTENANCE
- ELECTRIC RESISTANCE PREHEAT
- MAINTENANCE ACCESS VIA CEILING TILE
- MOST COST EFFECTIVE ($1,250/UNIT)



HEATING AND COOLING

TYPICAL NEW CONSTRUCTION SYSTEMS

PTAC

- INDIVIDUAL CONTROL
- EXPENSIVE TO RUN
- LARGE ENVELOPE PENETRATION
- COST $7,000 PER RESIDENTIAL UNIT

MINI SPLIT HEATING AND COOLING

- INDIVIDUAL CONTROL COOLING
- EFFICIENT
- COST $7,000 PER RESIDENTIAL UNIT
- BACK UP HEAT REQUIRED

HE FURNACE W/ CONDENSER

- INDIVIDUAL CONTROL
- OVERSIZED
- COST $10,000 PER RESIDENTIAL UNIT

RADIATOR WITH MINI SPLIT COOLING

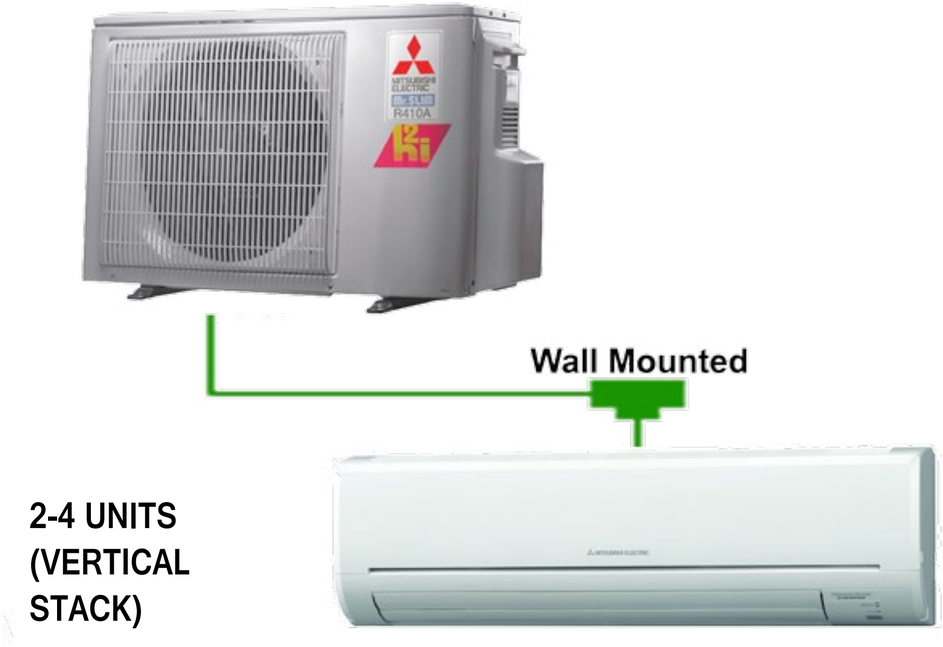
- INDIVIDUAL CONTROL EITHER HEATING OR COOLING
- EFFICIENT
- COST $10,000 PER RESIDENTIAL UNIT

AIR SOURCE VARIABLE REFRIGERANT FLOW

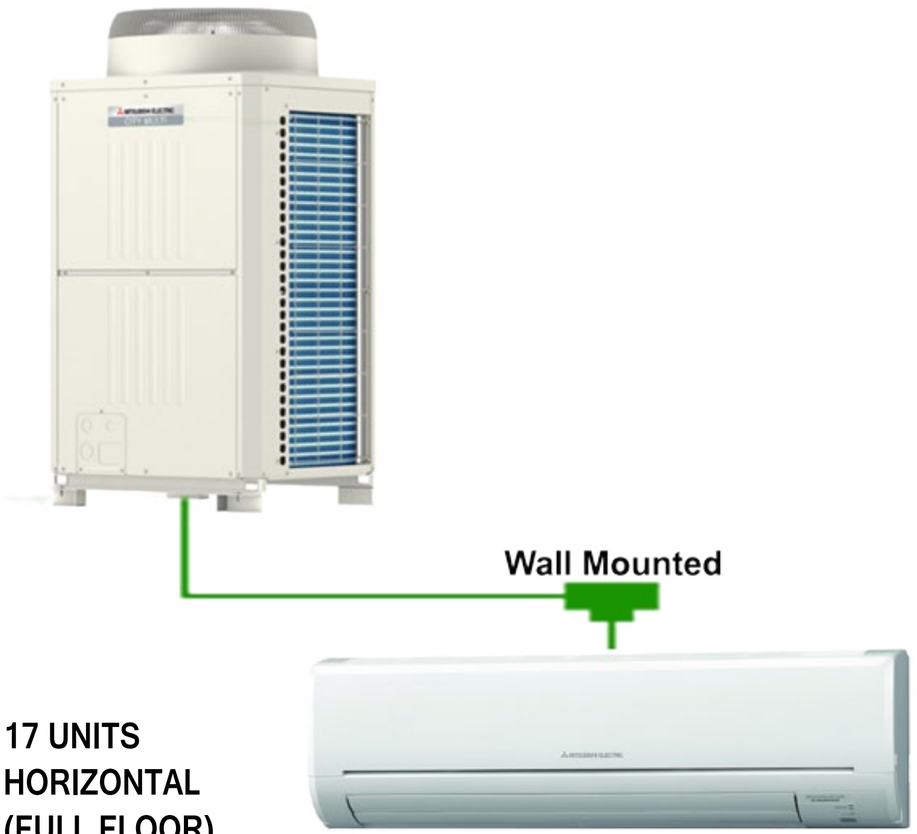
- INDIVIDUAL CONTROL
- VERY EFFICIENT
- COST $8,500 PER RESIDENTIAL UNIT
- BACK UP HEAT REQUIRED

GEOTHERMAL VARIABLE REFRIGERANT FLOW

- INDIVIDUAL CONTROL
- VERY EFFICIENT
- COST $13,000 PER RESIDENTIAL UNIT
- LONGEST LIFE SPAN



2-4 UNITS (VERTICAL STACK)



17 UNITS HORIZONTAL (FULL FLOOR)

CONTROLS

WHEN TENANTS DO NOT PAY THEIR OWN UTILITIES HVAC CONTROLS BECOME IMPORTANT

- RANGE LIMITERS
- OCCUPANCY SENSORS
- WINDOW SWITCHES
- KWH TRACKING
- REMOTE BUILDING MANAGEMENT