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# Existing Retrofit for Enhanced Performance

Portland State University. School of Architecture

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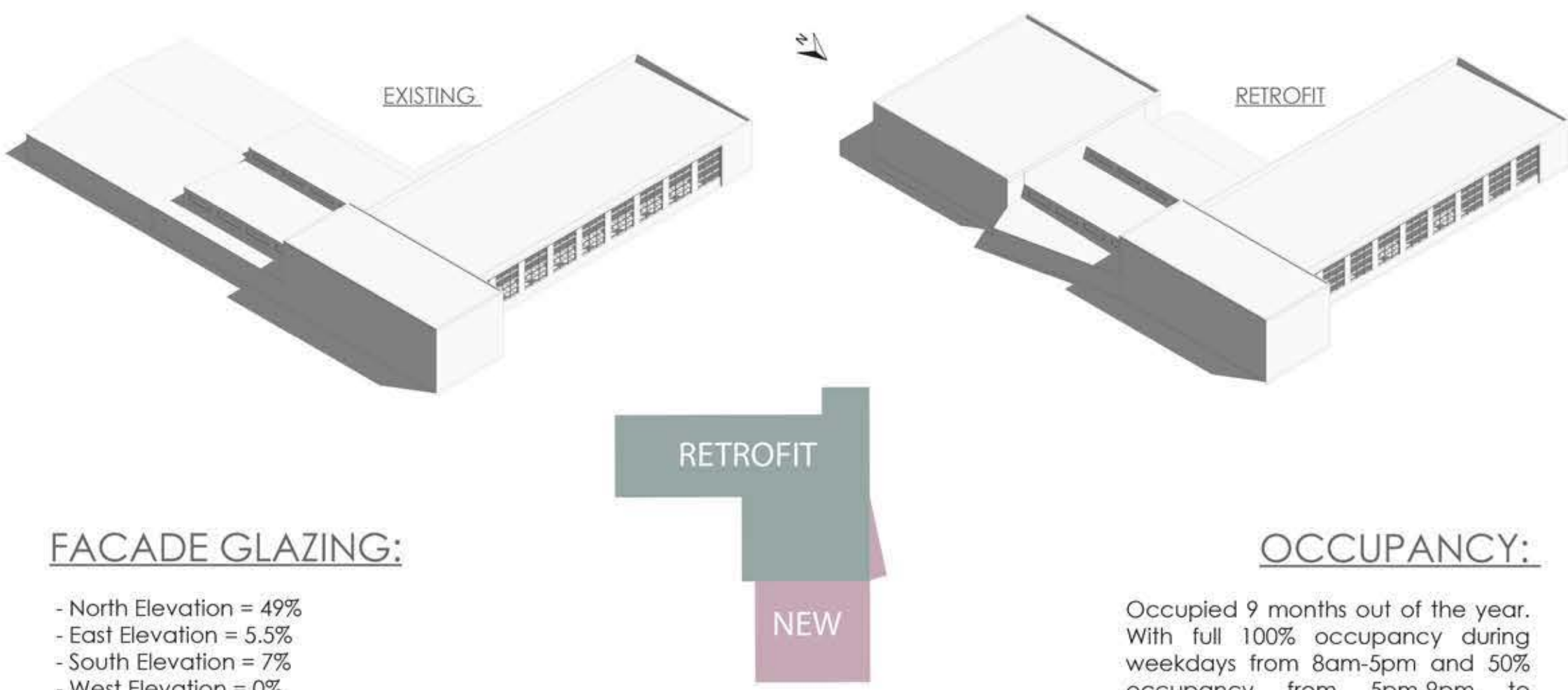


# EXISTING RETROFIT FOR ENHANCED PERFORMANCE



Hacker is renovating Cruess Hall on the University of California, Davis campus. It is a 22,000 sf structure built in 1959. Over the years it has had many uses included being a meat processing plant and is to become a multi-use space which will include an auditorium and wood shop to name a few.

UC DAVIS CRUESS HALL ENVELOPE ANALYSIS



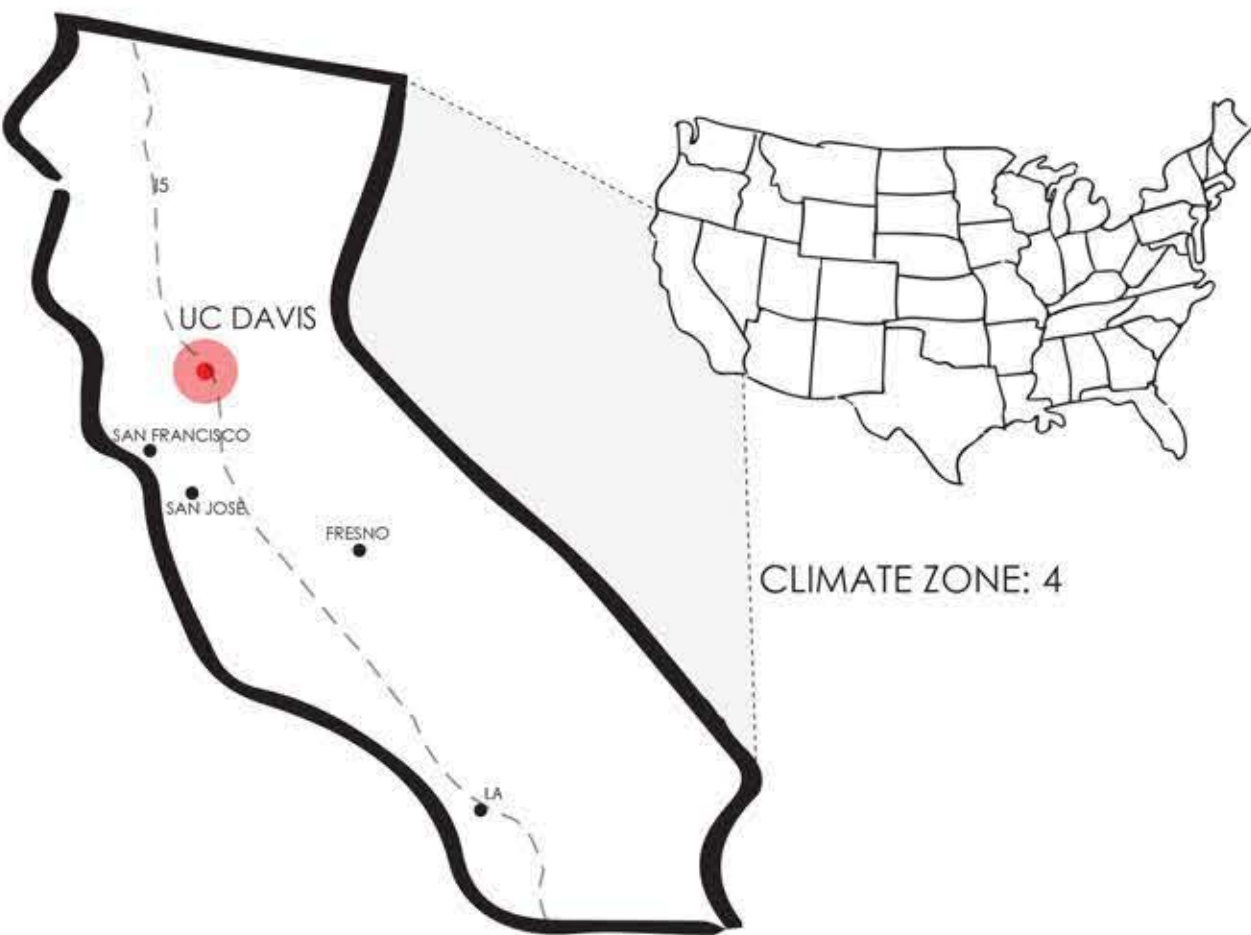
### FACADE GLAZING:

- North Elevation = 49%
- East Elevation = 5.5%
- South Elevation = 7%
- West Elevation = 0%
- No skylights or roof glazing

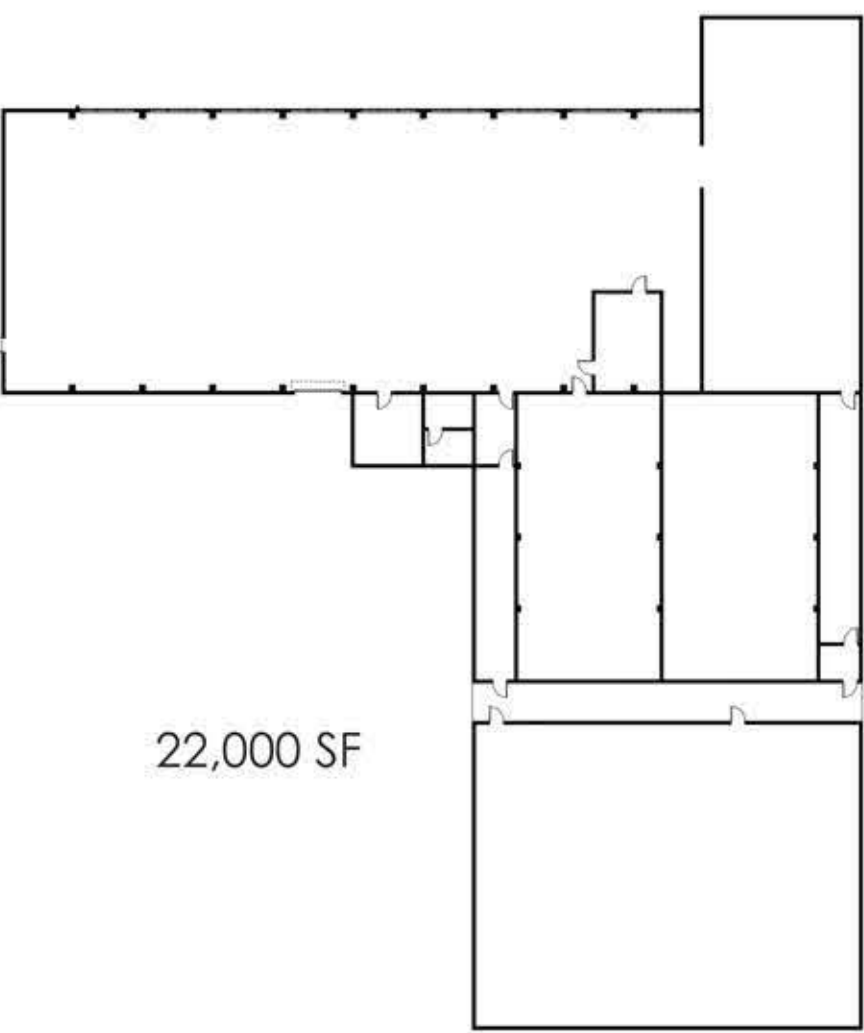
### OCCUPANCY:

Occupied 9 months out of the year. With full 100% occupancy during weekdays from 8am-5pm and 50% occupancy from 5pm-9pm to account for night classes. On weekends light occupancy ranging from 10-25% is assumed for shop use.

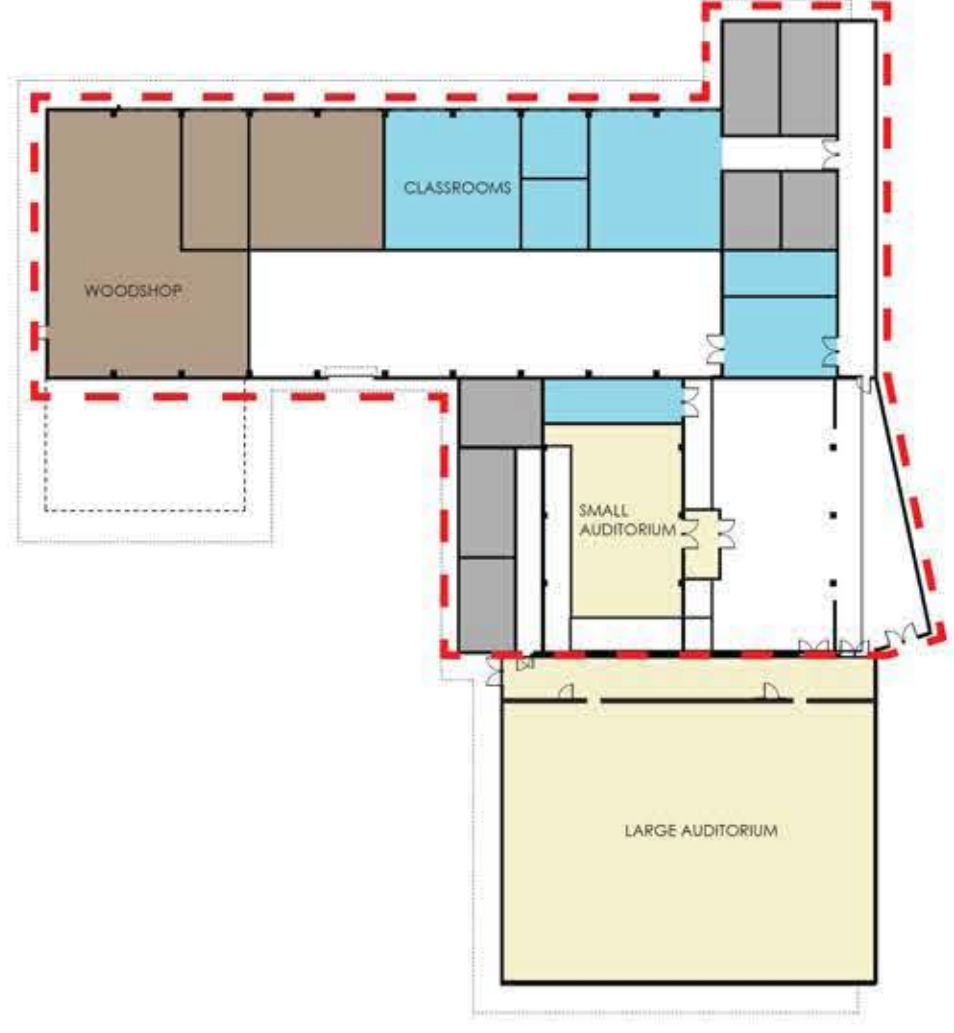
### LOCATION: CALIFORNIA



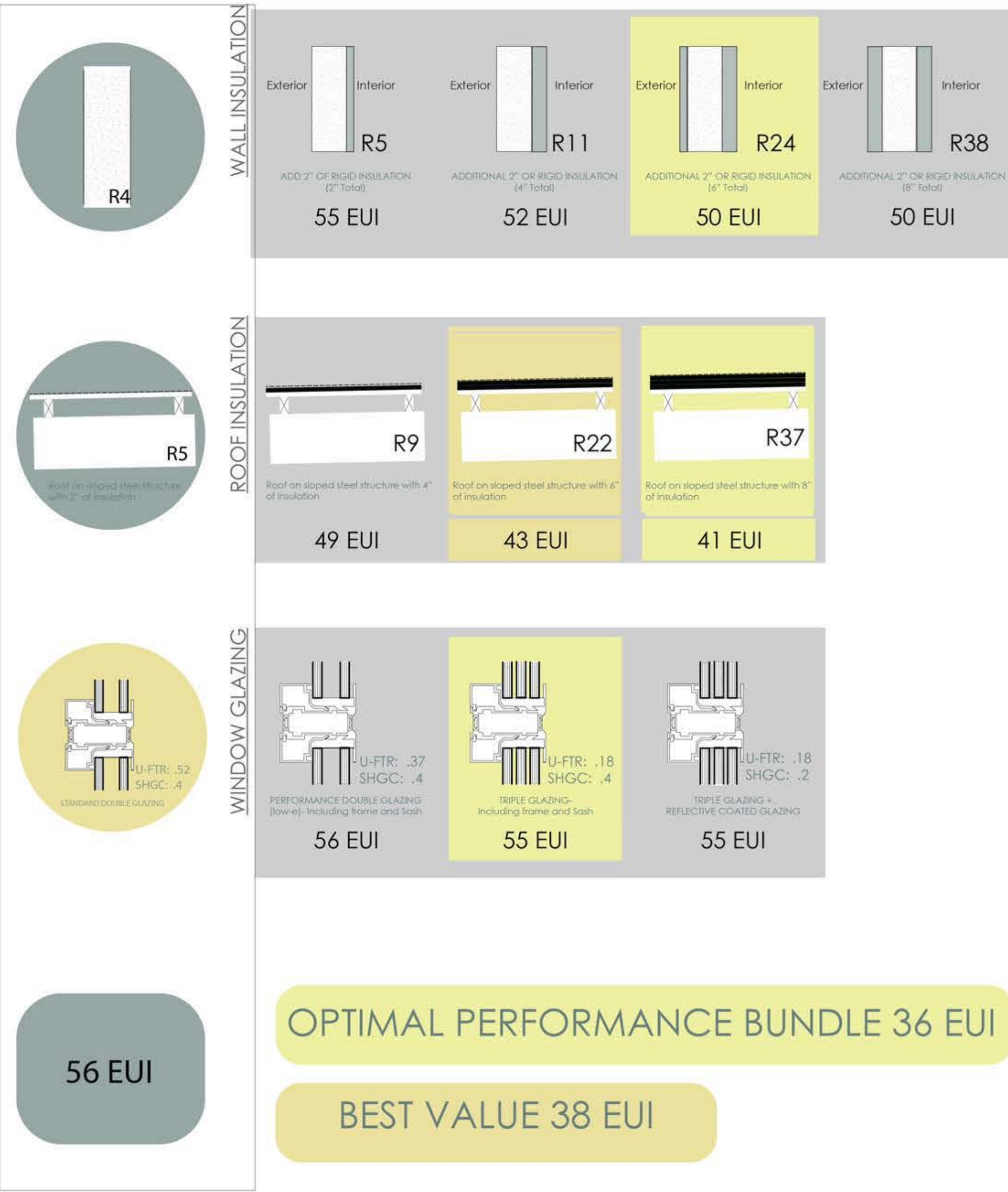
### EXISTING CONDITIONS:



### RETROFIT WITH NEW CONSTRUCTION:



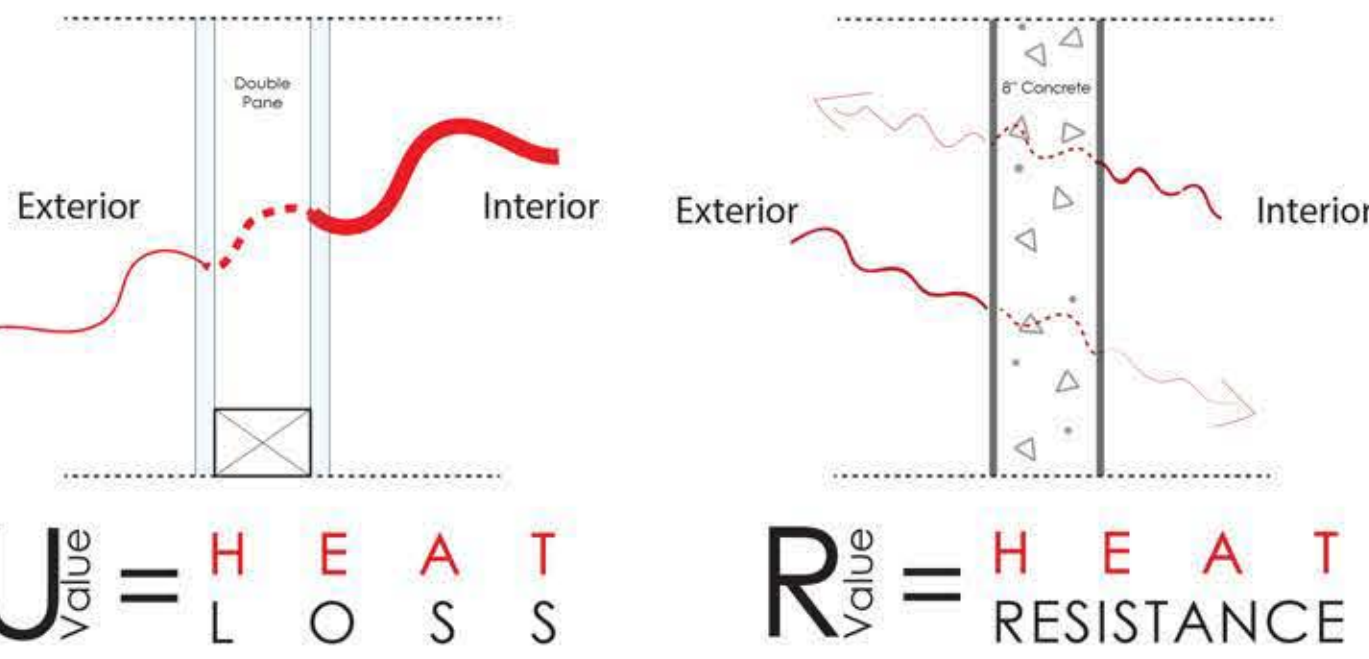
### TESTING RETROFIT OPTIONS



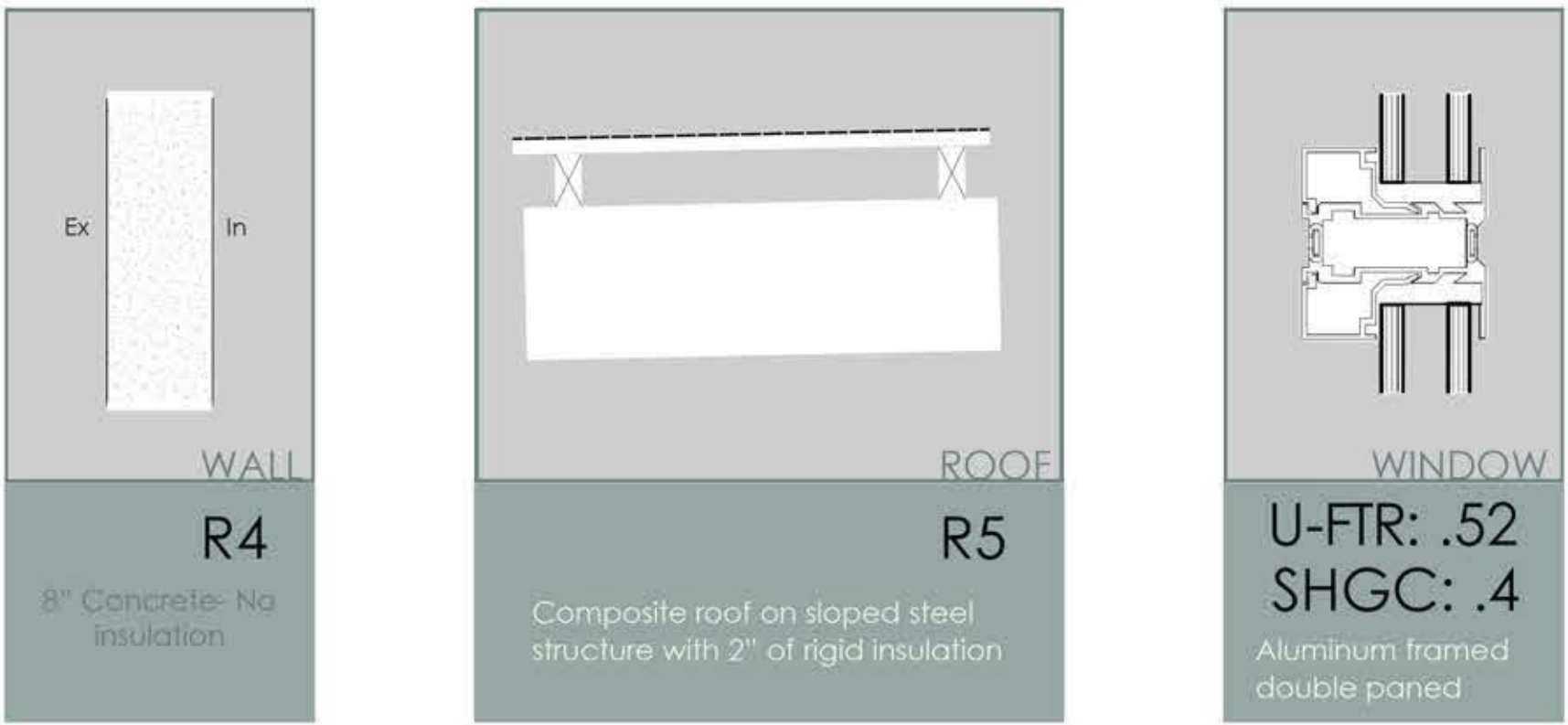
### WHAT IS BEING MEASURED?

**EUI** =  $\frac{\text{Energy Use Intensity}}{\text{sf/yr}}$

ANNUAL ENERGY USE ÷ TOTAL SF = EUI



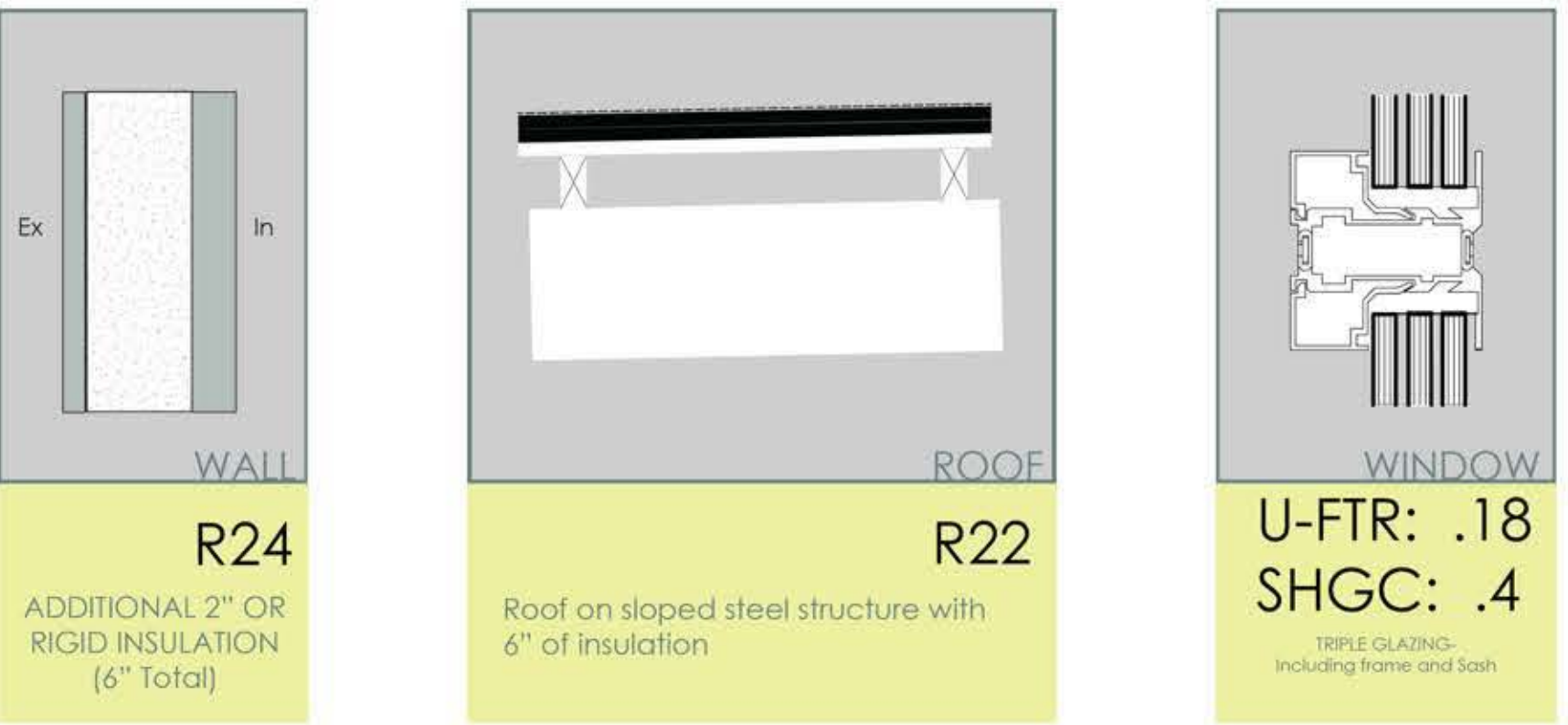
### EXISTING ASSEMBLY



Annual Energy Consumption:  
1,171,069 kBTU

**EUI: 56**

### OPTIMAL ASSEMBLY



Annual Energy Consumption:  
948,598 kBTU

**EUI: 36**