



NET ZERO ENERGY SUMMIT





CONSTRUCTION IN THE 21st CENTURY: GEARING UP FOR DISRUPTION

CASE STUDY: SLC Fire Stations 03 and 14

PROJECT VISION
DESIGN COMPONENTS
BUILDING PERFORMANCE
WHAT'S NEXT



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SLC FIRE VISION
CITY VISION
ARCHITECT VISION

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WHAT'S NEXT



SLC FIRE VISION
CITY VISION
ARCHITECT VISION

Functional Efficiencies
Engage the Public
21st Century Fire Station Model
Comfortable Atmosphere



SLC FIRE VISION
CITY VISION
ARCHITECT VISION

Net Zero Energy Building
LEED Silver
Support FD Long Term Needs



SLC FIRE VISION
CITY VISION
ARCHITECT VISION

**Convey Civic Presence
Create Architectural Excellence
Activate Public Realm
Responsible with Budget**



SLC FIRE VISION
CITY VISION
ARCHITECT VISION

SUCCESSFUL PROJECT





CHALLENGES to NET ZERO

Extensive Amounts of Glass
Pre-Determined Site Orientation
24 - 7 - 365 Occupancy
Commercial Gas Range
Natural Gas Back-Up Boiler
Individual Heating & Cooling
Multiple Appliances
USER INTERFACE

Station 14
2018



Station 14
1973





EXECUTION without COMPROMISE



EXECUTION without COMPROMISE



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EXECUTION without COMPROMISE

A modern, multi-story fire station building with a dark, metallic facade and large glass windows. The building is set against a clear blue sky. In the foreground, there are several raised garden beds with green plants and a paved area. A semi-transparent grey box with a grid pattern is overlaid on the right side of the image, containing the title and other text.

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108 KW array:
300 PV panels @
345 watts / panel

R42 Roof
R34 Walls

.16 U-value
Glazing

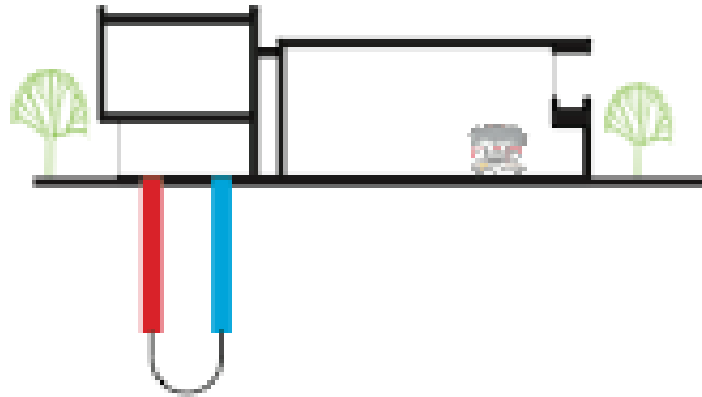
40 Well
Geothermal Field

BUILDING PERFORMANCE

EUI: 34.0; KWH use in June + July at 50% of Projected

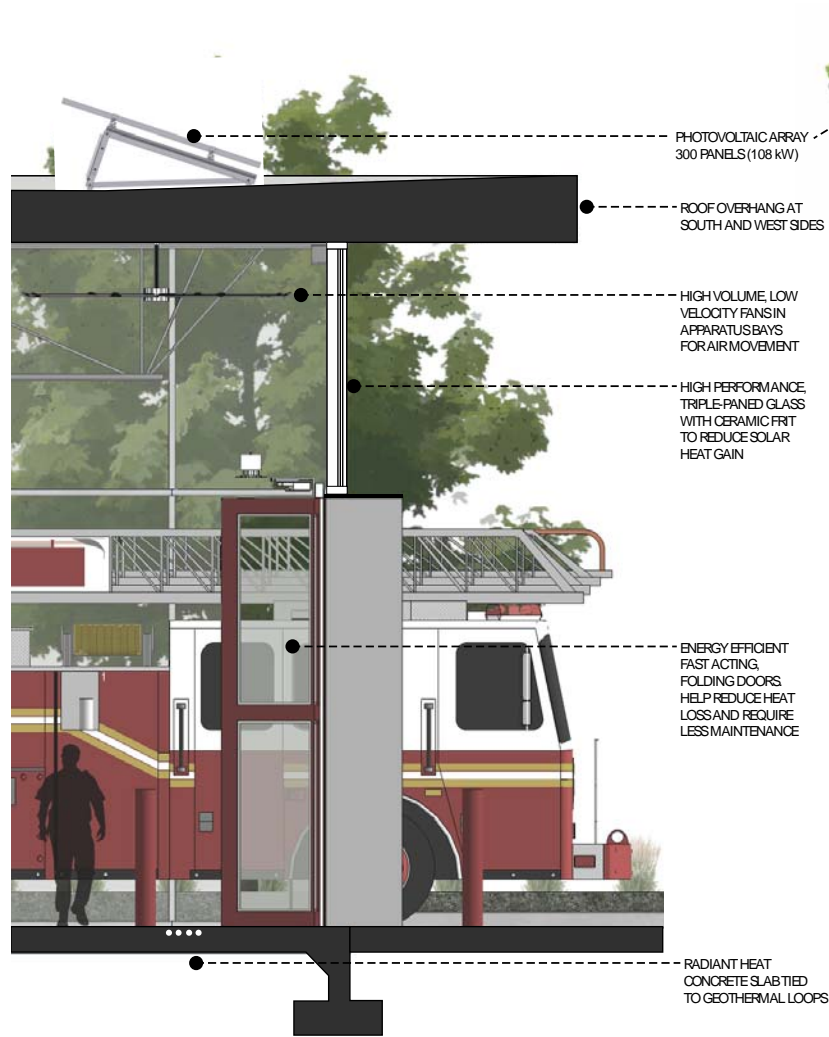
Geothermal Heating & Cooling:

SLC Fire Station 14 utilizes a geothermal heating & cooling system which makes use of the earth's ambient temperature to heat and cool the building. (40) vertical bores extend 300' down into the earth.

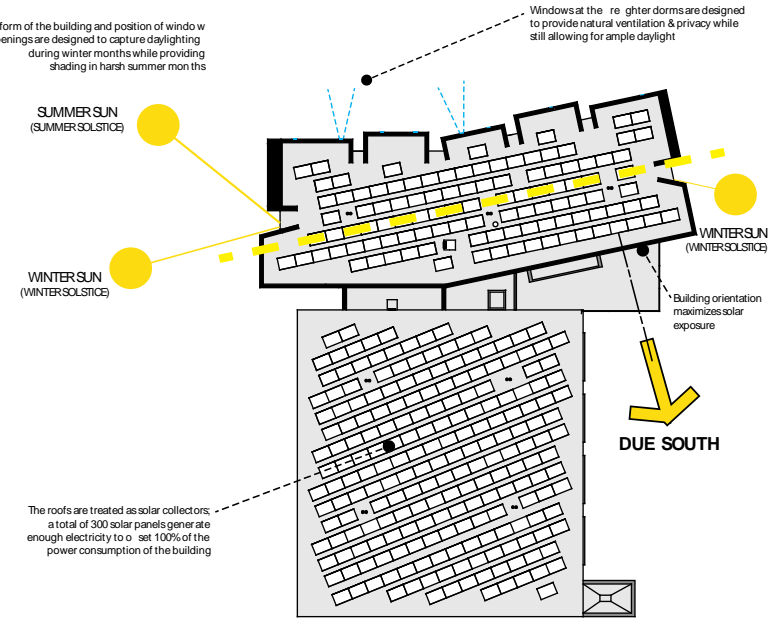


DESIGN COMPONENTS

PASSIVE SOLAR DESIGN, BUILDING ORIENTATION & DAYLIGHTING

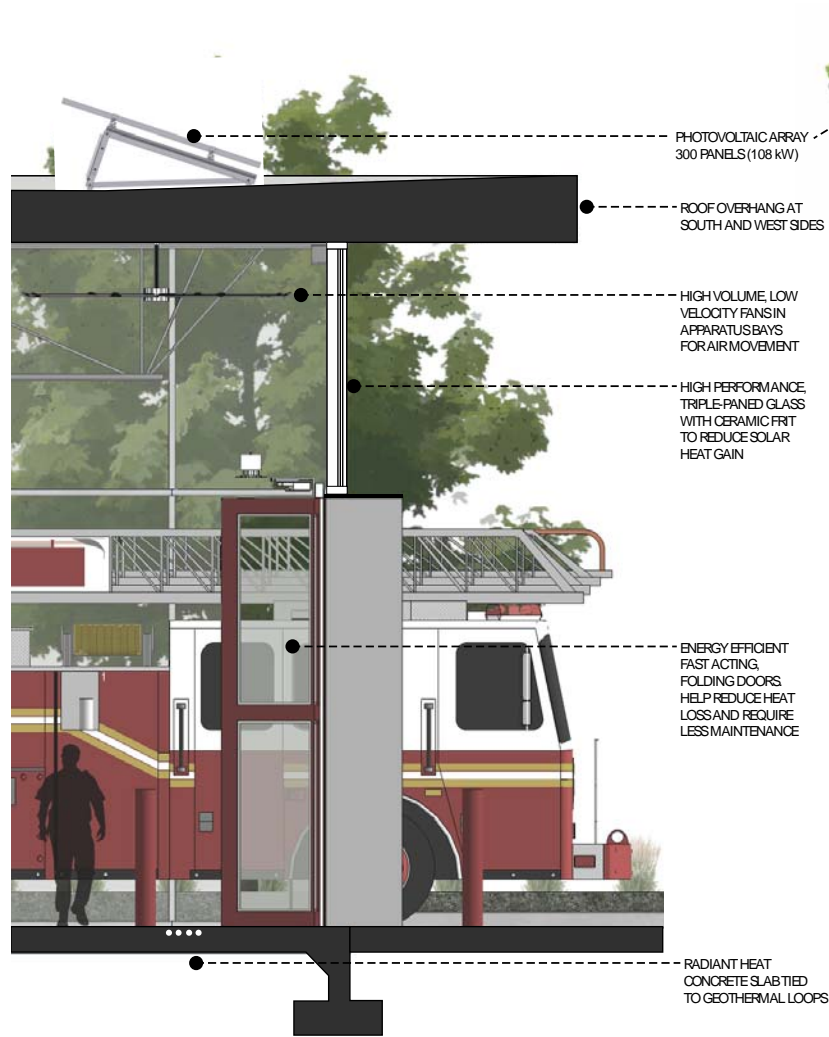


The form of the building and position of window openings are designed to capture daylighting during winter months while providing shading in harsh summer months

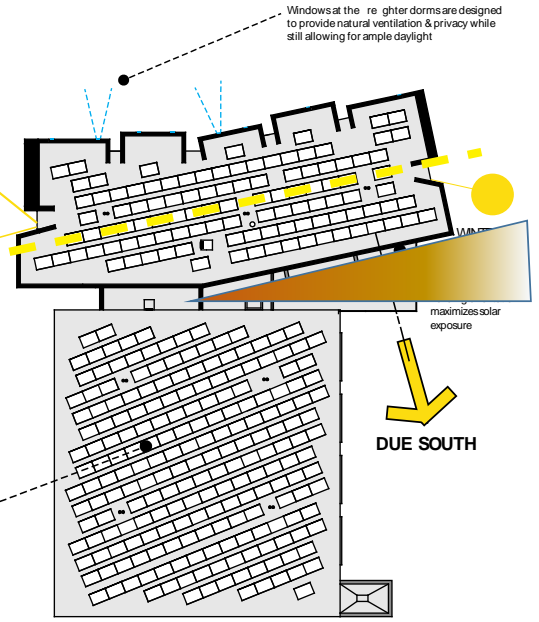


DESIGN COMPONENTS

PASSIVE SOLAR DESIGN, BUILDING ORIENTATION & DAYLIGHTING



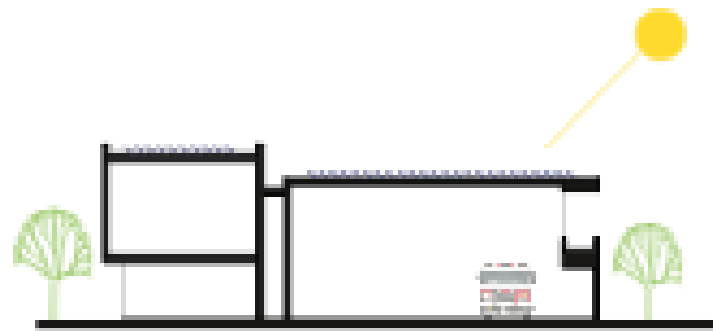
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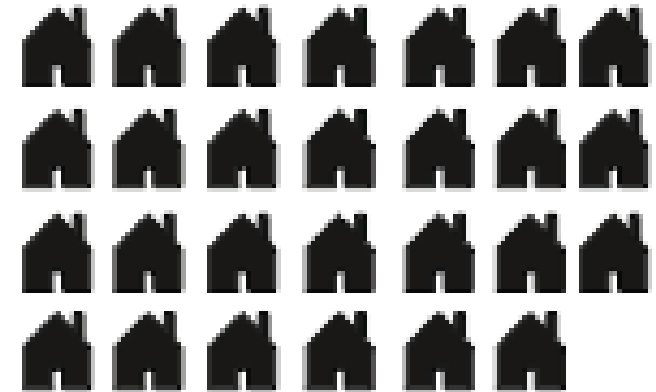
DESIGN COMPONENTS

Photovoltaic Energy:

The solar panel array mounted on the roof of SLC Fire Station 14 contains 300 panels which generate 108,000 watts of power at any point in time.

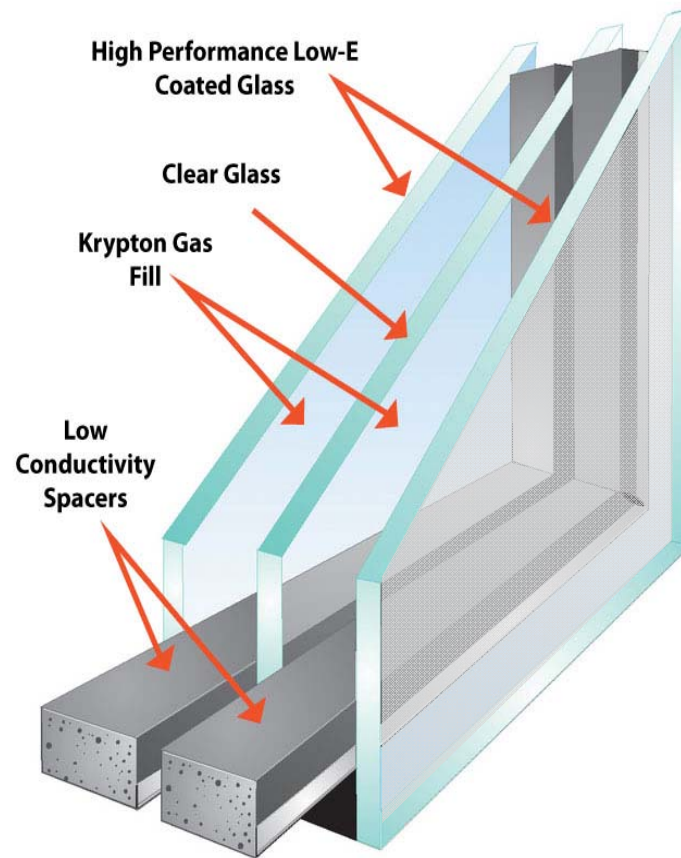


27



The power generated by the solar panel array is equivalent to the power needed to supply 27 SLC homes annually⁴

DESIGN COMPONENTS



High-Performance Glazing System:

- .16 U-Value
- Triple-Pane
- Thermally Broken
- Argon Filled
- Ceramic Frit

DESIGN COMPONENTS



High-Volume
Low-Velocity
Ceiling Fans

High-
Performance
Four-Fold Doors

Radiant Slab

DESIGN COMPONENTS



LG
461 kWh/yr



SAMSUNG
475 kWh/yr



GE
725 kWh/yr



DESIGN COMPONENTS

The Little Things: 792 kWh / year improvement



WHAT'S NEXT - ??

Evening Tour:
Station 03
2018



Station 03
1973





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thank you



architectural design studio