



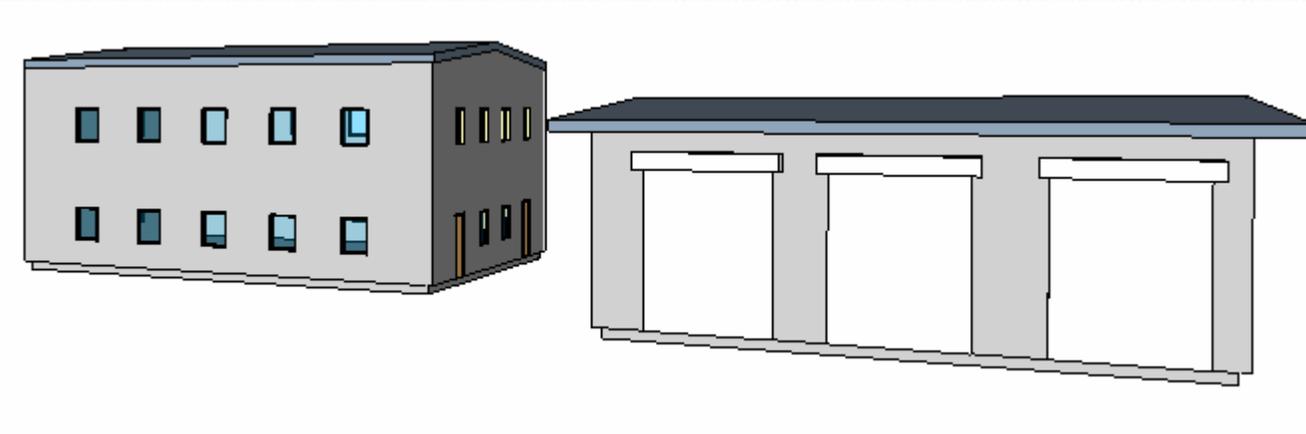
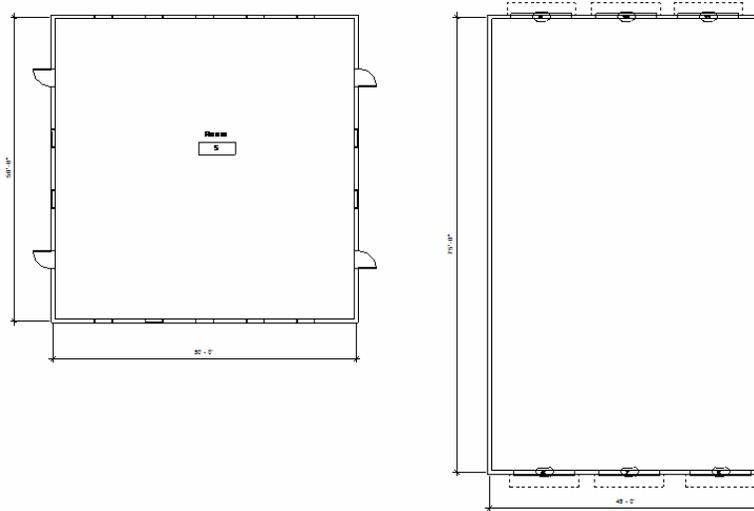
**COMMUNITY EMERGENCY
SERVICE STATION
OUTBRIEFING**

Planning and Design Charrette

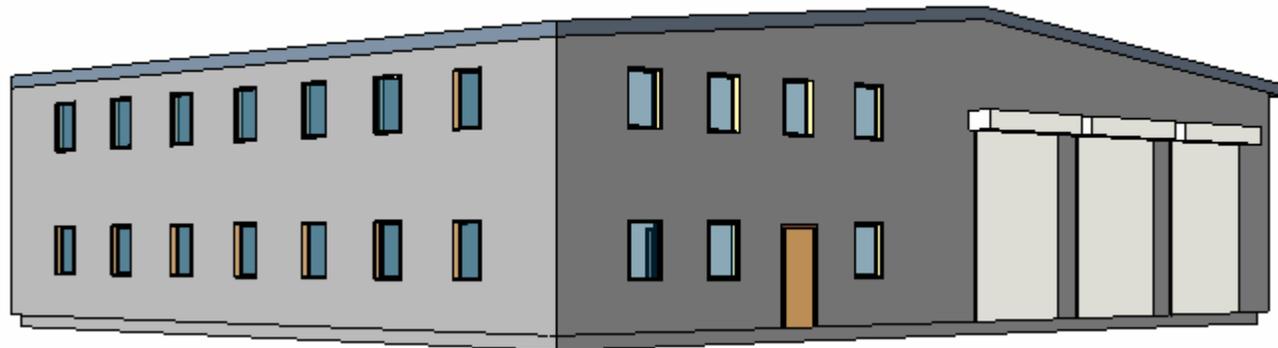
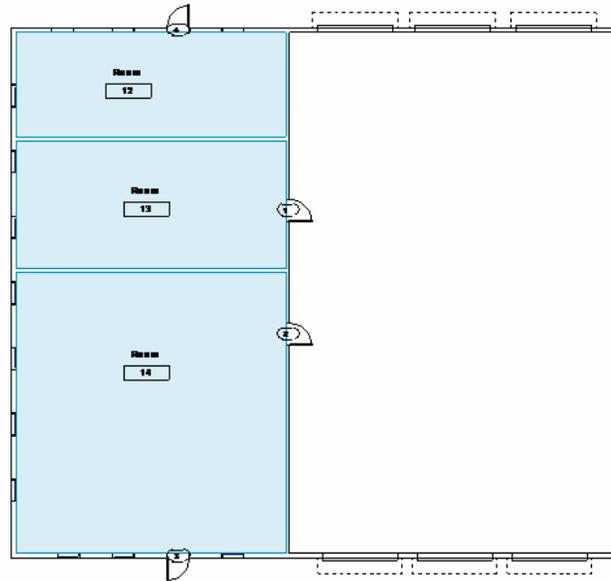
April 22-26, 2008



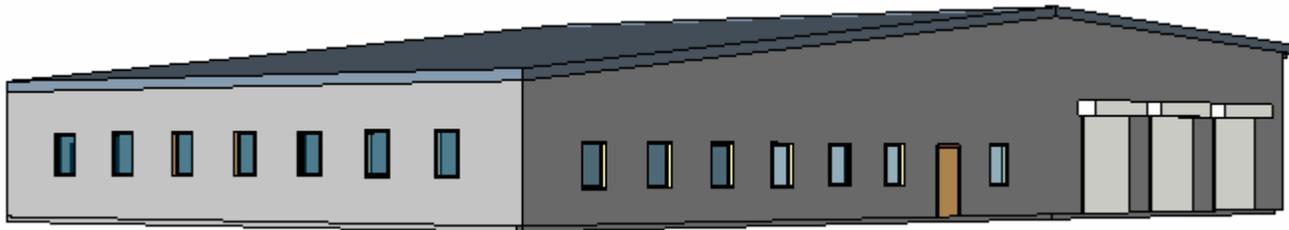
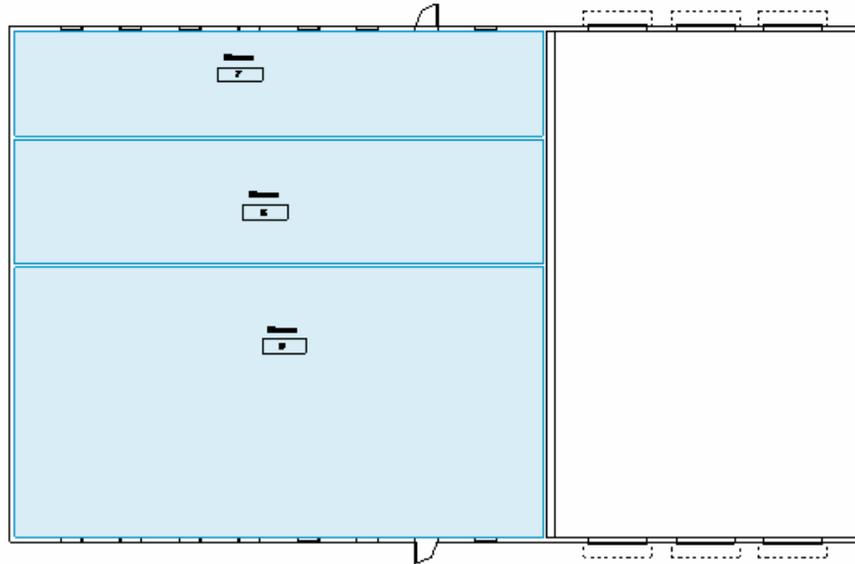
Model 1 – Two separate buildings

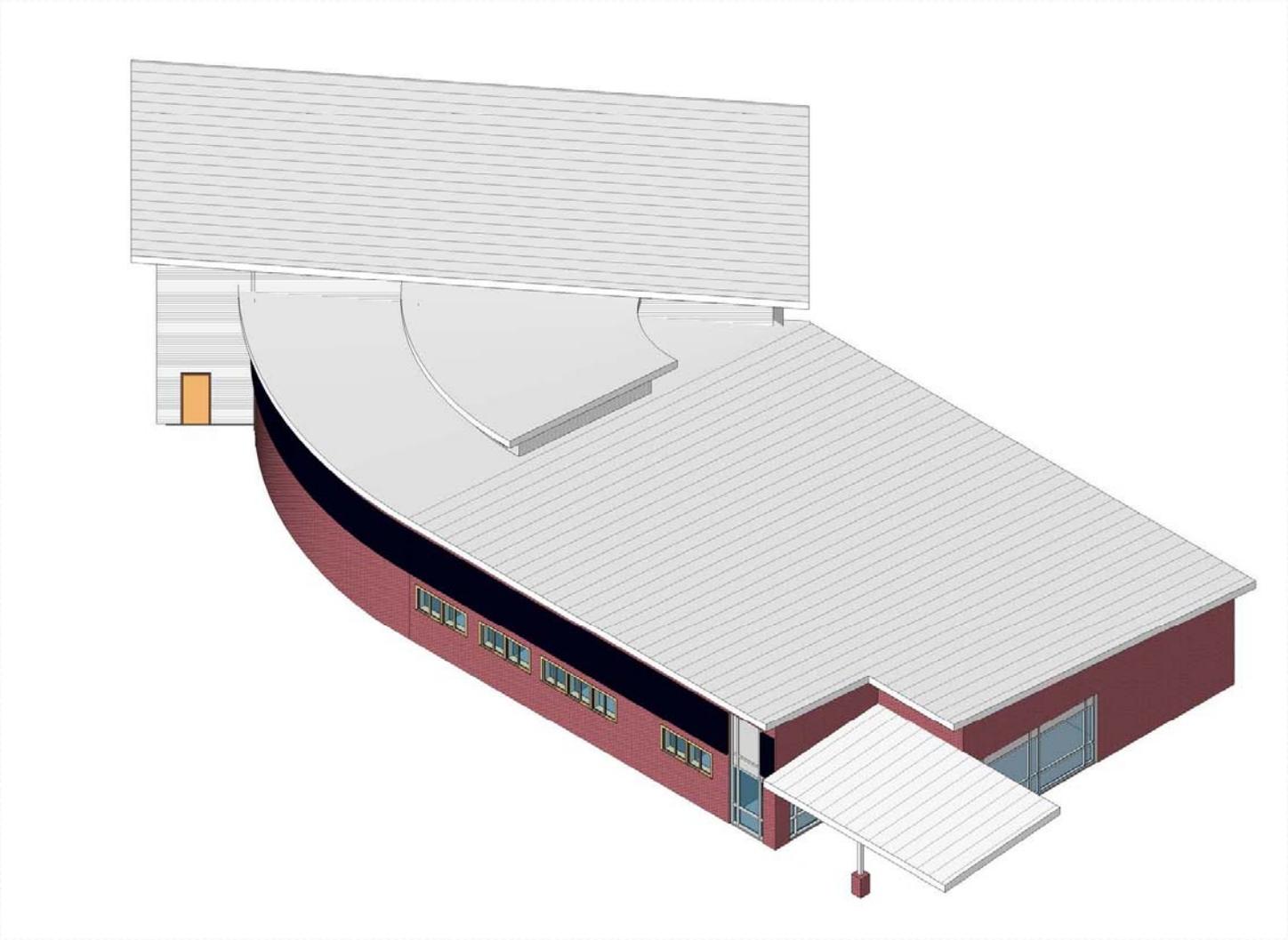


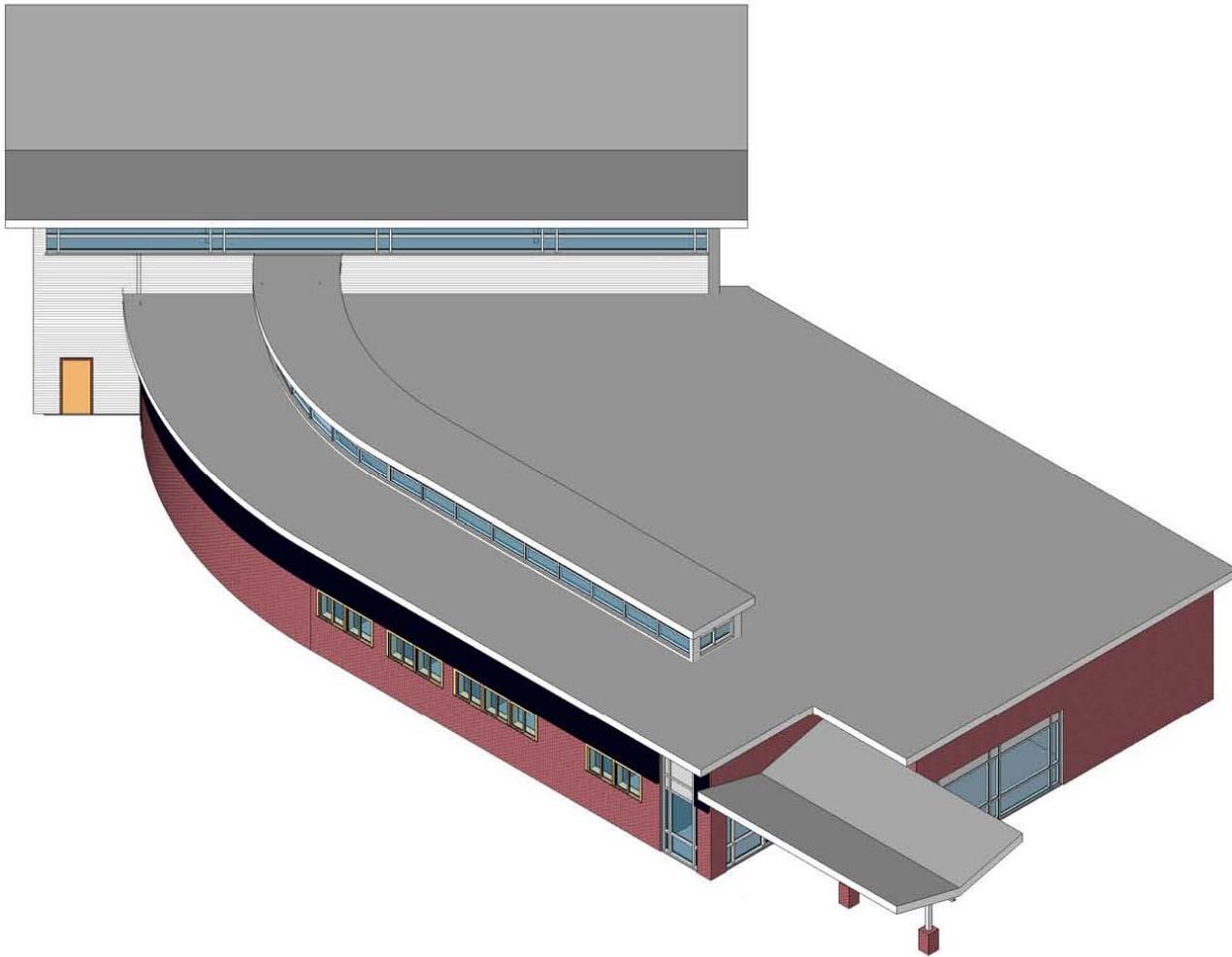
Model 2 – Two story one building

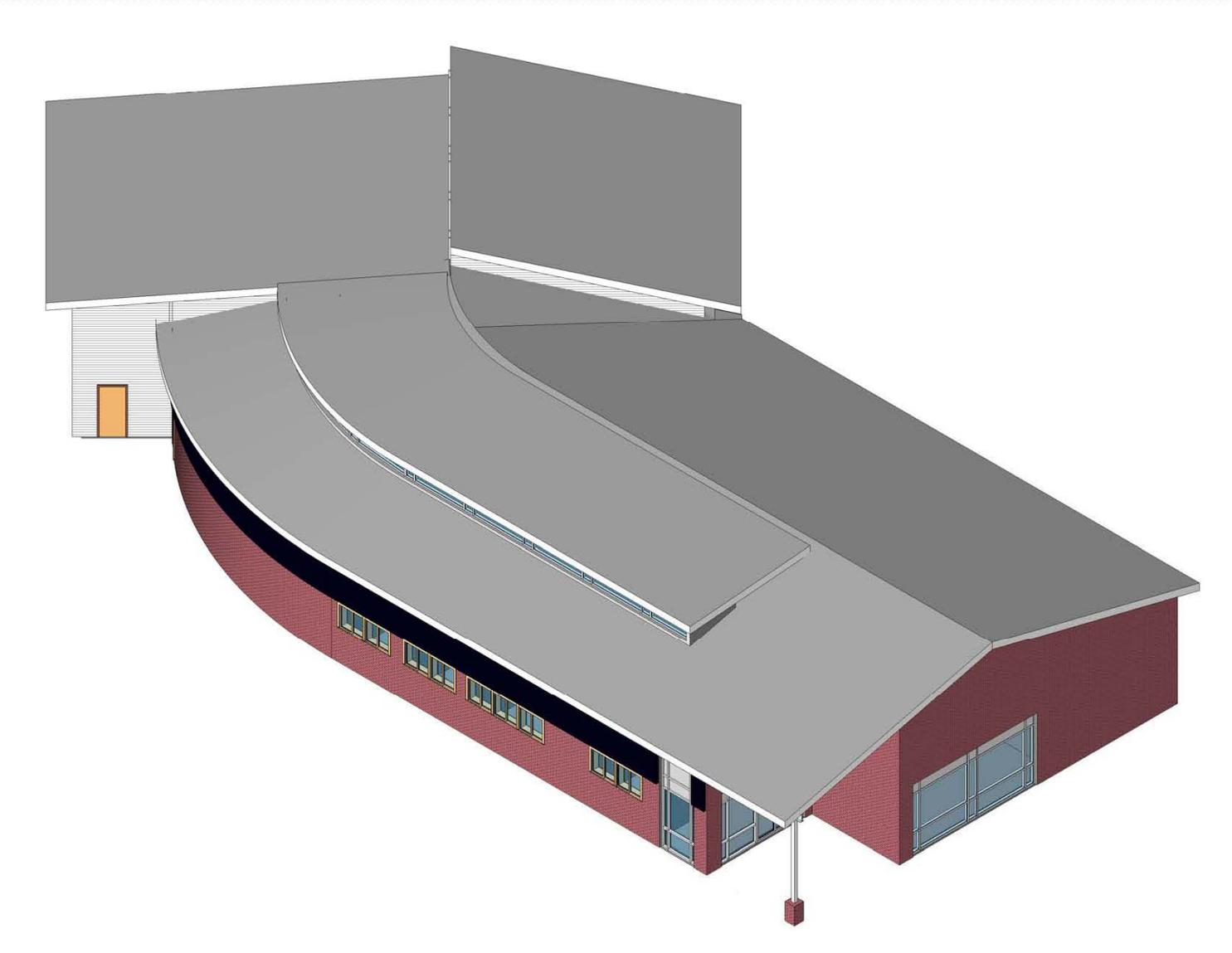


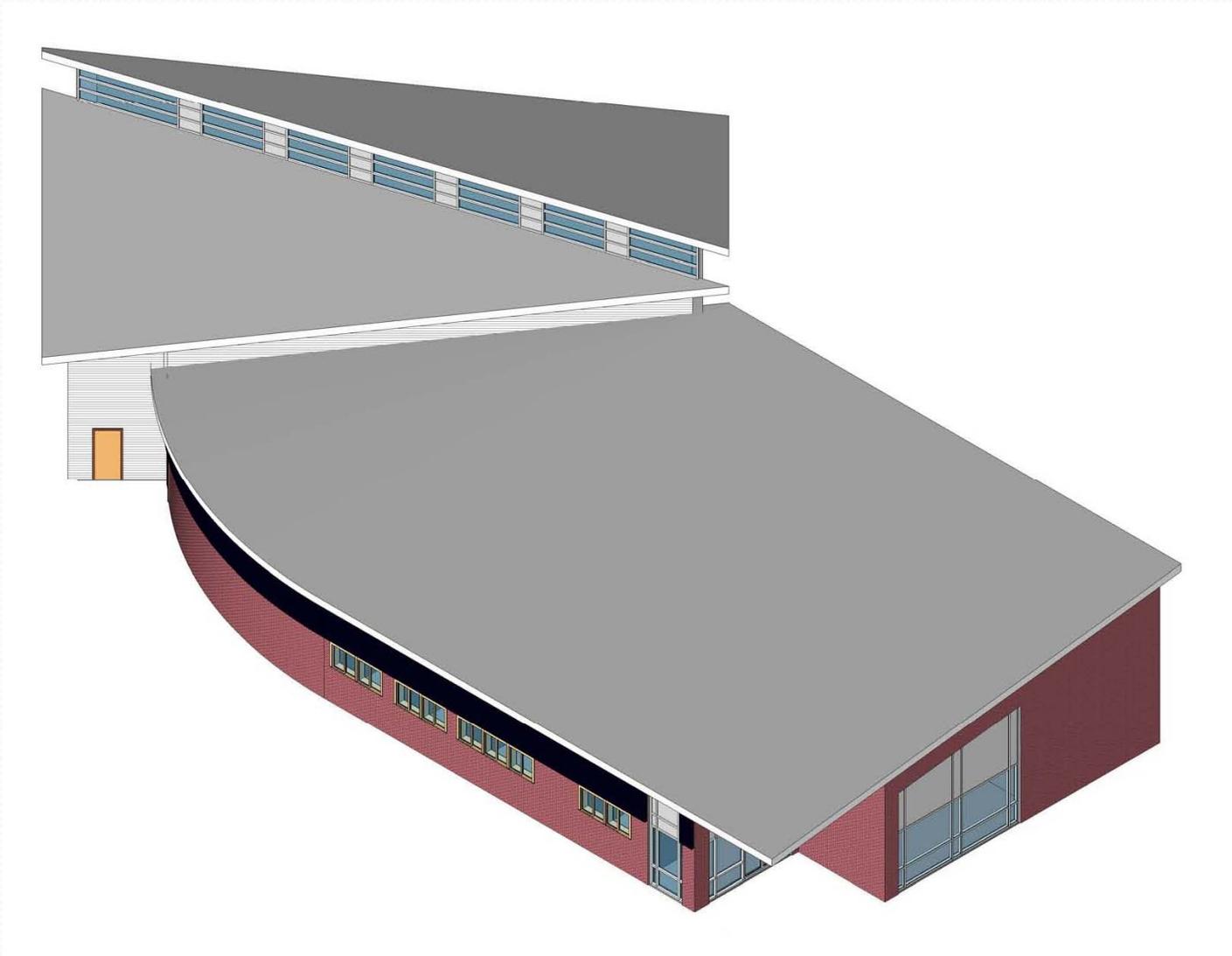
Model 3 – One story building



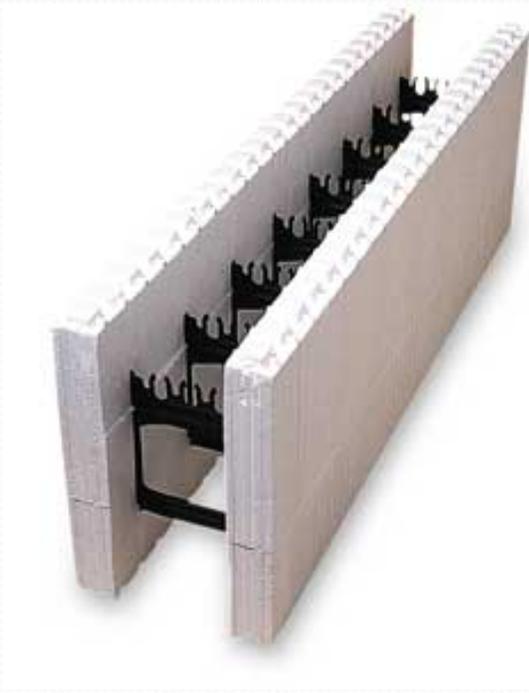








Insulated Concrete Forms



- Modular blocks made of expanded polystyrene create form for the concrete.
- Form stays in place and becomes the insulation (interior and exterior) for the walls.
- Energy efficiency equivalent from R-40 to R-50.

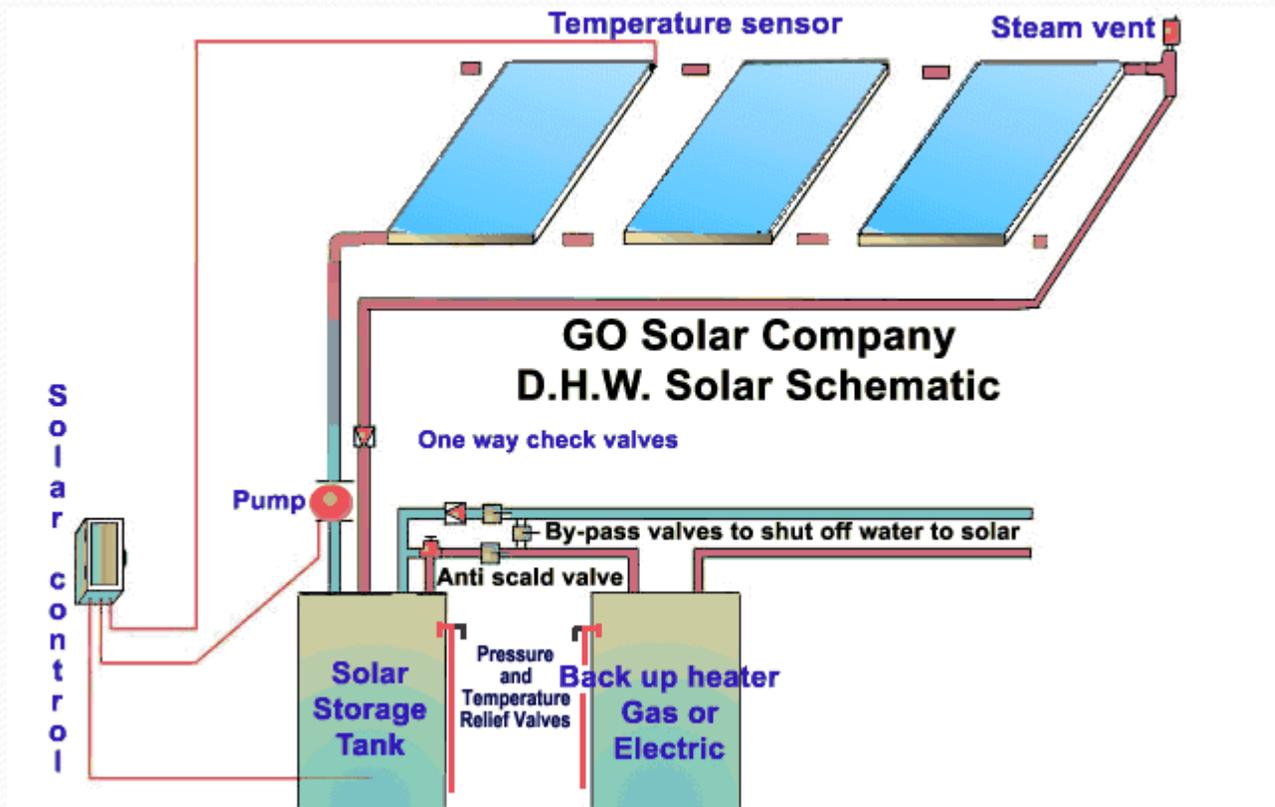
Geothermal Heating

18 EER Geothermal Heat Pumps

Dedicated Outside Air System with Energy Recovery (20 EER)



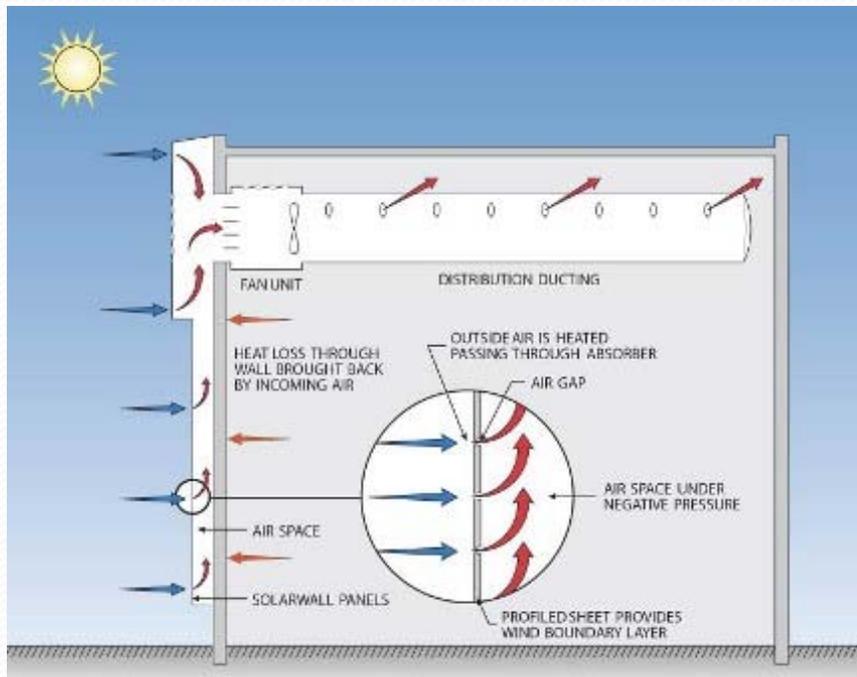
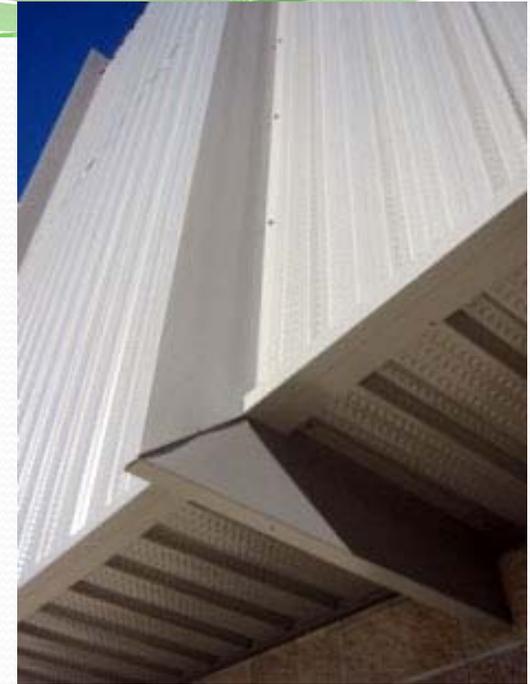
Solar Water Heating



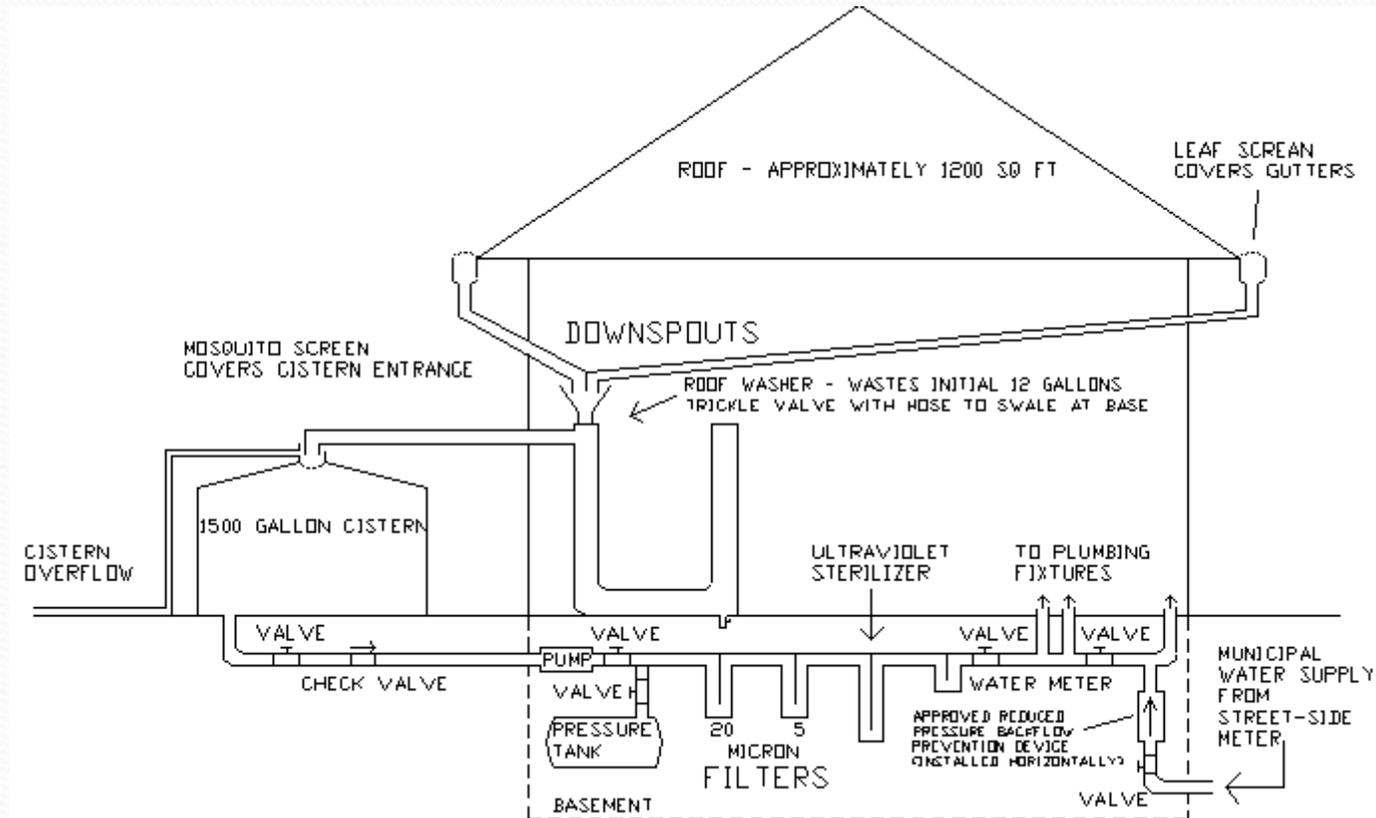
Solar water heating panels with storage tank and electric water heater backup, energy model estimates show a 5% energy savings for the entire facility.

Solar Walls

Solar wall technology to heat the high bay. Backup or supplemental heating coil (preferably with stages) will ensure sprinkler piping and trucks are not at a risk to freeze.

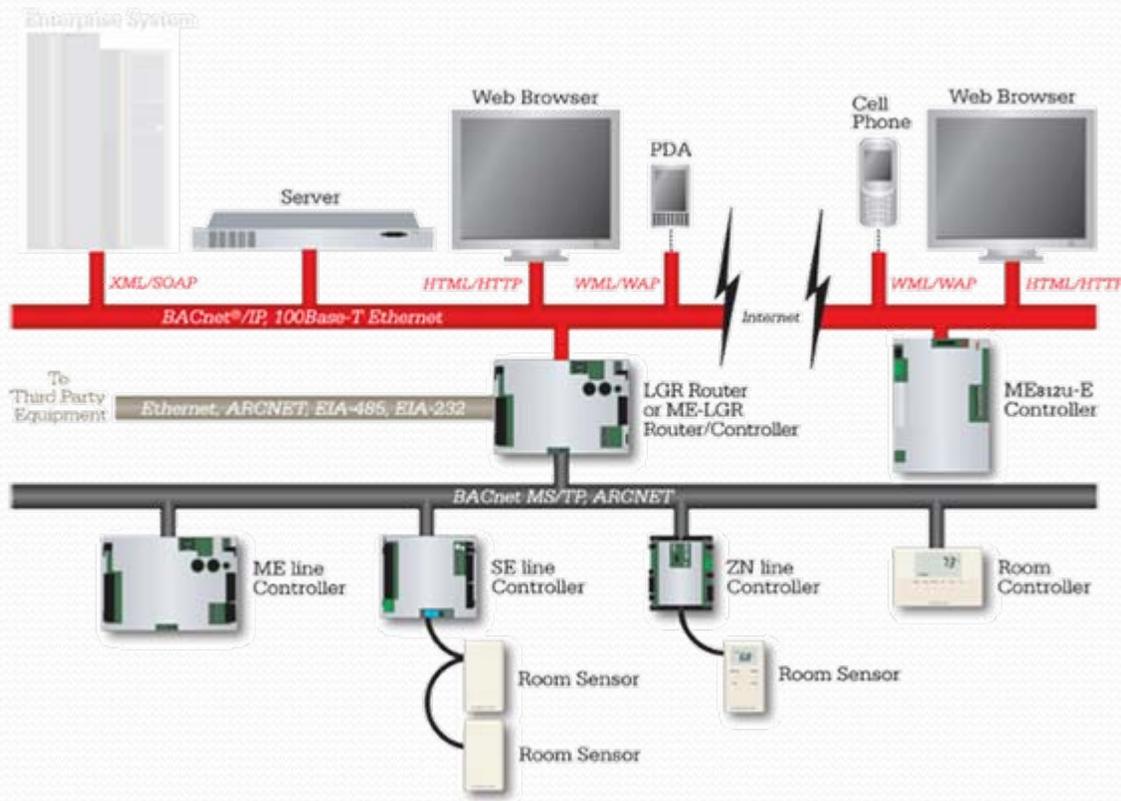


Rainwater Harvester



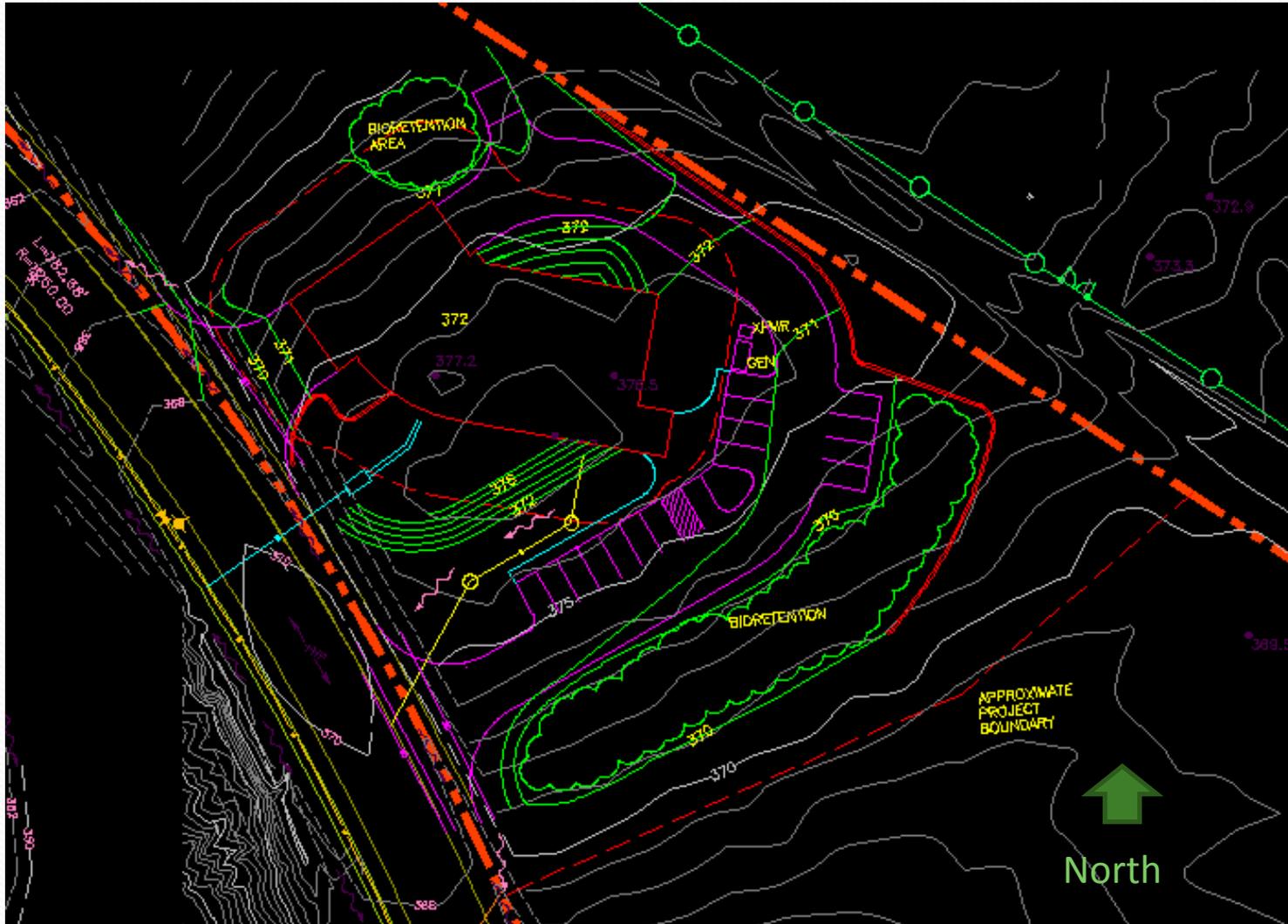
One large cistern will be installed for washing vehicles, the service will be pressurized. A second smaller cistern may be used for flushing toilets.

DDC Controls



DDC controls will allow for the control and reading of pumps, fans, sensors, etc. for necessary control and energy saving strategies as they emerge.

Site Plan



Minimum site impact

Sustainable Landscape

- Denton, Texas -Fire Station



Sustainable Landscape

- Denton, Texas -Fire Station



Sustainable Landscape

- Ft. Bragg



Sustainable Landscape

- Ft. Bragg



Cost Estimate

	1391	HSMM
Primary Facility	\$ 1,509	\$1,567
Supporting Facility	1,032	1,046
Contract Cost	\$2,541	\$2,613
Contingency (5.0%)	127	131
SIOH (5.7%)	152	156
Total	\$2,820	\$2,900

Sustainable Sites

- Native, drought tolerant vegetation
- Protect habitat
- Alternative transportation
 - Bike racks
- Cool roof, metal
- Stormwater management
 - Bio retention



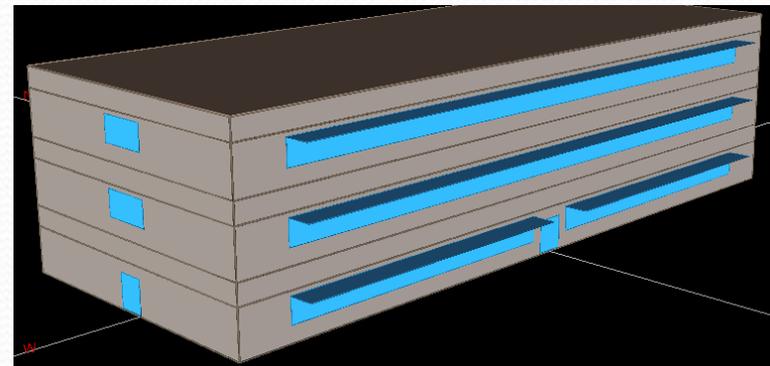
Water Efficiency

- Rainwater harvesting
 - Toilet flushing
 - Truck washing
- Low-flow fixtures
 - Dual flush toilets
 - Lavatories
- No permanent irrigation
 - Drought tolerant species



Energy

- Geothermal heat pump
- Solar wall
- Solar hot water
- Passive solar design
 - South facing windows
 - Clerestories
- Occupancy sensors
- Commissioning
- Measurement/Verification
- ICF Envelope



Materials



- Occupant recycling
- Construction waste management
- Recycled materials
 - Concrete
 - Metal roof
- Local materials
- FSC certified wood doors
- Rapidly renewable materials
 - Wheatboard cabinets
 - Linoleum floors



Indoor Environmental Quality

- Low VOC paints, adhesives
- Increased day lighting – 75% of spaces
- Construction IAQ management
- Controllability of systems
 - Lighting
 - Operable windows
- Increased ventilation
 - Energy recovery ventilator
- Pollutant source control
 - Permanent walk off mats



Innovation in Design

- Green Housekeeping
- Educational Tool
- 40% Water reduction
- 100% light colored hardscapes
- Process water reduction
- LEED AP on team



LEED Point Summary

- Certified 26-32
- Silver 33-38
- Gold 39-51
- Platinum 52-69

The Community Emergency Service Station
is currently achieving 57 points -

PLATINUM

Energy Modeling

Before the Charrette:

Southface & CERL Modeled Long Street Fire Station

CERL Modeled 4 proposed configurations

Results comparable. Underground building model didn't work. One story building with high-bay on end most energy efficient of 4.

During the Charrette:

HSMM drew 3D BIM models of 3 preliminary designs

CERL used 3D BIM files to Model 3 preliminary designs

Design revised, BIM model refined Thursday night.

CERL Modeled current design Friday.

After the Charrette:

HSMM can use GBS to optimize windows & features.



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 See a building designed to be [Carbon Neutral in five minutes.](#)
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User: AStumpf

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Product Advisor

IP SI

[Products by CSI Division](#)

Revolutionary new transparent solar control, low-e glass with an unmatched LSG of 2.33.

[more info...](#)

Only show checked items Show all alternatives

Run List [Community Emergency Services Building](#)

Previous Next

Runs	Date	User	Floor Area (ft²)	Annual Elec Cost	Annual Fuel Cost	Annual Elec Demand (kW)	Annual Elec Use (kWh)	Annual Fuel Use (MBtu)	EUI (kBtu/ft²)	Delete
<input type="checkbox"/> Model 4.xml +	Apr 24 08 4:02 PM	hkim	5236	\$4,415	\$844	29.8	76,406	42	57.8	<input type="checkbox"/>
<input type="checkbox"/> Model 2.xml +	Apr 24 08 3:55 PM	hkim	5236	\$4,171	\$844	26.5	72,187	42	55.1	<input type="checkbox"/>
<input type="checkbox"/> Model 1.xml +	Apr 24 08 3:50 PM	hkim	5234	\$4,021	\$847	21.5	69,590	42	53.5	<input type="checkbox"/>
<input type="checkbox"/> Ft-Braqq-Firehouse Scheme01_1.xml	Apr 24 08 3:16 PM	hkim	5234	\$5,362	\$847	24.7	92,792	42	68.6	<input type="checkbox"/>
<input type="checkbox"/> Model 2.xml	Apr 24 08 2:57 PM	hkim	5236	\$5,646	\$844	28.1	97,708	42	71.7	<input type="checkbox"/>
<input type="checkbox"/> Model 4.xml	Apr 24 08 2:57 PM	hkim	5236	\$5,552	\$844	29.7	96,088	42	70.7	<input type="checkbox"/>

Energy Modeling

Baseline Assumptions based on ASHRAE 90.1 - 2004:

Best Case Features Selected:

Windows: Insulated Grey Low E

Windows: same location and size as BIM model

Roof: Cool Roof R-value 20

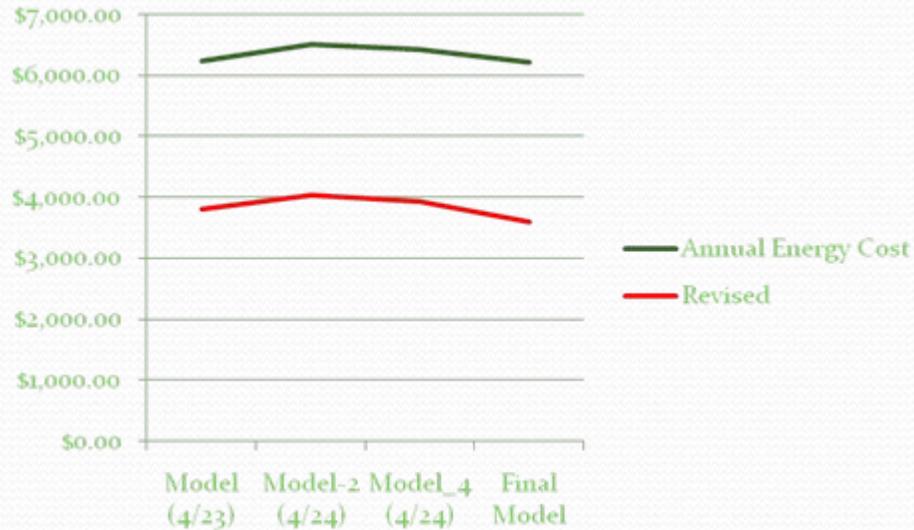
Wall: 10" ICF Wall

HVAC: 17.4 SEER/9.6 HSPF Split Heat Pump

Light Power Density - reduced 40%

Light control: Occupancy Sensor

Charrette Energy Modeling Results



	Annual Energy Cost	Revised	Saving	Average Energy Star	SF
Model (4/23)	\$6,229.00	\$3,808.00	0.388666	46.70%	5,234
Model-2 (4/24)	\$6,512.00	\$4,043.00	0.379146	43.50%	5,236
Model_4 (4/24)	\$6,418.00	\$3,940.00	0.386102	44.80%	5,236
Final Model	\$6,208.00	\$3,588.00	0.422036	48.60%	5,089

ESTCP Summary

WOW!!

- We're blessed with lots of work to do...
 - Spread design lessons learned to Services
 - Start monitoring Longstreet
 - Keep our promises to this project
 - Continue modeling support
 - Commissioning
 - Complete 6 LEED templates
 - Submit LEED documentation









Milestones

- Value Engineering Meeting May 20, 2008
- VE Conference May 27, 2008
- 85 % Documents June 24, 2008
- Review Meeting July 01, 2008
- Out for Bids July 23, 2008

Success Factors

- 1 35% Documents
- 2 Platinum
- 3 In Budget
- 4 Users Buy-in
- 5 Defined Technology of Systems
- 6 Innovative
- 7 Reproducible
- 8 Aesthetic
- 9 Community Education Aspect of Project
- 10 Satisfy Grants

TEAM CESS

