Entrance View

bethlehem inn

Overview of Intent

Everything on this planet shares three things in common: The needs for water, food , and shelter. Bethlehem Inn is an organization bringing these resources to the homeless of Central Oregon. The design of this building provides for the community on a local and global scale by creating a shelter that includes spaces to produce food, gather water, and produce alternative energy. These goals combine into a rejuvenating structure and aesthetic to inspire the community and heal the homeless. In combining the needs of a of a built environment with the function of natural environment this building also heals a planet who is home to all. This architecture is a shelter for the homeless, the employees of the organization, and the volunteers to work and live in good health in harmony with nature.

Site Plan: Resource Review

Site Plan: **Assets**

•Sun – Strong Southern orientation

•Wind – Summer NW winds are amplified by the Deschutes River 3 miles to the west and further diverted and channeled by Aubrey Butte 8 miles to the West. This creates a wind tunnel for summer winds. Winter Winds are from the South and South East.

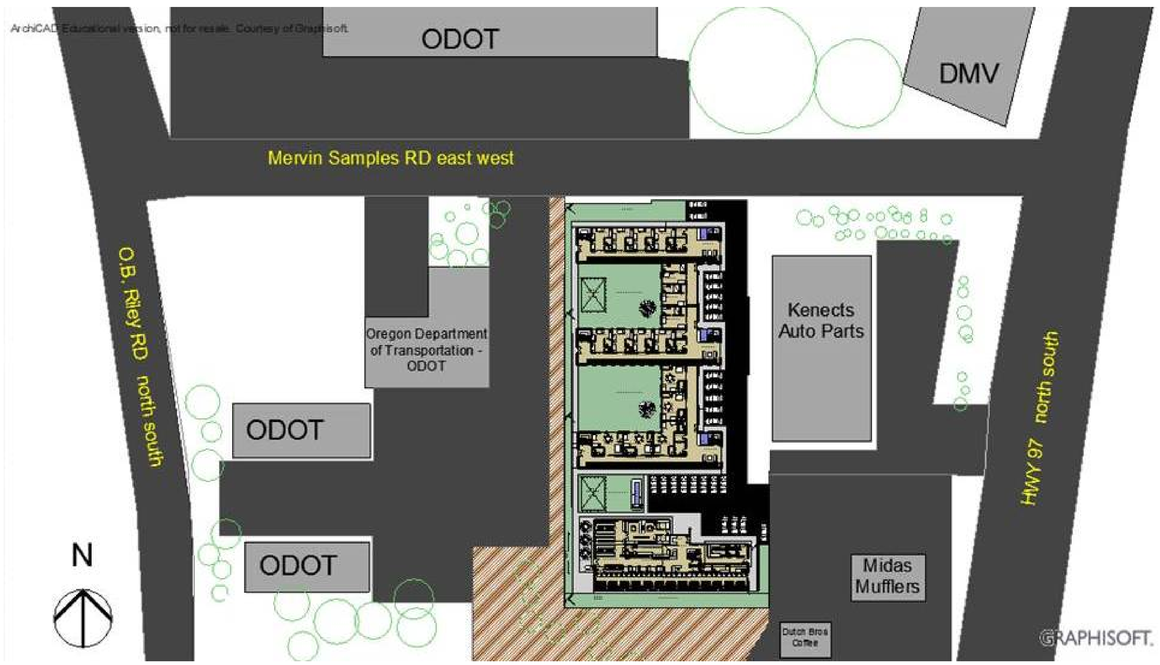
•Site is flat- with a 10' drop in grade on the West side raising the structure above the structures to the west that might block NW Wind.

Site Plan: **Challenges**

•Rain – High Desert climates get little rain, and near by watersheds are stressed due to water demands.

•Climate – Extreme environment with hot summer and cold winters.

•Urban Industrial Area – Heat Island Effect created by ample pavements mixed with poor air quality.



Site Plan

ARCHICAD EDUCATION VERSION
GRAPHISOFT.

O'DAIR DESIGN
- Escape the Box -

Designer:

Miriah Colleen O'Dair
Moblie: 541 . 788 . 3841
Email: MiriahODair@gmail.com

bethlehem inn
shelter • sustenance • self-sustainability

Sustainable Homeless Shelter
Academy of Art University
IAD 613
Professor: Marc DiGiacomo

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SHEET TITLE
COVER SHEET & SITE PLAN

A-001

SHEET 1 OF 7

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Admin Building Amenities

•Total SQFT – 9,231
•First Floor SQFT – 6,272
•Second Floor SQFT – 2,959

DESIGN FEATURES
•Thermal Gain Floors and Walls
•Radiant Heat Floors
•Interior Solar Pergola
•Greenhouse Food Production
•Water Feature
•Extensive Day Lighting
•Sliding Glass Doors aid in making many office furniture configurations possible.

FIRST FLOOR
•Medical Wing – 3 Exam Room w/office
•Computer Lab – 9 iMac Computers
•Guest Laundry – 9 HE Washer/Dryers
•Outdoor Clothes Line
•Private Laundry – 4 HE Washer/Dryers
•Commercial Kitchen
•Dining / Classroom Seats 108
•Outdoor Dining Seats 30
•Guest Restrooms- 2 standard 1 ADA
•Resource Storage

SECOND FLOOR
•Break Room with Mini Kitchen
•Employee Restrooms - 2
•Meeting Room
•Copy and Project Area
• Organizations Offices – 8
•Partner Agency Offices – 4
•Office Storage

Family Living Amenities

•Total SQFT – 10,400
•First Floor SQFT – 5,200
•Second Floor SQFT – 5,200

DESIGN FEATURES
•Thermal Gain Floors and Walls
•Radiant Heat Floors
•Interior Solar Pergola
•Greenhouse Food Production
•Water Feature
•Extensive Day Lighting
•Sliding Glass Doors aid in making spaces feel bigger.

FAMILY UNIT
•Family Living Units Total count 10
•Each Unit Sleeps 6 people
•Each Unit has 2 Bunkbeds & 1 Queen
•Private Full Bath with Tub Shower
•Mini Fridge and Micro
•Private Closet Space
•Family Dining Table

PUBLIC SPACES
•Lounge Area x 2
•Greenhouse Area
•Outdoor Courtyard with Playground

OPERATIONAL SPACES
•Storage x 2
•Mechanical x 2

Singles Living Amenities

•Total SQFT – 20,800
•First Floor SQFT – 10,400
•Second Floor SQFT – 10,400

DESIGN FEATURES
•Thermal Gain Floors and Walls
•Radiant Heat Floors
•Interior Solar Pergola
•Greenhouse Food Production
•Water Feature
•Extensive Day Lighting
•Sliding Glass Doors aid in making spaces feel bigger.

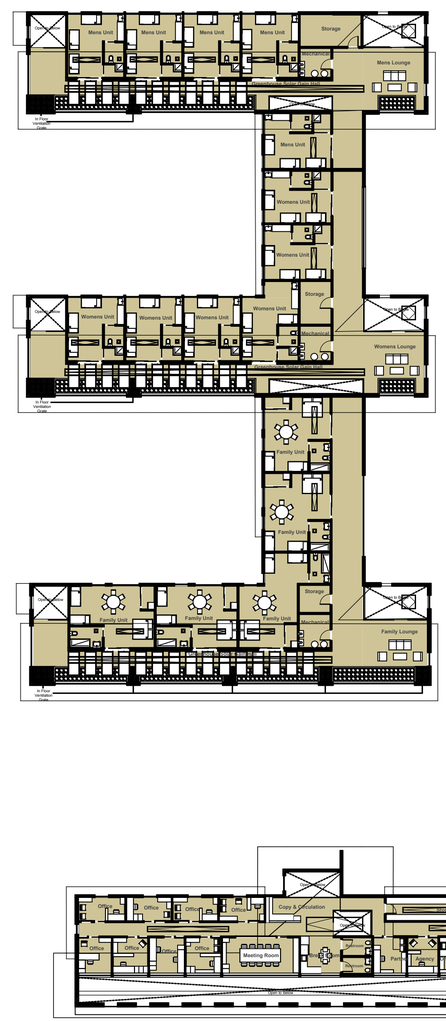
MENS & WOMENS UNITS
•Family Living Units Total count 10
•Each Unit Sleeps 6 people
•Each Unit has 3 Bunk Beds
•Private Full Bath with Shower
•Private Closet Space

MENS & WOMENS VA UNITS
•Womens VA Unit count 1
•Mens VA Unit count 2
•VA Unit Sleeps 2
•Each Unit has 2 Full Beds
•Private ADA Full Bath and Shower
•Private Closet Space

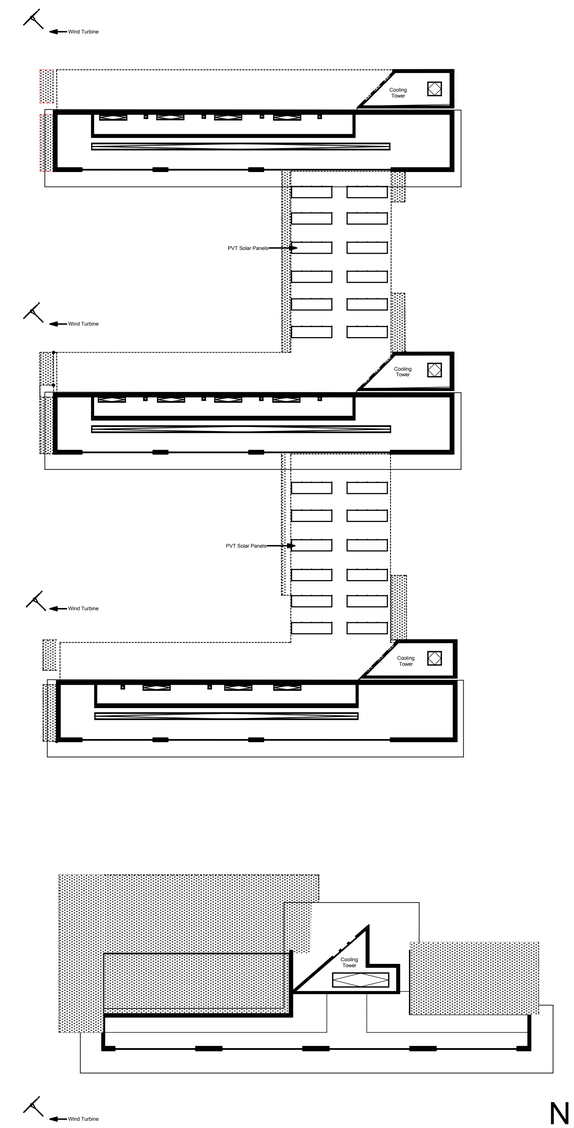
PUBLIC SPACES
•Lounge Area x 4
•Greenhouse Area
•Outdoor Courtyard

OPERATIONAL SPACES
•Storage x 4
•Mechanical x 4

Scale 1'=1/8" 1st FLOOR



Scale 1'=1/8" 2nd FLOOR



Scale 1'=1/8" Roof

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O'DAIR DESIGN
- Escape the Box -

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FLOOR PLANS

A-101
SHEET 2 OF 7

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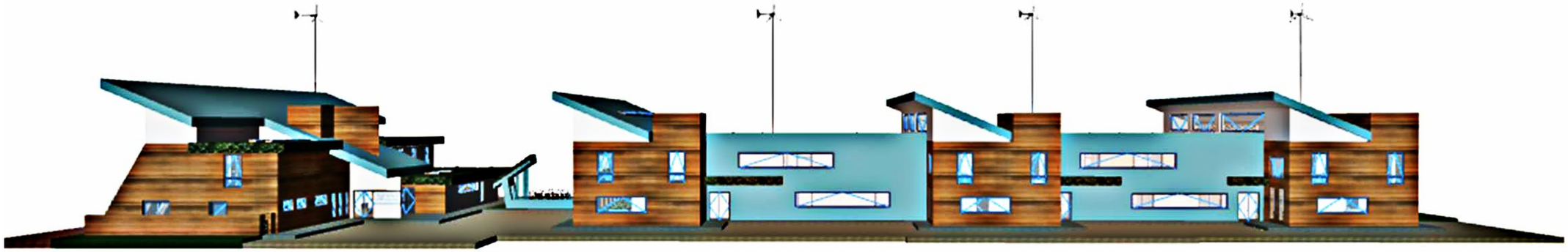
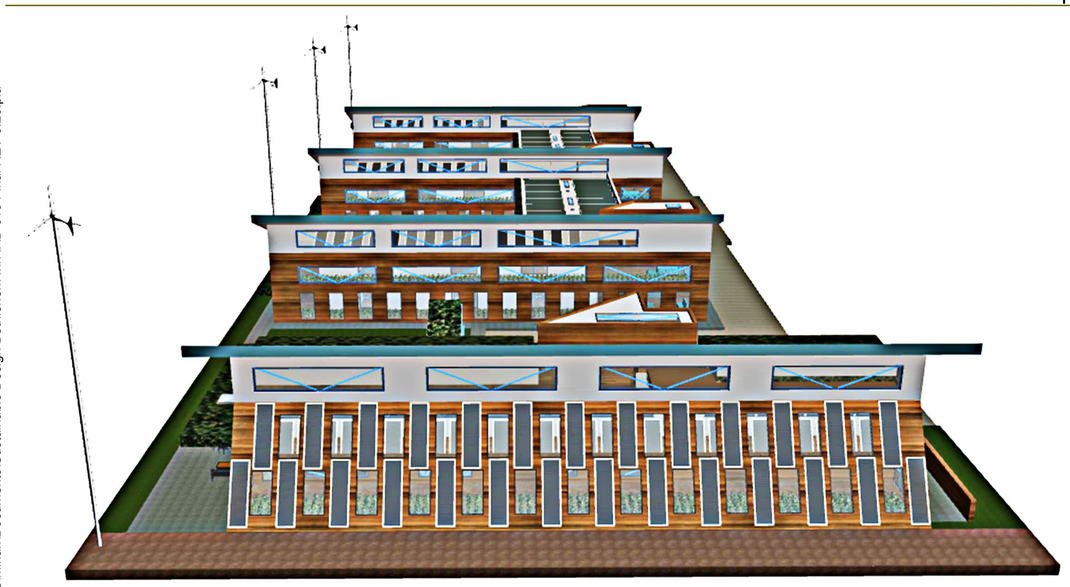
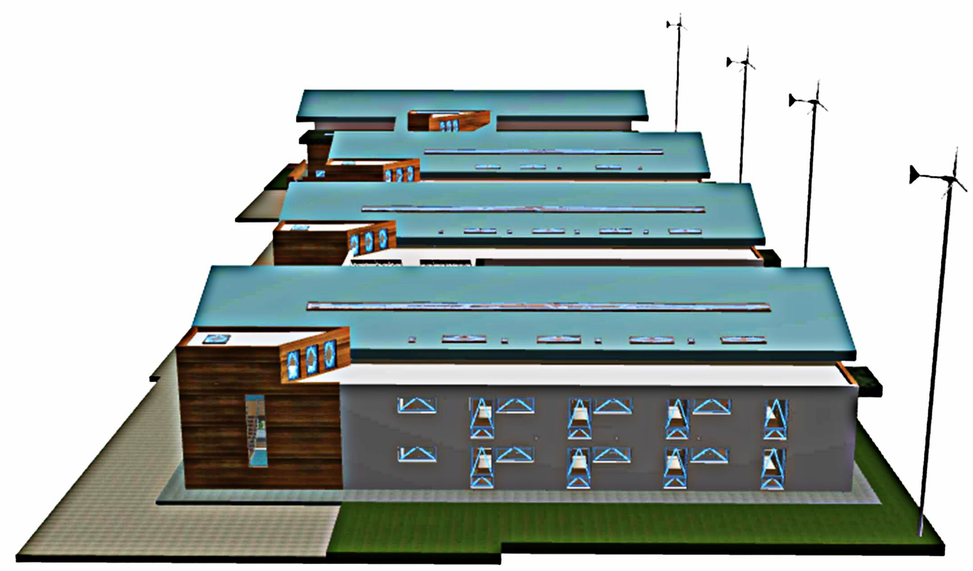


East Perspective View

West Perspective View



South Perspective View



North Perspective View

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SHEET TITLE

ELEVATIONS

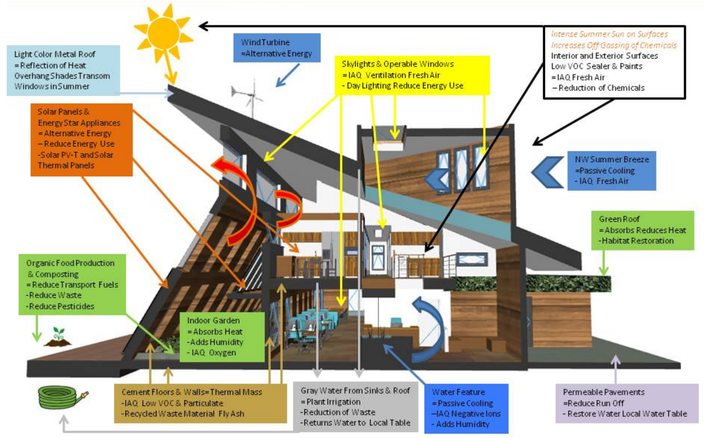
A-201

SHEET 3 OF 7

Green Section

Admin Building Scale 1'= 1/4"

Summer Day : In the center of the Admin Building is an open stairwell under a wind tower oriented to the NW summer breeze. Wind pushes air through the radial floor plans and gives momentum to the convection heat currents marked as curved outlined arrows onthe plan. Heat escapes out the hopper transom windows on the South side to cool the building. A water feature in the lobby enhances the cooling of the air and adds humidity.

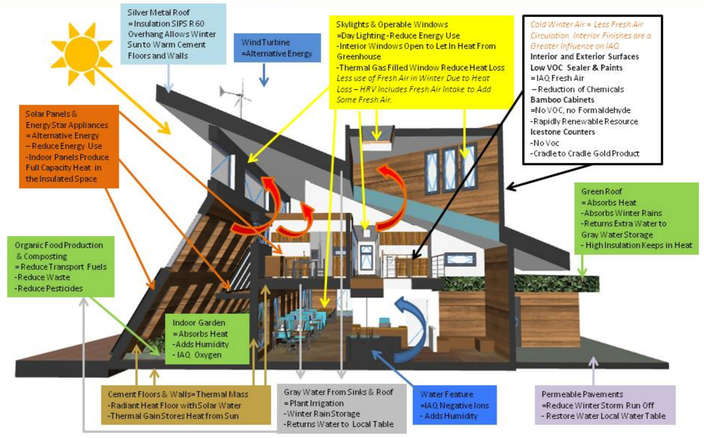


Green Section Summer Day

Green Section

Admin Building Scale 1'= 1/4"

Winter Day : Many of the general Green Design Features still function in winter. The main difference is how the building holds and recirculates heat; rather than vents it. In this diagram the rising warm air convection currents are kept in the building and pulled into ceiling vents and an HRV system. This system adds warmed fresh air to the building and returns the hot air back down to the first floor near windows and doors.

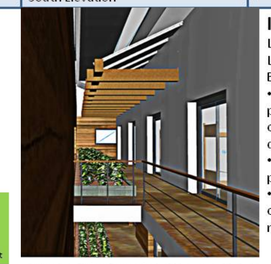


Green Section Winter Day

Solar Power

South Elevation

This South Elevation shows the PV panel configuration. Exterior panels are Solimpeks PowerTherm PV-T hybrid collectors. They are located on the south wall and Family Wing roof and Womens Wing roof. These panels produce both hot water and electrical. The interior panels are hot water only and noted as the design feature solar pergola.

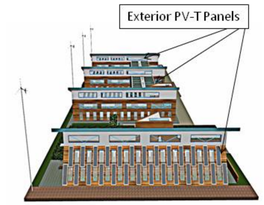


Interior Solar Pergola in Womens Living

Interior Solar Pergola

Located On the Second Floor of all Living Wings and in the Admin Building Greenhouse.

- In a control temperature space panels produce hot water at full capacity even on the coldest of days.
- Panels are arranged to create a pergola aesthetic.
- Panels create a shade space to cool the space and keep heat rising out of the building.

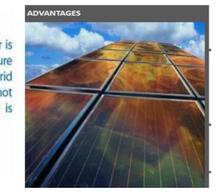


Exterior Solar Panels South View

PV-T Hybrid Collectors

In these systems, production of both electricity and hot water is done simultaneously. In PV modules, as the module temperature increases, the efficiency of the module drops down. In hybrid modules, the module heat is absorbed in order to produce hot water. In this way, PV efficiency is optimized as the heat is transferred into water for hot water production.

Solar Energy Corp. | www.solimpeks.com



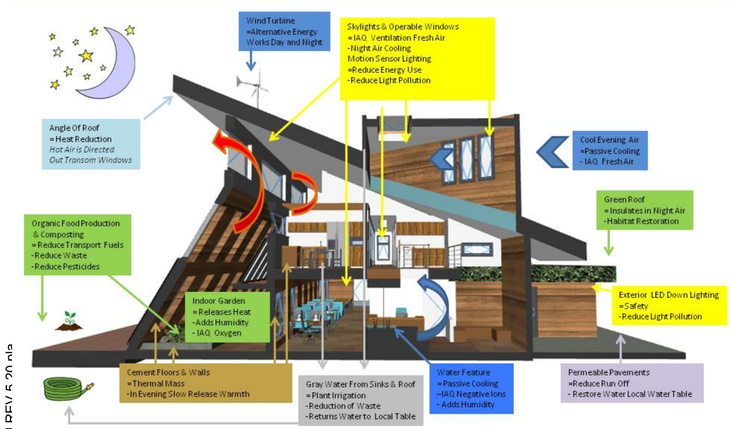
SOLIMPEKS

- Less roof space required than equivalent system comprised of a separate Solar PV and Solar thermal systems. In the UK this equates to approx 16m2 of PV-T panels compared to 25m2 of combined separate systems (21m2 PV and 4m2 solar thermal).
- Hybrid PV-T system's ROI (Return On Investment) is shorter than standard PV systems due to higher electrical yield and off-set heating costs.
- Lifetime of PV cells is lengthened because cell operating temperature is reduced.

Green Section

Admin Building Scale 1'= 1/4"

Summer Night : Many of the same Green Design features function during the summer night. The main differences are lack of solar power, and interior and exterior lighting plans that reduce energy consumption and light pollution. The windows when left open gain more cool air but still encourage hot air to vent out with thermal convection. Heat release from the thermal mass surfaces keep the space from becoming too chilled over night.

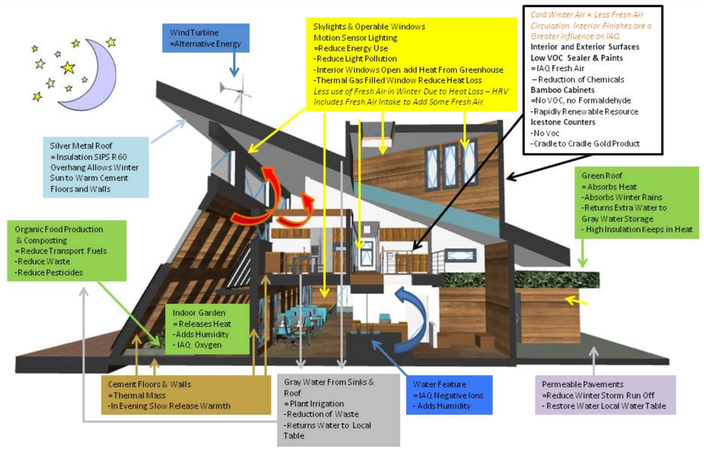


Green Section Summer Night

Green Section

Admin Building Scale 1'= 1/4"

Winter Night : Many of the same Green Design features function during the winter night. The main differences are lack of solar power, and interior and exterior lighting plans that reduce energy consumption and light pollution. High R values of cement walls and both SIPS and green roofs create an effective heat envelope. Heat release from the thermal mass surfaces added with radiant heat from solar thermal are energy wise.



Green Section Winter Night

Energy Use

Admin Building Resources

How the Admin Building Office resources are used plays a major roll in energy consumption for this building. Below is an overview of the high points in energy saving ideas for this building to help reduce the need for additional energy production.

- **LED Lighting Fixtures**
- **No Coffee Maker**
- **Clothes Line Outside**
- **Energy Star Appliances**
- **Gas Range, Ovens, Dryers, and Tankless Hot Water**
- **Energy Star Computers**

One centrally located Fax-Printer-Copier is networked to all computers in the building. This one unit serves as printer for all computers reducing the drain of energy from many printers resting most of the work day on standby. Also batch printing and leaving the work desk to retrieve copies relieves body strain.

WorkCentre 5150Pt 50 ppm Copier/Printer 4 Trays, Bypass Tray, DADF Printer Install Kit Network Controller 256MB Memory **Energy Star Label** W/ Office Finisher 2000 Sht Capacity W/ 50 Sht Multi-Purpose Staple

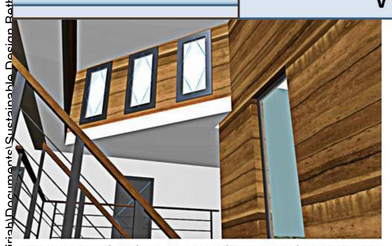
How Your Computers are Used	Estimated Lifetime (4 yrs) Savings per Desktop Computer	
	If you pay $.11 per kWh	If you pay $.18 per kWh
We typically leave our computers on nights & weekends	$88	$144
We typically turn our computers off every night	$24	$40
We will activate power management settings on the new computers, but did not do so on the old computers	$216	$352

EPA has strengthened the requirements for computers earning the ENERGY STAR in Version 5.0. For Desktop/integrated desktop and notebook computers, products must meet stringent TEC (total energy consumption) requirements for estimated annual energy consumption. Small-scale servers and thin clients must meet energy use guidelines in 'off' and 'idle' modes of operation, and thin clients supporting sleep functions must meet requirements in this mode as well, to ensure energy savings when computers are being used and performing a range of tasks, as well as when they are turned off or into a low power mode. ENERGY STAR qualified computers must also have efficient internal or external power supplies.

French Press Office Coffee & Eco Kettle

French press coffee reduces amounts of energy, water, and waste plastic or paper bi-products used to make a cup of coffee. Even the French press itself can be green, like the one by Bodum made with 30% post-consumer material. Water should be boiled in an electric kettle, like ECO Kettle which is very energy-efficient, shutting off automatically when water is ready. Used coffee grounds are also a good source of nitrogen in compost.

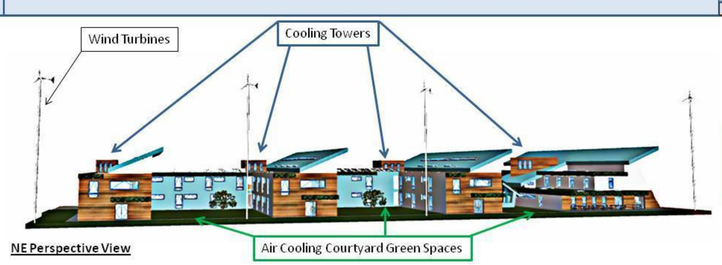
Wind Systems



Interior View of Cooling Tower Windows in Family Living Wing

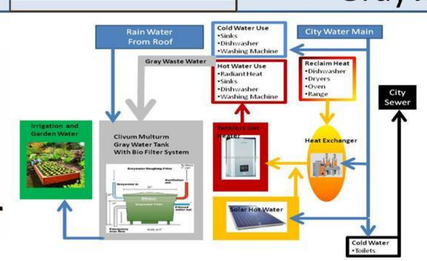
WIND TURBINES AND COOLING TOWERS

Using wind in partnership with solar brings the most consistent energy use system. Wind turbines have an ideal location on the West side of the property where slope of the land adds 10' of clearance to the nearest buildings. The low surrounding buildings and trees make wind power possible. This area is in a wind tunnel created by the Deschutes River and Aubrey Butte geological features. Cooling towers on the buildings are oriented to the summer NW winds. The turbines are self adjusting to capture wind from all directions. Courtyards between buildings add aesthetics to the urban industrial area as well as cooling the air going into the buildings.



NE Perspective View

Graywater System



The diagram overviews the relationships between the different water intakes, water outlets, and water heating systems. The graywater storage tank will also be used to collect roof rain water. In the Admin Building hot water system make use of solar and a byproduct heat exchanger. Graywater System 1 collects water from the Admin Building and Family Living. Graywater System 2 collects water from Mens and Womens Living buildings. These systems will produce water for irrigation from water already used for daily needs. This organization has very high cold and hot water needs.

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O'DAIR DESIGN - Escape the Box -

Designer:

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Sustainable Homeless Shelter

Academy of Art University

IAD 613

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SHEET TITLE

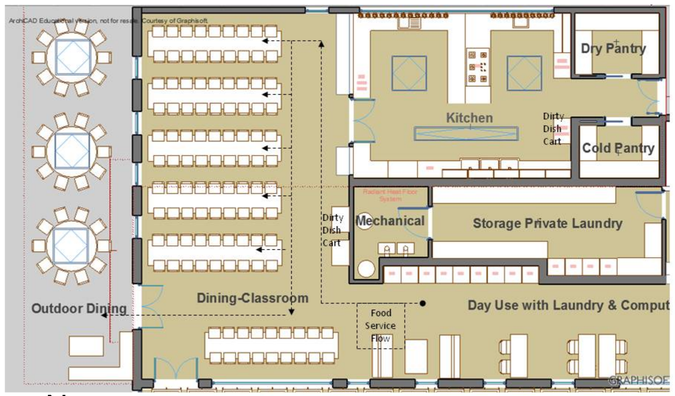
GREEN SECTIONS

A-301

SHEET 4 OF 7

Green Kitchen

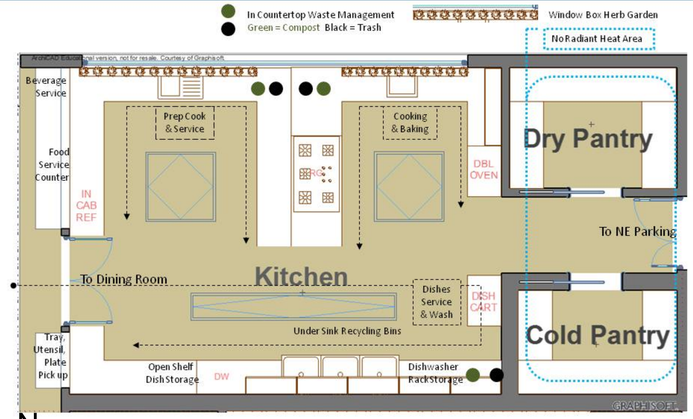
Overview for Flow of space. Volunteers are the life blood of nonprofit. It is important that the volunteer run kitchen is inviting and efficient. The warm finish materials, generous amounts of daylight make this kitchen smart and stylish. Dining Room also doubles as classroom, white board and drop down screen are located on the North wall. Stackable chairs keep configurations flexible.



Green Kitchen

Scale 1'=1/2"

- No Radiant Heat in Slab on Grade Floor in Pantry Areas
- Radiant Heat Floor Rest of Kitchen
- Thermal Mass Pantry Walls
- Skylights and Window For Natural Light
- LED Task Lighting
- Pull Out Storage In Cabinets
- Water Wise Faucets
- Stainless Steel Sinks



Green Kitchen

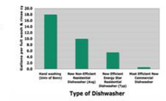
Appliances

Commercial appliances are all Energy Star Rated. Design plans for gas in place of electric in both the Range and Ovens. The Walk In Cold Pantry, Double Ovens, Gas Range, and Dishwasher all exhaust vent to a Heat Exchanger in the mechanical room that uses the bi-product heat to water for the buildings hot water needs and radiant floor heat system.

Walk In Refrigerator Cold Pantry

A device that reduces walk-in energy use for your cooler and freezer can help you earn points for EA Credit 1: Optimize Energy Performance if you follow the exception to ASHRAE 90.1-2007. In order to earn these points, you must follow the prescriptive measurements and baseline found in LEED-NC for Retail, Table 3 and you must use a simulation program especially for refrigeration equipment to successfully model the reduced energy use.

Fagor (FI-64W) - High Production Undercounter Dishwasher



700BR Refrigerator
Energy Star Certified

Thermador 48" Gas Range

Gas range ovens offer the choice of either conventional or energy-efficient, time-saving convection cooking. Even more efficient and economical than conventional gas ovens, convection ovens use fans to circulate heat, allowing them to cook at lower temperatures and for a fourth to a third less time.

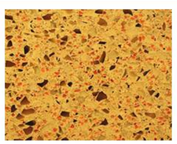
Southbend BGS/22SC, double stack gas convection oven

Quick Overview
- Double deck oven
- Gas type convection oven
- Natural or LP gas
- 6" legs standard with unit
- Castors optional
- 120v/60/1-ph
- 1/2 HP blower
- 108,000 BTU
- CSA
- NSF
- Energy Star Certified

Green Kitchen

Finish Materials

Countertops, cabinets, and floor all need protective sealers to wear properly in commercial applications. All finishes list the AFM Safecoat products that should be used to protect each type of finish material. All Safecoat products are Low or No Voc and contribute to maintaining high indoor air quality per LEED Standards.



Countertops: Icestone color Tuscan Sun

IceStone® is the world's safest and most sustainable durable surface. Each slab is made of three ingredients: 100% recycled glass, Portland cement, and pigments. Healthy for people and for the environment it is certified Cradle to Cradle Gold and a LEED Qualified Material.
Countertops to be sealed with AFM Safecoat MexeSeal. It is ideal for long term protection against food, oil and water stains on commercial surfaces. Non-hazardous and non-flammable – Low odor a total replacement for high solvent content systems. SCS CERTIFIED - LEED QUALIFIED

Cabinets: Vertical Grain Carbonized Bamboo with Stranded Bamboo Inset

Rapidly renewable bamboo cabinets with no Urea Formaldehyde, low VOC adhesives, and wheat board substrate. Finish is AFM Safecoat Safe Seal is a multi-use, waterbased, low gloss sealer for highly porous surfaces. Safecoat Safe Seal is virtually odorless on application and odorless once cured. SCS CERTIFIED - LEED QUALIFIED

20-06 Chair-Limited Edition

20-60 chairs weigh 5.5 lbs, and are made out of 80% recycled aluminum. These stackable chairs are made exclusively for DWR.

Carts are used to bus food from the Dry and Cold Pantry to Cooking and Prep Cooking area. These carts act like mini islands during the early cooking stages when preparing meals. When the carts are empty they are taken to the Dining Area to service as dirty dish carts. At the end of the evening they are used to transport the compost to the tumbler on the southern exterior.

Collaborate Conference 15' Table
Thin-profile work surface made from recycled Kraft paper
Frame & legs made from recycled & recyclable steel & aluminum

Cabinet Pulls
Recycled
Aluminum
Du Verre's Rise

Cement Floors Enviro Stains
are a unique line of water based, non-acidic polymer bonded stains that penetrate into the concrete surface to produce vibrant long lasting uv resistant stains that enhance any concrete surface. Seal with AFM Safecoat Safe Seal.

Large Scale Tumbler Compost Bins make quick work of food scraps. Adding wood pellets and baking soda with new food scraps keeps the smell earthy and pleasant as well as absorbs excess liquids from foods place in the compost.

Kitchen View NW

Kitchen View NE

Dining Room View NE

Kitchen View SE

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- Escape the Box -

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CHK'D BY:

SHEET TITLE
ENLARGED FLOOR PLAN - GREEN KITCHEN

A-401

Finish Materials

Lounge and Admin Seating

These small sofa's are part of the day use seating area and Living Area Lounge seating. Heavy use of these areas require sturdy and durable furniture. Wear in this area will be very heavy traffic and the metal frame with wool fabric maximizes the durability of the high use seating.

Rondi Armless Loveseat

Nice curves.

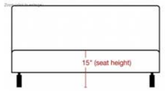
From the day we designed Rondi, we knew people would respond to it. This modern sofa is an example of how beautiful furniture can be, with dramatic lines and carefully crafted proportions.

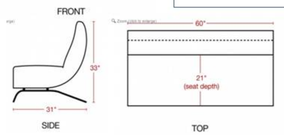
Fabric

Allure Eco-Wool - Sea (adds $1000)

Type of Foam Used (Go Green?)

Extreme Green - Natural Latex Everywhere (bottor





Allure Eco-Wool - Sea

- This soft wool fabric is very durable and cleanable and provides a luxurious look and feel for any modern furniture piece.
- 100% Eco-wool
- Highest Durability (100,000 double rubs)

This fabric is very smooth to the touch, and the very tight stitch create a finely crafted surface. With some colors more than others, the two-tone appreance is more visible. This fabric is reversible

Material	Frames made entirely from locally sourced SFI certified alder hardwood. You can choose sustainable materials above for each option including natural fillings, natural and recycled fabrics, etc. These materials create a healthy home.
Low chemical use	We use natural materials for our webbing and all other internal components of this green furniture. This is good for your health and the environment.
Manufacturing Process	We only build it once you buy it, so no pieces are ever built to make this eco furniture that won't be used.

Finish Materials

Admin Building: Outdoor Furniture

Exterior seating is tightly configured on the outdoor dining area of the Admin Building. These shapely pieces keep the aesthetic airy and open . The materials are eco conscience, recyclable, or biodegradable. Wood is FSC certified wood preserved with non-toxic teak oil. Outdoor area also features a clothes line for drying clothes in good weather, and saving valuable energy.

DESIGN WITHIN REACH

The Lucca Round Dining Table from Design Within Reach is fabricated with a corrosion-resistant aluminum base and glass top. Glass top and aluminum base are recyclable.

Ananda Teak Chair

- Material: Stainless steel and FSC teak
- Dimensions: Width 58 cm, Depth 63 cm, Height 87 cm
- Detail dimensions: Seating height 44.5 cm, seat depth 39 cm
- The wood has been oiled with teak oil
- The chairs are stackable

Close line Tree by Insitu Furniture make drying clothes outside art. The brown tree shape fits well with the project design motif and adds needed style to the eyesore of the classic clothes line.

Finish Materials

Wall Finishes Interior and Exterior

AFM Safecoat products can seal in toxic elements in drywall and texture muds improving indoor air quality. The building finishes are a mix of cement walls done in a "mock rammed earth" look; drywall with medium orange peal finish; and cement board exterior done in a stucco texture.

New Wallboard Primecoat HPV

Safecoat New Wallboard Primecoat HPV is a premium quality, fast curing, flat finish primer specially formulated to provide a superior prime coat over interior surfaces such as new gypsum wallboard and textured sheetrock. It equalizes the absorption rate of topcoat paints over a variety of surfaces with different porosities, and helps to eliminate decorating problems over textured sheetrock and tape joints on wallboard. Solves finishing problems such as "telegraphing" or "joint banding" by equalizing porosity and texture, filling voids left by today's building materials, so that top coats cover more evenly.
SCS CERTIFIED - LEED QUALIFIED

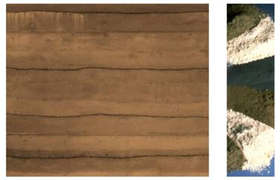
Zero VOC Eggshell

Eggshell sheen adds more durability. Tintable to thousands of colors with zero VOC colorants.
SCS CERTIFIED - LEED QUALIFIED

Project Color Pallet Interior and Exterior

All Purpose Exterior Satin

Safecoat All Purpose Exterior Satin is a sophisticated, premium quality, paint designed for a variety of exterior surfaces where a durable, weather resistant finish and superior film formation properties are needed. It is well suited for buildings in which the health of occupants is a concern: schools, hospitals, homes, offices - anywhere people want to reduce their exposure to toxic chemicals. It is blister and fade resistant, has excellent hide, extremely low voc for sustainability and pollution reduction; and cleans up easily with soap and water. Tintable to thousands of colors with zero VOC colorants.
SCS CERTIFIED - LEED QUALIFIED



Mock Rammed Earth Wall & Cement Colorants

Cement Walls with 35% recycled fly ash locally sourced. Adding colorant to the cement at each pour layers the colors for a "mock rammed earth look" at a fraction of the cost. Cement is colored with natural mineral oxide pigments both the interior and exterior of the walls needs to be sealed with Water Shield for durability.

Water Shield

Safecoat WaterShield is a clear, versatile, controlled penetration water repelling sealer which provides an invisible barrier against water and resists oils, grease and similar liquids. It is fast drying, has excellent adhesion, and is easy to apply. In addition to sealing and providing a protective barrier against water migration, it helps to harden, dust proof and control efflorescence in masonry surfaces. It is not toxic, non-flammable, lead free, formaldehyde free, and does not contain surface contaminating silicones, making it a desirable coating for interior or exterior use. May be used on painted surfaces and may be painted over when dry. Dries clear and does not discolor.

Design Motif

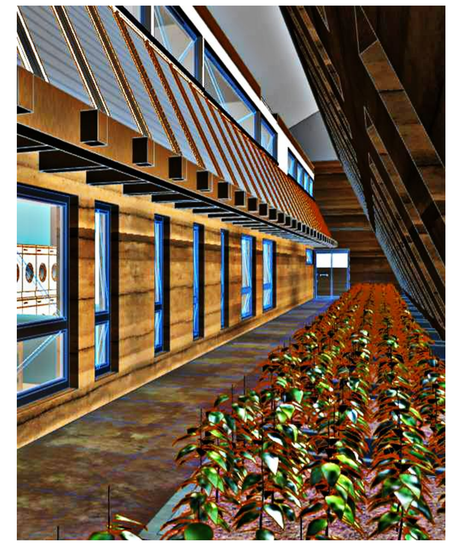
Pointillism-The Lea of the Land

This Pointillism is created from the colors of an aerial images of a high desert landscape, dusty earth, deep green juniper, bright spring green of rain soaked sage. The dusty tones converge into a earthy hand reaching out to help. The randomness in the aerial image looking down on the site is about natural resources reaching to help and shelter those in need.

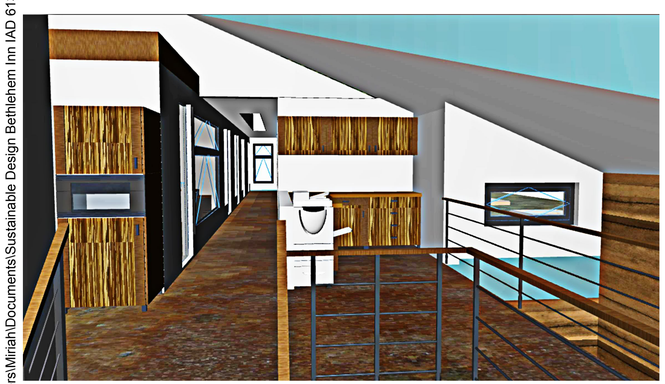
The site grade is flat but on the far west side is a steep 10' slope that speaks to the original lea of the land. A slope toward the Deschutes River, a precious resource of water 3 miles away. Lea means the sheltered side of a object and this land is to be a shelter for the homeless of Central Oregon. Themes of natural resource elements, earth, wind, sun, air, water all work into the design motif of this project. The thermal gain cement walls have a mock rammed earth striated pattern. Vertical grain and stranded bamboo cabinet finish uses liner patterns symbolizing resources reaching to help. Architectural elements combine in elongated walls paired with angled rooflines. Angles repeating the lea theme throughout the design to symbolize shelter. Tuscan yellow glass infused countertop materials celebrate the sun. Water a symbol of hope and renewal is repeated throughout the architecture adding aesthetics and evaporative cooling. Plant life is found in every building growing food indoors year round. Lush mini ecosystems also thrive in the water features. The blue tones of paint and fabric allude to sky and wind. These finishes harmonize with the day lighting in the architecture. The patterns of color, hopeful blues, reassuring browns, and the linear and angle shapes are a design infusion also found in the organizations signature logo. The entrance water feature mimics the iconic abstract home in the logo design.

bethlehem inn shelter • sustenance • self-sustainability

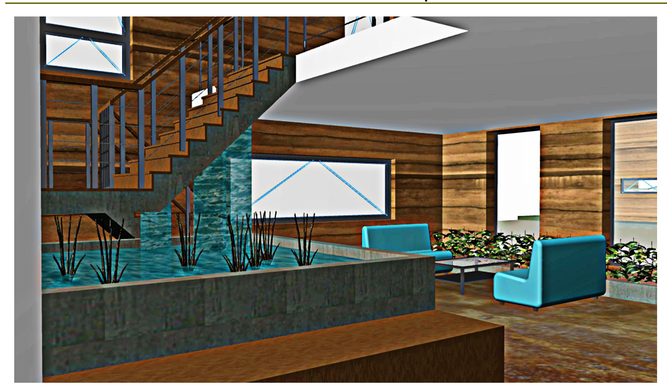
Reception View SE



Admin Building Greenhouse View East



Copy & Circulation View West



Family Living Lounge View SE

Womens Living Greenhouse Hall View East

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O'DAIR DESIGN
- Escape the Box -

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bethlehem inn shelter • sustenance • self-sustainability

Sustainable Homeless Shelter
Academy of Art University
IAD 613
Professor: Marc DiGiacomo

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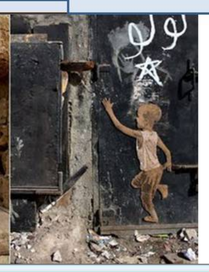
SHEET 6 OF 7

Entrance Waterfeature View NW

Homeless Street Art
by Michael Aaron Williams



Conclusion

The Bethlehem Inn Organizations creed is Shelter – Sustenance – Self Sustainability.

There are 22,000 homeless in Central Oregon. Volunteers who donate both time and funds are the life blood of the hope that is given to men, women, and children every day. **Today the wealthiest 16% uses 80% of the world natural resources.** Sustainable stewardship of these resources is necessary to bring relief to those in need. Building architecture that reduces the strain on natural resources means hope for all who call the planet earth home.

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O'DAIR DESIGN
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