SITE AND CLIMATE

SITE ADDRESS
1511 East Broadway,
Columbia MO

Heating Degree Days: 4800
Cooling Degree Days: 1550
TARGET MARKET

Young adults and families in the Columbia Mo area, who need a flexible living environment for growing families and an affordable place to live.

What is available in Columbia now...

- Requires vehicle to get around in Columbia
- Little to no green space
- High utility and rental
- Standard interiors

Our Design ...

- Close to Downtown Columbia (public transportation and walkability)
- On site gardening = reduce food costs
- Energy efficient building = low/no utility bill
- Low rent cost
- Interior flexibility
- Interior comfort and quality
Underground Parking Garage that allows the additional site to be used for gardening opportunities

Community Park Space with Stormwater Retention Basin

Stormwater Collection System that collects rainwater from courtyard while providing natural light into the underground parking garage

Pollinator Pathway using native plants to create habitats for birds/bees and insects

Utility Room that houses solar panel inverters, geothermal units and other mechanical functions

Storm shelter to provide a safe place for severe weather like tornadoes and high winds that commonly occur in central Missouri

Cross ventilation helps with passive cooling

Open air building circulation which allows opportunity for residential cross ventilation, daylighting and removes the need to heat/cool this area

Summer sun Roof overhangs prevent direct sunlight into residential spaces but optimal energy generation from solar panels

Winter Sun allows direct light to enter residential for natural lighting and passive heating

1009 Solar Panels
Different metal wall finishes to increase the feelings of ownership among residents.
ARCHITECTURE
Floor Plan

MAIN AND SECOND FLOOR PLAN DIAGRAM

RESIDENTIAL SPACE KEY
- DIRT WALL SYSTEMS
- PLUMBING WALLS
- MECHANICAL STORAGE SYSTEMS
- 3 BED/2 BATH UNIT
- 2 BED/1 BATH UNIT
2 BEDROOM FLOOR PLAN

2 Bedroom Unit Perspective

Modified 2 Bedroom to a 1 Bedroom
Plumbing

Bosch Tronic 6000c wh17
Tankless Water Heater

HVAC

30 CFM

40 CFM

Energy Recovery Ventilator

LINE OF DROPPED CEILING

Honeywell Energy Recovery Ventilator VNT5070E 1000 ERV
MARKETING ANALYSIS

Flexible Units to Fit the Residents Needs

Greenhouse

Direct Access to Green Space and Gardening Opportunities within a Community Environment

Commercial Spaces

Kitchen/Gathering Space

Fitness Center

Classrooms & Offices

Storm Shelter & Storage

Mechanical Space

DIRTT VS. Conventional Power

$3.79/SQ FT
WITH DIRT
15% LESS WITH DIRT

$4.48/SQ FT
WITH CONVENTIONAL

1056 HOURS WITH DIRT
1400 HOURS WITH CONVENTIONAL

DIRTT TOTAL COST
$625,378.38
Includes $ 65,110.50 access fee

CONVENTIONAL TOTAL COST
$739,722.55
No access fee

Mass Production
- Low value
- Standardized products

Customization
- Craftsmanship quality
- Flexible
- Unique
- High value

Efficient
- High speed
- Reduced errors
- Low cost
- Predictable

Inefficient
- Time-consuming
- High cost

- ICE design experience
RESILIENCE

Water Ponding Area (Depth Varies with Stormwater Flow)

Existing Soil

Infiltration

Gravel Bed

Rainwater Plants

Well-Drained Planting Soil

Sand Layer

Collection Systems:
Stormwater is collected from rooftops (gutters) and sloped green areas

Pre-storage Treatment:
removes trash and other unwanted matter from the harvested stormwater

Storage Unit: reservoir in this instance an open detention pond

Distribution System:
pipes and pumps used to distribute harvested for indoor uses or outdoor uses

Post-Storage Treatment: filtration or disinfection of harvested stormwater
EMBODIED ENVIRONMENTAL IMPACT

DIRTT Kitchen Example

DIRTT Cabinetry Example

DIRTT Panel Section

DIRTT Walls
- 95-97% Materials Purchased in North America
- Light-weight Aluminum Frame (High Recycled Content)
- 90-100% Pre-Consumer Recycled Content (Post-Industrial) Walls Tiles
- 80% Post-Consumer Recycled Cotton Denim Insulation

Metal Siding

Prefabricated SIP Wall Panels

All Core Construction Materials can be obtained within a 60 mile radius (excluding DIRTT Walls)
INTEGRATED PERFORMANCE

Passive Design Strategies

- Open Air Circulation
- Trees shade building during summer months
- Overhangs shade windows from direct sunlight into interiors during summer

Interior Passive Design Strategies

- Cross Ventilation
- Daylighting

Window Flashing Sequence

1. Cut condill "O" in house sweep
2. Apply sill flashing and caulk
3. Install window and head flashings
4. Apply head flashing
5. Fasten with screws
6. Turn up "O"
7. Cut and fold peel-and-stick flashing
8. Peel-and-stick flashing
9. Fasten with screws
10. Seal cut over head flashing

Exterior Envelope

- Air moisture/vapor barrier (green line)
- Membrane flashing (blue line)
- Metal siding
- Sealant (red)
- 5/8" GYP. board
INTEGRATED PERFORMANCE

Smart Technology

- Can be controlled by app
- Alerts to change filter
- Warns occupants of extreme indoor temperatures
- Intelligent comfort control
- Works with Amazon Alexa, Apple HomeKit, Cortana, and Google Assistant for Voice Controls
- 7-day flexible scheduling or location based temperature control

Honeywell Lyric WiFi Smart Thermostat

- Can be controlled by app
- Has a Fan Eco Mode (along with other special modes)
- 16 Dimmable Light Levels
- SenseMe Motion Sensor and Settings
- Includes Temperature and Humidity Sensors
- Works with Amazon Alexa, Google Assistant, and ecobee for Voice Controls

Haiku 52" Big Ass Fan

- Field-Selectable Color Temperatures LED Downlight
- 5 Selectable Color Temperatures: 2700K, 3000K, 3500K, 4000K, 5000K
- CRI: 90
- Phase-Dimming down to 5%

Halo RL4 SeleCCTable Downlight

- SenseMe Motion Sensor and Settings
- Includes Temperature and Humidity Sensors
- Works with Amazon Alexa, Google Assistant, and ecobee for Voice Controls
**OCCUPANT EXPERIENCE**

*Education Opportunities* through water collection systems, gardens, greenhouses, community center and pollinator pathway

*Co-Op* allows everyone to have an invested interest in the building and this allows the residents to make choices about what happens in the building.
ENERGY PERFORMANCE

HERS Index for Building

EUI Rating

Solar Panel Model SIL - 330 NL

1009 Solar Panels

Mechanical Room for Inverters

Summer

Winter

Solar Panel Meters

-68 Residential
-1 Commercial

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“Design that enhances the health, wealth, and quality of life for residents.”