IDAHO ARCHITECTURE COLLABORATIVE LUPINE FLATS

A workforce housing project in support of the Moscow Affordable Housing Trust.

Randall Fraser Teal PhD
Professor
Head of Architecture Program
University of Idaho
rteal@uidaho.edu

Owner | Principal
teal studio LLC
design + build

IDAHO
ARCHITECTURE
COLLABORATIVE

St Mary Immaculate Catholic Church Addition | St. Maries, Idaho
by UI students: Arwen Bloomsburg, Dillon Knight, Shirin Sheikh Aboumasoudi, Jacob Iverson
faculty: Randall Teal

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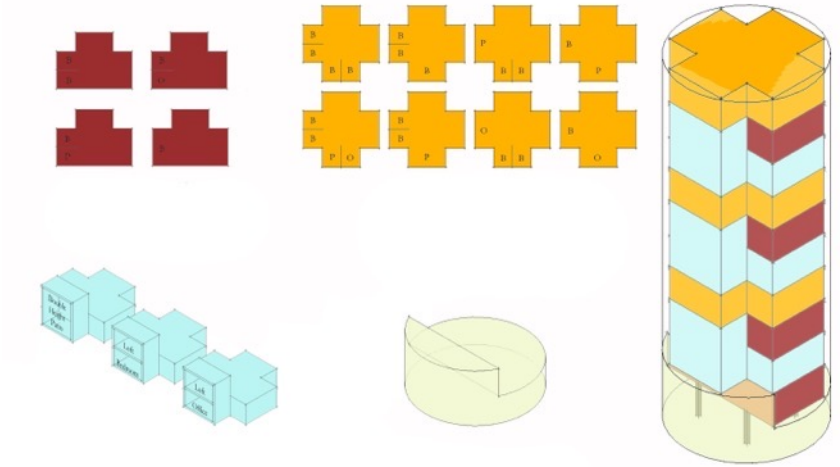
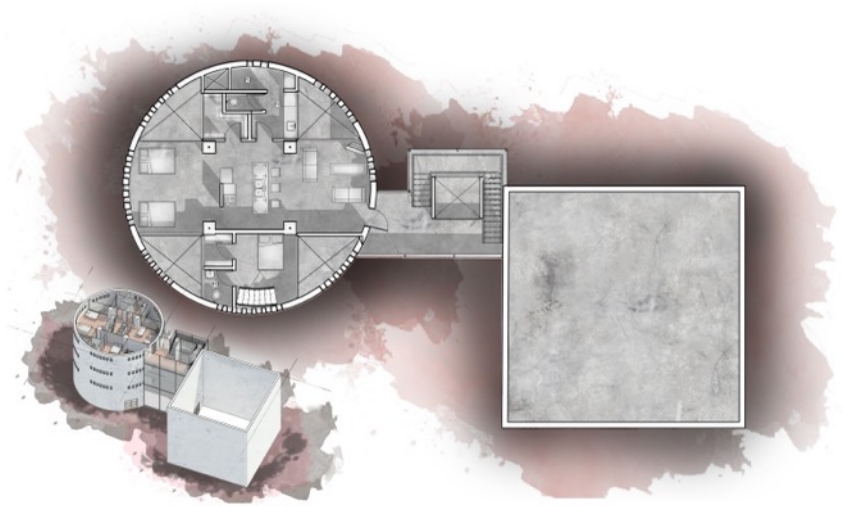
COLLABORATIVE





The Silos| Moscow, Idaho
UI student design team led by Associate Professor Scott Lawrence

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COLLABORATIVE

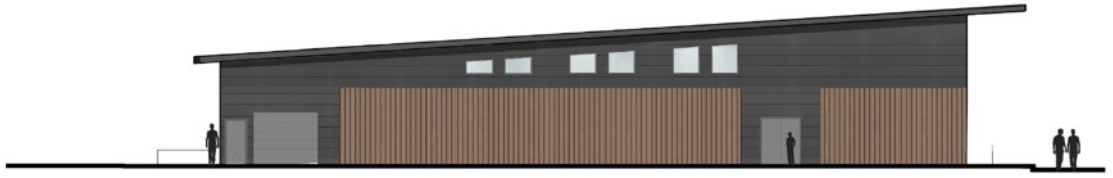
BEFORE

AFTER

St Luke's Hospital Thrift Shop Remodel | McCall, Idaho
UI student: Samantha Jesser
faculty: Randall Teal

North Elevation
1/8"=1'0"
0 5 10 20

East Elevation
1/8"=1'0"
0 5 10 20



South Elevation
1/8"=1'0"

West Elevation
1/8"=1'0"

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McDonald Elementary School Outdoor Classroom | Moscow, Idaho
UI student design-build team led by Associate Professor Scott Lawrence

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Hat Ranch Winery Tasting Room | Caldwell, Idaho
UI student design-build team led by Associate Professor Scott Lawrence

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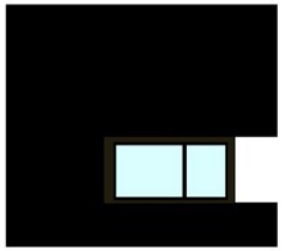
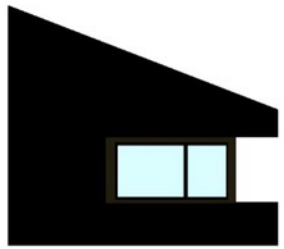
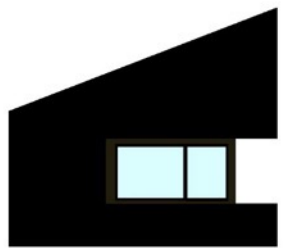
Snowmobile Warming Hut | Sandpoint, Idaho
UI student design-build team led by Assistant Professor Matthew Miller

R ZERO







CONCEPT

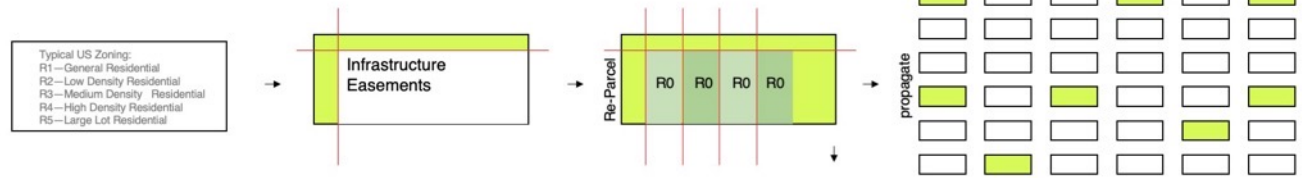
In response to continued trouble making smaller than "normal" dwelling units mainstream, a number of city officials around the world decided to confront the challenge of land use and financing as primary obstacles to the goal of making micro homes a real option. They called the project *Global R-Zero* and purchased an array of vacant lots and plots with existing homes in disrepair over a number of years in order to address a missing "middle" in the housing market. This was achieved through a strategy of micro-parceling and infrastructural support to incentivize micro-living.

At the outset, officials outlined a bold plan: subdivide and convert typical residential lots into *a new R-0 Zoning;* using this new zoning not only to provide housing but also to create resources—food, energy and finances— for the city and its citizens. With the program launch R0 became the most restrictive, but most community minded residential zoning on the books to date. As such, it became a new way to build equality in housing as well as create social resources for disadvantaged members of their communities. This program caused a cultural transformation as it allowed home ownership for those that would otherwise need to rent but perhaps more importantly enlisted the new owners as stewards of food and energy resources for the community.

Let's look at a case study of a 150 foot x 60 foot lot oriented on an east/west axis in a northern climate. Step 1: Officials broke the lot into 35 foot x 60 foot parcels, thus implementing the new R0 "mini-lot" overlay. The four mini-lots that the site became then was provided a common infrastructure that included: a grid connected solar PV array occupying what would have been the 5 foot north site setback; a solar evacuated tube array, which covers a parking area for residents, provides hot water for sinks, showers, and hydronic radiant slab heating; an urban farm is the final layer on the site and it consists of four chicken coops, four bee hives, and raised planting beds. An extensive underground greywater/rainwater irrigation system feeds the raised beds and four pollinator gardens; compost from table waste, chicken coops, and the required composting toilets in each residence supplement the health of the site. Residents also share laundry. Residents are offered free garbage, recycling and water service by the city if they agree to take care of chickens and plant and harvest the gardens. (otherwise this is taken on by foodbank and parks and rec workers subsidized by the owners utility payments)

The one other critical piece of provided infrastructure is a premade building plot—a 16 foot x 16 foot slab-on-grade that includes integrated PEX lines for hydronic heating. The dimensions of the slab are meant to promote a DYI spirit, as they are easily developed and outfitted using simple math, construction standards, and typical sized building materials. The included case study shows how homes might follow this home improvement store as "kit home" supplier through the whole design with most of the construction being able to be done with almost no cutting of material –simply acquire the right sizes of lumber and sheet goods, bring it all home, and begin assembly!

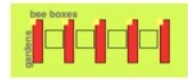
Residents may use solar to not pay for electricity or if one needs more access to electricity they may pay for supplemental electricity from the grid; conversely, residents who use little electric may claim tax credits for the electricity they give back to the grid. The food from the raised beds is shared equally between R-0 residents and the city foodbank.



Premade Building Sites

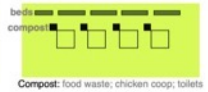
25m² = 269 ft²
16ft x 16 ft= 256 ft²
standard US building materials **divisible by 2 ft.**
(see below "off-the-rack" materials proposed)

Pollinator Gardens



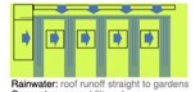
75 percent of all food crops grown in the United States depend on pollinator animals.

Compost + Raised Beds



Compost: food waste; chicken coop; toilets

Greywater + Rainwater Irrigation

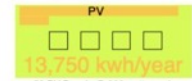


Rainwater: roof runoff straight to gardens
Greywater: ground filtered
(sink, shower and washing machine)

Chicken Coops

6 chickens x 4 Coops = **24 chickens**
1 chicken produces avg. 5 eggs per week
24 chickens produce 120 week*52 = 6240

Solar Electric



50 PV Panels @ 300 watts each
using average 2.5 hours of sunlight per day

Solar Hot Water + Radiant Floors

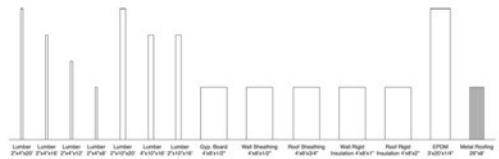
hot water: 1 person = 20 ft² per day
hot water: 8 people = 160 ft² per day
radiant floor: 10% of floor area = collector size
(4) R-0 homes (1024 ft²): 102 ft² collector needed
300 ft² of collector area needed

Solar Back to Grid

Average 2000 ft² home: **1000** kwh/month
(4) R-0 homes (1024 ft²): **600 kwh/month**
13,750 kwh/year - **7200** kwh/year = 6550 kwh/year

Off-The-Rack

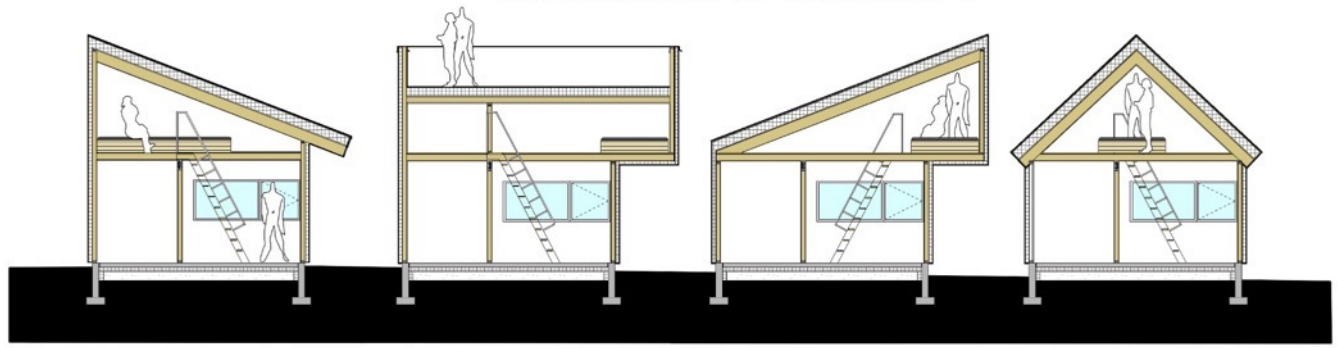
The provided slab-on-grade provides the opportunity for new lot owners to build their own home with little to no site work. The sites are meant to leverage standard US building material dimensions and allow the owners to approach standard building materials as a kind of kit home, just waiting to be assembled. In fact, the included designs illustrate how working with the 2' grid and using standard dimensioned lumber "as is" it is



Finances

5% down = $4,000
Loan = $36,000
@ 5% interest over 10 years

Monthly Payment:
$381.84



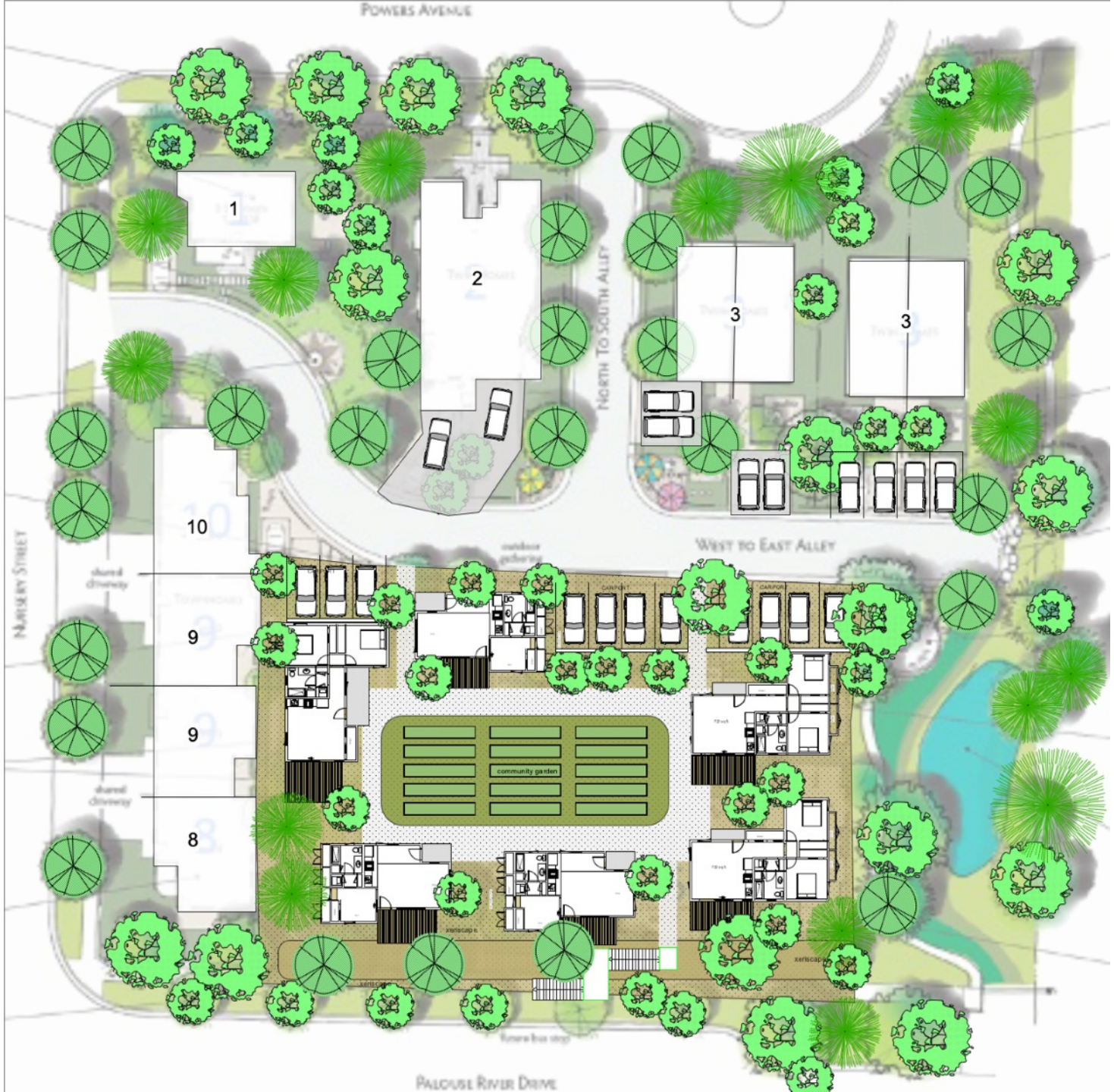
teal studio LLC

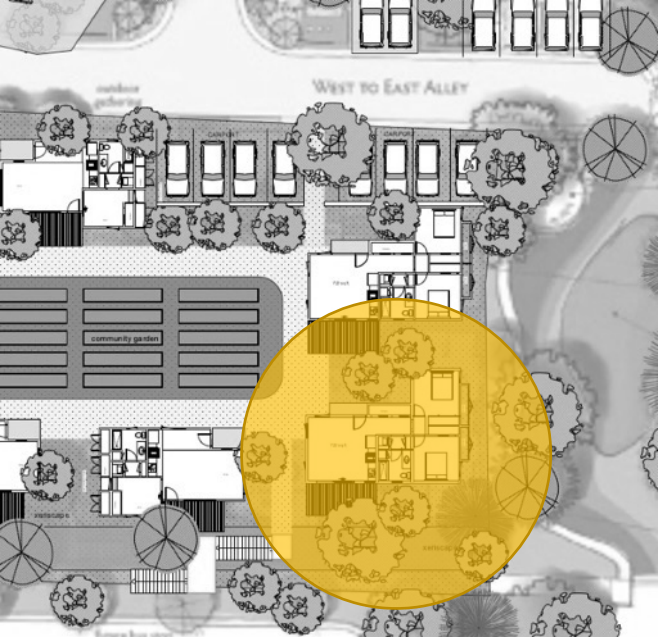
design + build

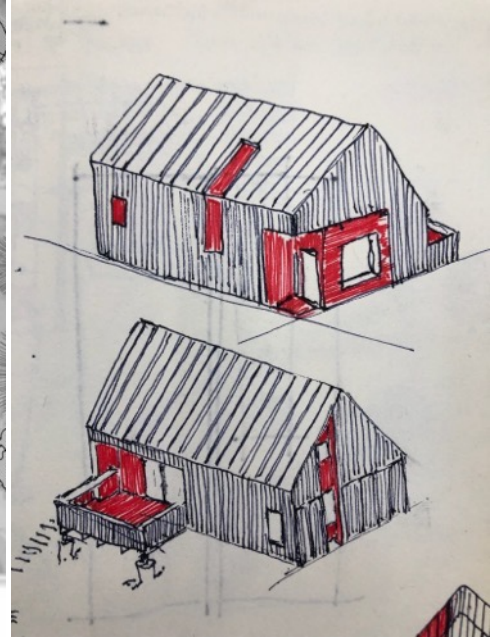
Palouse Divide Cabin

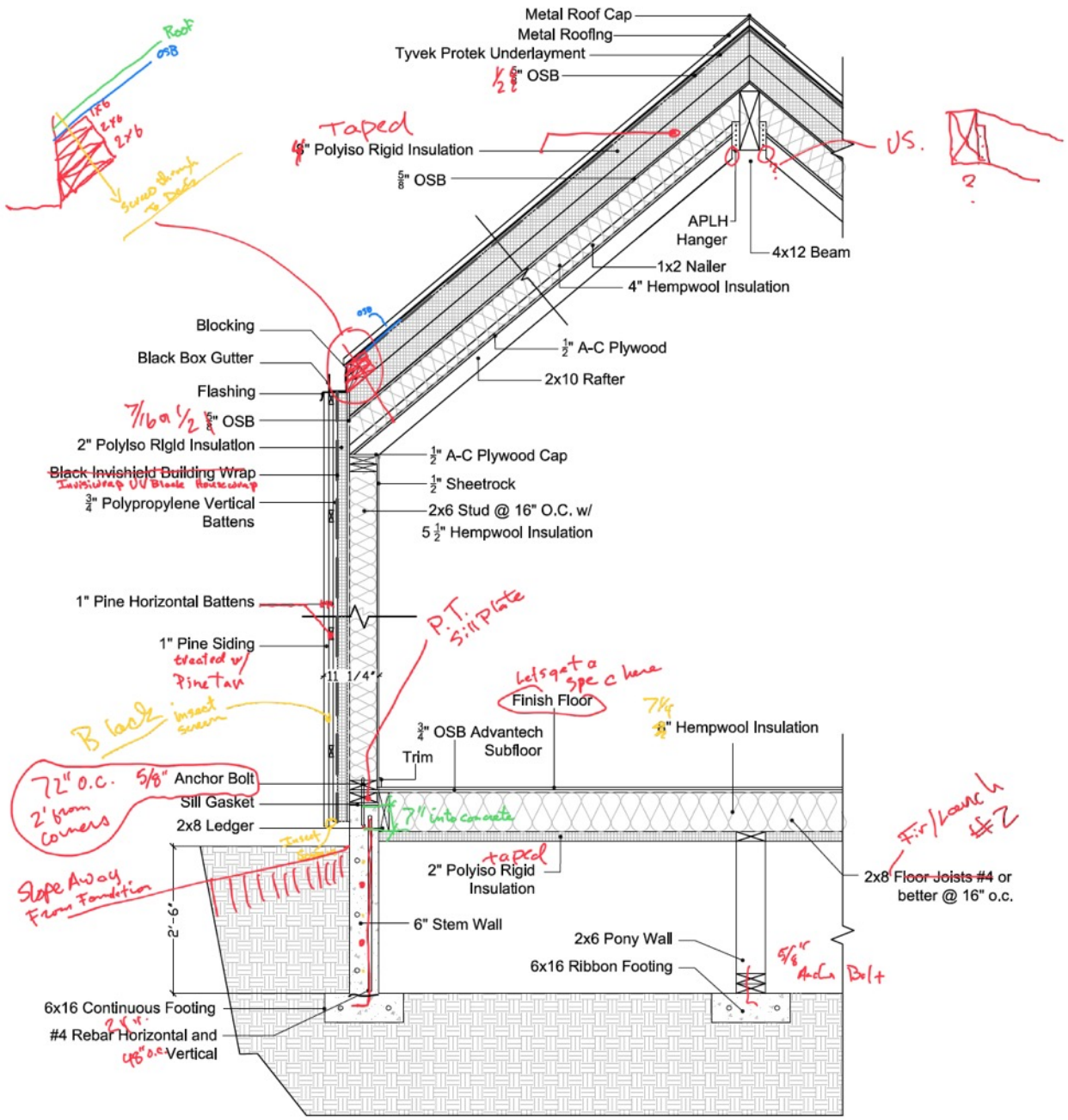
40m² design-build Idaho


“the housing shortage is significant. it's acute for small, entry-level homes”
Uri Berliner September 4, 2021 National Public Radio
LUPINE FLATS
Six affordable houses houses designed and built by students for home ownership
Moscow Affordable Housing Trust is a non-profit, community-governed corporation that acquires, develops, and stewards land to make permanently affordable home ownership opportunities.
The University of Idaho Architecture Department's Design-Build Program provides students with unique opportunities for hands-on experience building projects they have designed.
University of Idaho
College of Art and Architecture
EQUAL HOUSING OPPORTUNITY
A partnership between MAHT & UI CAA to create energy-efficient, permanently affordable home ownership
sponsors:
COLAB
DESIGN EVERYTHING
Idaho Central
CREDIT UNION
AVISTA
teal studio LLC
RELIANT ENGINEERING PLLC
PROVIDING CONSTRUCTABLE SOLUTIONS


Powers Avenue
North to South Alley
West to East Alley
Nursery Street
Palouse River Drive
1
2
3
3
10
9
9
8
community garden


WEST TO EAST ALLEY
community garden




Metal Roof Cap
Metal Roofing
Tyvek Protek Underlayment
OSB
Taped
Polyiso Rigid Insulation
OSB
APLH Hanger
4x12 Beam
1x2 Nailer
4" Hempwool Insulation
Blocking
Black Box Gutter
Flashing
OSB
2" Polyiso Rigid Insulation
Black Invisheild Building Wrap
Polypropylene Vertical Battens
A-C Plywood
2x10 Rafter
A-C Plywood Cap
Sheetrock
2x6 Stud @ 16" O.C. w/ Hempwool Insulation
1" Pine Horizontal Battens
1" Pine Siding
P.T. Sill Plate
Finish Floor
OSB Advantech Subfloor
Trim
Hempwool Insulation
72" o.c. 5/8" Anchor Bolt 2' from corners
Sill Gasket
2x8 Ledger
2" Polyiso Rigid Insulation
2x8 Floor Joists #4 or better @ 16" o.c.
Slope Away From Foundation
6" Stem Wall
2x6 Pony Wall
6x16 Ribbon Footing
6x16 Continuous Footing
#4 Rebar Horizontal and Vertical

HERE WE HAVE

IDAHO

F 22

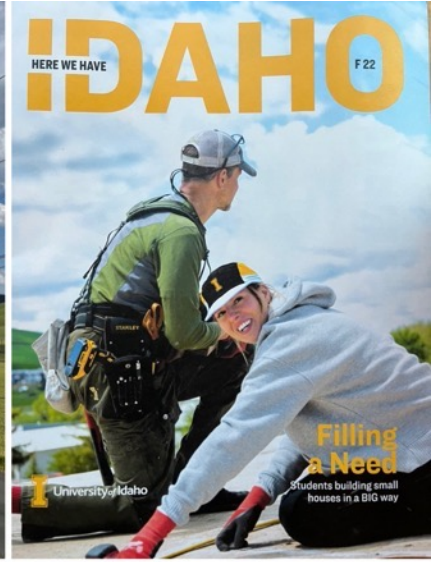
Filling a Need

Students building small houses in a BIG way

University of Idaho


1442


FINISHED November 2022 $168,000
SOLD December 2022 $127,000



DESIGN/BUILD INTERNSHIP

Apply today to be part of the next Design Build team for Lupine Flats. In this Moscow-based project you will work to *design and build* a small home with the assistance of COLAB Architects, Teal Studio, and Moscow Affordable Housing Trust. The position will count for the required 6 credit 554 design studio, feature a $2,000 scholarship for the spring semester, and will pay full-time wages from May 1st to August 21st.

All students may apply; preference will be given to qualified graduate students.

APPLICATIONS* DUE:

FRIDAY November 18th

by email to rteal@uidaho.edu

*PDF: statement of interest, resume, 10 page portfolio.

IDAHO ARCHITECTURE COLLABORATIVE

SCAN TO GIVE

LUPINE FLATS AFFORDABLE HOUSING

In support of the Moscow Affordable Housing Trust, the University of Idaho Architecture Program and architect and alumnus, Mark Engberg, have created a framework that will allow the construction of six small homes over the next six years with six different teams of student designer/builders. This project aims both to teach students the connections between drawings and construction, and address housing shortages in our community. The six houses are composed of three one-bedroom houses based on a 550 ft.² plan, and three two-bedroom houses based on a 750 ft.² plan. The six houses share a single lot that is owned by the Housing Trust; the scale of the homes and the shared land are the primary means by which the which these projects reach an otherwise disadvantaged population of potential homeowners and create a model for workforce housing in the region. The first house was completed in 2022; the second house (currently under design) will be completed in fall 2023.

Contacts
Randall Teal, Architecture Program Head rteal@uidaho.edu; Hannah Finkas-Ganders, Director of Development hfinkasganders@uidaho.edu

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