

University of Idaho
McCall Field Campus

PROGRAM

TOTAL SQUARE FOOTAGE ~15,500
FIRST FLOOR SQUARE FOOTAGE ~ 11,000
SECOND FLOOR SQUARE FOOTAGE ~ 4,500

AUDITORIUM ~ 3,400 SF (262 seats)
First Level ~ 2,200 sf (168 seats)
Second Level ~ 1,200 sf (94 seats)

DINING HALL ~3,800 SF (250 people)
Kitchen and Food Bar ~ 750 sf
Dining Area (open plan) ~ 3,050

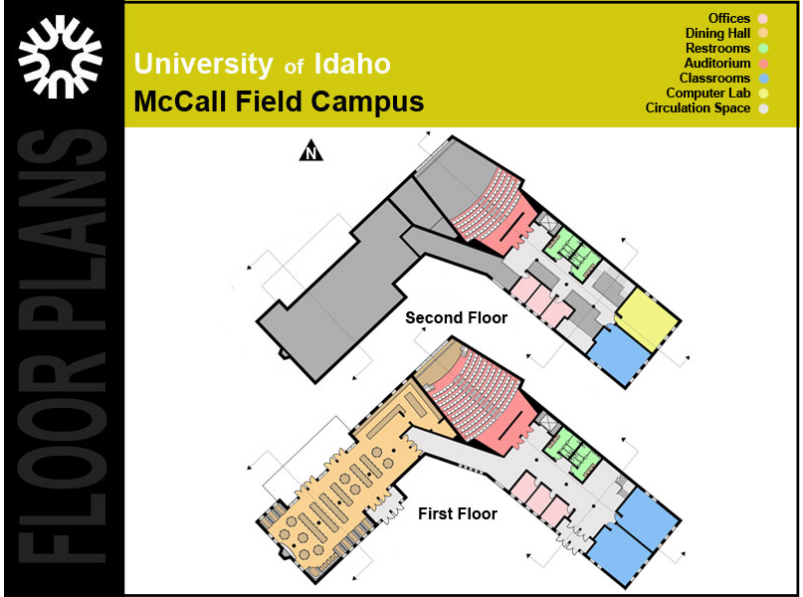
CLASSROOMS ~ 1,880 SF
First Floor ~ 1 @ 620 SF
Second Floor ~ 2 630 SF

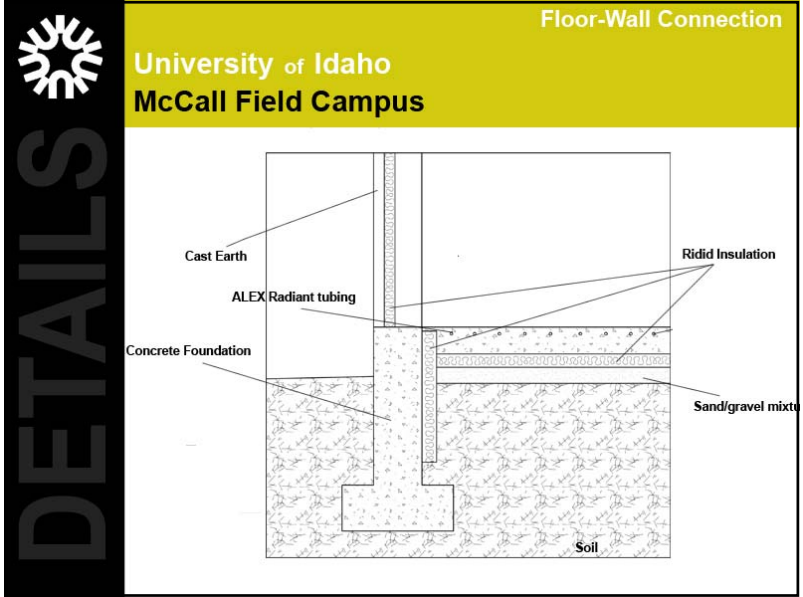
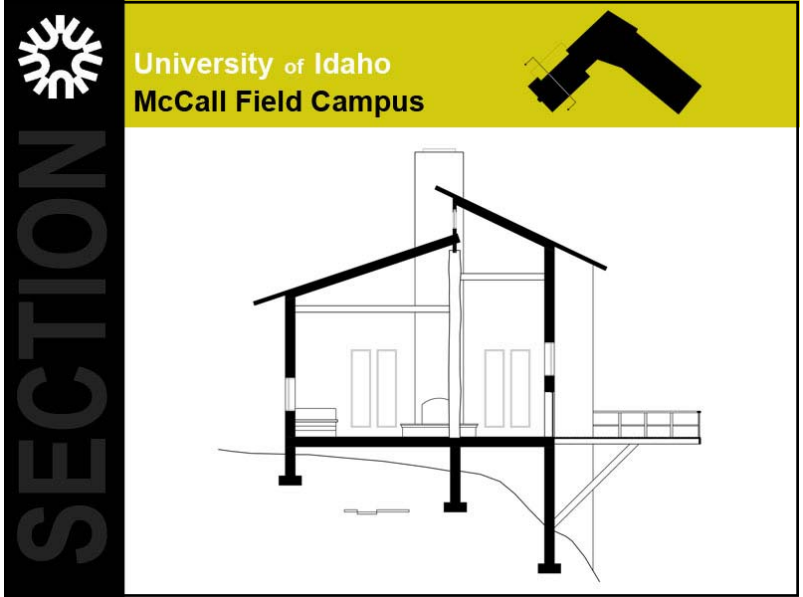
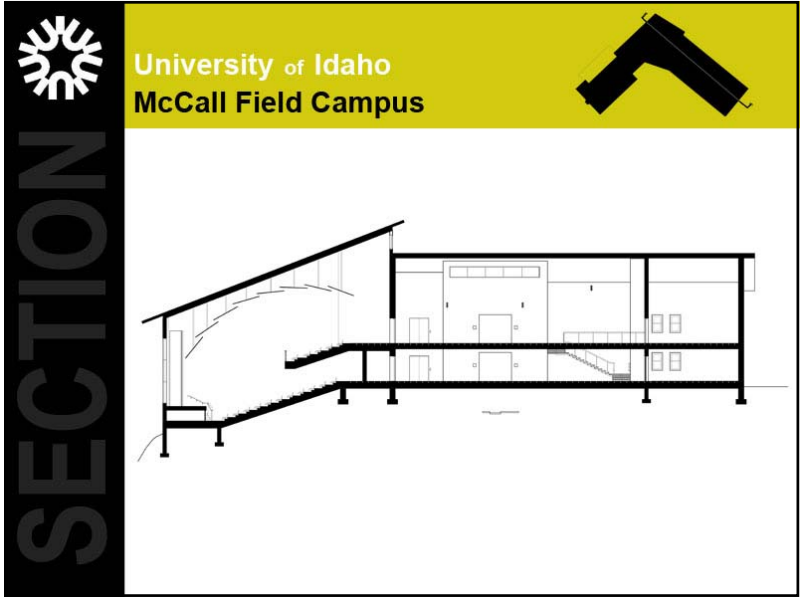
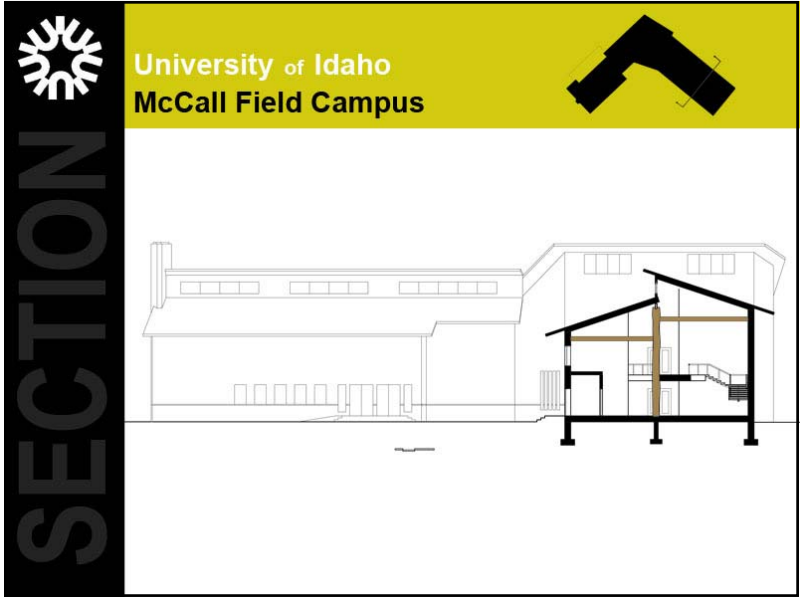
COMPUTER STUDIO ~ 620 SF
First Floor

FACULTY OFFICES ~ 840 SF
First Floor - 3 offices ~140 sf each
Second Floor - 3 offices ~ 140 sf each

RESTROOMS ~ 740 SF
First Floor - Mens and Womens ~185 sf each
Second Floor - Mens and Womens ~ 185 sf each

CIRCULATION ~ 4,200 SF





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Roof-Wall Connection

Labels in diagram: V-Cut Shear Blocking, Gypsum Board, Metal Roofing, TJI 360 joists, Drywall, Ridgid Insulation, Cement Wall Cap, Cast Earth, Concrete Anchors, Wall Braces, 2x6 Extenders.

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Ventilation

NATURAL VENTILATION

Wind will be directed through lower vents on the northern side of the building and then it will draw warm air out of the clerestories on the southern side.

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In-Floor Radiant Heating

RADIANT HEATING

Watts Radiant in-floor radiant heating will be used throughout the building. The Radiant PEX-AL system will be installed, due to its high performance in large buildings. Evacuation tubes and photovoltaic panels will be used to assist in heating the water. Grey water can be used from the cistern to flow through the heating unit and into the ALEX tubing. The tubing is just under 1 inch in diameter and can bend easily to allow for maximum coverage of the floor. An 8 inch slab of concrete will be poured on the first floor, with insulation on the underside of the slab and the inside of the foundation. Under the insulation is about 6 inches of sand and gravel, and then soil. An aluminum sheet will line the top of the concrete with the tubing being installed on the top of that. A thin layer of concrete will be poured, and topped off with 3'x3' concrete tiles, which will allow the heat to transfer through.

Labels in diagram: Watts Water Technology logo, Sun, Water, Heating Unit, Manifolds, Thermostat, PEX tubing, ALEX piping.

- 1) Master stainless steel manifold
- 2) System pump
- 3) Mixing valve
- 4) Pressure by-pass valve
- 5) Thermostat
- 6) Purge and vent assembly
- 7) ALEX piping

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Water Conservation

CISTERN

A cistern will be installed on the southern end of the building between the two wings. To reduce carbon debt, the cistern will be made of concrete and poured during the construction of the foundation. The cistern will sit just below ground with a depth of 8 feet and an interior diameter of 10 feet. The container should have a capacity of 4,700 gallons, more than enough water to supply the water closets. Water will be re-routed from the northern side of the building through channels in the crawl space, with a slight slope, into the cistern. The potable water in the building is supplied from the "Total Package" living machine, located to the south of the building.

Labels in diagram: Screenshot Overflow and Vent, Lock, Manhole Cover, Switch Control, Wrought Iron Shear, Electrode, Water Stop, Valve and Box, Screened Inlet and Outlet, Screened Drain, Slope Floor to Drain, Drain, Elevation.



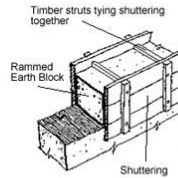
WALLS AND SUPPORT STRUCTURE

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Cast Earth
R-Value: 5
Insulation
R-Value: 10.8

CAST EARTH

Cast earth is made of mixing calcined gypsum and packed earth. The calcined gypsum (@15% of mixture) increases the strength, which allows the walls to be constructed without steel supports, and the mixture also increases the cure time and allows the building to be erected faster.



LARGE TREES

Large trees will be used to create columns to support the central forces caused by the roof. The trees can be process out of the large Ponderosa Pines on site that must be removed for new construction and fire safety.



LIGHT WOOD FRAME

A few walls in the building will be constructed by using dimension lumber (2x6) and insulation, along with gypsum board and drywall for casing.

MATERIALS



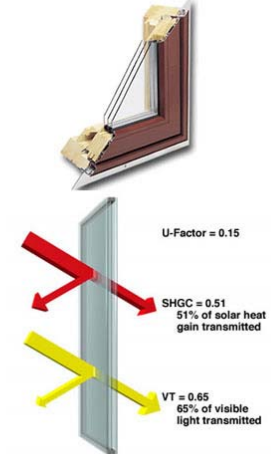
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GLAZING

Triple Glazed Window
R-Value: 5.3
Kalwall
R-Value: 10

TRIPLE GLAZED, LOW-E GLASS FILLED WITH ARGON/KRYPTON GAS

The heat loss rate for this glazing is very low, with a U-Value of 0.15, allowing very minimal heat loss through the glass. There is a .5" gap which is filled with argon gas. These windows will be good for the campus because they are designed for climates that deal with cold winters and warm summers. The average window size in the building is 3'x5', however there are some oversized windows used in curtain walls and general areas to allow sun to penetrate into the space.



KALWALL

Kalwall is used in the atrium space to create the "glowing" U of I logo above the staircase to bring daylight into the circulation space.

MATERIALS



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FLOORING

IN-FLOOR RADIANT HEATING

The floors will contain radiant floor heating, a Watt's Radiant Radiant PEX-AL. Evacuated tubes will be used to heat the water through solar power, which is achieved by the tubes storing 92% of thermal energy that penetrates through. The tubes are safe to -50 degrees.



CONCRETE FLOOR TILES

The concrete floor tiles will be 3'x3' tiles, with a dark tone and high gloss finish. These tiles will be placed throughout the circulation spaces, in the kitchen and in the restrooms.



HIGH-TRAFFIC CARPET

An acrylic berber will be used in the classrooms, offices, computer studio, auditorium, and dining hall. The carpet will also help with the acoustics in the dining hall and auditorium.



MATERIALS



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ROOFING

ROOFING STRUCTURE

The system used for the roof is a cold roof system, which encases all the insulation, joists, and venting aluminum. There is an overhang that has a vent underneath, allowing air to flow between the joists, above the insulation, right below the gypsum board, and vent out through the high point. Corrugated metal roofing will finish the roof, allowing snow to easily slide off.



ROOF ELEMENTS

Photovoltaic panels and Evacuation tubes will be secured to the roof. These will assist in heating the water used to pump through the in-floor radiant heating. The panels will be placed on a north facing roof at the peak due to the amount of trees located on the sothern side of the building. Aluminum rain gutters will be used to collect water runoff from the roof and store it in the cistern.



MATERIALS



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FINISHES

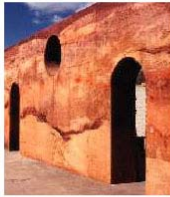
EXTERIOR SLATE BASE

A base on the exterior will raise 3' above finished floor level, and run to the ground. It will have breathing holes cut into it to allow for foundation ventilation.



INTERIOR WALL FINISH

The dining and circulation areas will keep the natural cast earth look, however the offices, and classrooms will be plastered and then painted an off white color to lighten up the spaces. The auditorium will be lined with acoustic paneling so that sound will not drown out in the walls.



LOW FLOW FAUCETS AND TOILETS

Ultra-low flush toilets and waterless urinals will be used in the restrooms throughout the building. Rainwater will be collected and stored in a cistern, which will be reused in the toilets.

MATERIALS



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SBSE CHECKLIST

Regeneration-Based Checklist for Design and Construction © SBSE & Tabourez 1999

Project:	degeneration				sustainability				regeneration				
	100% always	75% usually	50% sometimes	25% at all	0% balances	25% sometimes	50% usually	75% always	100% always				
pollutes air													cleans air
pollutes water													cleans water
wastes materials													recycle materials
consumes food													produces food
destroys rich soil													creates rich soil
dump waste unused													consumes waste
destroys wildlife habitat													provides wildlife habitat
imports energy													exports energy
requires fuel-powered transportation													requires human-powered transportation
intensifies local weather													moderates local weather
excludes daylight													uses daylight
uses mechanical heating													uses passive heating
uses mechanical cooling													uses passive cooling
needs cleaning and repair													maintains itself
produces human discomfort													provides human comfort
uses fuel-powered circulation													uses human-powered circulation
pollutes indoor air													creates pure indoor air
is built of virgin materials													is built of recycled materials
cannot be recycled													can be recycled
serves as an icon for the apocalypse													serves as an icon for regeneration
is a bad neighbor													is a good neighbor
is ugly													is beautiful

greater score: 2500 possible
 -150

greater score: 2000 possible
 575

final score: 425

CHECKLIST



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Carbon Debt Analysis

	ORIGINAL				LIFE CYCLE			
	NONE	LOW	AVE.	HIGH	NONE	LOW	AVE.	HIGH
FOUNDATION								
Concrete								
Steel reinforcement								
Acid wash								
WALLS								
Earth								
Calcined gypsum								
Insulation (4")								
2x6 studs								
Drywall								
Slate								
WINDOWS								
Triple glazed								
Kalwall								
SUPPORTS								
Tree columns								
ROOFING								
14" Joists								
Insulation								
Gypsum board								
Drywall								
Metal roofing								

CHECKLIST