Crash Test Housing

Becky Whitlock
Terminal Studio: Winter/Spring 2009
Prof. Peter Keyes & Architect Richard Shugar

...a more sustainable, higher density, infill housing typology

SINGLE LOT, THREE-UNIT DEVELOPMENT

DOUBLE LOT, SIX-UNIT DEVELOPMENT

Scales of Use

providing a variety of indoor and outdoor spaces to allow differing scales of use throughout the site

Materials and Textures

moving away from the gypsum board box of suburbia by introducing a variety of materials and textures both inside and outside of the home

The Unexpected

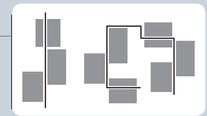
introducing unexpected elements into unit and site designs - unexpected uses, unexpected spaces, and unexpected heights

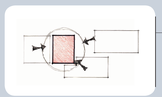
Transition Spaces

providing a hierarchy of transition spaces ranging from communal public spaces to private interior spaces

Unit System

the "party wall" acts as an organizing element throughout the site for the arrangement and attachment of individual units





Community Spaces

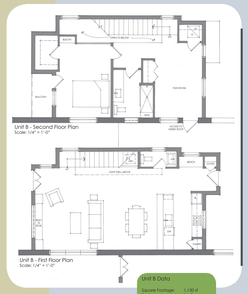
providing centralized shared spaces for unit owners, thus allowing smaller unit designs

providing shared outdoor spaces in addition to private outdoor spaces for each unit

Unit Adaptability

three different sized units provide a variety of housing types for the existing neighborhood, enhancing viability

units designs can combine for larger units or divide for smaller units



Unit B Data

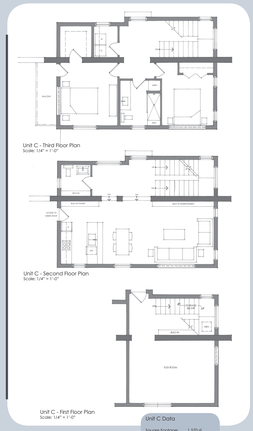
Square Footage:	1,150 sf
Bedrooms:	1 + flex
Bathrooms:	1.5

Unit A Data

Square Footage:	815 sf
Bedrooms:	1
Bathrooms:	1

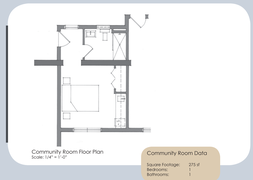
Site Plan Data

Location:	1148 20th Ave. Capitol Hill Neighborhood Portland, OR
Square Footage:	6,000sf (120' x 50')
Zoning:	R5,000
Units per Acre:	22
Proforma Data	
Construction Cost:	$1.13 million
Unit Selling Prices:	$380,000 Unit A $450,000 Unit B $750,000 Unit C



Unit C Data

Square Footage:	1,570 sf
Bedrooms:	2 + flex
Bathrooms:	1.5 + flex



Community Room Data

Square Footage:	275 sf
Bedrooms:	1
Bathrooms:	1

Site Plan Data

Location:	4006 & 4016 NE 10th Ave. Portland, OR Alberta
Square Footage:	12,000sf (120' x 100')
Zoning:	R5a1
Units per Acre:	24
Proforma Data	
Construction Cost:	$2.13 million
Unit Selling Prices:	$380,000 Unit A $350,000 Unit B $450,000 Unit C

Unit A Interior

Unit B Interior

Unit C Interior

Water Collection

integrated gutters collect stormwater run-off from roofs for use in yard irrigation

Summer Sun

overhangs, trellis structures, and awnings provide shading of southern window surfaces to prevent overheating in summer

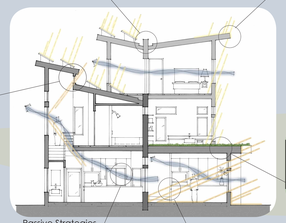
photovoltaic panels provide energy to supplement plug loads within units

solar collectors heat water for all units

Clerestory

providing additional opportunities for light to enter each unit brings southern light to northern spaces

a light well in the floor below allows the daylight to penetrate down to the lower level



Passive Strategies

Green Roof

serving as a symbol of sustainability from the street, the green roof also provides added insulative material, reduces stormwater run off, and is a pleasing roof surface

Cross Ventilation

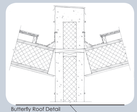
narrow unit dimensions and southern exposure allow summer winds to cross through each unit, providing all necessary cooling in warm months

Winter Sun

overhangs are sized to allow winter sun to penetrate the unit, providing some direct gain heating of the thermally massive floor and party wall

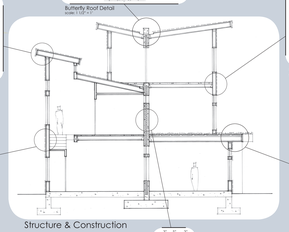
Three-Unit Street Elevation-Perspective

Six-Unit Street Elevation-Perspective



Butterfly Roof Detail

Roof Eave Detail
scale: 1 1/2" = 1'



Structure & Construction

Upper Floor Detail
scale: 1 1/2" = 1'

Exterior Wall Detail
scale: 1 1/2" = 1'

Green Roof Detail
scale: 1 1/2" = 1'

Party Wall Detail
scale: 1 1/2" = 1'

Three-Unit East-West Section Perspective

Six-Unit North-South Section Perspective