HIGH PERFORMANCE BUILDING & PASSIVE DESIGN

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MODERN INDIA – LE CORBUSIER’S CHANDIGARH

Courtesy: Administration of Chandigarh
http://www.chandigarh.gov.in/
• Columbus’ first Green residential development
• Eleven acre development featuring 30 high performance homes to be built by local builders
• 15-year property tax abatement on building improvements
Project Highlights

Builders required to meet:

• Building Performance
  – ENERGY STAR homes
  – Third party verified

• Building Durability
  – Moisture control

• Indoor Air Quality
  – Improved air quality
Project initiated and facilitated by Columbus Green Building Forum (CGBF)

CGBF brought in volunteers for designing the LEED-Home Pilot project

258 N. 21st Street, Columbus
The AWARE Manual promotes:

**Universal Design Accessibility Standards**
At least 20% of all Federally Funded Projects are to meet all Universal Design Accessibility Standards:
- 1 to 5 houses = 1 house
- 6 to 10 houses = 2 houses
- 11 to 15 houses = 3 houses

**Healthier Homes**
- Testing and mitigating radon gas, if necessary (a main cause of lung cancer)
- Active/forced or passive air systems to bring fresh air into the home
- Ventilation to remove moisture, which causes mold and mildew
- Integrated pest control using non-chemical methods
- Low/No VOC products:
  - Paints
  - Adhesives
  - Carpet
  - Floor tiles and sheet goods
  - Bathroom and kitchen cabinets

**More Accessible Homes**
- No-step entry (making it wheelchair accessible)
- Wider doorways and halls (making them wheelchair accessible)
- Wider stairways (for future installation of a stair lift)
- 1st floor bath and bedroom (making home accessible to all)
- Providing floor space and fixtures to accommodate wheelchair access in bathrooms and kitchens
- 1st floor laundry (accessible to all)
- Lever handle faucets (easy operation for all)
- Lever handle door locks/latches (easy operation for all)
- Wood blocking in the walls (for future installation of grab bars)
- Positioning the height of wall outlets, switches, thermostats, door locksets and cabinet handles (accessible to all)

**Environmentally-Friendly Homes**
- Recycling construction waste
- Using recycled materials/products
- Using a detailed framing plan to reduce material waste (wood without compromising structural integrity)
- Creating a framing order waste factor limit holding the waste material to 10% or less
- Using pre-cut or pre-assembled building systems or methods
- Use materials from renewable resources or agricultural byproducts

**Resource and Energy Conscious Homes**
- 90% + gas forced air furnaces
- Water-saving plumbing fixtures
  - Commodes
  - Faucets
  - Shower heads
- Better house insulation
- Using Energy Star Rated:
  - Windows and doors
  - Appliances
  - Light fixtures
  - Fans
  - Hot water heaters

No-step entries allow everyone to easily enter a home
Pull-out work surfaces make kitchens more accessible
How Energy Is Used in Homes (2005)

- Space Heating: 41%
- Lighting and Other Appliances: 26%
- Water Heating: 20%
- Refrigeration: 5%
- Air Conditioning: 8%

Diagram of Leaky Home: In typical homes, air leaks are often found at holes and penetrations for plumbing, wiring, lighting, and ductwork.
Infrared Image of House Exterior: In this infrared photo of a typical house, the yellow shows excessive heat loss in winter because the house was not built with the comprehensive air barriers and proper insulation details found in ENERGY STAR homes.