

NATIONAL LABORATORY FOR HOUSING AND SUSTAINABLE COMMUNITIES



The National Laboratory for Housing and Sustainable Communities is a multi-disciplinary team with research interests in:

- Housing, environment, and sustainability,
- Technology for architecture and urbanism,
- Human settlements and heritage,
- Habitability and resilience.

Our facilities are located in strategic regions of México at four universities, in Chihuahua (UACJ), Sonora (UNISON), Jalisco (UDG) and Chiapas (UNACH).
Objectives

- Provide research and technological development services in the housing sector and sustainable communities.
- Educate high-level human resources associated with the housing sector (postgraduate and continuing education).
- Provide regional coverage that recognizes regional strengths, capacities, and resources.

We offer services with an integral quality management system, certified by ISO 9001: 2015 and ISO 14001: 2015, including:

- Simulation and evaluation of urban-architectural.
- Geo-referencing 3D
- Living lab for housing.
- Prospective studies on a public, urban and housing policy.
- Sustainable urban and housing executive projects.

One of our services consists in the recreation and analysis of solar path and its interaction with preexisting or new constructions. Using a scale model of the project and the Heliodon Orange gives us the certainty to take decisions that can have a great impact in comfort and energy efficiency of a building.

The following project intends to provide a model for social housing that takes under consideration the climate conditions and integration of renewable energy sources. This house was specially designed for hot dry climate, and it is located at Hermosillo, Sonora, Mexico. Hermosillo has a six-month hot season from May to October with approximately 300 sunny days per year. During these periods the maximum temperatures vary from 40°C – 44°C being July the critical month.

To adjust the house to these harsh conditions the interaction and activities developed in each piece were taken under consideration, as well as the addition of solar protections integrated to the design and a solar chimney for ventilation and conditioning. As a demonstration of the accuracy of the Heliodon Orange, we took a series of pictures for a comparison between the built house and a solar simulation using a scale model.

LUX METER RESULTS		
10:00 Exterior:208.46 lx Interior: 10.67lx	12:00 Exterior:240.80 lx Interior:8.32 lx	14:00 Exterior:260.05 lx Interior:9.68 lx

The following pictures were taken on the 17th of May 2018 at three different hours.

Conclusions: From the projection of the shadows, we can conclude that the effect of the solar protections is the desired one. Indirect natural light and ventilation are provided through the windows, without exposing the interior to direct sunlight.

The lectures of the lux meter show a remarkable difference between the interior and exterior of the house confirming the efficiency of the design for these months of extreme heat.

MAY 17, 2018 10:00

NORTH FACADE

WEST FACADE

SOUTH FACADE

EAST FACADE



MAY 17, 2018 12:00

NORTH FACADE

WEST FACADE

SOUTH FACADE

EAST FACADE



MAY 17, 2018 14:00

NORTH FACADE

WEST FACADE

SOUTH FACADE

EAST FACADE

