



Energy Efficient Buildings in Oman (Green Buildings)

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**OMAN
CONSTRUCTION**

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قال الله سبحانه وتعالى في محكم كتابه ” وَاذْكُرُوا إِذْ جَعَلَكُمْ
خُلَفَاءَ مِنْ بَعْدِ عَادٍ وَبَوَّأَكُمْ فِي الْأَرْضِ تَتَّخِذُونَ مِنْ سُهُولِهَا
قُصُورًا وَتَنْحِتُونَ الْجِبَالَ بُيُوتًا ۖ فَاذْكُرُوا الْآءَ اللَّهِ وَلَا تَعْتُوا فِي
الْأَرْضِ مُفْسِدِينَ“

Allah said in the holy Quran – translate

“"And remember when Allâh made you successors after 'Ad (people) and gave you habitations in the land, you build for yourselves palaces in plains, and carve out homes in the mountains. So remember the graces (bestowed upon you) from Allâh, and do not go about making mischief on earth."

Al-Araf --- Aya 74



What did we do ?!

Football ground sized offices,
bedrooms, living rooms, sitting rooms.

1. Intensive cooling ← Electricity ← Hydrocarbon as fuel ← Environment Damage.
2. Electricity Bill ← Money ← Greed
3. Subsidy ← Money ← National Resource



What must we do ?!

Fit for purpose offices, bedrooms,
living rooms, sitting rooms.

1. Have fit for purpose spaces
2. Decorate and make it livable



What did we do ?!

Large houses but empty !!.

1. Intensive cooling ← Electricity ← Hydrocarbon as fuel ← Environment Damage.
2. Electricity Bill ← Money ← Greed
3. Subsidy ← Money ← National Resource

Culture changed – our sons no longer live with us



What must we do ?!

Buildings fit for purpose.

1. Have fit for purpose houses
2. Decorate, grow vegetables and make it livable



What did we do ?!

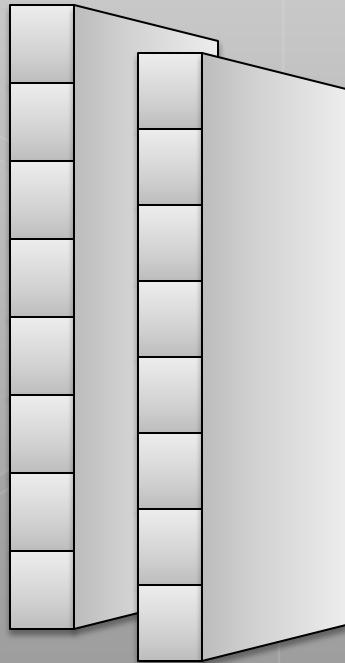
Concrete, Steel and glass Structures

1. At Summer; convert sun light to heat as if heat generators
2. At Winter; convert breeze into refrigeration as if refrigerators



What must we do?!

Concrete, Steel and glass Structures



Thermal insulated
Concrete walls



Thermal insulated
steel structure



Double Glazing with
Thermal insulation medium



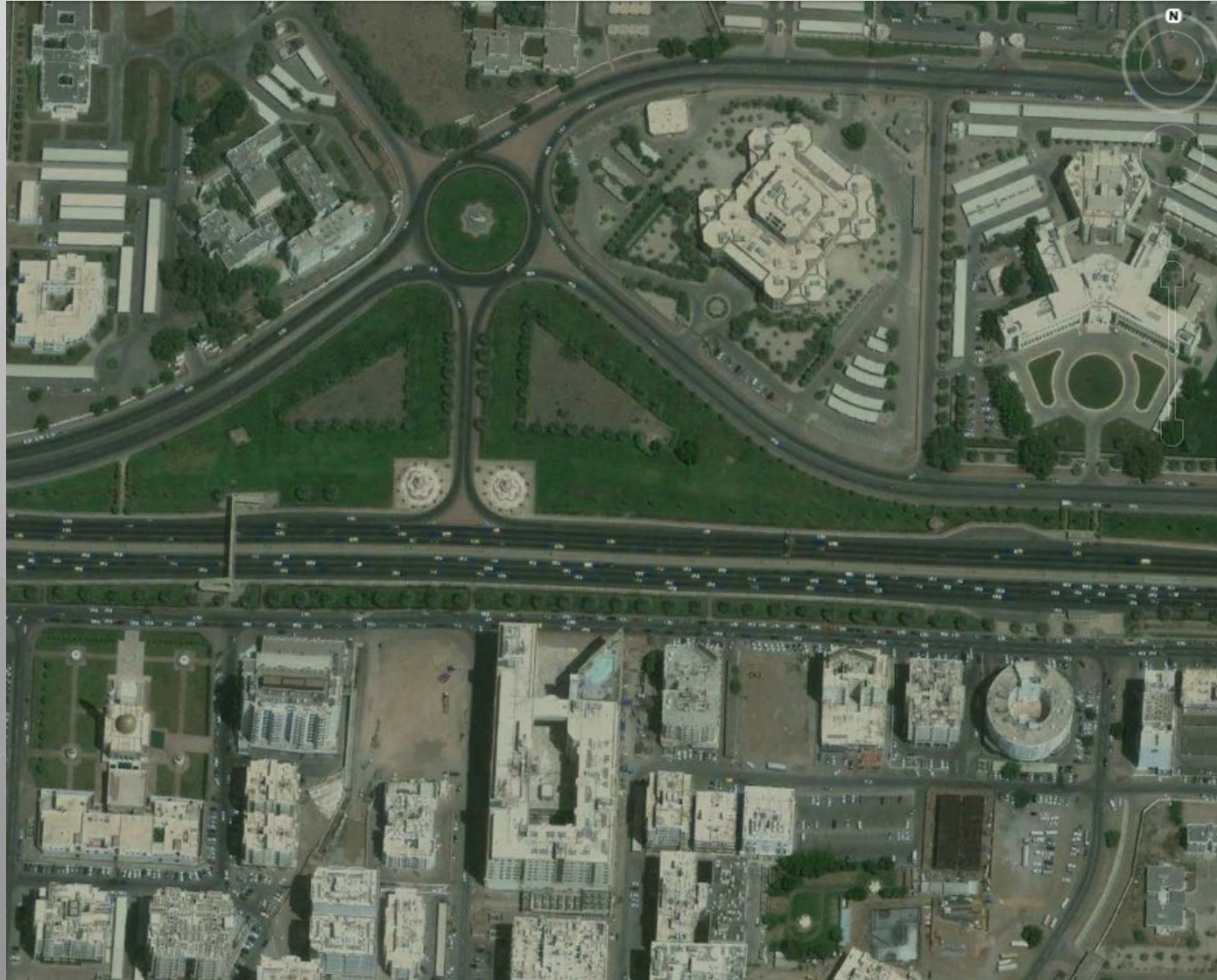
What did we do ?!

Built facing the Sun !

Longest sections of the buildings facing the sun as if heat collectors



What did we do ?!





What must we do ?!

Build diagonal to the sun

Minimize building sections
facing the sun





What did we do ?!

Built with Flat Roofs!

Un utilized flat roofs, sun light absorbers and heat generators



What did we do ?!





What did we do ?!

Assumptions

800 thousand buildings in Oman with flat roof on average 300m². Each meter requires 5 Wh of electricity to cool. Cost of electricity is 25 baiza per kWh

Total empty, heated roofs in m²

$$=800,000 \times 300 = 240,000,000 = 240,000 \text{ km}^2$$

Total kWh in cooling roofs = 120,000 kWh

Total O.R. wasted on 800,000 roofs cooling = O.R. 3000 per hour.



What did they do ?!

Roof Vegetation at Udhaibah residence

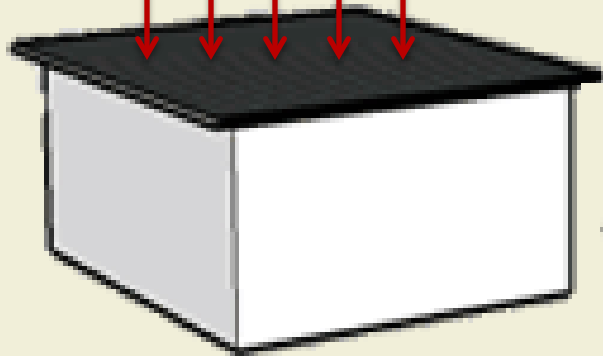
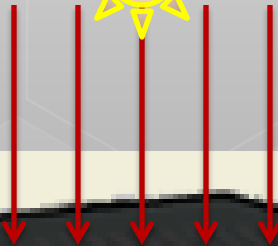
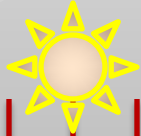
A number of
residents of this area
have grown
vegetables on
houses roofs





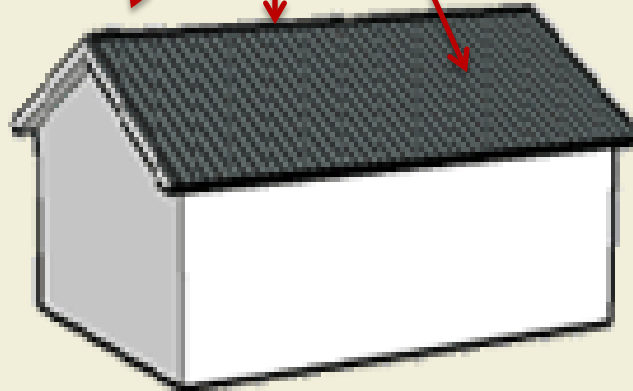
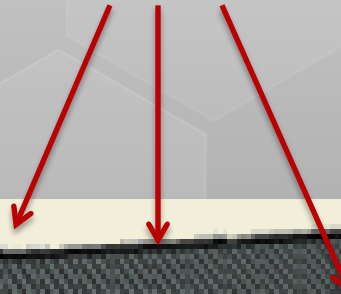
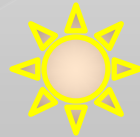
What must we do ?!

Type of Roofs



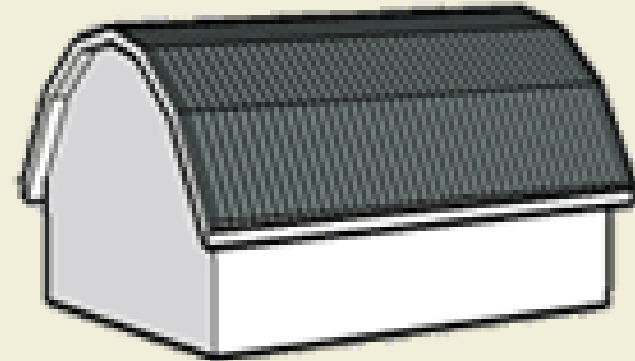
Flat Roof

Low Energy Efficiency



Gable Roof

High Energy Efficiency



Gambrel Roof

Medium Energy Efficiency



What must we do ?!

Electricity Micro Generation



Globe Roof



Flat Roof



What did we do ?!

Built dark buildings with poor ventilation!
With the presence of electricity (artificial lighting and ventilations), designers gave low attention to natural lighting and ventilations



What must we do ?!

Build for Natural lighting and ventilation
To save electricity, national resources and environment, designers must carefully design buildings with natural lighting and ventilations



Our Vision

TO BE ONE OF THE MOST
RESPECTED ENERGY
SOLUTION PROVIDER IN THE
REGION BY 2020



What did Majan Electricity Do?!

Designed and under construction five floors, 3000 m²; the first energy efficient building in Oman



What did Majan Electricity Do?!





What did Majan Electricity Do?!

Building Features

1. Insulated structure
2. Water chiller air conditioning
3. Recycle gray water
4. Natural Lighting
5. 50kWhr Solar Power
6. Recycle papers



What did Majan Electricity Do?!

MJEC has got budget approval for 6 satellite offices as green buildings. Soon will start design and completion in stages by end of 2013



What did Majan Electricity Do?!

Satellite Office



International Standards on Green Buildings

1- ISO 16813, ISO 16818

(Indoor building environment and energy efficiency)

2- ISO 15392

general principles on sustainability in building construction.

2- ISO 14000 series

Environment Concerns

Source of Information



To conclude

It is better be late than never.

Let us be the pioneers in saving earth.

Act upon Allah guidance and satisfy our subconscious.

Be good to earth and save for generations to come.

Together we make the difference



Thank You