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THE IMPACT OF EARTHSCRAPER IN HOUSING ON REAL TIME WORLD AND FUTURE

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ABSTRACT

The Paper aim is to study and understand the The lost art of building underground, While infinite constructions are buried underground, such as automobile parks, arenas and laboratories these are no longer earthscrapers..

Earthscrapers are described as inverted or opposite to the skyscraper.

Although an extraordinarily fascinating concept, at existing earthscrapers solely exist as plan concepts, both in fiction or architectural proposals.. None yet been built, as far we are aware.The aim of this paper is research about the earthscraper on this world and and how it works on housing and understanding the earth building or underground building some case studies and providing better conclusions with referenced inferences The underground building construction around the world develops low prompt rates. It solves the most important problems of over population of cities in the world: big traffic, ecology problem, decreasing natural environment, decrease of energy of resources.

Hidden under the lower earth automobile and the railroads, warehouses, technical rooms, shops make room on a surface for creation of more comfortable . But the people are forced go down day to day life under the earth to use all was hidden there. Stay underground and build underground for many people is dangerous. In there are different phobias which negative to the mental health, working ability an opportunity completely to live in society, appear and become worsened. In this article the mental disorders arising when finding the person underground in underground constructions of different function are described. Ways and examples of decrease in discomfort of psychological from stay underground by architectural, planning and design discussion are shown.

Keywords: *Earthscraper;underground; earth building;*

1. INTRODUCTION

One solution to the scarcity of surface space in densely populated cities has been the construction of skyscrapers. Skyscrapers have had a huge impact in the development of cities. Finding new ways to make “buildings taller by providing much more structural support” has led to the use of bigger surface areas, the addition of stronger soil and much more material for the foundations alone (Banavalkar, 2012). In addition Require skyscrapers restrictions and codes regulating “structural, flame, smoke, mechanical and plumbing control in order to improve their quality” and safety (Jones,.However, since many of these “codes were developed afte rthe early skyscraper era between the early 1900’s and post-World War II” (Kelley, 2010)it has, led to the creation of new codes to ensure that the presence of skyscrapers does not jeopardizethe quality and functionality of adjacent low-rise buildings.On the other hand, underground civil engineering works could help solve the problem skyscrapers were meant to solve. In urban areas such as London or New York, or the chaotic,fast –growing cities of India and East Asia, there just isn’t much space on the surface. Taking a small ground footprint and building upwards into a skyscraper, the choice for maximizing space since the 1920’s, has its limitations. The earthscraper, which has been designed for a specific Location in Mexico City by BNKR Arquitectura, is best described as an underground skyscraper

That will provide the option to deal with the issues of not having enough surface area while not jeopardizing the important neighboring buildings (Nathan, 2015). With this in mind, if the industry wants to start implementing new concepts such as the earthscrapers that could require less use of surface area, it has to be shown that all the concerns and questions regarding their feasibility and security have been addressed.

Aim and Objectives

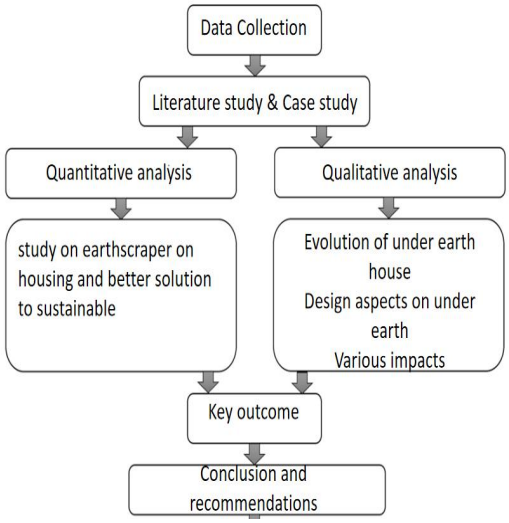
The aim is to bring study and explore how earthscraper impact housing on real time world

1. The objectives of the proposal are as follows:
2. To understand the history of the under ground housing
3. To study different aspect of earthscraper
4. To study about the sustainable on under ground building
5. To study about positive and negative impact of underground ground construction

The scope of the study is to study about the To understand the housing on under earth impact of human and enhancing their quality to the sustainable

2. METHODOLOGY

The design proposal methods has been three different stages 1.Literature study and case study. 2. Site selection and Site analysis 3. Design of underground housing and different form of underground earthscraper or underground structure.



3. LITERATURE STUDY

[1] WHAT AN UNDERGROUND HOUSE OR BUILDING IS NOT ?

Perhaps we have to begin with what an underground residence is not. An Underground residence is now not dark, damp and dirty. It's not airless and gloomy. It is truly no longer a basement. An underground residence has no extra in Common with a basement, Than a penthouse condo has in frequent with a hot, dark, dusty attic.

WHAT AN UNDERGROUND HOUSE IS; ADVANTAGES

NO FOUNDATION.

2. LESS BUILDING MATERIALS.

3. LESS LABORS.

4. MOST AESTHETICALLY PLEASING SPACE.

5. LESS AMOUNT OF TAX.

6. WARM IN WINTER SEASON .

7. COOL IN SUMMER ALSO .

8. CUT ATMOSPHERIC RADIATIONS . .

9. BUILT IN GREENHOUSES.

10. ECOLOGICALLY SOUNDS.

11. INCREASE YARD SPACES.

12.THE FALLOUT SHELTERS.

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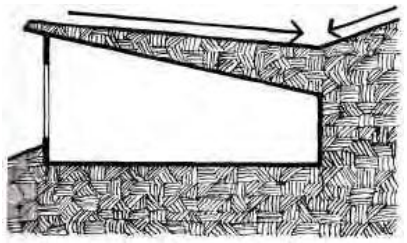
[2] DESIGN

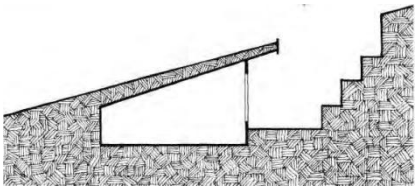
FIRST-THOUGHT HOUSE

The First-Thought House is an strive to get a view downhill at the rate of the most important consideration, drainage. Drainage, in fact, is on occasion in no way viewed at all. The sketch consists of a massive wall of home windows on the downhill facet and a shed

roof which drains again in opposition to the hillside. A cutaway view of the First-Thought House appears like this:



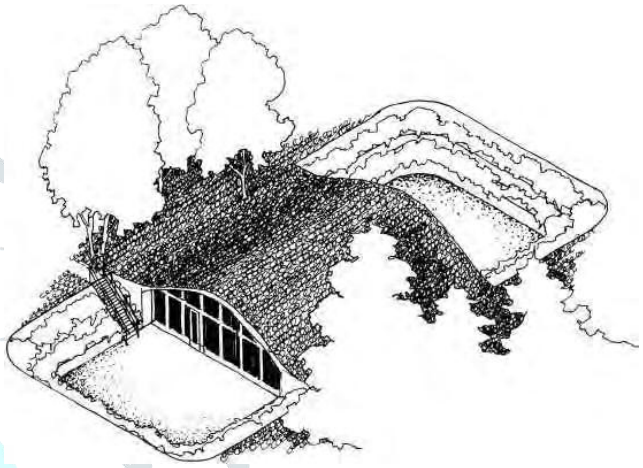
THE BASIC DESIGN



Your range one trouble on underground housing is DRAINAGE. As mentioned, the shed roof on our Basic Design without difficulty disposes of all precipitation that falls on the roof. But what about the water coming down the hill? The patio takes care of that.

THE BOWED ROOF HOUSE

If you are constructing a rectangular or rectangularly formed residence you would possibly get suitable roof ,drainage and a pleasingly one of a kind ceiling impact by using bowing the roof. The drainage would run off to the facets the place there are French drains and stable earth. The the front and returned of the residence would face out onto sunken patios or greenhouses or both. The roof may want to come above floor degree if you favored the view.



THE CAVES AND GROTTOS

Caves as Burial Sites

Caves as Temples and Monasteries

Caves as Dwellings

[3] UNDERGROUND SPACE FOR THE FUTURE

Underground area for the future will be based totally on modern-day lookup and development. In addition to the examples simply discussed,future underground area will additionally strive to innovatively use underground city area in exceptional ways. In China, for instance,

Shanghai's authorities has determined to discover the underground area in the following six directions:

1. Strategic learn about of Shanghai underground house exploitation
2. Future underground building science and gear find out about
3. Deep underground area planning idea and graph learn about
4. Low-carbon underground house exploration science learn about
5. Safe operation and digitalization find out about of underground construction's full existence cycle
6. Study on danger administration and long-term assessment and experiments

[4] Underground Space in Cities

Urban environments can characteristic extra effectively the use of multipurpose underground area to alleviate the

strain on the surface. As in the past detailed, metro traces in cities throughout the world already alleviate the transportation networks aboveground. Other makes use of of underground house on the surface. As in the past detailed, metro strains in cities throughout the world already alleviate the transportation networks aboveground. Other makes use of of underground areas.

The Earthscraper task proposed by means of Mexican architects BNKR Arquitectura. It is a 65-story inverted skyscraper that plunges 300 m under floor (Dvice.com [DV], 2011). Another revolutionary venture is the underground cemetery in Jerusalem. To meet the high demand for burial house besides increasing current cemeteries on the surface, the metropolis of Jerusalem determined to increase one depth-wise. Beneath its predominant cemetery, tunneling groups are working on 45-m-deep constructions that will finally add every other 22,000 burial spots (Liebermann, 2016). This answer saves floor area whilst preserving proximity to the cemetery for visitors. The undertaking is a proper example of how a centuries-old burial technique (catacombs) is now being carried out with contemporary technologies.

The questionnaire "Your relation to underground objects" has helped to estimate prevalence of the revealed phenomena among young people. The questionnaire consists of a sequence of questions of the opened and closed kind and its consists of 2 thematic parts: "relation to the underground constructions" and the "mental state of underground". The research conducted at the Moscow State University of Civil Engineering in 2016. 327 students aged from 17 up to 23 years with various social status, income level, constantly living in Moscow and its suburb, and also arrived to university from other cities of Russia have participated in a research.

Results of research

Let's consider psychological phenomena which can arise at the person at stay in rooms of different type.

Elena Romanova / Procedia Engineering 165 (2016) 1176 – 1183

Table 1.

Construction type	Time of stay of the person
without presence of people	-
short-term stay	no more than 5 - 10 minutes
temporary stay	till 1.5 - 2 o'clock
long stay	till 3 - 4 o'clock
stay on duty and replaceable	till 24 o'clock

4 CASE STUDY

4.1.1 Landaburu Borda Rural House

Landaburu Borda is a precise instance of when the industry allies itself with design and architecture, reaching their shared primary objective: enhancing the lives of humans thru effificiency and creativity.The Landaburu Borda Country House has been confifirmed as a fifinalist project in the 2020 FAD Awards. The jury has made a selection of projects defifined as “attentive to context, strategy and trade, in dialogue with space, time, matter, body and nature; an architecture with a purposeful spirit.

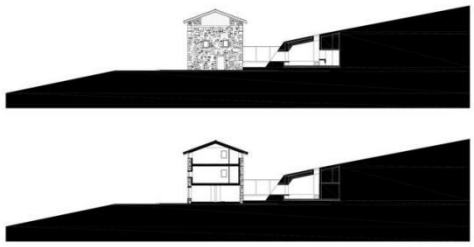


Figure1 :Landaburu Borda Rural House section

Figure2 :Landaburu Borda Rural House interior

4.1.2 "Earthscraper" hotel in Shanghai's unused quarry

The Project: Shimao Wonderland Intercontinental

Location: Songjiang, Shanghai, China

Developer: Shimao Group

Architect: Martin Jochman Dip Arch RIBA - STUDIO JADE+QA (Concept with ATKINS)

Time scale: 2006 -2018

Opened: 15th November 2018

Interior Design: CCD / Site Area: 105350 m2

Building Area: 60072. sq m

Above Ground Building Areas: 13520.6 m2

Underground Buildings Areas: 46551.5 m2

Construction Firm: Shenzhen Asiantime International Construction Co., Ltd.

The world’s first quarry hotel has been opened in China, designed via Martin Jochman and his studio JADE + QA. Situated in an 88-meter-deep, water-filled, disused quarry,

the 337-guestroom Intercontinental Shanghai Wonderland Hotel incorporates solely two tiers above ground, with sixteen extra stages plunging into the quarry below.

The winner of an global plan opposition in 2006, Jochman developed the scheme in collaboration with ATKINS, in a manner decade. The resulting

"groundscraper" features such facilities as underwater restaurants and aquariums, all set inside a structure which seeks to limit its affect on the neighborhood environment.

Internally, passive sustainable aspects take benefit of the scheme's orientation, low profile, grass roof, and thermal homes of the quarry rock mass and lake, therefore growing a special microclimate that presents summer time cooling and wintry weather heating. As such, the schemeers anintriguing instance of the workable makes use of for brownfield web sites worldwide.The greatest impediment going through the sketch group at some stage in the scheme's inception used to be stabilizing the cli faces adjoining to the motel wings, a project performed in late 2015. Following the completion of the foundations and substructure on the quarry flooring level, work on the metal shape inside the quarry started in February 2016.

The 336room resort has 18 flooring two underwater and two above floor entire with a restaurant and sports activities and pastime services which include rock mountain climbing and bungee jumping, in accordance to its developer Shimao Group. The deluxe motel faces an synthetic waterfall cascading down to a pond at the backside of the quarry. It additionally retains a cliffside route used to transport rocks and a good deal of the pit's authentic fauna.

Exploited in the course of World War II, the quarry was once shut down in 2000 due to new environmental safety regulations. It commenced its transformation in 2006 when Shimao Group determined to make use of the deep pit to construct a hotel. The building took 12 years to complete. British architect Martin Jochman, who designed the hotel, stated the pit is the supply of his inspirations and he aspired to construct a inn that integrates with its herbal environment. "It's the first time to flip an deserted quarry into a exquisite lodge below the ground. This is such a special possibility that offers me some actually fascinating thoughts of reshaping the relationship between metropolis and nature," Martin said. Su Shuangxi, a 63yearold resident who used to be a employee in the quarry, was once amazed by means of the transformation of pit.

Figure3. Shimao Wonderland Intercontinental

Figure4. Shimao Wonderland Intercontinental view

4.1.3 BNKR Arquitectura

The Earthscraper, was designed by BNKR Arquitectura, is the first Skyscraper's antagonist in the historic urban landscapes of Mexico City where the latter is condemned and the preservation of the built environment is the paramount ambition. It preserves the iconic presence of the city square and the existing hierarchy of the buildings that surround it. More images and architects' description after the break.

The main square of the Mexico City, known as "Zocalo", is 57,600 m2 (240m x240m), making it one of the largest proposal in the world. It is bordered by the Cathedral, the National Palace and the City Government buildings.

Figure5. BNKR Arquitectura proposal

4.1.4 Kansas City, Missouri Project Subtropolis

The largest underground business complex in the world, with more than 4.5 million square feet of leasable space and 10 million square feet of total developed space housed in a limestone mine. The project, which contains office and industrial uses, will include approximately 50 million square feet of developed space at buildout.

Subtropolis is an 868-acre, master-planned underground complex that features both office and

industrial uses and also functions as a limestone mine.

The thriving subsurface business community includes approximately 55 tenants involved in a range of businesses, from office operations, light manufacturing, and warehousing to cold storage. The types of goods stored include food and paper products, stamp collections, and the original prints of classic Hollywood films such as Gone with the Wind.

Temperatures in this subsurface development are consistently between 65 and 72 degrees throughout the year, significantly reducing the need for cooling and heating systems and resulting in savings of as much as 80 percent of the cost of utilities for the above-ground facilities.

Project marketing has had to deal with a perception problem about exactly what Subtropolis is

and what it is not. Potential tenants who initially may be skeptical of moving their business to what they wrongly perceive as dark, wet "caves" often change their mind when they discover that this development is clean, dry, and well lighted. Hunt Midwest employs an on-site maintenance crew that cleans and scrubs the roads and pillars regularly, ensuring that the project is attractive to potential tenants and maintaining its efficiency.

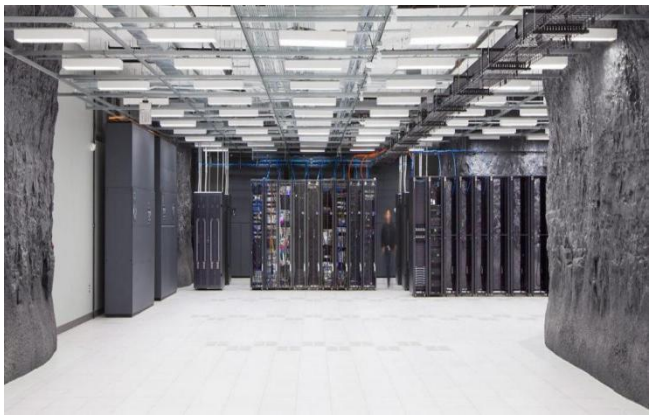


Figure6. Subtropolis country data storage area

5. RESILT AND FININGS

5.1 Conclusion from Literature studies:

The mankind doesn't stand still and constantly develops. The population of the Earth grows at the accelerating prices

Now society has faced a problem of overpopulation of the cities and lack of necessary grounds under building

Natural caves for shelter, excavation pits for stones and storage are dated returned to prehistoric instances and the use of underground house developed over the records

Underground space for the future: all developed countries research to make a new trend to the world and also development stage.

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psychological phenomena which can arise at the person at stay in rooms is an example for underground stay.

5.2 Conclusion from Case studies:

Few rooms site in the existing building, and a spacious annex living area with kitchen built inside the mountain becoming part of it

Passive sustainable features take advantage of the scheme's orientation, low profile, grass roof, and thermal properties of the quarry rock mass and lake, thus creating a unique microclimate that provides summer cooling and winter heating.

Two underwater and two above ground -- complete with a restaurant and sports and recreation facilities including rock climbing and bungee jumping, according to its developer Shimao Group

The BNKR world first earthscraper proposal for problem solving and also for the future model.

Subtropolis is the one of the best example for underground structure in large area clean, dry, and well lighted

6. SITE SELECTION AND ANALYSIS

The site choice primarily based upon the underground shape metropolis Neom is a deliberate metropolis in the Tabuk Province of northwestern Saudi Arabia. It is deliberate to include clever town applied sciences and to feature as a vacationer destination. The web page is north of the Red Sea, east of Egypt throughout the Strait of Tiran, and south of Jordan. It will cowl a whole location of 26,500 km2 (10,200 sq mi) and will prolong 460 km alongside the coast of the Red Sea. Saudi Arabia pursuits to entire the first area of Neom by means of 2025. The task has an estimated value of $500 billion.On January 29, 2019, Saudi Arabia introduced that it had set up a closed joint-stock organisation named Neom with $500 billion. The goal of this company, which is thoroughly owned with the aid of the Public Investment Fund, the sovereign

wealth fund, is to improve the financial quarter of Neom. The venture is deliberate to be completely powered by using renewable electricity sources. Nadhmi Al-Nasr is the chief government officer of the Neom joint-stock company. The Neom mission is placed in Tabuk, Saudi Arabia in the northwest of the kingdom,extended alongside with Aqaba Gulf and 468 km of shoreline with seashores and coral reefs, as nicely as mountains up to 2,500 m high, with a complete place of round 26,500 sq m. km The Line Main article: The Line, Saudi Arabia In January 2021, the challenge unveiled plans for The Line, a 170- kilometre (110 mi) lengthy linear town inside the Neom place that is supposed to have 1 million residents besides traditional cars.

Neom International Airport The standard Development Area covers an region of 20.2 sq. km. 6,600 m lengthy via 3,061 m wide.The work is below progress.

The place is placed at the crossroads of the world – 40%

of the world's populace will be capable to attain NEOM in less than four hours, and approximately 10% of the world's trade already flows through the Red Sea. Flying into NEOM's new airport, London is only five hours away, Dubai and Cairo two, and Zurich five-and-a-half.

The Line

The Line, Saudi Arabia

In January 2021, the project unveiled plans for The Line, 170-kilometre (110 mi) long linear city within the Neom area that is supposed to have 1 million citizens without conventional cars.

Neom International Airport

The overall Development Areas covers an area of 20.2 sq. kms. 6,600 meter long by 3,061 meter wide.The work is under progress.

Neom Bay

The development work of the project's first phase, Neom Bay, was once deliberate to begin in the first quarterof 2019 and be performed by way of 2020. The tendencies have been to encompass setting up the airport at Sharma which would function ordinary business flights between Riyadh and Neom The design of Neom Bay's tendencies additionally includes constructing the first residential region in Neom as section of segment 1..

Neom Industrial City (NIC)

Neom Industrial City (NIC) is located around 25 kilometres (16 mi) north of the town of Duba, and covers roughly 200–250 square kilometres (77–97 sq mi) of land, of which approximately 40 square kilometres (15 sq mi) forms the NIC. The project will focus on modern manufacturing and industrial research, and development centered on the expansion of the Duba port.

Agriculture

Neom plans for 6,500 hectares (16,000 acres) of the surrounding land to become agricultural fields, and to rely heavily on genetically engineered crops.

This ambitious city looks like something that will attract the whole world and will encourage people to visit Saudi Arabia, which hasn't really been a hub for tourism, except the holy pilgrimage.

Figure 7. The line neom

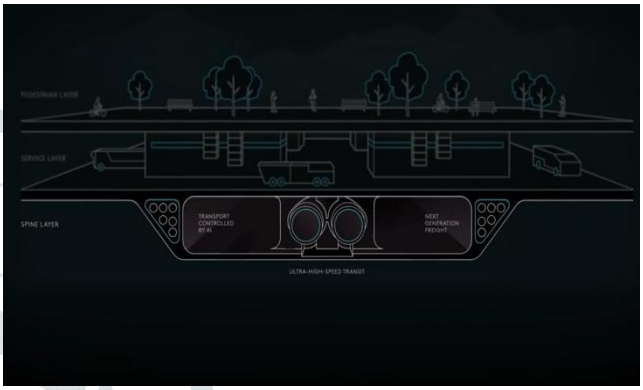

Figure 8. The line neom proposal in underground

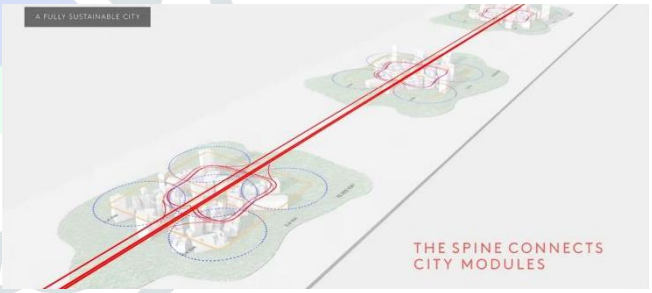

Figure 9. The line connect whole city

7. DISCUSSION

The accelerating boom of the populace of Earth reasons the extraordinary stress upon city areas. We have already surpassed that factor the place extra than a 1/2 of world's populace lives in city areas. But with the aid of 2050 it is anticipated that 70% of world's populace will stay in the cities. It ability what all humans dwelling nowadays on our planet will live in the cities by means of 2050.The underground metropolis area - the area below a day floor used for growth of the habitat of citizens, cognizance of priorities of ecology monetary properly being and sustainable development, advent of stipulations of pastime of humans in intense instances is greater and extra worried in planning of city development. Innovators of underground city planning are Canada, Japan and Finland.

The design proposal was developed by following the results and study . It is in the different form of design the earthscraper form was in under earth and also in above earth it's the new variety design form to earthscraper

The green resident form was biomimic form termite mount design function and its in the down towards earth and nature form of sunlight and stack effect to whole building

The fully closed underground recreational area with natural light and ventilation gives the new form of space to the design

The action plan is planned to bring the people together by enhancing the public space, providing cool and shaded areas where people can gather together.These spaces include public squares, sports playgrounds. pedestrian shaded paths along the residential area and pedestrian paths along with the connectivity of three layer of line it connects commercial area, top layer and transportation area .This master plan is based on the compact city concept

8. CONCLUSION AND FUTURE RESEARCH

The Design proposals is justify underground structure nearly to earthscraper, this design gives solution for neom city and also to the world in the form of sustainablity .

Underground constructions are very diverse. They differ to destination, to the location in the city, according to the space-planning scheme, laying depth, quantity of tiers, etc. For our research classification "to destination" is significant. According to her all underground constructions subdivide depending on time of stay of the person on an object.

When the exact form of earthscraper have to research and want to give solution for all kind of climatic zones and areas. As a result of success achieved today in development of technical equipment of underground construction (conditioning and odor removal of air, artificial lighting, thermal insulation, sound insulation and a waterproofing) use of considerable underground spaces has become a reality.

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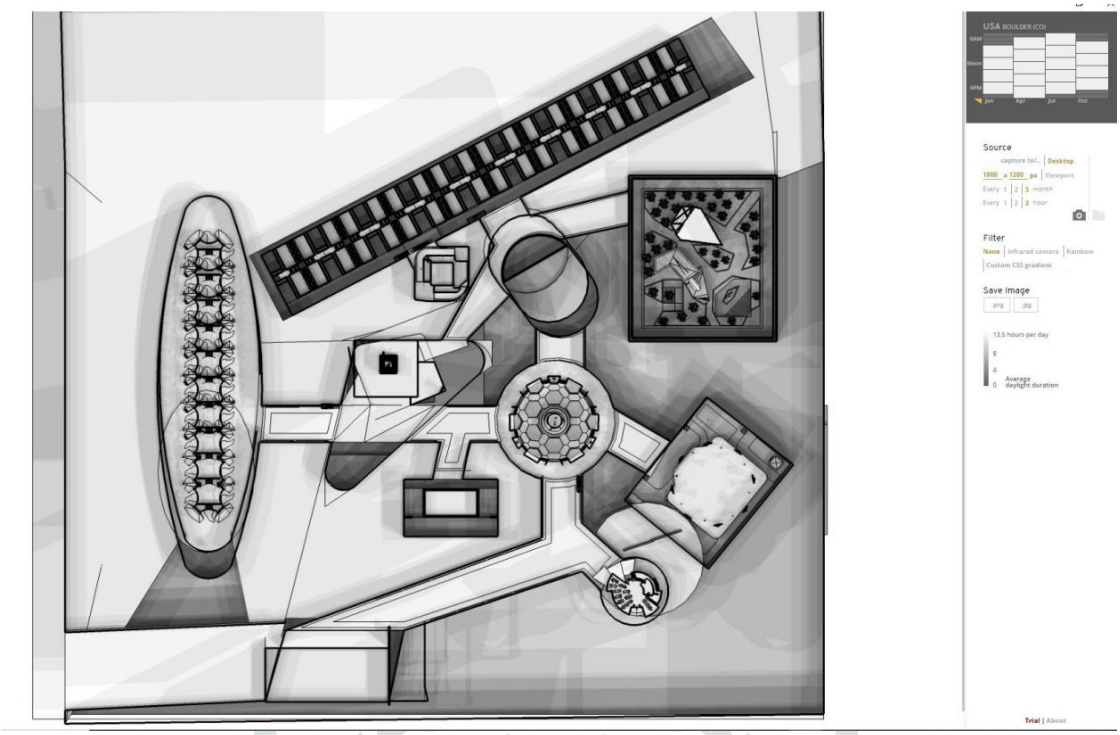
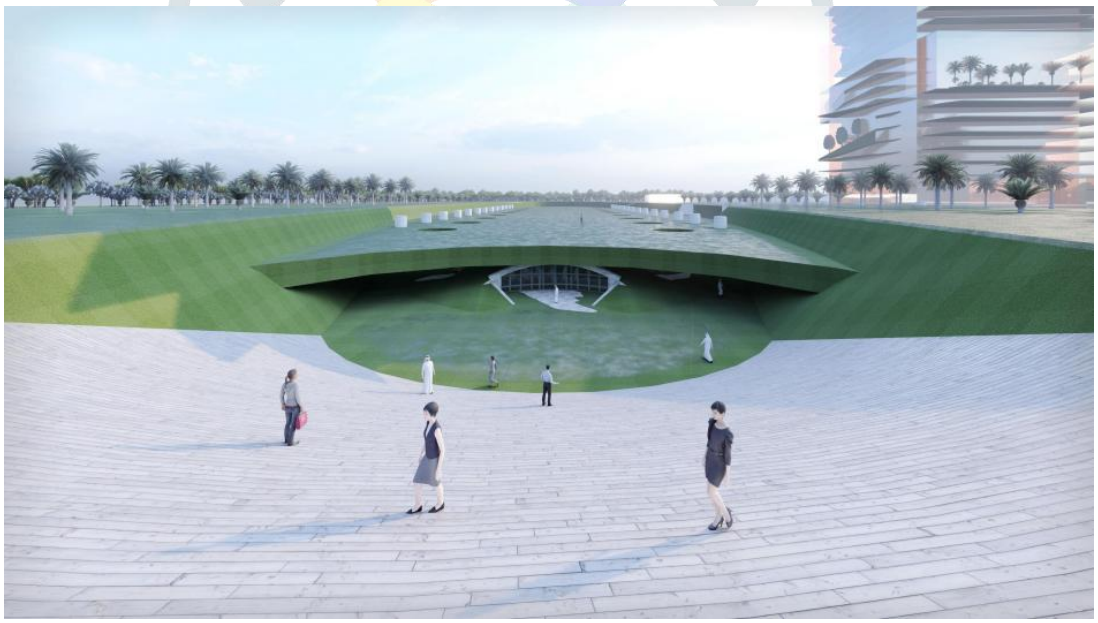


Figure 1: master plan

Figure 2: GREEN RESIDENT



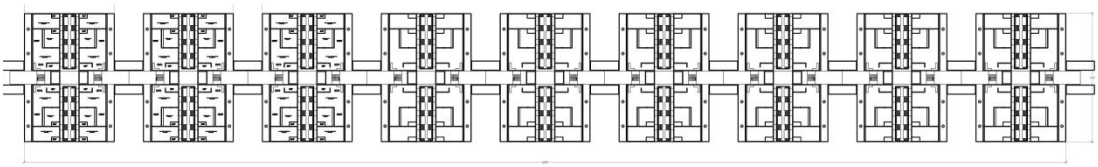


Figure 3: GREEN RESIDENTPLAN

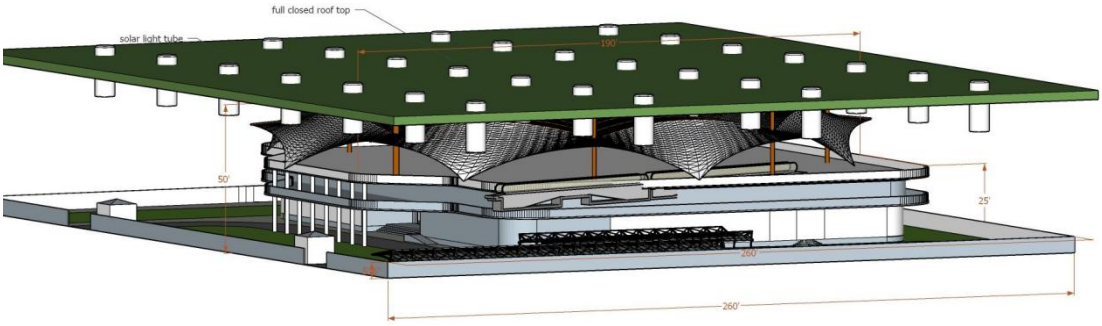


Figure 4: RECREATIONAL SPACE

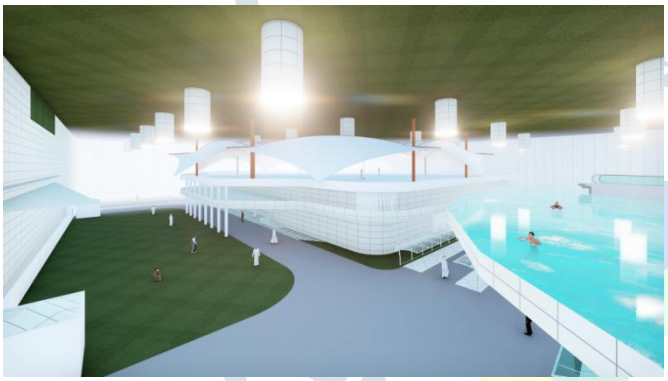


Figure 5: RECREATIONAL SPACE INTERIOR

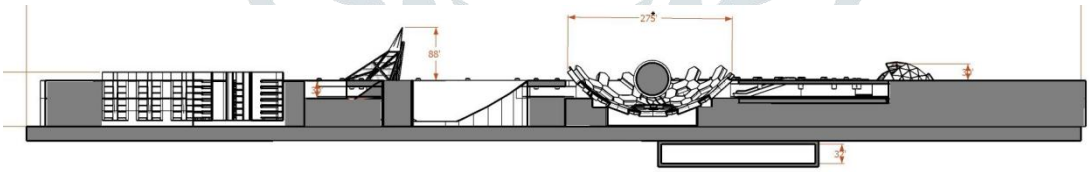


Figure 6: OVERALL SITE SECTION

Figure 7: INTERIOR PEDASTRIAN WAY VIEWS

Figure 8: OFFICE INTERNAL VIEW

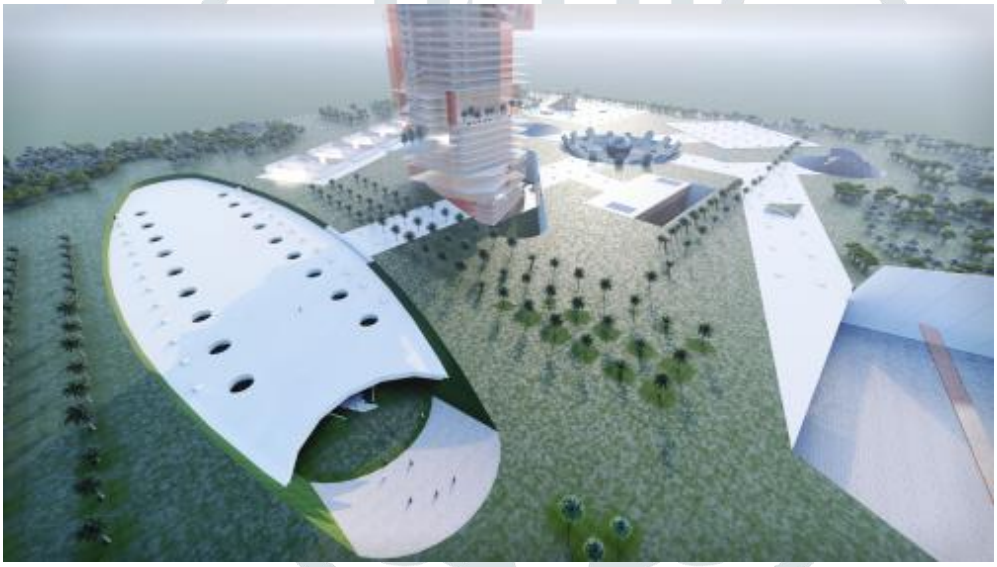


Figure 9: MASTER PLAN VIEW

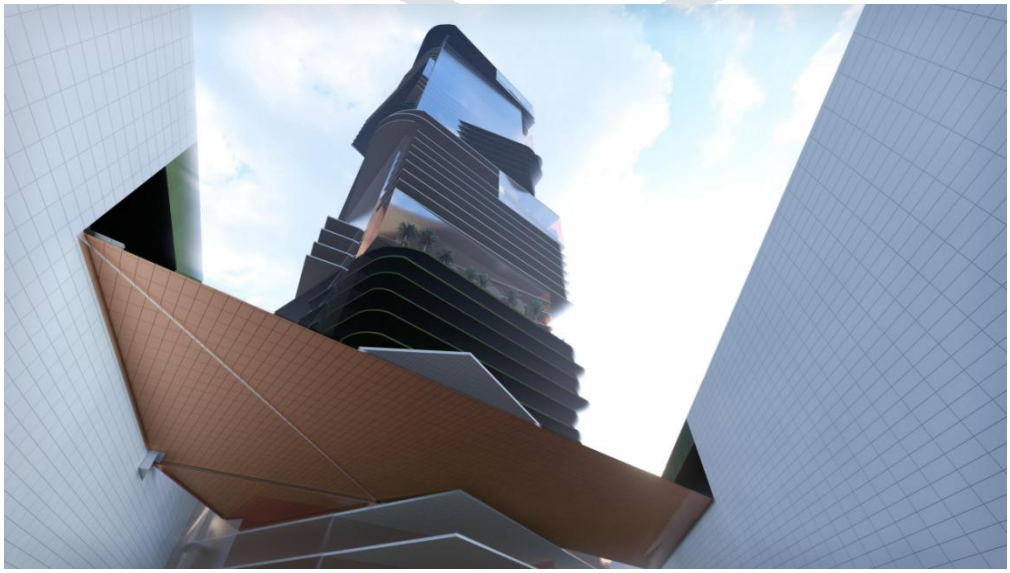


Figure 10: EARTHSCAPER ABOVE GROUND VIEW

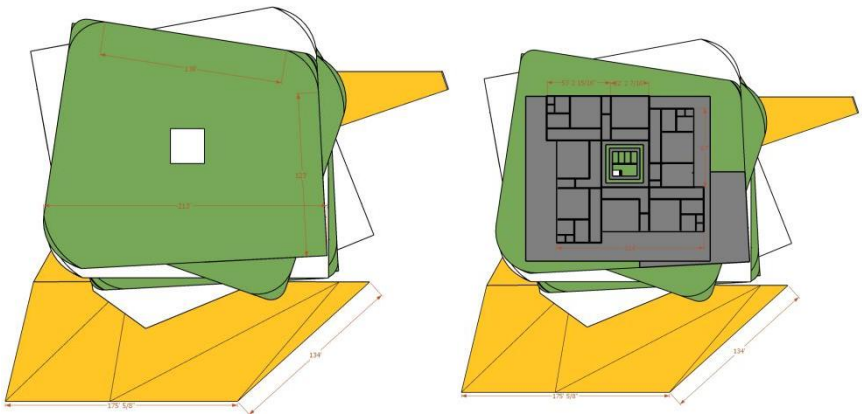


Figure 11: EARTHSCAPER TOWER PLAN

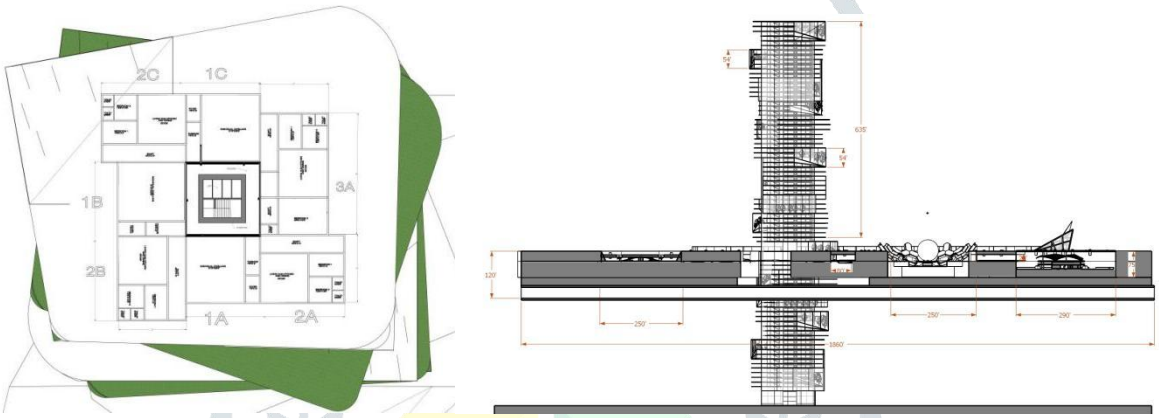


Figure 12: SITE SECTION WITH EARTHSCRAPER