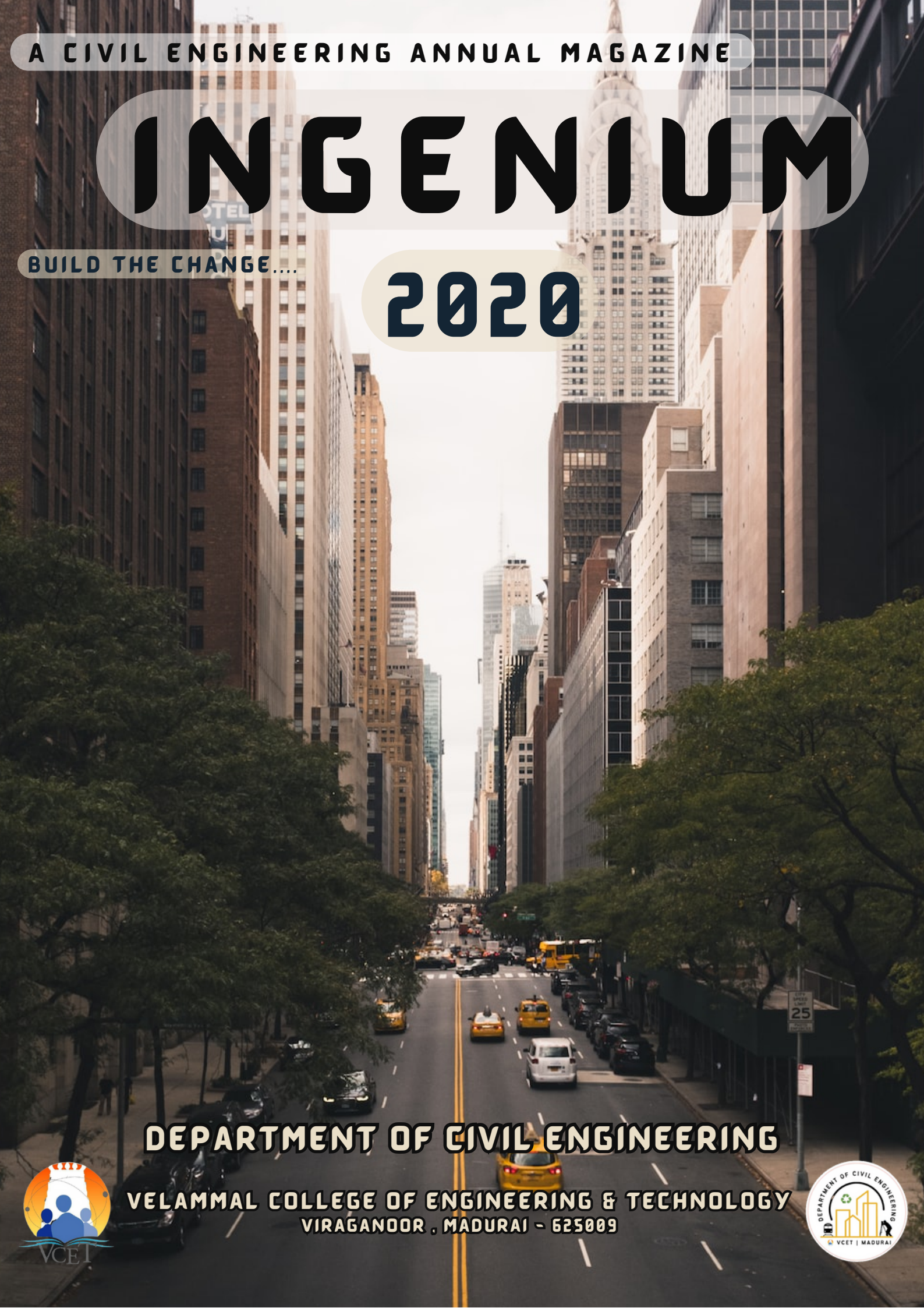
A CIVIL ENGINEERING ANNUAL MAGAZINE

INGENIUM

BUILD THE CHANGE....

2020



DEPARTMENT OF CIVIL ENGINEERING

VELAMMAL COLLEGE OF ENGINEERING & TECHNOLOGY

VIRAGANOOR , MADURAI - 625009

Vision

To emerge and sustain as a centre of excellence for technical and managerial education upholding social values

Mission

Our aspirants are

- *Imparted with comprehensive innovative and value based education*
- *Exposed to technical managerial and soft skill resources with emphasis on research and professionalism*
- *Inculcated with the need for a disciplined, happy, married and peaceful life*

DEPARTMENT OF CIVIL ENGINEERING

VISION

To inspire and mould Civil Engineering aspirants as competent and dynamic infrastructure developers.

OUR MISSION IS TO

- *Integrate high quality Civil Engineering education and research.*
- *Keep the students abreast with the state of the art theory and practice.*
- *Create a supportive environment to meet professional challenges.*

CONTENT

MESSAGE FROM PRINCIPAL

Dr. N. Suresh Kumar
Principal
Velammal College of Engineering and Technology

Pursuing a vibrant and dynamic atmosphere within the academic setting is an activity that is both wholesome and holistic. Because of this, it is imperative that students be included in the quality assurance processes of the college.

Through the use of a multidisciplinary approach that combines theory and practise in educational pedagogy, the objective is to make learning an experience that is rewarding, satisfying, and enjoyable for the student.

At VCET, we are making a concerted effort to uphold academic integrity and accountability, to maintain open and transparent systems, and to be sensitive to our social responsibilities. Having a work culture that encourages collaboration, sharing, and consultation is the only way this could be accomplished. Using the solid base that the college provides as a starting point, let's all work toward making improvements in the overall development that are measured, consistent, and catalytic so that we can make room for creative ideas and ways of thinking.

Message from HOD

Dr. L. Andal
Professor & Head
Department of Civil Engineering
Velammal College of Engineering and Technology

It is an honour for me to welcome the eagerly inquisitive generation of contemporary India to a prestigious hall of learning. This department's undergraduate programme is extremely robust. In addition to imparting technical knowledge, the department's programme aims to encourage students to be more creative.

The department places a premium on the development of technical proficiency and critical thinking. Our mission at VCET is to cultivate an interactive learning environment. The teaching philosophy of the institute is to create an environment conducive to knowledge retention. The department has been able to cultivate this distinguished approach with the assistance of a staff with outstanding credentials and an optimistic outlook. The faculty is well-educated and has published numerous journal articles and conference proceedings. It is a privilege to lead such a prestigious and comprehensive department in every way.

Department Faculty

Dr. L. Andal , PhD
(Structural Engineering)
Professor & Head
Dept of Civil Engg

Mrs. J. P. Annie Sweetlin M.E
(Structural Engineering)
Associate Professor
Dept of Civil Engg

Dr. T. Naveen Raj M.Tech, PhD
(Remote Sensing)
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Mr. M. Sathish Kumar M.E
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Ms. Anumeena M.Tech
(Structural Engineering)
Assistant Professor-III
Dept of Civil Engg

Message from EDITORIAL TEAM

Dear Readers, Greetings to you !!! As the editor of INGENIUM, A Civil department biannual Magazine, I would like to start by conveying my regard to all the team members of editorial board and faculties who supported me for making this happen We are pleased to bring you this special edition of our Departmental Magazine "INGENIUM".This special edition is reflection of Departmental activities– the achievements, the spirit of all the students and teachers, fantasies and goals, experiences and everything that is a part of the B.E Civil Engineering course, be it curricular, co-curricular or extra–curricular during this semester In order to keep the readers widely interested and updated we will off course continue the tradition of communicating the significant events and activities of civil department. I would like to thank Dr.L. Andal (HOD,Civil) and faculty Advisor Mr.S. Sathyanarayanan for (Ass prof-III) the continuous motivation , input and time to time feedback for the final draft of Special Edition of "INGENIUN".

CHIEF ADVISOR

Dr. L. Andal
Professor & Head
Dept of Civil Engg

FACULTY ADVISOR

Mr. S. Sathyanarayanan
Assistant Professor-III
Dept of Civil Engg

CHIEF EDITOR

VIJAY RATHINA RAJ R
Dept of Civil Engg
2020-24 Batch

SPECIAL THANKS

MATHAVAN A B
I-YEAR

ANANDHA KUMAR .N
I-YEAR

JUDITH LOURD TINA P
I-YEAR CIVIL

SNEHA R A
I-YEAR CIVIL

SAKTHI NIVEHA R
I-YEAR CIVIL

YHAALINI SHRI D
I-YEAR CIVIL

magazine

TECHNICAL

- Ribbon Building
- Timber Bridge in China
- Hyperloop
- Eiffel Tower
- Dubai Frame
- Landfill Gas
- The Steinway Tower
- Modular Construction

“

We are born to build,
We made roads where it leads us to success
Cause success is always under construction.
We built towers,
Which makes us to reach the height.
We design our building,
They design our career.
We are the art of directing source of nature.
If almighty fails to sketch the world,
Civil engineers will do it.
We play with other’s life,
To screw up their life apex
That’s why we are Engineers!!

”

YHAALINI SHRI D
I-YEAR CIVIL

TIMBER BRIDGE IN CHINA

Timber bridge pays homage to water village traditions in China Gulou, in the city of Jiangmen, China, is known for its flat, tidal land that has traditionally been managed by digging ponds and forming soil mounds for fishing and farming. The tidal lands and the fishponds created a fragmented pattern of land and water use in the water villages, as they were known, necessitating numerous bridges. However, urbanization over the decades in the Guangdong-Hong Kong-Macao Greater Bay Area have meant that many of these traditional water .

Villages and the fishing lifestyles they contained have disappeared.
To honor this history, the Gulou Waterfront — an eco-cultural tourism resort — is being developed by Jiangmen OCT Co. Ltd. In an effort to revitalize the rural and cultural history of the area, the resort integrates nature education, family recreation, fishing, and husbandry activities against the site's historic physical backdrop of tidal lands, soil mounds, and fishponds.

The resort provides access for small fishing vessels as well as larger tour boats, so the bridge is sized to enable boats of various sizes to pass beneath. The load-bearing platform at the bottom of the 2.8 m high arch is 1.35 m higher than normal water level, providing clearance of 4 m at the top of the arch.
To form the structure of the bridge, smaller wooden components were interlocked and anchored to these finished beams.

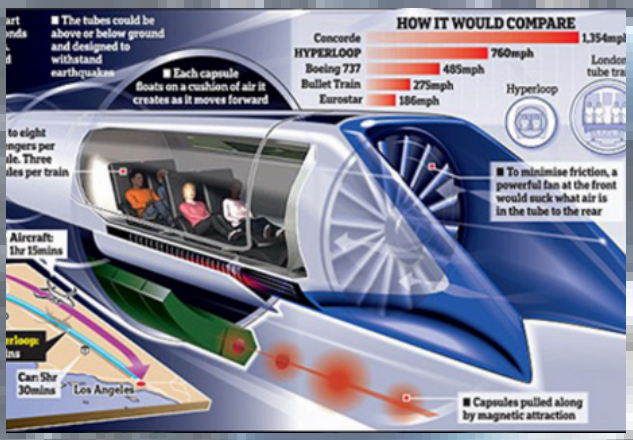
M.Parasuraman
II-YEAR CIVIL

HYPERLOOP

THE 5TH MODE OF TRANSPORT

CONSTUCTION TUBE

The tube is made of steel. There are two tubes which are welded together side by side configuration to allow the capsules travel in both directions. The tube will be supported by pillars. There is a solar arrays are provided on a top of the tubes for the purpose of power to the system



ROUTE

THE HYPERLOOP TRANSPORT SYSTEM WILL COVER 736 KM BETWEEN BENGALURU AND THIRUVANANTHAPURAM IN ONLY 41 MINUTES VIA COIMBATORE AND KOCHI IT WILL COVER 1317 KM FROM DELHI TO MUMBAI VIA JAIPUR AND INDORE IN ONLY 55 MINUTES. THE DISTANCE OF 1102 KM BETWEEN MUMBAI AND CHENNAI WILL BE COVERED IN 50 MINUTES VIA BENGALURU.

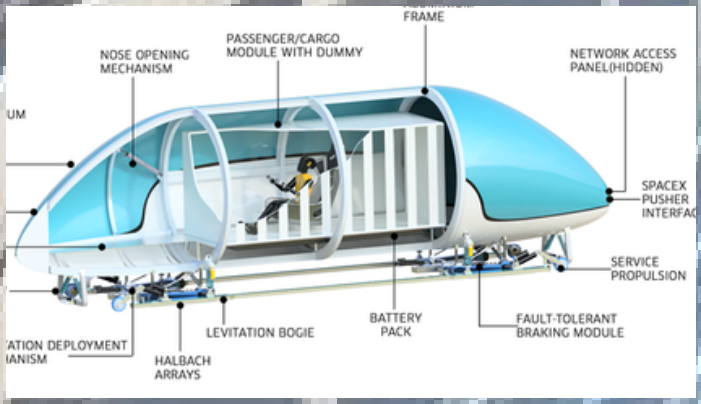
INTRODUCTION

A hyperloop is a proposed high-speed transportation system for both public and goods transport. The term was popularized by Elon Musk to describe a modern project based on the *vactrain concept* (first appearance 1799). Hyperloop designs employ three essential components: tubes, pods, and terminals.

CAPSULE

The capsule can carry 28 passengers at a time and it send at a very high speed and it is levitated by a high pressure air cushion. The design of capsule is start with the aerodynamic shape. There are two version of capsule are being considered: a passenger only version and a passenger plus vehicle version

COMPRESSOR



The compressor is fitted at the front side of the capsule. It supplies the air to the air bearings which supports the weight of the capsule. The compressor allows the capsule to traverse to the low pressure tube without choking the air flow that travels between tube walls and capsule

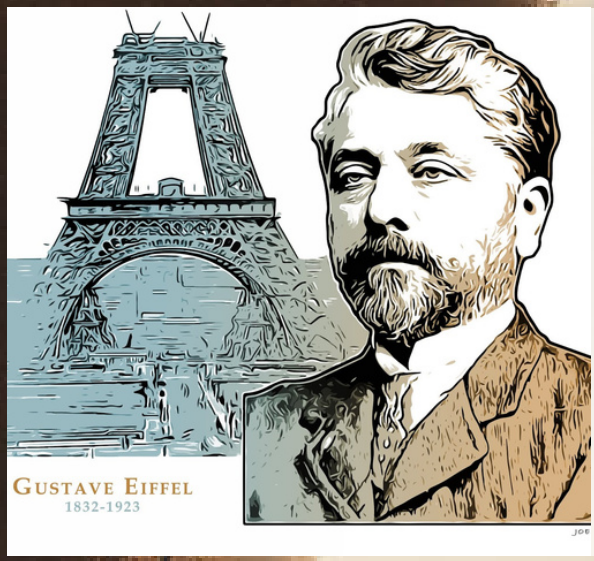
VIJAY RATHINA RAJ R

EIFFEL TOWER

Interesting fact on Eiffel Tower:

• Alexandre Gustave Eiffel a Civil Engineer designed Eiffel Tower.

• This tower was built on 1889 for world's Fair. The constructions was under 2 years 2months and 5days.



• Alexandre designed and built a secret private Apartment in Eiffel tower where he and Thomas Edison stay. Later it became a public visting room

• When Effiel Tower was built it was 300m high and now it's tip is 330m

• When Eiffel tower is fully built with iron (puddle iron) totally 7500tons of iron and 2.5 million rivets

- When Eiffel tower was under Hitler's control. The french resistance fighters revenged by cutting the elevator cables. So the Nazi's climbed 300m up to the hoist their flag
- Eiffel tower moves, it is a massive iron structure and wind resistant and will sway during strom.if the weather becomes bad enough it can even more.even due to heat of the sun iron expand and contract upto 7 inches

SANJEEVIKUMAR
I-YEAR

Dubai Frame

- The Dubai Frame (Arabic: ب) is an architectural landmark in Zabeel Park, Dubai.It holds the record for the largest frame in the world. Whilst described by The Guardian newspaper as "the biggest picture frame on the planet, it is also controversial as the "biggest stolen building of all time."
- The project was conceived by Fernando Donis, and selected as the winner of a design competition by the Government of Dubai. The designer has alleged that he had his intellectual property stolen and was denied credit for the design

Architecture competition

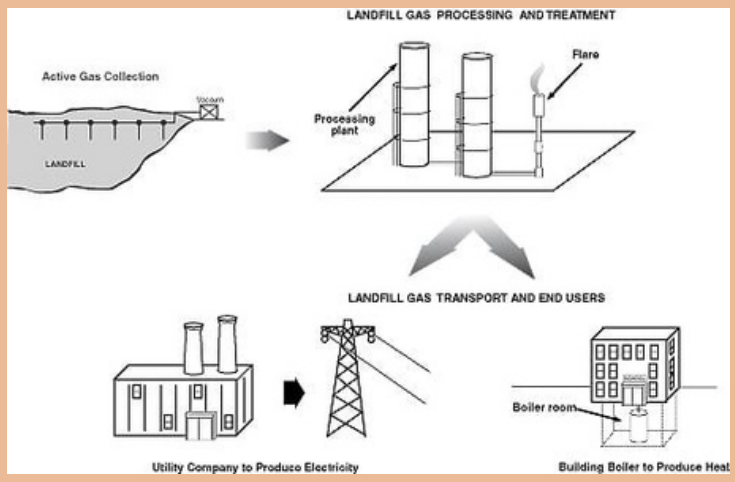
- The design was selected as the winner of the 2009 ThyssenKrupp Elevator International Award from 926 proposals. Participants from all over the world were invited to submit an emblem that would promote "the new face for Dubai". It is near the Star Gate of Zabeel Park and stands at 150.24 m (493 ft) tall and 95.53 m (313 ft) wide.
- Donis' design was ultimately selected, for which he won an AED 367329.70 ($100,000) prizeAccording to Donis, when designing the structure he saw Dubai as a city full of emblems and rather than adding another one, they proposed to frame them all: to frame the city. Instead of building a massive structure, the purpose of the proposal was to build a void of 150 meters by 105 meters to continuously frame the development of the past, current, and future Dubai. To become the structure that celebrates yet constrains the city.

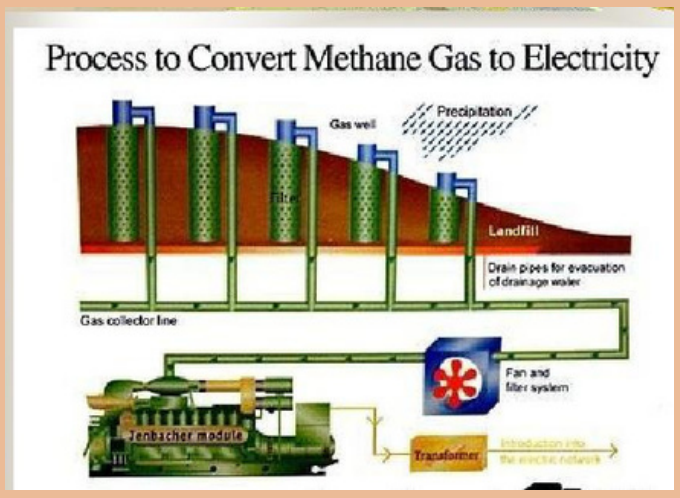
- The Dubai Frame is created out of glass, steel, aluminum, and reinforced concrete with designs of the logo of Expo 2020 embedded on the outer facade. It is positioned in such a way that representative landmarks of modern Dubai can be seen on one side, while from the other side, visitors can also view older parts of the city.
- An observation deck spans the top of the frame, with glass-bottomed floors looking down almost 150 meters onto the building's lower span. The lower span contains a museum showing the history of the city, and a video exhibit predicting the city's future.

JAGANNATHAN S
I-YEAR

LANDFILL GAS

1. What is Landfill Gas (LFG)?
2. LFG is generated when organic materials in landfills are naturally decomposed by bacteria
3. LFG is roughly 50% methane with carbondioxide being the second most prevalent gas.
4. All solid waste landfills emit this gas in amounts that depend on a variety of factors, such as waste composition and landfill siz





How is LFG Collected?

- Landfill is sealed from above. i.e. by a layer of clay.
- Gas collection wells are placed in the landfill.
- Passive gas collection – uses natural variations in landfill gas pressure and concentrations (not considered very reliable)

How is LFG collected? (cont.)

- Active gas collection – use of vacuum or pumps to move gas out of the landfill

Treatment of gas after collection

- Combustion – open or closed flame flares, enclosed combustion which creates energy

(boilers, process heaters, gas turbines, internal combustion engines)

- Noncombustion –
- Energy recovery technology – phosphoric acid fuel cell, other fuel cells are being developed.
- Gas to product technologies – converting LFG into commercial products, (natural gas, methanol, purified CO_2 or methane)

Gas Collection System (cont.)

▫ Each well is connected to a pipe which leads the gas to a pipeline connected to the engine site.
▫ The gas is collected by vacuum.

Energy to the Kibbutz

▫ 400 volt cables lead from the engine site to the Kibbutz and are transformed to electricity that can be used by the families and the Kibbutz factory.
▫ The project creates 40-60% of the Kibbutz' energy.
▫ There are 300 Kibbutz members, about 200 homes and a factory. The daily usage is about 2 megawatts per hour.
▫ At night the project supplies all of the Kibbutz electricity needs and excess energy is created.

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- **Conclusions**
- **▫ Multiple environmental and economic advantages make energy from LFG a beneficial endeavor.**
- **▫ Unfortunately, the conditions of a given landfill must be "just right" in order to collect LFG which can create energy. In addition, factors such as proximity to energy consumers, etc. can make a LFG electricity not worthwhile.**
- **▫ Energy from LFG should be pursued at compatible sites in order to supplement existing electricity sources.**

SATHYA SURYA
I-Year

PHASES OF KEEZHADI EXCAVATION

First phase

In June 2015, an Archaeological Survey of India group led by Amarnath Ramakrishnan started the first phase of the excavation in the area near the Vaigai river in Keezhadi.

Second phase

The second phase began on 2 January 2016. Various documents, including medical jars, antique kitchen wells, and factory and government seals, were found. At the end of the second phase, more than six thousand artifacts were found. It was confirmed that these artifacts were 2,200 years old when they were tested by radiocarbon dating.

Third phase

The third phase of the excavation was conducted under the chairmanship of Sri Ramanan of the Archaeological Survey of India from January 2017. The work ended on 30 September 2017. In the third phase, 16 digging sites were selected, taking up a total area of 400 square meters, which is 80 acres of land.

Fourth phase

The fourth phase of the excavation was conducted between 2017 and 2018, bringing out 5,820 artifacts. This phase was conducted by the Tamil Nadu Archaeology Department while the first three phases were conducted by the Archaeological Survey of India. Six carbon samples collected from the fourth phase of excavation at Keezhadi were sent to Beta Analytic, Miami, Florida, USA for Accelerator Mass Spectrometry (AMS) dating; samples collected at a depth of 353 cm, were dated between 580 BCE and the 1st century CE. The graffiti marks on the artifacts obtained from the excavation site were said to be similar to the Indus Valley script by the excavators. Bisnupriya Basak questioned whether the sherds actually came from the same level that was dated to the 6th century BCE. Some of the marks might have been made during the pottery-making process. Archaeologist E. Harsha Vardhan commented that “we cannot state scientifically that the Tamil-Brahmi script belongs to the sixth century BC” on the basis of this report.

01

Fifth phase

In June 2019, the Tamil Nadu Archaeology Department began the fifth phase of the excavation led by Dr R Sivanantham. This phase was completed in four to five months in which 15 trenches was planned to be dug. In the 5th stage of excavation, Sangam-era bricks and more than 700 objects were found and these have been sent for testing. As of 2020, the preliminary report of the fifth phase of excavations was nearing completion.

02.

Sixth phase

Sixth phase of excavation along with simultaneous excavation in neighbouring villages (Manalur, Kondhagai, and Agaram) began on 19 February 2020.

Seventh phase

03

The seventh phase was launched on February 13 and began on February 19, 2021.It came to an end on September 20, 2021

Eight phase

On February 11, 2022, the eighth phase of excavations began.

MATHAVAN A B
I-YEAR

RIBBON BUILDING

The Ripon Building is the seat and headquarters of the Greater Chennai Corporation in Chennai, Tamil Nadu. It is an example of neoclassical architecture, a combination of Ionic and Corinthian styles. The Ripon Building is an all-white structure and is located near the Dr. M.G.R Railway Station Commissioned in the year 1909, Ripon Building was designed by G.T.S. Harris.

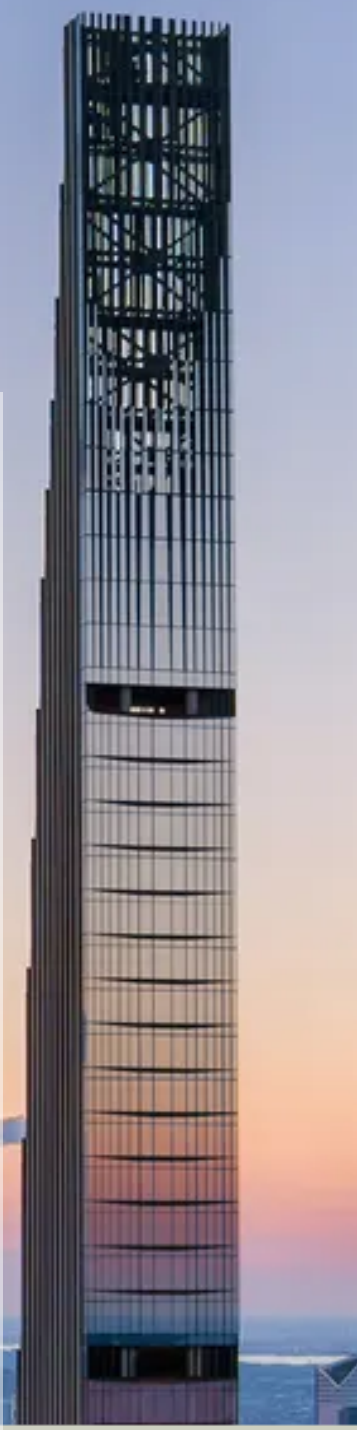
The foundation stone was laid by Lord Minto, Viceroy of India, on December 11, 1909.It was built by Loganatha Mudaliar, and took four years to build at a cost of 750,000, including a sum of 550,000 paid to Mudaliar.[citation needed].The Ripon building was named afterLord Ripon, Governor-General of British India and the Father of local self-government.Earl of Minto, the then Viceroy and Governor General of India laid the foundation on 12 December 1909. The Municipal Corporation of Madras, after functioning from several other places including Errabalu Chetty Street, settled at Ripon building in 1913, with P. L. Moore as the President of the Municipal Corporation at the time of the inauguration. The inaugural function was attended by over 3,000 of the city's elites.

Restoration

In 2012, a massive renovation was initiated at a cost of 77 million under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), to preserve the building's original grandeur.The main building is also being renovated under the process with the use of lime mortar for plastering. It is the first heritage building in the country to have received funds from JNNURM for renovation.

ANANDHA KUMAR .N
I-YEAR

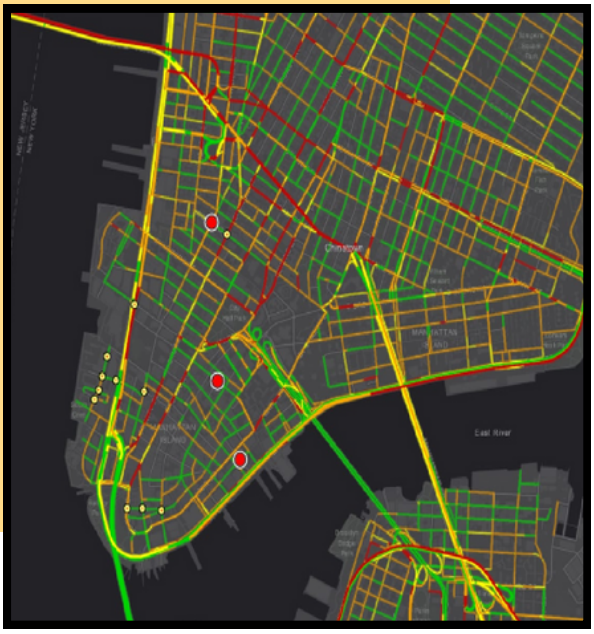
The Steinway Tower



- *Constructed by SHoP Architects.*
- *Situated at 111 West 57th Street in the Midtown Manhattan, neighborhood of New York City.*
- *By March 2021, the exterior hoist was finally dismantled, and the building was completed.*
- *Steinway Tower holds the title of world's most slender skyscraper, with a width-to-height ratio of approximately 1:24.*
- *Steinway Tower boasts 82 floors. The first 5 will contain share recreation spaces and high-end retail, while the upper 77 will house luxury apartments*
- *The highest apartment fetches at least $100 million.*
- *The tower's construction required 49,000 cubic yards of concrete.*
- *The tower's tapering form was inspired by New York's iconic early-20th century towers.*
- *The project used the "air rights" of Steinway Hall, a 96-year-old historic building that housed concert halls and piano showrooms for the famous Steinway & Sons.*
- *The tower is perfectly aligned with the axis of Central Park, giving future residents a symmetrical view of this iconic public space, the Upper East Side and the Upper West Side.*

MUTHUMARI P
I-YEAR CIVIL

Asset Mapping



This technique focuses on collecting data from serial numbers, firmware, engineering notes of when it was installed and by whom, and combines the data in one place.
It shows engineers in real-time on a map where the equipment needs to be installed and, once the assets are connected to the real-time system using the internet.
These can be operated via the web, app, and other remote devices and systems.
Asset mapping helps customers build databases of asset performance, which can assist in proactive building maintenance, and also reduce building procurement and insurance costs

Modular Construction

It includes the building constructed off-site using the same materials and designed of the same standards as conventional on-site construction.
It also helps in limiting environmental disruption.
It also offers strong sustainability benefits, from vehicle movements produce less waste.
By using this method with up to 70 percent of a building produced as components, it allows a move towards "just in time" manufacturing and delivery.
This method is currently popular in the United States and the UK, Chinese developer Broad Sustainable Building recently completed a 57-story skyscraper

ARUNA H
I-YEAR CIVIL

magazine

NON - TECHNICAL

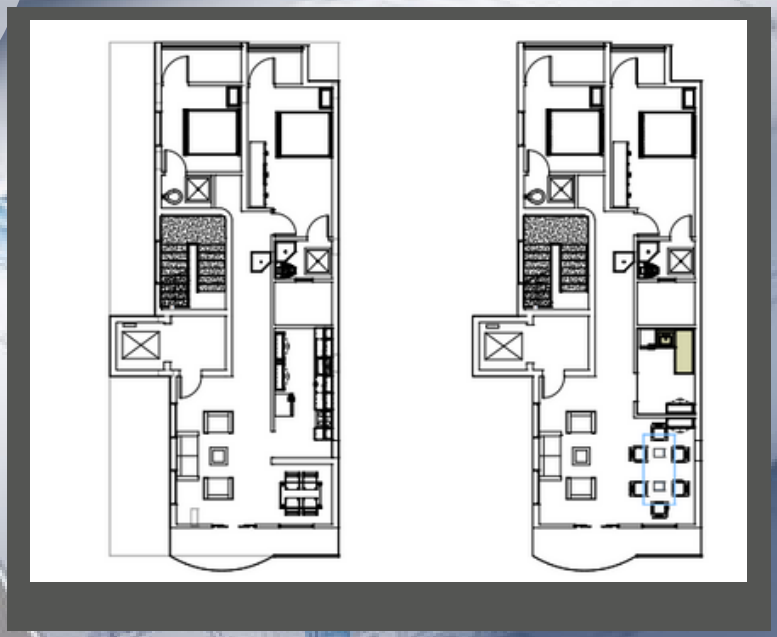
- The Home plans
- Painting is a silent poetry
- Poster Making
- Memes

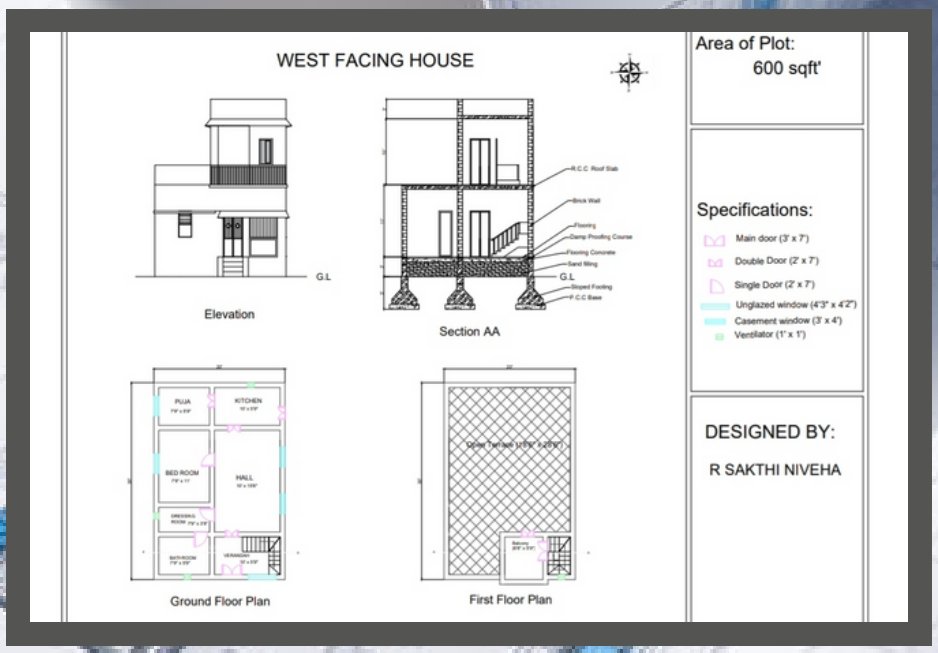
NON TECHNICAL
MEMES

M.Parasuraman
II-YEAR CIVIL

The Home Plans

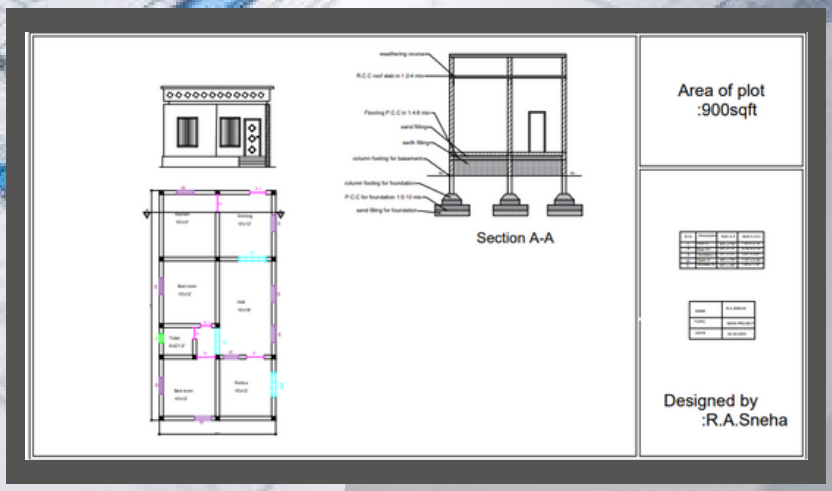
JUDITH LOURD TINA P
I-YEAR CIVIL





SAKTHI NIVEHA R
I-YEAR CIVIL

SNEHA R A
I-YEAR CIVIL



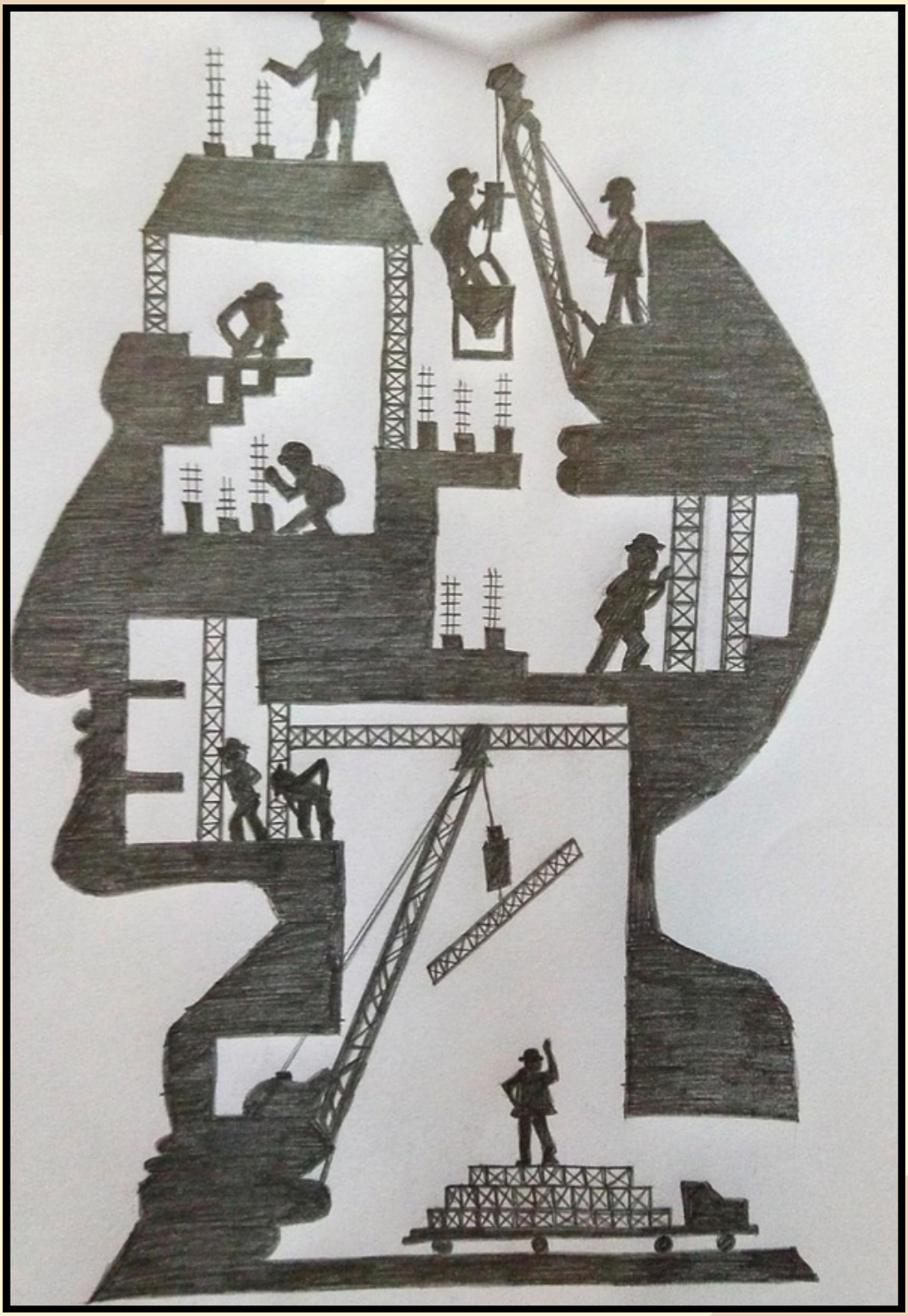
PAINTING IS A SILENT POETRY

SAKTHI NIVEHA R
I-YEAR CIVIL

JUDITH LOURD TINA P
I-YEAR CIVIL

POSTER MAKING

YOUR DIRECTION IS MORE IMPORTANT THAN YOUR SPEED....



ABIERAAMI S K
I-YEAR CIVIL


YOU
DREAM
IT...
WE
BUILD
IT