



ROHINI

COLLEGE OF ENGINEERING AND TECHNOLOGY

Approved by AICTE and affiliated to Anna University, (An ISO Certified Institution)

“ARCHITECTUS 23” MAGAZINE



**YOU
DREAM IT,
WE
BUILD IT.**



Department Vision

To be centre for quality education and research in diverse area of civil engineering, and provide service to nation in terms of nurturing Civil Engineers with a strong social commitment.

Department Mission

To nurture Civil Engineering professionals by providing strong fundamentals and technical skills in civil engineering through effective teaching - learning Methodologies

To articulate research learning by dissemination of diverse areas of civil engineering in practical applications and undertake professional consultancy services

Programme Educational Objectives (PEOs)

PEO1: Graduates will demonstrate how to apply fundamental principles of civil engineering to solve engineering problems.

PEO2: Graduates will work effectively as individuals and as part of interdisciplinary teams with a sense of social responsibility

PEO3: Graduates shall excel in recent advancements in industry and accomplish professional competence.

PROGRAM OUTCOMES

Civil Engineering Graduates will be able to:

PO 1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution to complex engineering problems.

PO 2. Problem analysis: Identify, formulae, review research literature, and analyze complex engineering problems reaching substantiated conclusion using first principles of mathematics, natural sciences, and engineering sciences.

PO 3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.

PO 4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusion.

PO 5. Modern tool usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO 6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.

PO 8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9. Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10. Communications: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO 11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.

PO 12. Life-long learning: Recognize the needs for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES(PSOS)

PSO1: Apply and develop basic concepts of civil engineering by including the best practices for solving real time problem through feasible solution and to specialize in various academics.

PSO2: Ability to provide interdisciplinary skill to meet the social needs through civil engineering and to develop successful professional career along with strong technical, communication and presentation skill.

PSO3: To apply experimental knowledge, analysis, interpretation of data and information to Civil Engineering problems.

FOUNDER MESSAGE



Shri. K. NEELA MARTHANDAN

CHAIRMAN

ROHINI College of Engineering and Technology

I am very glad to know that the students of the Department of CIVIL are bringing out a magazine to throw light on the activities and achievements of their department. Such activities among the students will enhance their communications skills, technical skills, innovative thinking and knowledge as well. I congratulate the students of departments of CIVIL for taking up this task and I wish all the students of CIVIL can have a great future which is ahead.

PRO-CHAIRMAN MESSAGE



Dr. N. Neela Vishnu., MBA., Ph.D.,

PRO-CHAIRMAN

ROHINI College of Engineering and Technology

It is a great pleasure for me that our CIVIL Engineering department is releasing magazine "ARCHITECTUS 23". As the Pro-Chairman of ROHINI College of Engineering and Technology, I feel proud about it. We have taken a path that we will develop RCET to world class standard and provide an overall development to all the students. We march towards that goal. We are happy that the students of RCET are properly shaping up, facilitating us to meet our goal. I wish all success to the CIVIL students.

MANAGING DIRECTOR MESSAGE



**Dr. V. M. Blessy Geo., MSc., Ph.D.,
MANAGING DIRECTOR
ROHINI College of Engineering and Technology**

It is a great pleasure for me that our CIVIL Engineering department is releasing magazine "ARCHITECTUS 23". As the Managing Director of ROHINI College of Engineering and Technology, I feel proud about it. We have taken a path that we will develop RCET to world class standard and provide an overall development to all the students. We march towards that goal. We are happy that the students of RCET are properly shaping up, facilitating us to meet our goal. I wish all success to the CIVIL students.

PRINCIPAL MESSAGE



**Dr. R. Rajesh., ME., Ph.D.,
PRINCIPAL
ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**

It is a great pleasure for me that our CIVIL Engineering department is releasing a magazine. The magazine is presenting a glimpse of the growth of the institution on many fronts. The essential purpose of a magazine is to inform, engage, inspire, and entertain a diverse readership- including alumni, parents, students, faculty, staff and other friends of the college- by telling powerful stories that present a compelling, timely and honest

portrait of the college and its extended family. This magazine has recorded achievements of staff members and students of CIVIL Department, competitions won by the hugely talented CIVIL students, innovative projects carried out by CIVIL students with the guidance of CIVIL staff, among others. They stand as a witness to the monumental efforts taken by the management to make the college a center of excellence in education and research. I wish the management, CIVIL staff and CIVIL students of the college success in their future Endeavor's

HEAD OF DEPARTMENT MESSAGE



Dr. J. SAHAYA RUBEN

HEAD OF THE DEPARTMENT

ROHINI College of Engineering and Technology

I am highly elated and proud to announce that our department of CIVIL is inaugurating the LIVIC Magazine Edition "ARCHITECTUS 23". As our CIVIL department acts as a pioneering department in preparing students to completely globally in their profession and to reach the pioneer levels of intellectual attainment. I deem that the LIVIC Association and symposium will trigger the talents of the students and kindle the light of innovation and technology. It's a fact that we constant updating to establish ourselves in this revolving dynamic world. I express my heart full and sincere thanks to all conveners, colleagues and students is who are the backbone of this endowers. I am happy and wish the technical symposium as well as the release of magazine a grand success.

EDITORIAL MESSAGE

It is an occasion of immense pleasure for the Department of CIVIL Engineering to publish the magazine "ARCHITECTUS 23". The Editorial board of department of CIVIL wants to thanks all the faculty members and students who have made this issue a success by providing an article. This magazine focuses on the recent trends evolved in the field of CIVIL engineering & wants to provide advanced knowledge and awareness among the students about the same. The Editorial board also wants to thanks the Management of the Institute and Head of the department for inspiring us to go forward in publishing this magazine.

Editorial Board

Dr. N. SUTHAN KUMAR., ME., Ph.D., (Editor in chief)

Dr.M.Tamil Selvi ., ME., Ph.D., (Associative Editor)

Prof. A. ANANTH., ME (Associative Editor)

ASSOCIATION OF OFFICE BEARERS

A special guest Lion Er. P. Justin Paul, was invited for the inauguration of Association of Office Bearers was held on 19.09.2022 at ROHINI College of Engineering and Technology.

The chief guest delivered a technical talk on Industrial Expectations from Academic Institutions. His talk highlighted about some practical examples on how an organization was bridging the gap between science and disaster risk reduction in different regions of the world.



A NATIONAL LEVEL TECHNICAL SYMPOSIUM “LIVIC 22”

Department of Civil Engineering organized LIVIC'22 on 1st April 2022 for the students to showcase their technical soundness. Lion Er. P. Justin Paul has been invited as the Chief Guest for the event. Receiving the dignitaries for the Inauguration to the “The Grand Arena”. The event started at 10.30 AM with the prayer song with august presence of Board of the directors, departments, Event Coordinator Dr. Sudan. The events such as Paper Presentation, CAD Contest, Code Cracking, Brick Tricks, Model Making and Photography was held as a part of the Symposium. Several committees were formed inclusive of Editorial, Event Management, Registration, Technical and Financial and Miscellaneous committees and were headed by faculty members under the guidance of Dr. Sudan, Event Coordinator of LIVIC 2022.

Chief Guest Lion Er. P. Justin Paul Addressed the gathering stating few tips for the Engineering Professional Life. He also emphasized the importance of Civil Engineering in connection towards all the other branches in the field of Engineering, “Civil Engineering is the Mother of all the other Branches in Engineering”, said Lion Er. P. Justin Paul.

INDUSTRIAL TRAINING/INTERNSHIP UNDERGONE BY STUDENTS

During summer vacation, students are permitted to undergo training in reputed industries/companies to get practical exposure to latest technologies. It helps the students to relate theory and its application to real world engineering problems.

S.NO	YEAR	NO. OF STUDENTS
	IV Year -A	46
	IV Year -B	47
	III Year -A	21
	III Year -B	12
	II Year	42

INDUSTRIAL VISITS

The department is associated with various government, quasi-government and private industries in the field of Civil Engineering. Our students visit these companies to get practical exposures to current work practices.



Poigai Dam



Ready Mix Concrete Plant

S.NO	YEAR	DATE OF VISIT	PLACE OF VISIT	SCOPE OF VISIT
1.	IV	09.04.2022	<ul style="list-style-type: none"> ➤ Poigai Dam ➤ Ready Mix Concrete Plant 	<ul style="list-style-type: none"> ➤ Dam and harbor structures are included in the civil engineering. ➤ Major projects like dams, roads, bridges, tunnels, canals etc., are mostly made by concrete.

SEMINARS/WORKSHOPS ATTENDED BY STUDENTS



SI.NO	NAME	TOPIC	INSTITUTE
1.	AKRAM KHAN .A .R	<ul style="list-style-type: none"> ➤ Why Civil Engineer is best? ➤ How to build a Building without heat affection? 	<ul style="list-style-type: none"> ➤ PSN College of Engineering and Technology. ➤ Stella Mary's College of Engineering.
2.	PRABINA .M	<ul style="list-style-type: none"> ➤ Innovative usage of slag ➤ Alternatives for fine aggregates. 	<ul style="list-style-type: none"> ➤ Arunachala College of Engineering. ➤ Civil Engineering Association of Kanyakumari District.
3.	THANGA SELVI.C	<ul style="list-style-type: none"> ➤ Sewage water treatment plant. 	<ul style="list-style-type: none"> ➤ PSN College of Engineering and Technology.

CLASS TOPPERS

S.NO	NAME	YEAR	CGPA%
1.	ASHIKA .R	IV-A	8.41%
2.	PRABINA .M	IV-B	9.09%
3.	JAMEELA JASEEMA .A	III-A	9.01%
4.	PREETHIKA .R	III-B	8.9%
5.	SEMIYA ROSE .J	III-B	8.9%
6.	ROHIT LAISHRAM	II	8.8%

Rohini College of Engineering and Technology
Department of Civil Engineering



Final Year A (2019-2023) Batch



Final Year B (2019-2023) Batch



Third Year A (2020-2024) Batch



Third Year B (2020-2024) Batch



Second Year (2021-2025) Batch

Rohini College of Engineering and Technology
ME-Construction Engineering and Management



II year (2021-2023 Batch)



I year (2022-2024 Batch)

கவிதை தூரல் மலடி

திடீரென மனதிற்குள் வரு படபடப்பு
வரு நொடி சிலிந்தி நின்றேன்
கண்ணுக்குள் குளிந்தது
மலநான் காணாத வருவரை அன்றுதான்
என் வாசலில் பார்த்தேன்
வாசலில் வந்ததும் வந்த மனம்
என் மனதில் அழகான பாரிசையே
உண்டாக்கியது.
யார் என்னை தெரிந்துகொள்ள அல்லாமல்
உங்களை போல் நானும் சென்று பார்த்தேன்
அது என் மனதை நனைத்த
"தூரல் மலடி".

ரா. கிருஷ்ண பிரியங்கா.
B.E. '90 Year Class 'A'.

கல்யாணி நாடகம்

கனாந்தன் பல கண்டு
கல்யாணிக் கிள் நடைபெறும்!
எனது பாரமாய் என்னாலும்
அன்பாய் இருவனைத்தாம்!
நாயாய் துடிக்கு
வாழ்க்கையைக் கற்பித்தாம்!
வாழ்க்கையின் பாதையில்
சில பாடுகளை துணைத்தாம்!
திருள் சூழ்ந்த வாழ்வில்
ஒளியாய் வந்தாம்!
பாதுகொண்டால் போல் நம்முடைய
மனறையும் கல்யாணி நாடகம்!
மீண்டும் மலகிடை
திருந்த கல்யாணி நாடகம்!!!

By

சுருஷி

புள்ளியுருவம்

கையால் கிழித்து
கை கால் உடைத்து
அழுது புயல்
கண்ணின் கண்ணில்
புயல்களின் முகங்களையே பிடித்துக்கொண்டு
வெகு கிழிப்புமில் அம் புயல்கள்
பிரிந்து அழுகிச் சென்ற
அவர் தவிர்த்து விட்ட
முதலாம் வந்தபிறகு
பிரியாத எதற்கு
செரியாத முகம்
உரியாத உயர்
என் புதிய உலகில்
ஒளிமயில் வந்திருக்க வேல்
அது ஒருகூடம்
அழகு நான் மட்டுமே என்னைக்கொண்டு
அனைத்துமே பார்த்துக்கொண்டு
அவ்வளவு அழகு நான் மட்டுமே
என் விரும்பும் குணங்களுக்கும் நான்
அனைத்தும் சொப்பனமே
என்னைக்கு முன் நான்
ஒளிமயில் அழகு புதிய உலகில்
நீதியை சொல்லும் உருவமொன்று
அனைத்துமே.

84

A. Arunthugala

கல்யாணி புத்தகம்

கல்யாணி என்னும் புத்தகத்தைப் படித்து ஒப்புகொண்டு
நான்கு வருடங்கள் கழிந்தபின் . அப்போது
நான் புத்தகத்தைக் கையேடில் வைத்துக்கொண்டேன்
பயனாகியது என்னவென்று சொல்ல முடியாது
வெகுநேரமாக அது கைக்குள் . அதன் புத்தகத்திலே
அனைத்துமே நான்கு வருடங்கள் நான் வாசித்து
உறுதியாகியது ஒப்புகை அப்படி வாசித்தபின் , என்ன
நான்கு வருடம் நான் வாசித்தபின் .
அது கல்யாணி என்னும் புத்தகம் பயனாகியது
பாடுபாடுகள் என்னவென்று மீண்டும் பய
பாடுபாடுகள் என்னவென்று உறுதியாகியது

என்னும் கல்யாணி

உறுதியாகியது

M. அருண் குமார் . . .

கல்யாணி புத்தகம்

[illegible]

தனியும் உயிர்
உயிரும் தனியும்
H. அகிலன் எழுதி

அனபு தம்பி

வினாயாட யாரும் கிலலை என்று
நினைத்தேன நீ வந்தாய்
கோலா கூட்டத்துக்கு கோலா பூ
பூதநல தான் அயுதி
நம் விடகல நீ பிறந்ததால் அயுதி
எந்த ஆடலும் வேண்டாம் நினைப்பது
அது உன் பெரும் தன்மை
நீ என்னை வாழ்கையில் வந்த
அன்புதான் வரம்
நீ என்னை வாழ்கையில் அன்புதான்
பிறந்தாய் அது நான்மீன் செய்குத்தலம்

P. Vishnavi

"உணவிலே மறித்து" என்ற காவல் போய் "மறித்து உணவு" என்ற காவல் வந்ததுவியது. நம் இன்னொருவர் எந்த நேரமாவதும் தியங்கை. உணவானவிய உணவு மறித்தாக எடுத்துக்கொள்ளுங்கள். அனால் தியவாது உணவு காண்கையத்தில் தியங்கைவைய மாற்றித் தருகிறால் மறித்தைய கணவையில் எடுத்துக்கொள்ளியோம். தியவாது உணவு காவல்களில் உணவுகள் கூட திடுகை மாற்றிவிடுவது. இத்த நிறைய மாறு நாம் தியங்கை. இவரையில் உணவுகளை கிவகையில் வைத்துள் அது நம் தியங்கையில் நிராழ்நியம் நமம் துதிவகை அமைத்து. அதில் காணில் பயன்படுத்துபதில் மறித்திடுகைவைய மறித்துகளை களவையையல் மறித்துள் இவல் தியங்கைவைய காயமாற்றுவம். அதுமாவல் கண்டு உணவானவிய திடுகையியோகையில் திடுகையில் தியங்கை யான துதித்திடுகைவைய மறித்து வேய் திடுகைகள். வேய் கண்டுணவுகள் யோன்றவைகளை கிடு பயன்படுத்துவம்.

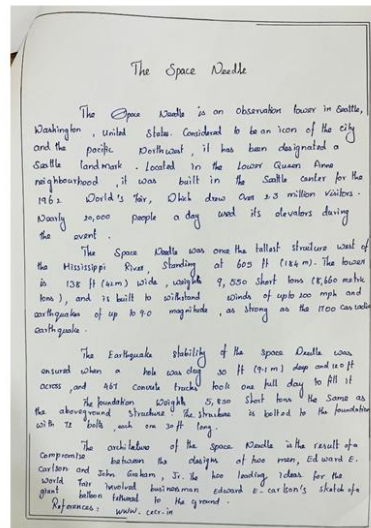
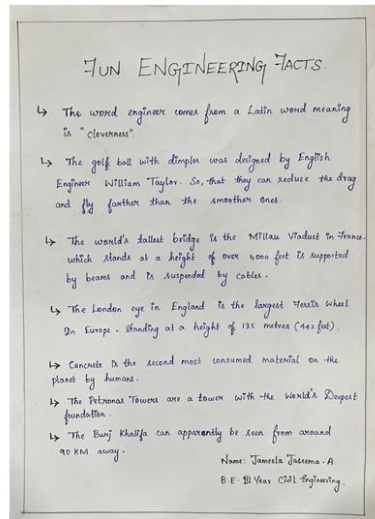
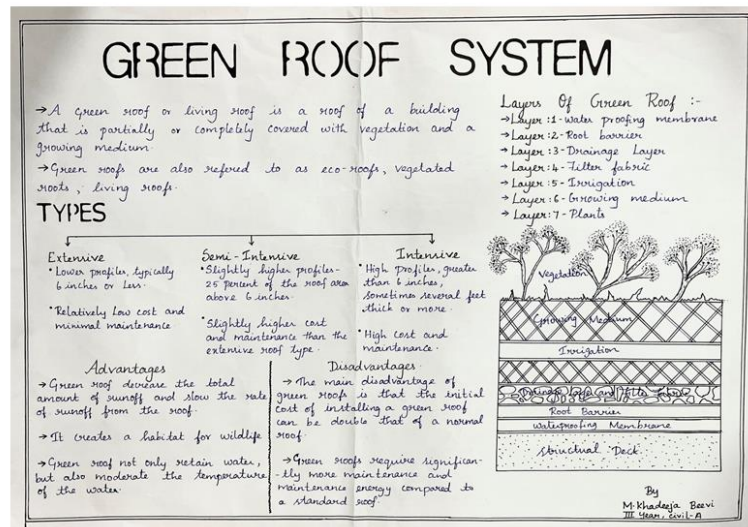
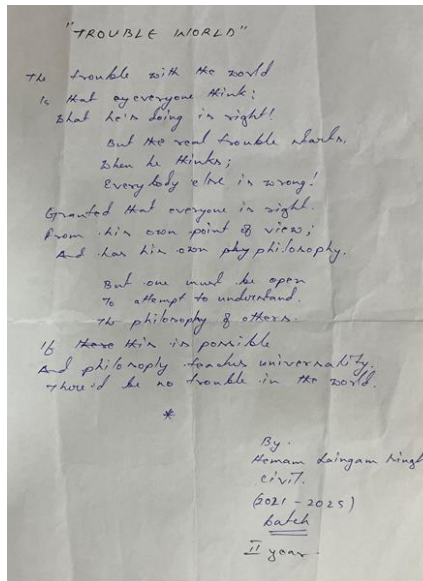
[illegible]

விவசாய நிலங்கள் தீயிர்ப்பாடு பலமுள்ளதை மாற்றப்பட்டு
கவிழ்த்து- கித்தி நிலை கொங்குதலை ஒடுக்கப்படுத்தல்
விவசாயம் என்ற ஒன்று கித்தித்த கொடியால் போய் கிடம்.
மாவை ஒத்தவை கிணைங்கள் ஒல்கிடுவாய் கண்கொம்பிப்புகையில்
சிலைவான்ற விவசாய பயன்பாடுகளில் கண்கொம்பிப்புகையில் சித்தி
நாட்டினைய விவசாயத் துறையில் மிகவும் பயன்படுத்தக் கித்தித்தம்.

[illegible]

திரைப்படங்கள் மூலம் வாழ்த்து விவசாயத்தை
வளர்ப்போம் ! விவசாயத்தை காப்போம் !

1. வயல் 2. நானாயம் 3. பெரி 4. கையாணி
5. சிமடை 6. தோடு 7. கடிதாரம் 8. கடிதம்
9. பால், மீதர், நெய் 10. நூலாணி.



PAPERS PUBLISHED BY FACULTY

BUILDING INFORMATION MODELLING (BIM)- A SUCCESSFUL KEY TO CIVIL ENGINEERS

R. Reno Infanto, AP/CIVIL/RCET

Building Information Modelling, BIM is the new tool in the construction, that links the client's idea with the technology to process an explicit virtual model of proposed building to construct. It helps architects, engineers, and constructors visualize what is to be built in a simulated environment to identify any potential design, construction, or operational issues. BIM workflows allow for a much more dynamic and synchronized approach to project management.

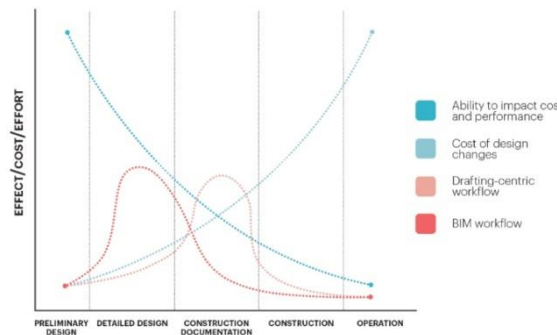
How BIM works in a construction project?

Design-Building proposals can be rigorously analyzed, simulations performed quickly, and performance benchmarked, enabling improved and innovative solutions.

Workflow planning - Adopting BIM means establishing a continuous flow of information. Every phase of the building process – from early planning and design, to construction, operation, maintenance and final recycling – is captured, digitally. This opens new possibilities for better efficiency, accuracy, collaboration and cooperation between the parties involved in the built.

Construction - A building information model can be effectively used to coordinate material ordering, fabrication, and delivery schedules for all building components.

Operation- Better operation with all the workflow data and proper maintenance is not compromised anywhere.



As the red line in the graph demonstrates, by dynamically connecting design, analysis, and documentation in a BIM workflow, most of the effort in a design project is shifted back into the detailed design phase, when the ability to impact project performance is high and the cost of making design changes is low. This allows engineers to spend more time evaluating what-if scenarios to optimize the design, and less time generating construction documentation.

Why should I adopt BIM?

1. Via a rapid exchange of design information, different scenarios can be explored faster, allowing for more iterations of the architecture, structure and engineering systems and resulting in an accurate and optimized building design.

2. All drawings can be captured into one comprehensive 3D model, avoiding information loss and enabling more educated decisions based on data.

3. Necessary engineering calculations for ventilation, heating and piping systems can be performed quickly and easily.

4. All geometric and spatial data required to perform energy calculations can be produced directly from the model.

5. Ensuring compliance with environmental requirements is easier and the increased efficiency helps reduce building lifecycle costs.

6. Integration of cost and scheduling data enables online cost estimation and visualization of the construction progression.

7. Accurate Bills of Materials can be produced directly from the model.

8. Data required to control procurement can be linked directly from the model, optimizing the procurement process.

9. Detailed model contains all data and geometry required for accurate installation of MEP systems.

10. Once the building is completed, the next version of the model will inform facilities management decision-making and systems, allowing for preventative maintenance and repair.

Applications of BIM in construction

- **Visualization:** 3D renderings can be easily generated in house with little additional effort.

- **Fabrication/shop drawings:** It is easy to generate shop drawings for various building systems. For example, the sheet metal ductwork shop drawings can be quickly produced once the model is complete.

- **Code reviews:** Fire departments and other officials may use these models for their review of building projects.

- **Cost estimating:** BIM software has built-in cost estimating features. Material quantities are automatically extracted and updated when any changes are made in the model.

- **Construction sequencing:** A building information model can be effectively used to coordinate material ordering, fabrication, and delivery schedules for all building components.

- **Conflict, interference, and collision detection:** Because building information models are created to scale in 3D space, all major systems can be instantly and automatically checked for interferences. For example, this process can verify that piping does not intersect with steel beams, ducts, or walls.

- **Forensic analysis:** A building information model can be easily adapted to graphically illustrate potential failures, leaks, evacuation plans, and so forth.

- **Facilities management:** Facilities management departments can use it for renovations, space planning, and maintenance operations.

BIM Benefits: Case Study

Case Study: Aquarium Hilton Garden Inn, Atlanta, Georgia

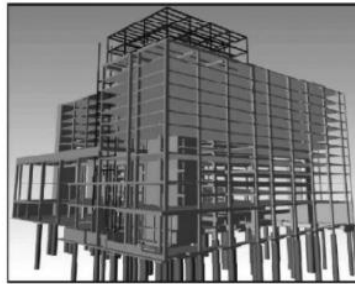
The Aquarium Hilton Garden Inn project comprised a mixed-use hotel, retail shops, and a parking deck. Brief project details are as follows:

- Project scope: \$46 million, 484,000-square-foot hotel and parking structure
- Delivery method: Construction manager at-risk (CM at-risk)
- Contract type: Guaranteed maximum price
- BIM scope: Design coordination, clash detection, and work sequencing
- BIM cost to project: \$90,000, or 0.2% of project budget (\$40,000 paid by owner)
- Cost benefit: Over \$200,000 attributed to elimination of clashes
- Schedule benefit: 1,143 hours saved

Although the project had not been initially designed using BIM technology, beginning in the design development phase, the GC led the project team to develop architectural; structural; and mechanical, electrical, and plumbing models of the proposed facility, as shown in Fig. below. These models were created using detail-level information from subcontractors based on drawings from the designers.



(a) Architectural Model



(b) Structural Model



(c) Plumbing Model

After the initial visualization uses, the GC began to use these models for clash detection analysis. This BIM application enabled the GC to identify potential collisions or clashes between various structural and mechanical systems. During the design development phase, 55 clashes were identified, which resulted in a cost avoidance of \$124,500. Just this stage alone yielded a net savings of \$34,500 based on the original building information model development cost of \$90,000. At the construction documents phase, the model was updated and resolved collisions were tracked. Each critical clash was shared with the design team via the model viewer and a numbered collision log with a record of individual images of each collision per the architectural or structural discipline. The collision cost savings values were based on estimates for making design changes or field modifications had the collision not been detected earlier. More than 590 clashes were detected before actual construction began. The overall cost savings based on the 590 collisions detected throughout the project was estimated at \$801,565, as shown in Table 1. For calculating net cost savings, a conservative approach was adopted by assuming that 75% of the identified collisions can be detected through conventional practices (e.g., sequential composite overlay process using light tables) before actual construction begins. Thus, the net adjusted cost savings was roughly considered to be \$200,392.

Table 1. An Illustration of Cost and Time Savings via Building Information Modeling in the Aquarium Hilton Garden Inn Project

Collision Phase	Collisions	Estimated cost avoidance	Estimated crew hours	Coordination date
100% design development conflicts	55	\$124,500	n/a	30-Jun-06
Construction (MEP Collisions)				
Basement	41	\$21,211	50hrs	28-Mar-07
Level 1	51	\$34,714	79hrs	03-Apr-07
Level 2	49	\$23,250	57hrs	03-Apr-07
Level 3	72	\$40,187	86hrs	12-Apr-07
Level 4	28	\$35,276	68hrs	14-May-07

Level 5	42	\$43,351	88hrs	29-May-07
Level 6	70	\$57,735	112hrs	19-Jun-07
Level 7	83	\$78,898	162hrs	12-Apr-07
Level 8	29	\$37,397	74hrs	03-Jul-07
Level 9	30	\$37,397	74hrs	03-Jul-07
4Level 10	31	\$33,546	67hrs	05-Jul-07
Level 11	30	\$45,144	75hrs	05-Jul-07
Level 12	28	\$36,589	72hrs	05-Jul-07
Level 13	34	\$38,557	77hrs	13-Jul-07
Level 14	1	\$484	1hr	13-Jul-07
Level 15	1	\$484	1hr	13-Jul-07
Subtotal construction labor	590	\$564,220	1,143hrs	
20% MEP material value		\$112,844		
Subtotal cost avoidance		\$801,565		
Deduct 75% assumed resolved via conventional methods		\$601,173		
Net adjusted direct cost avoidance		\$200,392		

Source: Holder Construction Company, Atlanta, GA.

Note. MEP = mechanical, electrical, and plumbing.

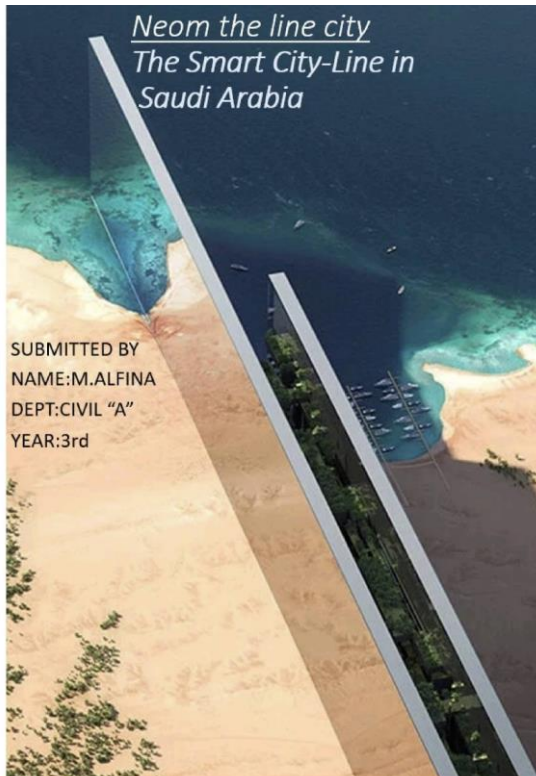
During the construction phase, subcontractors also made use of these models for various installations. Finally, the GC's commitment to updating the model to reflect as-built conditions provided the owner a digital 3D model of the building and its various systems to help aid operation and maintenance procedures down the road.

In a nutshell, the Aquarium Hilton Garden Inn project realized some excellent benefits through the use of BIM technology and certainly exceeded the expectations of the owner and other project team members. The cost benefits to the owner were significant, and the unknown costs that were avoided through collaboration, visualization, understanding, and identification of conflicts early were in addition to the reported savings. After this project, the architect and GC began to use BIM technology on all major projects, and the owner used the developed building information model for sales and marketing presentations.

Conclusion:

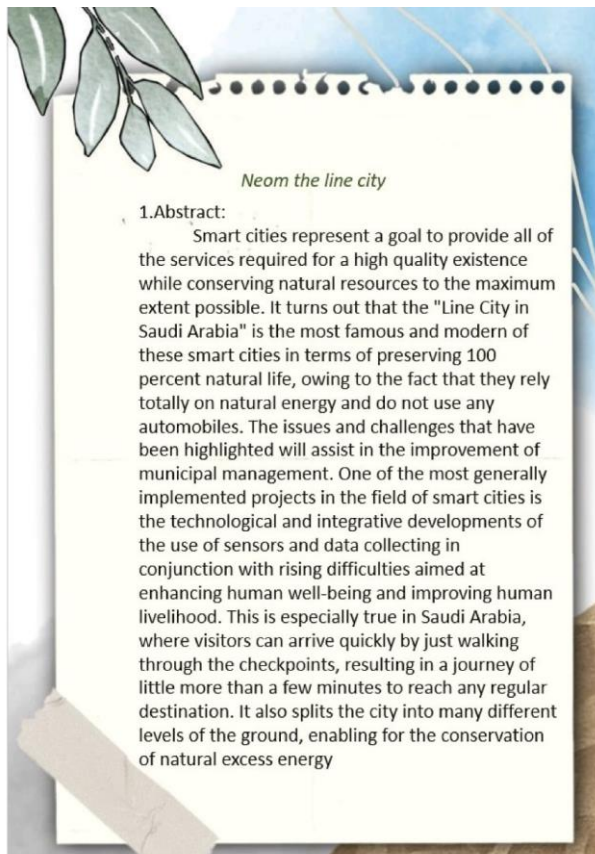
BIM is used in many Indian construction Projects by various companies for the betterment of their resources, scheduling, planning and implementing. Like other software, BIM is one of the desired software and processor to excel in the field of Civil Engineering as predictability of building performance and operation is greatly improved.

ARTICLE BY STUDENT



Neom the line city: opportunities and challenges

- Synopsis
- **1. Abstract**
- **2. Introduction**
- **3. Inside NEOM's LINE**
 - 3.1 spine layer
 - 3.2 service layer
 - 3.3 Pedestrian Layer
- **5. Neom plan for renewability and sustainability development**
- **6. Job opportunities in Neom**
- **7. The Ideal Crossroads of the World**
- **8. The Challenges Associated with NEOM**
- **9. Conclusion:**
- **10. Reference**



2. Introduction:

The Line is a [linear smart city](#) under construction in [Saudi Arabia](#) in [Neom](#), Tabuk Province, which is designed to have no cars, streets or carbon [emissions](#). The 170-kilometre-long (110 mi) city is part of [Saudi Vision 2030](#) project, which Saudi Arabia claims will create around 460,000 jobs and add an estimated \$48 billion to the country's GDP. The Line is planned to be the first development of a \$500 billion project in Neom. The city's plans anticipate a population of 9 million. Excavation work had started along the entire length of the project by October 2022

The project has faced criticism over its impact on the environment and the current population of the area, as well as doubts about its technological and economic viability.

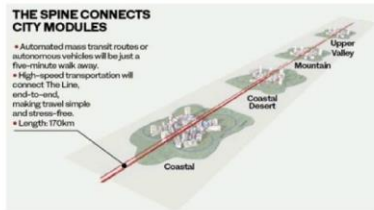
3. Inside NEOM's LINE:

The total area of Neom is 26,500 km² (10,200 sq mi) or 33 times the size of New York City. The city's plans include multiple regions, including a floating industrial complex, global trade hub, tourist resorts, and a linear city—"all powered exclusively by renewable energy sources"



3.1. The spine layer

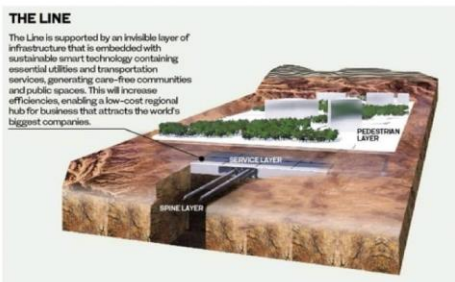
Saudi Arabia's man-made vertical city THE LINE, is currently developing its own high-speed rail link called "THE SPINE". The rail link will improve connectivity across all of the US\$500bn NEOM city, cutting down travel times. "THE SPINE [high-speed rail link] on THE LINE will deliver amazing journey times down its length from the airport and we can then spur off the line or take people up into TROJENA,"



This spine will connect the different communities, which Neom envisages will house one million inhabitants and be stretched across 100 miles. Transportation from one end of The Line to the other will never take more than 20 minutes, according to Neom's developers.

3.2 service layer

The second level, called Service Layer, will contain all daily service facilities such as schools, medical clinics, leisure facilities.



3.3 Pedestrian Layer

The top level, called Pedestrian Layer, will be dedicated to only pedestrians without cars and streets, with green spaces.

6. Job opportunities in Neom

Chief urban development officer at Neom, Antoni Vives, said one of the largest international airports in the world would be ready before 2030. A business and tech centre is expected to contribute \$48bn to the kingdom's gross domestic product and create **380,000 jobs**.

Bechtel, one of the world's largest industrial contractors, has been appointed as the project management consultant for Trojena at Neom, the mountain development in Saudi Arabia.

Neom Construction And Real Estate Development pays an **average salary of \$4,830,375 and salaries range from a low of \$4,249,482 to a high of \$5,473,856**. Individual salaries will, of course, vary depending on the job, department, location, as well as the individual skills and education of each employee.

NEOM has an overall rating of 3.3 out of 5, based on over 35 reviews left anonymously by employees. 47% of employees would recommend working at NEOM to a friend and 34% have a positive outlook for the business. This rating has improved by 8% over the last 12 months

7. The Ideal Crossroads of the World

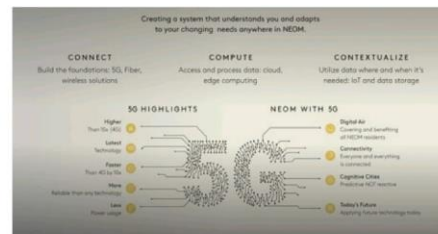
The line is distinguished by that it connects four distinctive ecologies. The place extends along the beaches and is characterized by the presence of exotic nature and continues to extend to the southeast of Neom as it reaches beyond the Red Sea islands, and the abundance of places and natural reserves



The following area is also distinguished by the coastal desert region by its relatively flat land, its interior areas in which THE LINE is the axis in it,

4. Artificial intelligence (AI)

NEOM After the rapid development of artificial intelligence (AI) in all fields of machine learning (ML), deep learning (DL), natural language processing (NLP), and others, life has become easier.



The greatest successes in various tasks such as "speech recognition", "autonomous vehicles", "image classification", "machine translation", and "question answering systems" have been achieved through a high degree of integration and a mixture of ideas between "artificial intelligence (AI)", "neuroscience", "machine learning (ML)", and other multiple fields. The advancement of a society is done not just by increasing the capabilities of artificial intelligence, but also by maximizing the societal benefits that AI can provide

5. Neom plan for renewability and sustainability development

All energy in NEOM will be 100 per cent renewable -- from solar, wind and hydrogen-based electricity generation -- ensuring a zero-emissions, carbon-positive ecosystem. NEOM will be a regional powerhouse in water production and storage based on water desalination. Neom use solar power to provide energy for the city. The city has the potential of using 20 MJ/m2 of perennial solar resources from its desert location. Solar, along with wind and water energy will launch Neom into becoming **one of the most sustainable cities in the world. The city will preserve 95 per cent of the site's natural environment, highlighting mankind's relationship with the natural world.** All energy in NEOM will be 100 per cent renewable

which is a corridor between the north and south of the project, and it is the main meeting point for the transportation routes in THE LINE



The mountain region, the most famous of which is Jebel al-Lawz, and some mountains may reach 2500 meters in height, and the mountain is one of the least populated areas in it due to its geological nature,



Here are the high valleys that connect the regions of the Kingdom of Saudi Arabia with the eastern region of Neom. These valleys are characterized by rocky layers interspersed with sandy plains, and these valleys are related to the province of Tabuk



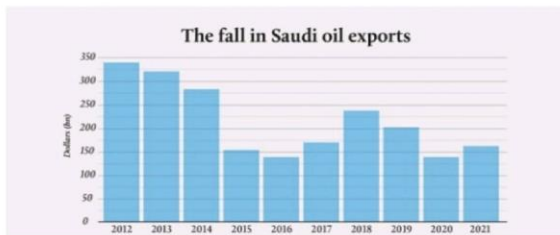
8. The Challenges Associated with NEOM

The new way of living is meant to limit the number of people who die. Given that life will end at some time, this will result in the extension rather than the saving of the lives of around 8 million people. providing clean water and food to an ever-increasing population that poses the most significant challenge for us as a species, as we are doing little to address the underlying problem of overpopulation.

the fundamental problem of an uncontrolled and limitless population constrained by a finite supply of food and water; however, the elimination of pollution from transportation and road fatalities is commendable. Humans, on the other hand, have only been given a certain supply of water, which is vital to our survival as a species despite our potential ability to produce more food than we consume.

Saudi Arabia's Desalination Plants are **Producing Seawater Pollutants**. Everyday, large amounts of seawater undergo processing in Saudi's 30 desalination plants. As the desalting processes extract high concentrations of salt, the brine extracted becomes wastes the go back to the sea.

Saudi Arabia's crude oil exports hit a five-month low in November 2022, as it declined to 7.28 million barrels per day from 7.7 million bpd in October, the International Energy Forum said.



On the negative side, Saudi Arabia remains heavily dependent on oil revenues, for 88% of total export earnings, about 75% of state revenues, and 40% of GDP. The dramatic reduction in revenues will result in a **significantly lower GDP growth rate, as well as higher budget deficit**. Hence it affects the neom project growth

9. Conclusion:

According to what was previously talked about, when the NEOM project is fully completed in 2025, this will be within the framework of the ambitious aspirations of Vision 2030 to transform the Kingdom of Saudi Arabia into a leading global model in a variety of areas of life, with a particular emphasis on the development of the future city. The Line that provides a life that puts the human being on top of its priorities. It is characterized by an ideal geographical location that is characterized by wonderful nature, sustainable energy, and easy-to-access services, and thus the artificial intelligence technology is important and deeply influencing. Regarding the view of the Kingdom of Saudi Arabia, considering that artificial intelligence is the one that revolutionizes urban life to transform the state. The life that cannot be achieved by relying on hydrocarbon fuels. Thus, through this research, we can expect that artificial intelligence will make a qualitative leap in the development of the Kingdom of Saudi Arabia in technology in the future

10.Reference:

1. Agarwal, P. K., Gurjar, J., Agarwal, A. K., & Birla, R. (2015). Application of Artificial Intelligence for Development of Intelligent Transport System in Smart Cities. International Journal of Transportation Engineering and Traffic System, 1(1), 20-30.
<http://civil.journalspub.info/index.php?journal=JTETS&page=article&op=view&path%5B%5D=24>
2. <https://en.wikipedia.org/wiki/Neom#:~:text=The%20total%20area%20of%20Neom,City>
3. Integration of solar thermal and photovoltaic, wind, and battery energy storage through AI in NEOM city. Energy and AI, 3, 100038.
<https://doi.org/10.1016/j.egyai.2020.100038>
4. Rezk, H., Kanagaraj, N., & Al-Dhaifallah, M. (2020). Design and sensitivity analysis of hybrid photovoltaic-fuel-cell-battery system to supply a small community at Saudi NEOM city. Sustainability, 12(8), 3341. <https://doi.org/10.3390/SU12083341>



CIVIL

YOU DREAM IT WE BUILD IT

UG Courses

- ✓ B.E – Civil Engineering.
- ✓ B.E – Computer Science and Engineering.
- ✓ B.E – Electrical and Electronics Engineering.
- ✓ B.E – Electronics and Communication Engineering.
- ✓ B.E – Mechanical Engineering.
- ✓ B.E – BioMedical Engineering.
- ✓ B.Tech – Agricultural Engineering.

PG Courses

- ✓ M.E – Communication Systems.
- ✓ M.E – Computer Science and Engineering.
- ✓ M.E – Construction Engineering and Management.
- ✓ M.E – Thermal Engineering.
- ✓ M.E - Applied Electronics*
- ✓ M.E – Manufacturing Engineering*

Management Programme

- ✓ Master of Business Administration

Research Programme

- ✓ Ph.D in Mechanical Engineering.

Become a Student at RCET

- ✓ Online Application Form
- ✓ Eligibility
- ✓ Download Brochure

DEPARTMENT OF CIVIL ENGINEERING