



# SIGMA COLLEGE OF ARCHITECTURE

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## TABLE OF CONTENTS

<p><b>CULTURAL HERITAGE SITES</b> Ar.INDIRA KOLLI M.Arch Principal</p>	4
<p><b>CO-LIVING AND CO-WORKING SUSTAINABLE mixed use TOWER</b> “A Sustainable lifestyle of where we live there we work” Ar.S.CHINNADURAI M.Arch Head of the Department</p>	5
<p><b>ROLE OF CULTURE IN SUSTAINABLE ARCHITECTURE</b> Ar.R.REGHU M.Arch Assistant Professor</p>	6
<p><b>THERMAL ENERGY STORAGE SYSTEM</b> Er.Z.JENNER M.E. Assistant Professor</p>	7
<p><b>LANE ART INSTALLATION</b> <b>Chengdu Dachuan Lane Art Installation / VCD Lab</b> Ar.K.ASWIN PRAKESH M.Arch Assistant Professor</p>	8
<p><b>SHADING DESIGN – Sun path</b> Ar.R.ANAND GODSON M.Arch Assistant Professor</p>	9
<p><b>USE OF TRIGONOMETRY IN ARCHITECTURE</b> Mr.P.S.STEM EDILBER M.Sc,M.Phil Assistant Professor</p>	10
<p><b>LANDSCAPE SOLUTIONS FOR POLLUTION ARISING IN TEXTILE INDUSTRY</b> Ar.M.PRIYADARSHINI M.Arch Assistant Professor</p>	11
<p><b>TWO BILLION NEW HOMES TO BE CREATED IN THE NEXT 80 YEARS...</b> Ar.T.DINESH PANDIAN M.Arch Assistant Professor</p>	12
<p><b>GEOMETRIC RELATIONSHIP IN DESIGN</b> Ms.R.MARIA ANUSHIYA M.Sc Assistant Professor</p>	13
<p><b>STRENGTH AND DURABILITY ASPECTS OF REINFORCED SELF COMPACTION CONCRETE USING GLASS FIBRE</b> Er.C.JENIL KUMAR M.E. Assistant Professor</p>	14



<b>BIG DESIGNS NO 1 QUAYSIDE, AN OFFICE BUILDING IN NEWCASTLE, UK</b>	<b>15</b>
Ar.K.KEERTHANA B.Arch Assistant Professor	
<b>CONSTRUCTION WITH RECYCLED MATERIALS</b>	<b>16</b>
Er.E.M.JERIN SHIBU M.E. Assistant Professor	
<b>MATERIAL DRIVEN FUTURISTIC FACADE SYSTEMS A PARAMETRIC APPROACH BY RATLAB STUDIO</b>	<b>17</b>
Ar.M.RAGHAVENDRAN M.Arch Assistant Professor	
<b>GREEN CONCRETE</b>	<b>18</b>
Er.R.RELIN GEO M.E. Assistant Professor	
<b>TRANSFORMATION OF PAINTING INTO ARCHITECTURE</b>	<b>19</b>
Ar.T.JOSEPHINE SABEENA B.Arch Assistant Professor	
<b>DIGITAL TRANSFORMATION IN ARCHITECTURE</b>	<b>20</b>
<b>OPTIMIZATION PROCEDURE FOR EXISTING BUILDING</b>	<b>21</b>
<b>MARXISM</b>	<b>22</b>
<b>A look into communist theory and how it affects architectural discourse and Engels take on art.</b>	

## CULTURAL HERITAGE SITES

Ar.INDIRA KOLLI M.Arch  
Principal

If we look at any of the historic buildings, monuments, palaces, fort complexes, settlements, towns, cities they refer to particular culture, beliefs, religion, customs, time, topography, climatic conditions, resources, power, skills, art, manpower and practices of particular period. If we look at any historic edifices, it gives sense of wonder, belongingness, unity, beauty, better understanding of past generations, and history of that place. These are cultural heritage of three types

1. Cultural heritage
2. Natural heritage and
3. Artefacts.

Cultural heritage is an expression of ways of living developed in particular period. Cultural heritage often expressed as Tangible or Intangible cultural heritage. Tangible heritage refers to those significant spaces that advocate the countries history and culture. Example: Monuments, palaces, shrines, forts etc. Intangible heritage that refers to those aspects of country that cannot be seen or touched. There are four main aspects to understand the significance of cultural heritage sites.

1. Histori significance
2. Social Significance
3. Easthatic significance
4. Scientific significance.



**UNESCO World heritage site**



**Taj Mahal**



**Hampi site**

In conclusion Cultural heritage plays Important role in our life.

## CO-LIVING AND CO-WORKING SUSTAINABLE MIXED USE TOWER

### “A Sustainable lifestyle of where we live there we work”

Ar.S.CHINNADURAI M.Arch  
Head of the Department

The modern world has brought not only the technology to our doorstep but also the recent pandemic diseases, thereby not allowing us to move out of the doorstep. Therefore People cannot use any kind of transit to go for work but the internet connects the people all over the world. The professionals can do their work wherever they are. Considering safety of the employees and energy saving aspects, most of corporates started the concept of Work from home. So connecting the working space and the living space becomes the integral part in the modern Architecture era.



Nowadays, co-living and co working space is trending in residential space making. The idea is very simple how we live and how we work in a same space. This concept is trending in few developed countries. So many professional nomads' uses this kind of space. Generally it will be like hostel with high speed internet connection throughout the building. But in Indian context we need to think about the family. So residing space for the family which requires privacy and community interactive spaces and same time working station for the people to work. The challenges of collaborating these two different spaces need certain ambience to conduct its own activity. Another hand land scarcity in urban areas, we have to go for vertical towers is an only option. The towers can have this two spaces (**Mixed use**) residing and working spaces. If these spaces are perfectly planned with sustainable approaches as per the standards. The tower can be called as “**Co-living & Co-Working Sustainable Mixed use tower**”.



## ROLE OF CULTURE IN SUSTAINABLE ARCHITECTURE

Ar.R.REGHU M.Arch  
Assistant Professor

### Introduction

“Sustainable architecture” being discussed in a great many publications is an exceedingly contentious issue. Invented stories, a collection of verbal communication is referred to put transversely this kind of planning such as; ecological design in 1970s, inexperienced design in 1980s, ecological design in late 1980s and 1990s and to finish sustainable architecture from mid-1990s until today.

### Eco-Cultural Logic of Sustainable Architecture

Chap and cultivator classify sustainable design under six diverse categories based on the main logic and methods as: eco-technic, eco-centric, eco-aesthetic, eco-cultural, eco-medical and eco-social. The competing logics of the sustainable design. One or more logic can be found in a sustainable architecture according to the main ecological trouble

Definition of “sustainable” for an architecture changes depends on the judgment. Eco-technic judgment defines sustainable architecture as energy-sufficient architecture insertion significance to the progress of knowledge while in eco-centric logic, sustainable architecture is well thought-out to be an architecture that is a part of environment during by means of natural equipment and has zero biological footprint. Aesthetic, stylish and stimulated merits make the green design as sustainable for eco-aesthetic logic. On the other side, architecture creates “therapeutic environment” and following the healthy everyday life of the people is measured as sustainable within eco-medical logic. Also, there is an eco-social judgment major the architecture that embodies the quality of the culture, self-government and togetherness as sustainable. The eco-cultural conclusion spaces of concentration the defence and protection of the selection of the existing cultural archetypes with a concern for enlightening permanence. This judgment guide to transformation and recycle of conventional construction technique, building typologies and arrangement patterns for appearance of the inspirational sustainability. This approach denies wide-ranging and systematically based design methodologies that often fail to be in contact with the enlightening values of a fastidious place or people.

### Architectural Practices Adopting Eco-Cultural Logic

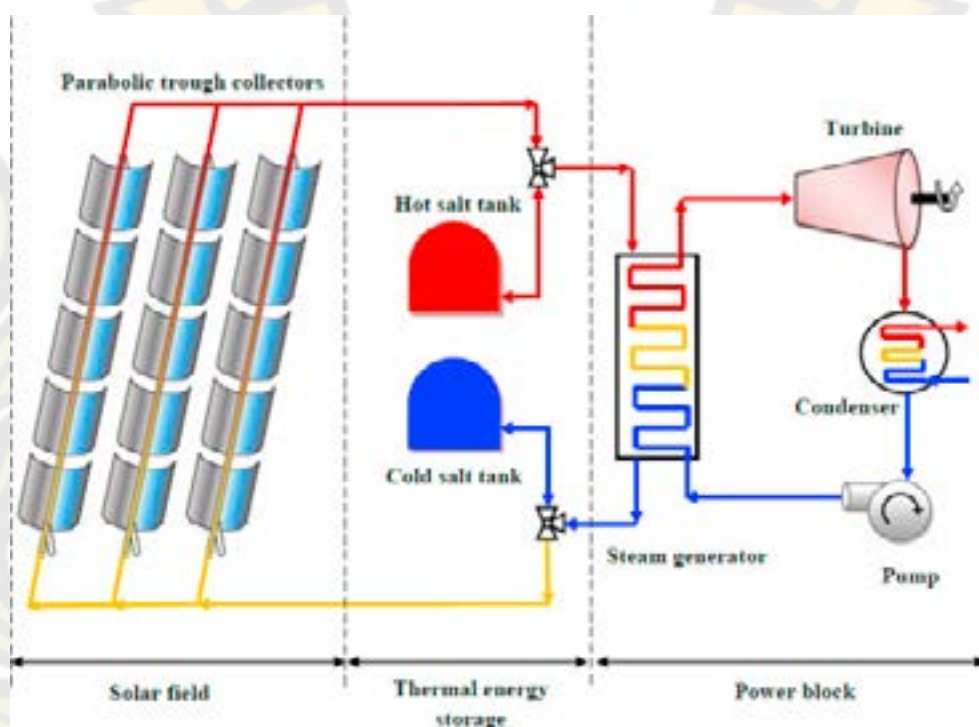
The concern for the cultural sustainability, connection of space characteristics, use of local materials and proper responses to nature can be seen in regional approaches of the leading architects, Hassan Fathy from Egypt in addition to Charles Correa from India.

New Gourna rural community is a reinterpretation of a conventional metropolitan and architectural setting by Hassan Fathy who is an early visionary of sustainable architecture. It provides sustainability in assistance in culture from commencement to end use of local materials and techniques and in environment with its extraordinary sensitivity to climatic problems. It is a dazzling example of the integration of vernacular technology with modern architectural principles. Fathy brought back the use of sludge brick (adobe) and with special techniques keep building cooler during the day and warmer during the night.

## THERMAL ENERGY STORAGE SYSTEM

Er.Z.JENNER M.E.  
Assistant Professor

Intermittent nature of renewable energy resources such as solar and wind is one of the drawbacks when compared to fossil fuels. Solar and wind are available only when there is sunshine and the wind. In order to make these resources a replacement for fossil fuels, energy storage technologies must be developed. Thermal energy storage (TES) is one of the technologies that is used to store thermal energy by heating or cooling a storage medium so that the stored energy can be used later for power generation. This technology requires two separate tanks. The fluid which is stored in a cold tank is heated in the solar collector field and then stored at high temperature in the hot tank. The solar collector consists of parabolic mirrors to concentrate direct solar radiation onto an absorber pipe. The Heat Transfer Fluid flows through the pipe, absorbs the heat. The stored energy in the hot tank is delivered to the load by pumping the Hot Transfer Fluid through the boiler. The Steam produced from the boiler is used to turn the turbine to produce mechanical energy. The Steam turbine is coupled with a Generator which converts electrical energy into mechanical energy.



## LANE ART INSTALLATION CHENGDU DACHUAN LANE ART INSTALLATION / VCD LAB

Ar.K.ASWIN PRAKESH M.Arch  
Assistant Professor



Chengdu Dachuan Lane, the west bank of Jinjiang River, the intersection of Dafuhe River and Nanhe River, a historical street linking Jinjiang Qingling Wharf and Chengdu East Gate City Wall Site, with a total length of more than 140 meters. Dachuan Lane before the renovation was a noisy and busy “courier street”.

Due to its special history and geographic location, in the new round of urban renewal, Dachuan Lane has been given a new positioning and function-”urban art block”, which also created the block entrance art installation. The design would offer not only washroom functionality but also provide space for a commercial kiosk and environmentally friendly benefits. Topped with a green roof, the sculptural, metal-clad pavilions would be integrated with digital technology for advertising or educational purpose along with a rainwater system.

Inheriting history, continuing memories, and reviving streets and lanes are the new meanings that the new street entrance device will carry. By constructing a new type of link relationship, a new collision between historical archetypes and contemporary culture is created, showing the intimate relationship between human history, modern business and resident life. From the deep and orderly arrangement of the component spaces, a considerable, swimmable, and stopable street and lane installation space was created. “New structures are iconic in their design and adaptability- transforming to varied site needs” the architect explained. “developing these design alternatives, along with the incorporation of varied native grasses and trees, allow for cohesive collection of pavilions that are as varied as san Francisco’s neighborhoods.”

The installation space itself is the image sign of the street entrance, while ensuring the basic traffic function, it is also the carrier to communicate the street memory and street life. How to let citizens experience a fun and dramatic space that interweaves memory, life and culture is the challenge and goal of this design. 8, 250, 4000 (unit: mm). This group of figures reproduces an old street-like structural space. In the tangible and intangible spaces, a space that is separated from sight and blurred boundaries is constructed. The overall device is a 8mm diameter stainless steel copper-plated solid pipe with a modular displacement welding at the factory, and then assembled and processed on site. The ground is paved with blue bricks and slate from local traditional streets.



## SHADING DESIGN – SUN PATH

Ar.R.ANAND GODSON M.Arch  
Assistant Professor

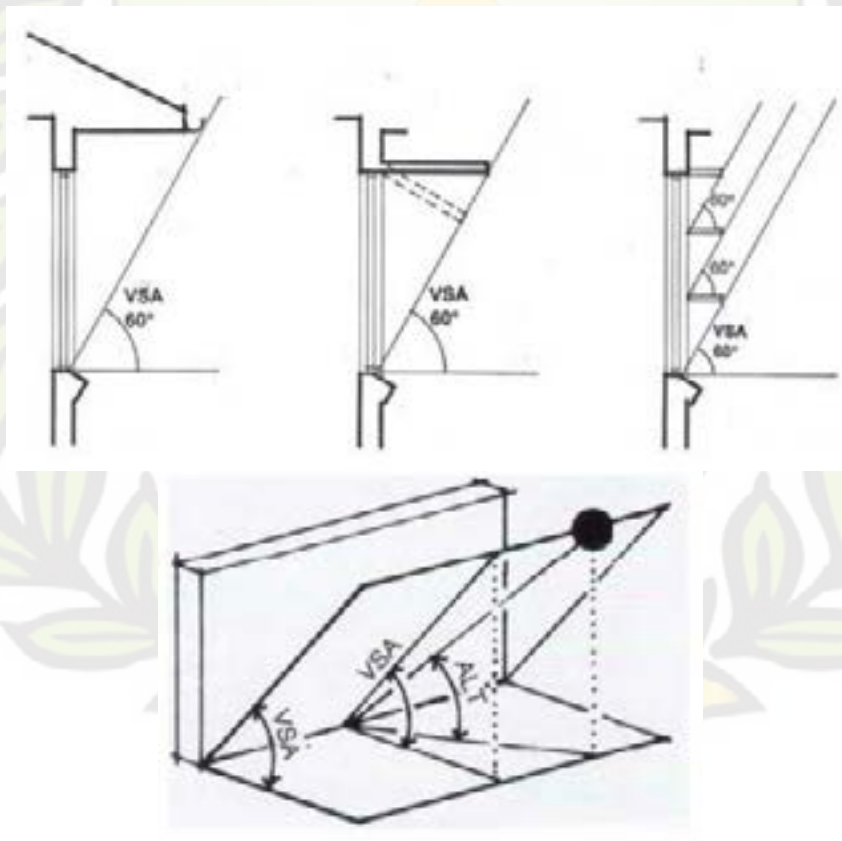
Solar radiation incident on a window consists of three components: beam- (direct-) radiation, diffuse- (sky-) and reflected radiation. External shading devices can eliminate the beam component (which is normally the largest) and reduce the diffuse component. The design of such shading devices employs two shadow angles: HSA and VSA.

### Shadow angles

Shadow angles express the sun's position in relation to a building face of given orientation and can be used either to describe the performance of (i.e. the shadow produced by) a given device or to specify a device. Horizontal shadow angle (HSA) is the difference in azimuth between the sun's position and the orientation of the building face considered, when the edge of the shadow falls on the point considered  

$$\text{HSA} = \text{AZI} - \text{ORI}$$

By convention, this is positive when the sun is clockwise from the orientation (when  $\text{AZI} > \text{ORI}$ ) and negative when the sun is anticlockwise (when  $\text{AZI} < \text{ORI}$ ). When the HSA is between  $\pm 90^\circ$  and  $270^\circ$ , then the sun is behind the facade, the facade is in shade, there is no HSA. Section 4.4 gives two further checks for results beyond  $270^\circ$ . The horizontal shadow angle describes the performance of a vertical shading device. Many combinations of vertical elements can give the same shading performance.



## USE OF TRIGONOMETRY IN ARCHITECTURE

Mr.P.S.STEM EDILBER M.Sc,M.Phil  
Assistant Professor



Ancient architects had to be mathematicians because architecture was part of mathematics. Using math and design principles, they built pyramids and other structures that stand today. Because angles are an intricate part of nature, sines, cosines and tangents are a few of the trigonometry functions ancient and modern architects use in their work. Surveyors also use trigonometry to examine land and determine its boundaries and size. Although surveyors perform this task, architects may rely on surveys when designing structures. One of the most common architectural uses for trigonometry is determining a structure's height. For example, architects can use the tangent function to compute a building's height if they know their distance from the structure and the angle between their eyes and the building's top; clinometers can help you measure those angles. These are old devices, but newer ones use digital technology to provide more accurate readings. You can also compute a structure's distance if you know a clinometer angle and the structure's height. In addition to designing the way a structure looks, architects must understand forces and loads that act upon those structures. Vectors -- which have a starting point, magnitude and direction -- enable you to define those forces and loads. An architect can use trigonometric functions to work with vectors and compute loads and forces. For instance, you can use sine and cosine functions determine a vector's components if you express it terms of the angle it forms relative to an axis.



## LANDSCAPE SOLUTIONS FOR POLLUTION ARISING IN TEXTILE INDUSTRY

Ar.M.PRIYADARSHINI M.Arch  
Assistant Professor

### Channel system:

1. The gravity to change water flow
2. Used as a transportation network
3. Easy for water treatment and filtering solid waste
4. Can control and boundary water - green buffer polluted, it is easier to find out the causer who discharge illegally.

### Injection of decentralized water treatment process:

1. No enough treatment capacity in this region instead of having own water treatment system/ green noise buffer it can be put up for a textile industrial chain,
2. Textile cluster need to be introduced- to severe total quantity of waste water discharge.
3. So dyeing mills, cotton mills and garments factory consist one textile cluster, forming industrial production line(cluster)
4. Improves the production efficiency.

### HOW POLLUTION CAN BE CONTROLLED:

Mandatory solution to control of textile pollution is known as the treatment plant (ETP). There are mainly three types of treatment plant.

1. Physicochemical
2. Biological
3. Physicochemical followed by biological.

Physicochemical followed by biological is considered as more effective plant. Generally biological treatment plant is the method includes main three methods. They are:

1. Primary method
2. Secondary method and
3. Tertiary method

#### 1. Primary method/ treatment:

Primary treatment mainly does the task of removal of these solids which is suspended from the waste water.

#### 2. Secondary method/ treatment:

The bio-degradable organic matters and suspended solids are removed in secondary treatment in presence of nutrients.

#### 3. Tertiary method/treatment:

The remaining residual suspended solids are removed in the tertiary treatment. Granular medium filtration or micro-screens is used to do this tertiary treatment. In tertiary treatment disinfection is also done typically.

## TWO BILLION NEW HOMES TO BE CREATED IN THE NEXT 80 YEARS...

Ar.T.DINESH PANDIAN M.Arch  
Assistant Professor



It is an inevitable truth that the world population is growing exponentially. Higher numbers can only cause a better demand for resources, food, and housing. By the year 2100, the 7.6 billion people currently living on earth will reach, consistent with the UN, a whopping 11.2 billion. This increase can only mean that the need to accommodate these people will become an urgent priority, innovating and shifting from the household system that is present nowadays. Soon enough this may be a worldwide pressing issue. The size of apartments has been decreasing for the past half-century, making way to efficient and affordable tendencies, especially in the urban realm. In fact, this is also related to a global trend of a decline in fertility rates.

On another hand, the average life expectancy is extended, mainly in developed countries, making older households less available, and the demand for new constructions to accommodate the fast-growing population higher. This can be directly highlighted through the recorded need for one or two-person residences, new housing requirements. In fact, on a rough average, we will need more than two billion new homes by the end of the 21st century, raising the question of availability of material for such a massive demand.

New strategies in housing started to look at alternatives solutions especially for faster construction procedures. The prefabricated systems and offsite production are a booming market, that has grown rapidly over the years, speeding up the whole process. However, this method is far from easy and reliable. It has many constraints on a logistic level, in trained individuals, in the installation of amenities and in preparation period whether it is on-site for the foundations or in factories.

On the question of materials, efficiency and sustainability are the main headlines. Policies and strategies should help regulate and manage the use of construction supplies in order to avoid future problems of availability and pricing. In fact, new buildings being constructed should be able to guarantee future re-use.



## GEOMETRIC RELATIONSHIP IN DESIGN

Ms.R.MARIA ANUSHIYA M.Sc  
Assistant Professor

Geometry is that the elementary science science of forms and their order. Geometric figures, forms, and transformations build the fabric of architectural design. Every elevation of the building is distinctive and geometrical depending on the approach. These thought-out facades explore the language of house. In the history of architecture, geometric rules base on the ideas of proportions and symmetries kind fix tools for architectural design.



proportions were analyze in nature and realize as general aesthetic classes across nature and art. The geometric shapes project is outline by its pure mathematics. Creating from spherical spaces intersecting with trapezoids intend to activate the inner space.



*Geometric shapes design example of latest house.*

SICA

## STRENGTH AND DURABILITY ASPECTS OF REINFORCED SELF COMPACTION CONCRETE USING GLASS FIBRE

Er.C.JENIL KUMAR M.E.  
Assistant Professor

### MIX DESIGN OF SELF COMPACTION CONCRETE INITIAL MIX COMPOSITION

In designing the mix it is most useful to consider the relative proportions of the key components by volumes rather than by mass.

1. Total powder content - 160 to 240 liters (400-600 kg) per cubic meter
2. Coarse aggregate content normally 28 to 35 percent by volume of the mix.
3. Water / Cement ratio is selected based on requirement in EN 206 typically water content does not exceed 250 lit/m<sup>3</sup>

### ADJUSTMENT OF THE MIX

Once all the requirements are fulfilled, the mix should be tested at full scale at the concrete plant or at site.

1. Modifying the proportion of the sand or the coarse aggregate.
2. Using a viscosity modifying agent, if not already included in the mix;
3. Adjusting the dosage of the superplasticer and / or viscosity modifying agent;
4. Using alternative types of superplasticer (and / or VMA), more compatible with local materials;
5. Adjusting the dosage of admixture to modify the water content, and hence the water / powder ratio.

### PRODUCTION AND PLACING

#### Production

#### *Storage of constituent materials*

If possible, aggregates should be covered to minimize the fluctuation of surface moisture content. It is also necessary to have good storage capacity for aggregate and additions if used.



#### Production Control

##### Aggregates

During production of SCC, tests aggregate grading and moisture content should be carried out more frequently than usual, single SCC is more sensitive than normal concrete to variations. Subsequently, every delivered batch should be visually checked before transportation to site, and routine testing carried out to the frequency specified in EN206.

More frequent adjustment of mix proportion, particularly water content, may need to be made, depending on the results from monitoring aggregate moisture content.

##### Delivery

Unexpected production stops can result in consistency variations that adversely affect the result. Placing is faster, especially if a pump is used, but it is still essential to make sure that delivery and placing can be completed within the workability - retention (self-compact ability) time of the concrete.



## BIG DESIGNS NO 1 QUAYSIDE, AN OFFICE BUILDING IN NEWCASTLE, UK

Ar.K.KEERTHANA B.Arch  
Assistant Professor



Bjarke Ingels Group has just released images of No 1 Quayside, its latest office block in Newcastle. Along with local studio Xsite Architecture, the project's curvature is directly inspired by the bridges over the Tyne and thus the sloping neighboring hills.

The building - 12-story project is bordered by major transportation arteries. Located "just off the Quayside", near the waterway, between the Tyne and Millennium Bridges, will hold 10,000-square-metres of workspace and rooftop gardens. Imagined as a replacement landmark for the town, No 1 Quayside "reflects the dynamic quality of its surroundings".

With a curved mass, emphasizing the road's arc, the architects generate "a skinny 13m ribbon-like office space". Inspired by the architectonic elements of the location, the nearby bridges, and therefore the surrounding landscape, the event takes on a curved and sinuous design. Resembling the serpentine pavilion, the structure blends in its context, extending the urban fabric of the town. Green roof terraces and personal gardens open up the project to its natural context.

## CONSTRUCTION WITH RECYCLED MATERIALS

Er.E.M.JERIN SHIBU M.E.  
Assistant Professor

Waste is generated from all directions. They not only require huge space to stock it, but also pollute the environment. The polluted environment is harmful to human health and for the sustainability of system. Thus, generation of waste must be minimized or recycled for human use. Further the growth in industries is continuously throwing huge quantities of wastes and byproducts such as fly ash silica fume, red mud, blast furnace slag etc. Also huge amount of municipal waste is generated every day in each Indian city and World over. For example, Delhi alone generates about 650 tons of garbage every day. By 2020 its amount may reach 1,800 tons. So it is necessary to recycle and use it as construction material especially for sustainable development.

### Fly Ash

Fly ash is a by-product produced during the operation of coal-fired power plants. Fly ash is classified into two groups, ASTM Class C or high calcium fly ash and ASTM Class F or low calcium fly ash. Fly ash exhibits pozzolanic properties and in certain type cementitious properties as well. In Concrete, Class F fly ash has pozzolanic properties when introduced to water, whereas Class C fly ash is naturally cementitious due to its high amount of calcium oxide. The cement industry is one of the primary producers of carbon dioxide, a major green gas. So when we reduce the usage of cement in concrete by adding fly ash, the cement production get reduced at some extent. Some of the technical benefits of concrete with fly ash are, higher ultimate strength, increase durability, improve workability, reduce bleeding, increase resistance to sulfate attack, increase resistance to alkali-silica reactivity, reduce shrinkage.



Fig 1:Fly Ash

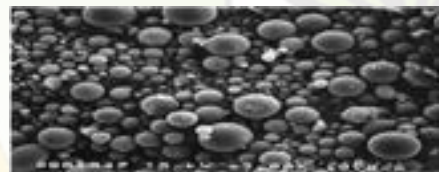


Fig 2:Fly Ash Particle

### Silica Fume

Silica fume is a byproduct which is liberated while producing silicon metal or ferro silicon alloys. One of the most beneficial use of silica fume is in concrete because of its chemical and physical properties. Silica fume is 100 to 150 times smaller than a cement particle it can fill the voids created by free water in the matrix. Silica fume is added to fresh concrete it chemically react with calcium hydrates(CH) to produce additional calcium silicate hydrates(CSH).When we reduce the usage of cement in concrete by adding silica fume, the strength of the concrete get increases, durability of concrete improves, resistance to corrosion and protect the structure from aggressive salt.



Fig 3: Silica Fume



Fig 4: Pores occupied by Silica Fume



## MATERIAL DRIVEN FUTURISTIC FACADE SYSTEMS A PARAMETRIC APPROACH BY RATLAB STUDIO

Ar.M.RAGHAVENDRAN M.Arch  
Assistant Professor

Building skins and façades have a multitude of roles and functions. On one hand, they provide a visual character to a building, which extends to the local character of a neighbourhood or at times, to a skyline of a city. On the other hand, façades have a key role towards building performance and creates a link between the interiors and exteriors of a building with respect to climatic response, protection from harsh physical conditions and maintaining user comfort levels. The role of facade systems is as complex as the building itself as it needs to strike a balance between all the parameters such as aesthetics, visual character, structural stability, solar heat gain, daylight filtration, visibility, thermal comfort, branding and programmatic zoning, among other aspects. This is one area of research where rat[LAB] Studio cofounders Sushant Verma & Pradeep Devadass based their research in 2012 with a vision to develop a new facade system. The project is designed by Nonscale Co., while the highlighting roof-structure has been envisaged and designed by rat[LAB]. This large span adaptive roof structure inherits hybrid qualities of a tensile and a grid shell, with automated shading devices inbuilt in the structure. The project explores Computational Techniques to develop Form, Structure & an Adaptive Skin /Envelope for the Architectural Built. The material-driven intelligence of adaptive [skins] project formed the basis for adaptive control of the building skin to derive a complex geometric system that can harness the potential of sun using sensing and actuating systems. An intelligent, pre-programmed mechanism of response and feedback needs to be embedded in architecture, with a real-time response and improvisation, for it to be termed 'adaptive'. It is a complex phenomenon with a multi-layered non-linear process.



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## GREEN CONCRETE

Er.R.RELIN GEO M.E.  
Assistant Professor

Color has nothing to do with green concrete. It is a thought of thinking and atmosphere into an every part of the raw ingredients manufacture over construction, combination design to structural design, and toughness. While a normal building practices are shown by short term financial considerations, maintainable construction is absorbed on best observes which highlight on long term affordability, toughness and efficiency.

Cement, fine aggregate, coarse aggregate, demolished bricks and silica fume have been used for this concrete. Cement grade 53, coarse aggregate size 20 mm, artificial M sand which is passing through 4.75 mm IS sieve were used. Demolished bricks were composed from the devastated building of age 50 years. The collected sample were wrecked physically into pieces of size passing through 4.75mm IS sieve and kept on 150 micron IS sieve.



Silica fume used was settle down to ASTM – C and was stock by “ELKEM INDUSTRIES” was name Elkem – Micro Silica 920 D. The silica fume is used as a fractional replacement of cement.



## TRANSFORMATION OF PAINTING INTO ARCHITECTURE

Ar.T.JOSEPHINE SABEENA B.Arch  
Assistant Professor

Art and architecture share common goal and similar common principles. Their goal is to express an abstract spiritual content through harmonious pure and beautiful material form. The important shared principles of form generation in art and architecture are abstraction, dematerialization, organization and construction of space. Art and architecture utilize visual form to express a spiritual, harmonious, beautiful and pure essence of nature, which affects the subconscious, evokes emotions, and alters human understanding about immediate surroundings, nature, and one's own existence. Both art and Architecture which aspire to an expression of a universal spiritual content.

Art and architecture aspire to the embodiment of formal as well as spiritual beauty. Beauty is the means for expressing the spiritual content in art through paintings. He emphasizes that the preeminence of inner beauty, which lies beyond the physical form of the objects and touches the soul, and it represents the spiritual essence of the universe. Kandinsky asserts that, the external formal beauty pleases the eye but it which is fails to touch the soul as it soothes the eye and keeps the soul from penetrating the external surface - of the art work.

Art and architecture aspire to the attainment of harmony in form and content as well as purity. In art and architecture is the expression of the inner meaning of objects which lies beyond utilitarian needs and technological considerations. In art, and architecture purity is the complete freedom of the work from any utilitarian use or reference to utilitarian or material objects.. Art and architecture, both are the silent reflection of the philosophies of an epoch, man's beliefs, aspirations, and the universal spiritual truth which embodied in physical form.

## DIGITAL TRANSFORMATION IN ARCHITECTURE

The impact of digital is seen everywhere, from the devices we use to communicate to the programs we use to traverse the world.

In architecture, from AI to big data to fabrication technologies to machine learning; the digital tools are creating increased interest and greater impact. The rapid increase and the potential of digital tools and technologies render epic opportunities to convey our understandings towards the world from an architectural perspective to wider group of people. The transformation is not only in the adaptation of new set of tools; rather, it is the major shift in the culture, technical innovation and collaboration facilitated by technology.

The rise of new communication technologies in 2000's signified a shift from machine era to information era, when architects started to expand the potential of practicing by leveraging advances in information technology. As digital tools evolved they enabled architecture to embody fluidity, temporality, movement; which transformed the built environment more responsive to their users and nature.

The age of digitization have direct links to embedding organic logic and synergy into form so that can be experienced in every detail of the built form at every scale of design. This evolution in design enables a new system which possesses a close collaboration between humans and machines; in which emerged technologies are used to increase the capabilities, augment design and also construction processes.

To conclude, the transparency and openness about the power of digital technology and the production of the built environment is necessary for better serving all people and designing a more equitable world.





## OPTIMIZATION PROCEDURE FOR EXISTING BUILDING

**Step1:** Performance evaluation of Building using **cognitive, empirical and simulation method** (Simos Yannas).

**Cognitive-** Documenting existing Building and basic observation observed in site.

**Empirical-** The empirical study is done using measuring instruments like measuring tapes, lux meter, and hygrometer

**Computational Simulation-** Model of the Building is done with exact dimension and material in software and simulated for the particular climatic condition.



**Step2:** Initial 3D model of design is created and imported into the Energy.

**Step3:** The designer needs to define a **single design objective or multiple design objectives** with different **design variables and its parameters**. For an existing Building only **few design variables can be considered**.

### Optimization objectives

Envelope, comfort, lighting, renewable energies, systems.

### Optimized design variables

Transparent Building envelope, opaque Building envelope, mechanical systems.

### Optimization design variable parameters

DESIGN VARIABLES	PHYSICAL QUANTITIES	DESIGN PARAMETERS
ORIENTATION	in degree	0, 30, 45
SHAPE	depending upon site dimension	depending upon wind movement
FLOOR HEIGHT	in meters	2.5, 3, 3.5
WINDOW WALL RATIO	<b>in percentage</b>	<b>0, 30, 45,</b>
SHADING DEVICE SIZE	<b>Ratio to window height</b>	<b>1/4, 1/2, 3/4,</b>
EXTERIOR WALL U-VALUE	w/sq.m K	<b>1.4, 1.2, 1, 0.8, 0.6</b>
ROOF U-VALUE	w/sq.m K	<b>1, 1.2, 1.4</b>
FLOOR U-VALUE	w/sq.m K	<b>1, 0.9, 0.8, 0.7, 0.6, 0.5</b>
SINGLE CLEAR GLAZING	w/sq.m K	<b>1, 0.75, 0.5, 0.25</b>

**Step4:** The **simulation** can be compared **manually or a computer** can compare automatically to check if the required objective is satisfied.

**Step5:** If the design **objectives are satisfied**(to the **thermal and lighting comfort of occupant or minimal Energy usage**) the design process will be **terminated and the optimal design will be determined**. Otherwise, the design process will be repeated, **calls for the optimization engine to generate a new design based on the design objectives and its parameters** provided to the engine (The repetition process can be done manually or automatically by the simulation engine).

## MARXISM

### A look into communist theory and how it affects architectural discourse and Engels take on art.

Architectural theory as we know it today is informed by Western, neo-Marxist theories. But throughout history Marxism has influenced architectural thinking in many more ways than just through this well-known intellectual trajectory. Distinct forms of Marxist architectural theory have been articulated in countries where orthodox Marxism was the foundation of political theory or where Marxism inspired revolutionary or postcolonial struggles. This Special Collection of Architectural Histories examines architectural theory and its Marxist imprint in the Second and Third World from the 1950s to the 1980s, the interconnections between these different countries and traditions and the entanglements with postcolonial or anti-imperialist theories. It offers a preliminary inventory of what was going on where, and who were some of the key figures. It provides the groundwork for a more precise mapping of the worldwide impact of Marxist thinking on architectural discourse. Engels explains that in any society where art, science and government are the monopoly of a few, that minority will use and abuse its position in its own interests. This is the real basis of all class society. And this will always be the case, as long as the majority are compelled to work long hours to obtain the basic necessities of life. Aristotle long ago explained that man begins to philosophise when the needs of life are provided. The creation of a leisure class through slavery was the real material basis upon which art, science and technology has been developed. But these achievements serve to conceal the dark side of human history: namely, the exclusion of millions of men and women from the benefits of culture. An immense potential has been systematically aborted and destroyed. It is the task of socialism to put an end to this terrible crime against humanity and to open the door to a new and glorious page in human development



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