
MATERIAL EXPLORATION CENTRE: AN INVESTIGATION AND INITIATIVE TOWARDS A NEW ARCHITECTURE

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Abstract: Material use and understanding has become more directly linked to architectural practice and to architectural education. Most of the time, building materials serves more than one purpose. We have an increased responsibility to understand new and often complex methods of evaluating materials and possible ways to use them. This paper explores the possibility of “providing a centralized facility” which will aid and increase a healthy interaction between the students, researchers, suppliers and professionals to understand; the various building materials, their properties and availability, to have an open atmosphere for experimentation, research and testing facilities. Hence, the center consists of the following zones such as “the public zone” -Exhibition, Workshop, library and “Semi Public Zone”-testing facilities, administration and residential. A place that combines the past present and the future. A design to “Experience Spaces & Learn” .In order to achieve the objectives, several live case studies were carried out which covered available facilities, zoning concepts, landscape, orientation of the buildings, energy optimization/reduction concepts, water conservation systems etc. A resulting design generated based on the studies made Using light as a building material – tunnel lighting to emphasize on the sustainable and vernacular materials, Screen walls-to create an energy efficient design, feasibility . Cutting down electricity and water consumption, a “recyclable energy sources”, vocational training workshops, touch and feel experience, material testing facilities. The avalanche of this facility available to architects, designers & engineers necessitates rethinking of traditional classification, usage possibility or characterization of materials.

Keywords: Energy Efficient Architecture, Recyclable Energy Source.

Introduction: Today the character of activities and architectural solutions of traditional libraries do not answer the needs of modern information society and particularly its needs on information provision. There is a great lack of modern libraries in India.

The style of Indian Architecture took a sharp turn towards a new contemporary mode with a spin of 21st century [1]. The nation saw a drastic change in the modern built environment. Our society is moving at a faster pace in all terms, due to increase in population, there is demand for saving time and energy. Material use and understanding has become more directly linked to architectural practice and to architectural education. Choosing materials for an architecture project is not only about meeting technical requirements but also; Performance aspect, user experience; material appearance and durability play an equally important role while designing. Material knowledge is a vast area of different branches and category, from foundation to the end product, also with the number of choices available in market. One better way to understood is when all materials are made available at one place, and the knowledge that can be attained is not just on a local aspect but also on an international level. Hence the person not only learns the past, understands the present but can also explore new materials for an even better future.

Motivation of The Study: The aim of this project is to create a space where a whole range of material knowledge can be attained by the user, also create an open environment for the users to explore and discover new methods to build more energy efficient design for the coming future. A design to

“Experience Spaces” through stimulations such as the visual, sensory, audio or even the smell and feel of it and to generate and practice methods to minimize the negative environmental impact.

Methodology: In order to achieve the objectives, several live case studies were carried out which covered available facilities, zoning concepts, landscape, orientation of the buildings, energy optimization/reduction concepts, water conservation systems etc. Hence the person not only “learn” the past, “understand” the present but can also “explore” new materials for an even better future. The Comparative Case Studies Gives us a better understanding (Table.01).

The Table explains the following: Circulation pattern to be linear branched & radial. Also the style of the buildings is an added advantage showing a strong identity. Clear demarcation of zones – study , service , admin etc. Importance given to lighting during designing.

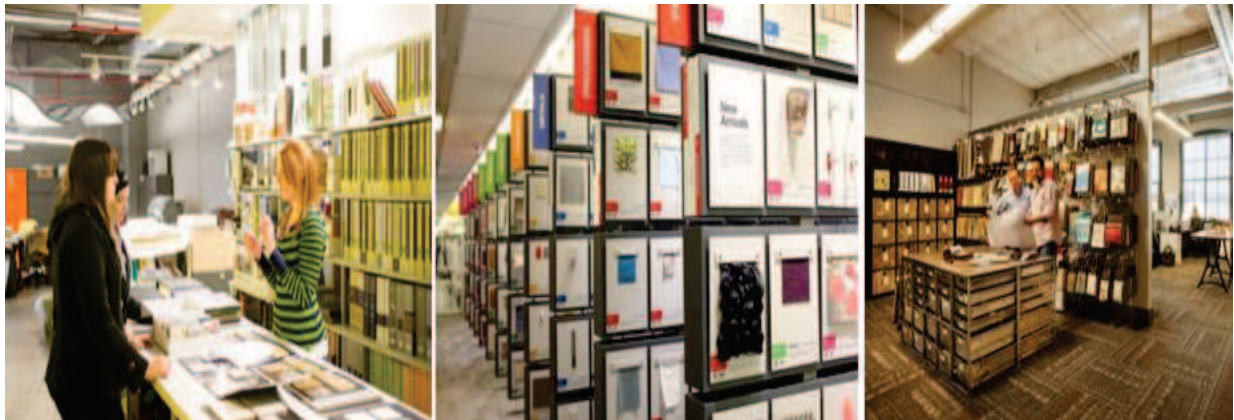


Figure 1: Literature Study [1]



Figure 2: Material Display & hands on Experience


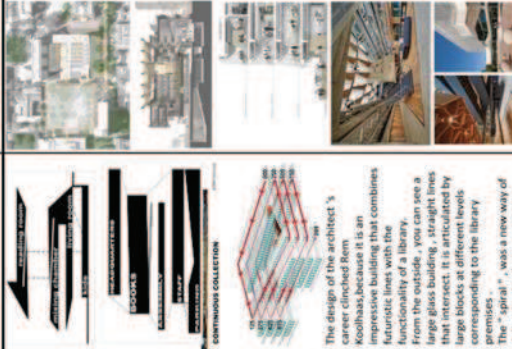





LOCATION	MELBOURNE SCHOOL OF DESIGN	SEATTLE PUBLIC LIBRARY	SALT LAKE CITY LIBRARY	AUROVILLE MUD WORKSHOP LIBRARY	BRITISH COUNCIL LIBRARY	ANNA CENTENARY LIBRARY	CONSENMARA PUBLIC LIBRARY	JEWISH MUSEUM
<p>LOCATION</p> <p>TPOLOGY</p> <p>AREA</p> <p>ARCHITECT</p> <p>PLANNING CONCEPT</p> <p>CIRCULATION PATTERNS</p>	<p>BERLIN,GERMANY</p> <p>Museum</p> <p>15,900 sq.m</p> <p>Daniel Libeskind</p> <p>Deconstructivism</p> <p>linear</p>	<p>SEATTLE, WASHINGTON</p> <p>Library</p> <p>33,733 sq.m</p> <p>Renn Koobas & Joshua Prince-Ramus</p> <p>Futuristic</p> <p>Linear & Circular</p>	<p>SALT LAKE CITY, UTAH</p> <p>Library Cum Public Space</p> <p>12,000 sq.m</p> <p>Mohe Sidle</p> <p>Contemporary</p> <p>linear & branched</p>	<p>AUROVILLE, MATTUR</p> <p>Library Cum Workshop</p> <p>Plot Area: 5,500 sq.m Built Up: 2,000 sq.m</p> <p>Vernacular</p> <p>linear & branched</p>	<p>ANNA SALAL CHENNAI</p> <p>Library</p> <p>Plot Area: 5,500 sq.m Built Up: 2,000 sq.m</p> <p>Contemporary</p> <p>linear & branched</p>	<p>GUINDY, CHENNAI</p> <p>Library</p> <p>Plot Area: 30,000 sq.m Built Up: 10,000 sq.m</p> <p>CRN Architects</p> <p>Contemporary</p> <p>linear, central & radial</p>	<p>EGMORE, CHENNAI</p> <p>Library</p> <p>Plot Area: 65,000 sq.m Built Up: 40,000 sq.m</p> <p>Henry Erwin</p> <p>Indo-saracenic Style</p> <p>linear & Branched</p>	<p>BERLIN,GERMANY</p> <p>Museum</p> <p>15,900 sq.m</p> <p>Daniel Libeskind</p> <p>Deconstructivism</p> <p>linear</p>
<p>PROGRAM & CIRCULATION</p>	 <p>Jewish museum: The museum is an extension in Berlin & Jewish history. Also stays forever in the memory of the citizen. between the lines, which is a depiction of a simple straight line broken to fragments into tortuous indefinite lines. The voids remind of world war 2 where the emptiness of Jewish past never to be eliminated The concrete walls add cold overwhelming atmosphere where light only penetrates through small gaps. The style creates fragments & sharp opening's like scars creating intersecting shadows representing the Jewish Community & voids forces visitors to pathways & voids</p>	 <p>Built Pedagogy: The building itself would teach the students about design, structure & construction 5th Floor Feature: Structural Timber Level floor Hanging Studio Exposed Steel Y Shopeces exposed Concrete Frames 12m Steel Cantilever & long Span Floor</p>	 <p>Salt Lake City Library: The building consists of a five-story triangular shaped structure housing the stacks & readers, an adjacent rectangular structure for the cafe & enclosed "urban room" facade cum stairway leading to the terrace roof garden also housing the reading spaces inside. The urban room opens into a large atrium which is lined with shops, restaurants, meeting rooms & auditorium. The fifth floor library, on the lowest level, spills outdoor into an open theatre & children's play area. A south facing five-story double glazed jms opens the entire library towards the mountain view while providing shade of trapping sun heat, & is appropriate to each season.</p>	 <p>CSEB (Compressed Stabilized Earth Blocks) composed of soil, sand, water, stabilised with 5% of cement & composed manually. Using raw materials as building materials. Low Cost, Low Carbon, Local material serve good advantage Also reusing the old methods into new ways</p>	 <p>ZONES: English teaching library, Conference section, Office, Parking (bike & car), Security PLANNING L Shaped Library Space Linear plan and fluidity show through the use of furniture a design played with levels outdoor reading space AMBIENCE: Use of Bright Colours and materials such as glass to increase the penetration of light into the building.</p>	 <p>Passive design features: Orientation: all reading areas are located in the north & east next to glazed facade while stacks are inside Landscape - green amphitheatre & landscape courtyard in the heart of the library Thermal buffers such as roof overhangs, pergola & metal elements are part of the design Building materials: solar efficient glass, roof over deck insulation of 75mm thick, fly ash bricks, VOC paints, fly recycled carpets Water recycling systems, rainwater system & STP are also provided</p>	 <p>Old Structure - INDO-SARACENIC CHARACTERISTICS Domes,Overhanging Onion (Bulbous) Eaves,Pointed Arches, Cusped Arches, or Scalloped Arches ,Vaulted floors ,Domed Chattris ,Towers or Minarets ,Harem Windows ,Open Pavilions ,Pierced Open Arcading New Building - To cope up with the increasing stack, a three stored T shaped building with 71,200 sq. ft. was constructed in 1973. Materials Such as brick & wood used. Zoned according to usage with increased facility & more reading space. But the re was an identity & style in the old building that the new did not posses.</p>	<p>DESIGN PRINCIPLE & ELEMENTS</p>

Table 1: Comparative Case Study

Site Location: Shollinganallur
 Zone: SEZ Zone
 Site Area: 23,000 sq.m
 OSR: 2,070M
 Plot Frontage: 20m Maximum FSI: 1.5 Minimum Setback: 6m
 The site is adjacent to the arterial OMR Road
 (Figure 3 & Figure 4)

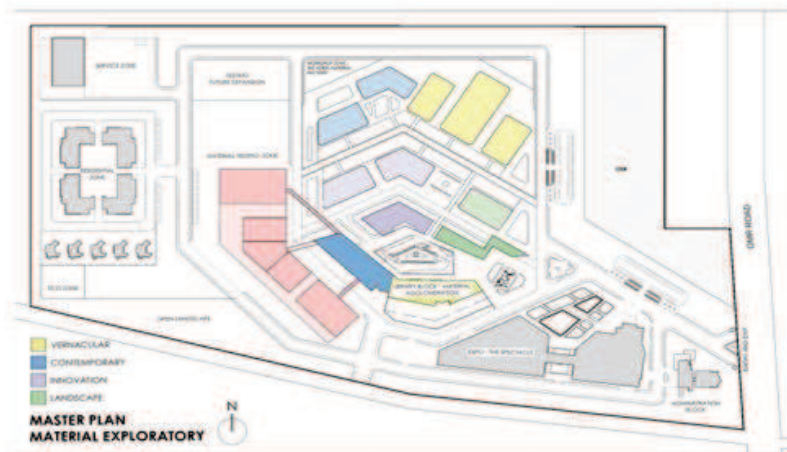


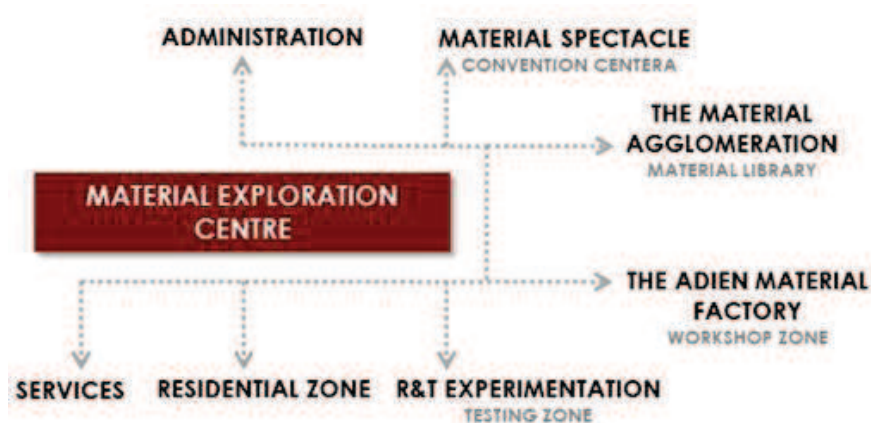
Figure 3: Site Plan with 4 Major Zone Style



Figure 4(a): Master Plan View



Figure 4(b): View



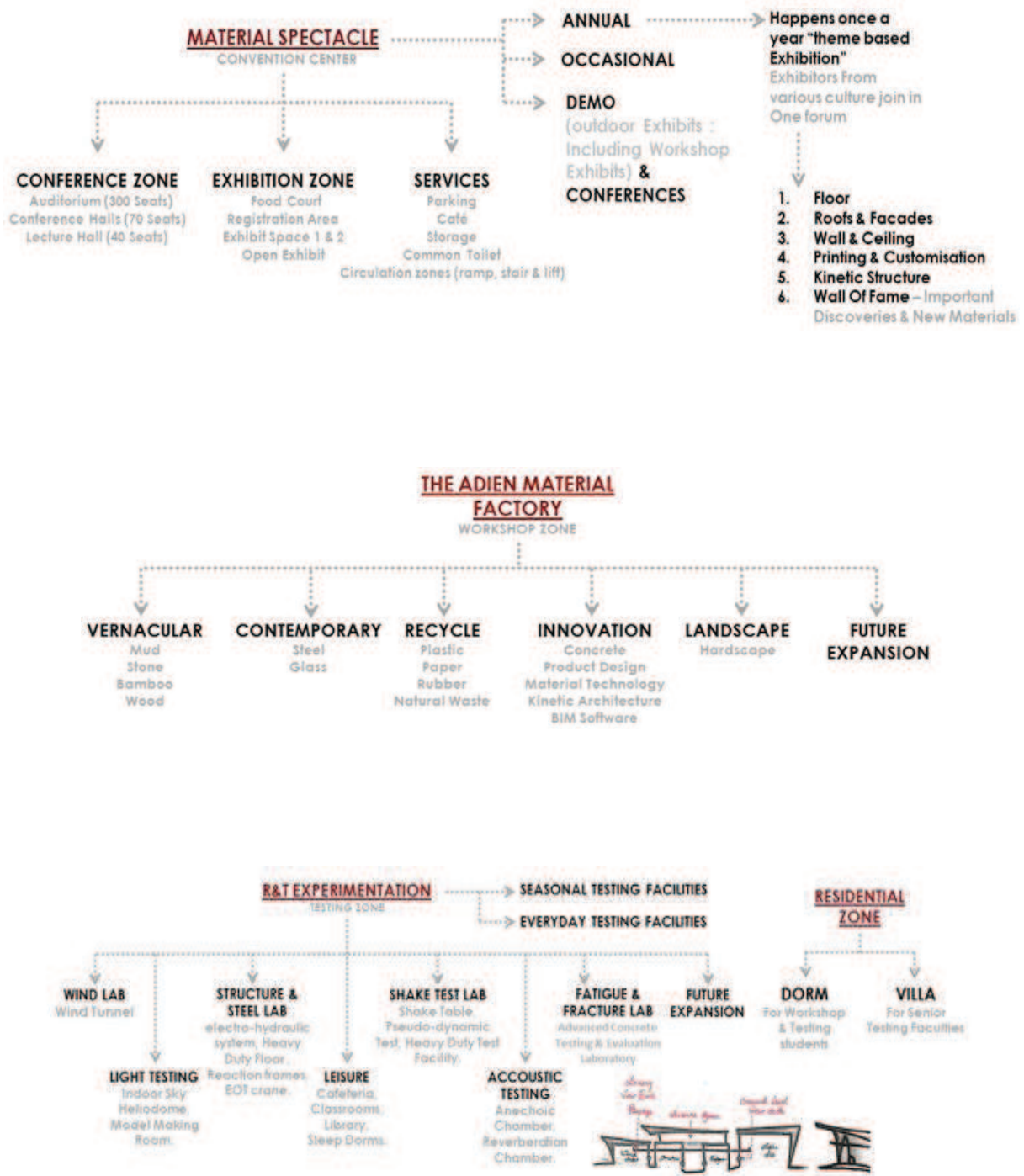


Figure 5: Zonal Program

THE MATERIAL AGGLOMERATION
MATERIAL LIBRARY

	VERNACULAR	CONTEMPORARY	INNOVATION	LANDSCAPE
Ground Floor	History & evolution	Architectural movements & Exhibit	Modern Innovative Materials	History & evolution of Landscape
First Floor	Vernacular structures around the world	Contemporary Structural knowledge: foundation to wall	Tensile Structure	Material & Technology : Disaster Resistant Construction Technique
Second Floor			Kinetic Structure	
Third Floor	Low-cost Sustainability climatology	BC ,SSP , BS & safety management	Parametric Architecture & 3d printing	Different Landscape Types
Fourth Floor	HOA, TOA , Urban Housing Conservation	Industrial Design , Productdesign, Ppe, Ad, Project Management & Safety Management	Research Books	Green House Explaining Hard & Soft Landscape & Different Plants

Figure 6: Library Program

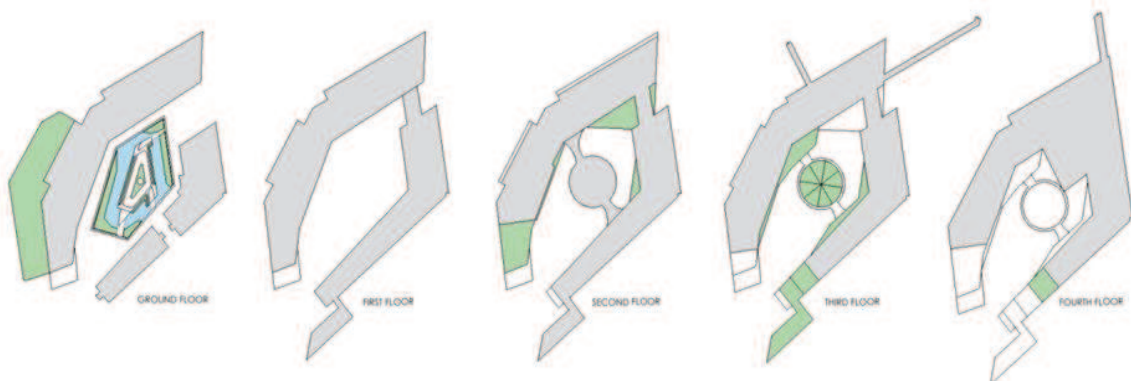
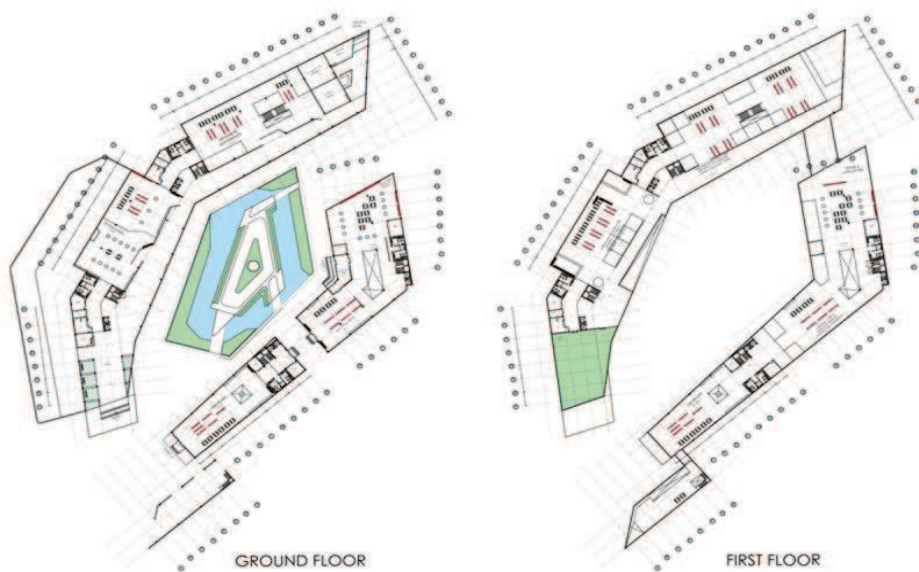


Figure 7: Library Conceptual Floor Plan



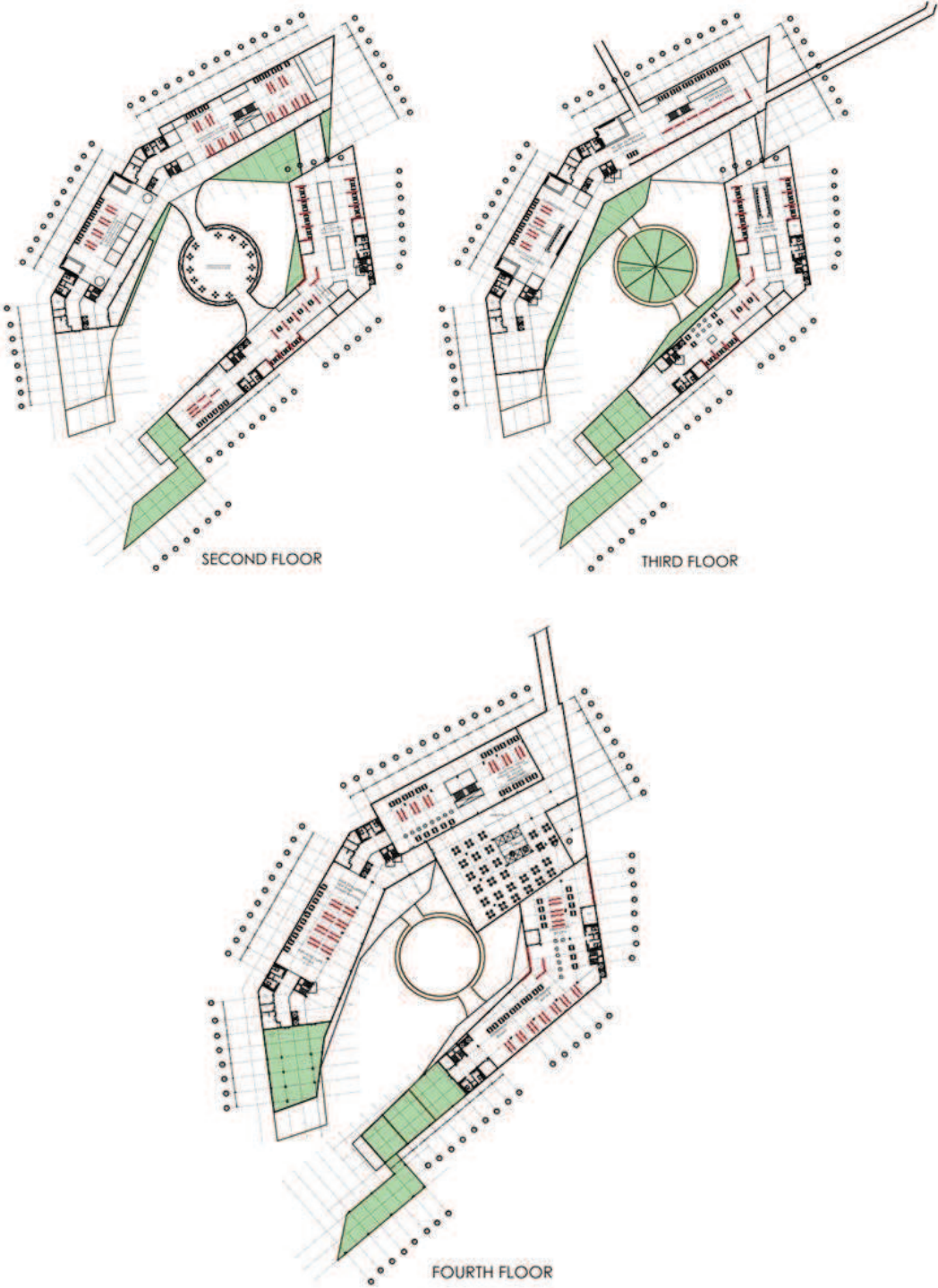


Figure 8: Library Detailed Floor Plan



Figure 9: Library Conceptual Section

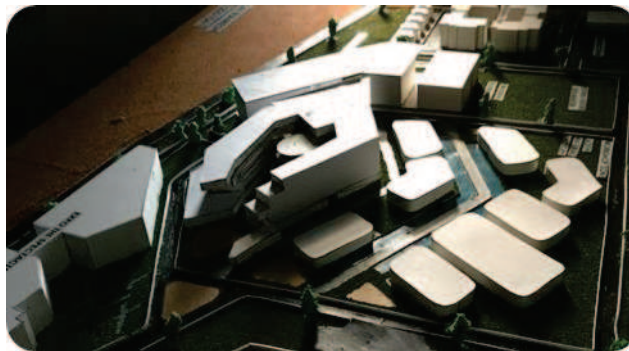


Figure 10: Library View

Conclusion: The Design concept: Deconstructivism, an idea to expose the wide range of materials and techniques used. Four major zone style : vernacular , contemporary , innovative and landscape. The service cores are situated on 4 main areas between zones on each floor. The library, testing (direct connection in 2 levels – (1)3rd floor for users to view the testing facilities & at 4th floor for researchers to access the cafeteria) & workshop (visual connection). The Breakage at the front along each level (near main entrance) is for the users at expo to view the library plaza. There are various materials technique used: exterior wood, old bricks used old wind shields in parking & semi open areas. Water at the central plaza, solar roofs etc. The Plan illustrates the formulated conception of modern library & better educational facility.

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