The Urban Tetris : Incubating through Collaboration & Community

Bhelpa, Lalitpur

BY

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760128

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CERTIFICATE

This is to certify that the thesis entitled **'THE URBAN TETRIS': "INCUBATING THROUGH COLLABORATION AND COMMUNITY"** at ***Bhelpa, Lalitpur*** submitted to the Department of Architecture of Khwopa Engineering College by **Ms. Prasoon Shrestha** of Class Roll No. 28 /B.Arch./076 has been declared successful for the partial fulfillment of the academic requirement towards the completion of the degree of Bachelor of Architecture of Purbanchal University.

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ABSTRACT

The project *"The Urban Tetris: Incubating through Collaboration & Community"* envisions a dynamic architectural intervention to foster innovation, entrepreneurship, and collaboration in Nepal. As the global economy shifts toward knowledge-based industries, incubation centers have become essential for supporting start-ups with resources, mentorship, and infrastructure. This project emphasizes the role of architecture in enabling these processes through modular, flexible spaces that adapt to the evolving needs of start-ups. By integrating physical and digital infrastructures, *The Urban Tetris* aims to create an environment conducive to creativity, knowledge exchange, and business growth.

In Nepal, the need for incubation spaces is critical. Despite rising entrepreneurial activity, challenges such as limited resources and weak infrastructure persist. According to the World Bank, Nepal’s start-up ecosystem is still emerging, with only a few formal incubators in operation (World Bank, 2021). Establishing dedicated incubation spaces can address these gaps by providing affordable work environments, fostering collaboration, and connecting start-ups to global networks. Countries with strong incubation frameworks show higher business survival rates and greater economic diversification (OECD, 2019).

This report outlines the architectural strategies behind *The Urban Tetris*, which focuses on spatial adaptability, sustainable design, and community engagement. Inspired by the modular concept of "Tetris," the design offers a flexible model that mirrors the evolving nature of start-ups. In a developing country like Nepal, where infrastructure challenges hinder innovation, incubation centers are crucial for fostering a knowledge-based economy and empowering future innovators.

The Urban Tetris seeks to be a model for future incubators, showcasing how architectural design can support entrepreneurial ecosystems and drive social and economic progress in Nepal.

Keywords: Incubation center, entrepreneurship, start-up ecosystem, Nepal, modular architecture, flexible design, knowledge-based economy, innovation, collaboration, community engagement, sustainable design, architectural strategies.

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DECLARATION

I declare that this dissertation, titled *"The Urban Tetris: Incubating through Collaboration and Community"*, is the result of my own independent research, design, and investigation carried out under the guidance of my academic supervisors, except where otherwise stated. It has not been previously accepted in substance for any degree, nor is it being concurrently submitted for any degree at any university or institution. All sources of information, case studies, and references have been duly acknowledged. I take full responsibility for the originality and authenticity of the content presented herein. I hereby give consent, if this dissertation is accepted, for it to be available for photocopying and understand that any reference to or quotation from it will receive proper acknowledgment.

Prasoon Shrestha

760128

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Introduction

An incubator is a specialized facility that supports early-stage start-ups and entrepreneurs working at the intersection of design, technology, and innovation. These incubators provide a structured environment where new businesses can develop and grow by offering critical resources such as office space, technical support, mentorship, and access to funding. Their primary goal is to nurture innovative ideas, help entrepreneurs overcome initial challenges, and guide them toward becoming sustainable and competitive businesses.

Business incubators typically offer a range of services that are vital for the growth and success of start-ups. These include business development support—such as assistance in creating business models, marketing strategies, and financial planning—and mentorship from industry experts and experienced entrepreneurs to help navigate technical, operational, and market-related challenges. Incubators also facilitate networking opportunities by connecting start-ups with investors, collaborators, and other entrepreneurs—creating an ecosystem where ideas can be shared and refined. Many offer access to advanced technology, prototyping facilities, and specialized design tools essential for product development and innovation.

In addition to providing physical and technical resources, incubators play a crucial role in reducing the risks of starting a business. Affordable office space, shared services, and professional guidance allow start-ups to focus on innovation while minimizing operational costs. Incubators also help businesses gain credibility and visibility—especially important when seeking investment or entering new markets.

However, in Nepal, the establishment of formal incubation and collaborative hubs remains virtually nonexistent compared to other developing countries. This gap limits opportunities for individuals eager to start or scale ventures. The creation of well-structured incubation centers—with proper guidance, networking platforms, and organizational frameworks—would not only empower aspiring entrepreneurs but also bolster Nepal's economic growth by fostering innovation and job creation.

A few promising examples show what's possible: ***Sajilo Marmat Sewa****, a home-services startup that began in* ***IdeaStudio Nepal's coworking space****, achieved an annual turnover of NPR 8.3 million after launching with design and operational support.* Similarly, **BatchNepal's "BatchNepal for Startups" program**, launched on July 1, 2024, has been offering mentorship,

global startup credits (over USD 50k), and technical guidance—helping Nepali tech start-ups gain traction and connect internationally.

The Nepali government has also recognized this need. In the fiscal year 2081/82 (2024/25), it announced a plan to establish **incubation centers in all seven provinces**, allocating **NPR 260 million** toward these provincial hubs. Furthermore, the subsequent budget (2082/83, 2025/26) included **NPR 740 million** for digital infrastructure—alongside **NPR 730 million** earmarked specifically for startup loans and support, including incubation through government-university-private partnerships with concessional 3% interest loans.

Figure 1Incubation introductory Scenario, Nepal

1.2 Types of Incubation models

a. Academic Incubators
b. Non-profit development
c. Venture Capital Firms
d. For profit developments

What are Design & Technology Start-Ups?

Design and technology start-ups are innovative, early-stage businesses that focus on creating new products, services, or solutions by combining design principles with advanced

technology. These start-ups operate across a variety of sectors, including software development, product design, artificial intelligence, digital platforms, and sustainable technologies. Their primary aim is to address modern challenges through creative problem-solving and technological innovation, often introducing disruptive solutions that reshape industries and consumer experiences.

Design and technology start-ups typically emphasize user-centered design, which prioritizes functionality, aesthetics, and ease of use while integrating cutting-edge technology. This combination allows them to develop innovative solutions such as smart devices, digital applications, and sustainable design products. Many of these start-ups adopt agile methodologies, enabling them to rapidly prototype, test, and refine their ideas in response to user feedback and market demands.

A defining feature of design and technology start-ups is their focus on scalability and innovation. These businesses often begin with a small, dedicated team and a novel concept, with the potential to expand rapidly as they attract investment and market adoption. Unlike traditional businesses, they thrive on experimentation, adapting quickly to technological advancements and shifting consumer needs.

Globally, design and technology start-ups play a crucial role in driving economic growth and technological progress. They contribute to job creation, advance technological development, and foster a culture of innovation. For developing countries like Nepal, these start-ups present an opportunity to bridge technological gaps, promote entrepreneurship, and participate in the global digital economy.

In essence, design and technology start-ups are the engines of modern innovation, blending creativity with technology to develop forward-thinking solutions that impact industries and improve everyday life.

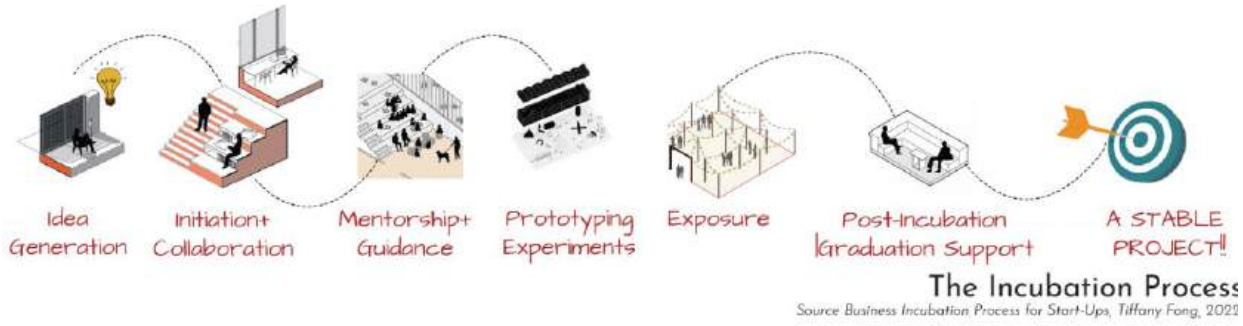


Figure 2Services & Process of Incubation

1.4. History of Incubation Centers

The concept of incubation centers originated in the 1950s in the United States, driven by the need to support small businesses and stimulate local economies. The first recognized business incubator, the Batavia Industrial Center, was established in 1959 in Batavia, New York, by Joseph Mancuso. It was created to provide resources and workspace for businesses affected by factory closures. This early model laid the foundation for modern incubation centers by offering affordable spaces, shared facilities, and business support to emerging companies. Throughout the 1960s and 1970s, the incubation model spread across the United States, focusing primarily on industrial and manufacturing sectors to address unemployment and economic decline in post-industrial cities.

In the 1980s, the incubation model evolved with the rise of technology and innovation-driven economies. Universities and research institutions began establishing technology incubators to commercialize research and support start-ups in fields like information technology and biotechnology. Notably, Silicon Valley became a global hub for innovation, with institutions such as Stanford University fostering the growth of tech giants like Apple and Google. During this period, incubation centers expanded beyond physical resources to include mentorship, business consulting, and investor networking. Organizations like the National Business Incubation Association (NBIA), founded in 1985, played a significant role in formalizing incubation practices and promoting global knowledge exchange.

The 1990s and early 2000s witnessed a surge in incubation centers worldwide, fueled by the dot-com boom and increasing government support for entrepreneurship. Countries recognized the economic value of start-ups and began investing in national innovation policies. Incubators diversified to include design, creative industries, and social innovation, supporting a broader range of start-ups. The emergence of business accelerators, which offer short-term, intensive programs, further transformed the incubation ecosystem, providing rapid scaling opportunities for high-potential start-ups.

Today, incubation centers are a global phenomenon, supporting a wide variety of industries from technology to sustainable development. Many governments, universities, and private organizations continue to establish incubation programs to drive economic growth, technological advancement, and job creation. In developing countries like Nepal, incubation centers are increasingly recognized as essential to fostering innovation, supporting entrepreneurs, and integrating local economies into the global market. The history of incubation centers reflects a continuous evolution driven by economic needs and technological progress, positioning them as crucial infrastructure for future innovation.

The review traces the evolution of incubation centers globally and in Nepal:

- **1950s-1960s**: Rise of Silicon Valley as a hub for technological innovation.
- **1980s-1990s**: Emergence of around 1000 incubation centers worldwide.
- **Early 2000s**: Informal business incubation centers begin to emerge in Nepal.
- **Late 2000s**: UNDP introduces entrepreneurship programs in Nepal.
- **2013**: Establishment of Nepal Entrepreneur's Hub (NeHUB).
- **2014**: Nepal Youth & Entrepreneurship Policy focuses on rebuilding and social entrepreneurship.
- **2020**: COVID-19 accelerates digital adaptation, leading to a 150% rise in start-ups in Nepal over the last decade.

1.5. Objectives

- To analyze existing incubation scenarios in Nepal and globally, identifying strengths, weaknesses, and areas for improvement.
- To investigate how architecture influences incubation culture by fostering an environment that encourages collaboration, innovation, and creativity.
- To study the integration of advanced technologies within incubation spaces and their role in supporting start-up development.
- To examine the relationship between physical space and the entrepreneurial process, exploring how spatial design impacts productivity, networking, and innovation.
- To achieve multidisciplinary and sustainable goals by designing a flexible, eco-friendly, and future-ready incubation center that supports diverse start-up needs.

1.6 Justification

Establishing a design and technology incubation center in Nepal is essential for bolstering the nation's economy and nurturing its burgeoning start-up ecosystem. Despite being relatively young, Nepal's start-up scene has shown significant promise, with innovative ventures transforming markets and redefining value creation.

However, many Nepali tech start-ups face challenges in expanding their customer base beyond national borders, limiting their growth potential.

Business incubators have proven effective in supporting start-ups by providing management assistance, mentoring, access to financing, and flexible leasing options. Graduated companies from

such incubators tend to have a higher probability of success and positively impact economic development. In developing countries, micro, small, and medium-sized enterprises (MSMEs) account for nearly 90% of all employment, underscoring their critical role in addressing unemployment and poverty. Business incubators serve as vehicles to improve enterprise survival and growth, thereby enhancing economic stability.

By establishing a design and technology incubation center, Nepal can create a supportive environment that maximizes the chances of success for start-up companies. This initiative would not only foster innovation but also stimulate job creation and contribute to the nation's economic growth. Such a center would address current challenges faced by entrepreneurs, including limited access to capital, networks, and knowledge, thereby democratizing entrepreneurship and making it more attainable for aspiring business owners.

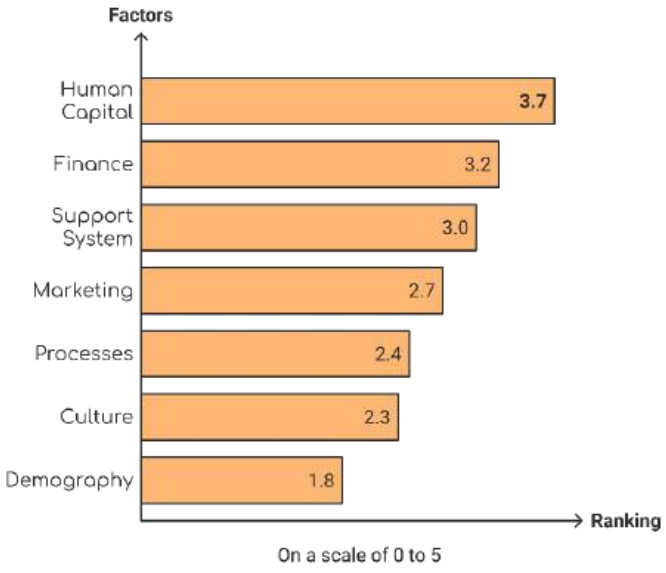


Figure 3Factors challenging start-up growth in Nepal

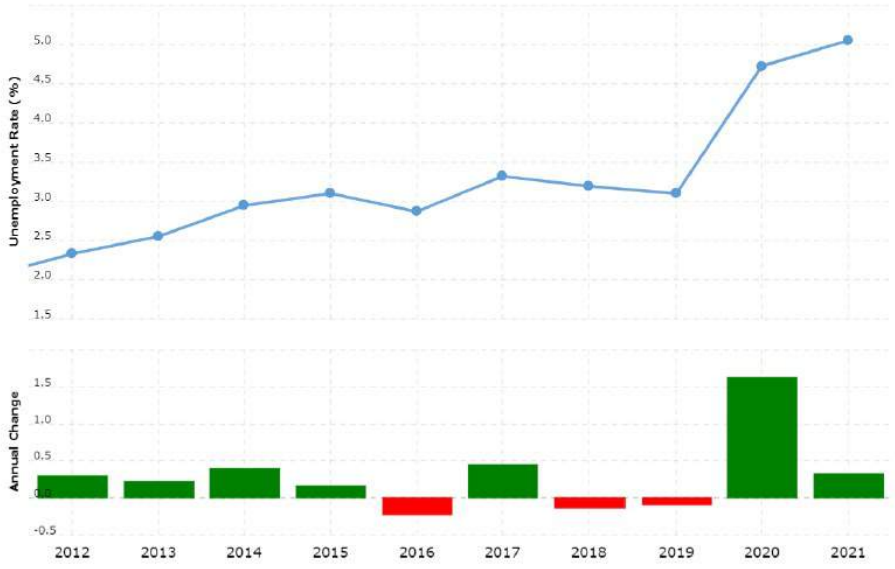


Figure 4: Rise of Unemployment over the years

2.Literature Review

2.1. Introduction

An incubator in business speak is a company that helps new and startup companies to develop. Its basic mode of this empowerment, is by providing services such as management training and/or office space.

2.1 An Incubator's Services

Since startup companies lack many resources, experience and networks, incubators provide services which helps them get through initial hurdles in starting up a business. These hurdles include space, funding, legal, accounting, computer services and other prerequisites to running the business. On average, incubator clients spend 33 months in a program while many incubation programs set graduation requirements by development benchmarks, such as company revenues or staffing levels, rather than time. The following services are generally provided by the Incubator:

Management: Management team identification

Help with business basics

Networking: Networking activities

Technological Accessibility: Links to higher education resources

High-speed Internet access

Marketing: Market Research

Marketing assistance

Financial: Help with accounting/financial management

Access to bank loans, loan funds and guarantee programs

Presentation/Advertising: Help with presentation skills

Business Training: Comprehensive business training programs

Mentorship: Advisory boards and mentors

Ethical/Legal Aid: Help with business etiquette

Regulatory Compliance: Help with regulatory compliance

IP Management: Technology commercialization assistance

Intellectual property management

Partnering: Access to angel investors or venture capital

Links to strategic partners.

2.3 Evolution of Business Incubators

The creation of Companies and Business and Product Market usually arises as a result of social, economic and technological crisis. It is widely considered that the idea of creating new companies as a favorable way of promoting the conditions of the country arose in Britain in the 1970's during the steel crisis by converting abandoned industrial buildings into the first European Incubators. The British example was taken as precedent and followed into France, Belgium, and Spain. By the 1990's, business incubators started to appear linked to universities which were targeted at students leaving university." As for the definition and character of incubators, the European Commission proposed a definition by consensus to its function:

"A business incubator is an organization that accelerates and systematizes the process of creating successful enterprises by providing a comprehensive and integrated range of support, including incubator space, business support services, and networking and clustering opportunities.

By providing their clients with services on a "one-stop-shop" basis and enabling overheads to be reduced by sharing costs, business incubators significantly improve the survival and growth prospects of new startups.

A successful business incubator will generate a steady flow of new businesses, with above average job and wealth creation potential. Differences in stakeholder objectives, admission and exit criteria, the knowledge intensity of projects and the precise configurations of facilities and services exist and will distinguish one type of business incubator from another." (Bengani, 2017)

2.4. Work Cultures in a Workplace

The Collaborate, Create, Compete, and Control work cultures, based on the Competing Values Framework (CVF), significantly influence the spatial planning and design of a workplace. Each culture emphasizes different values and work styles, shaping the physical environment to support specific behaviors, interactions, and workflows. Here's how each culture shapes the planning of a design-focused workplace:

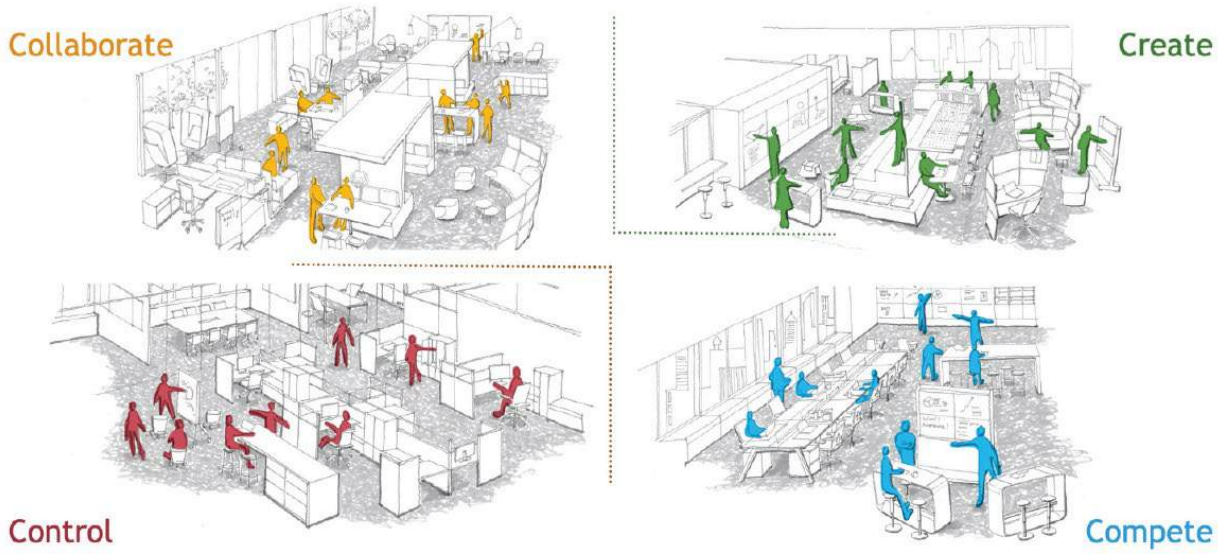


Figure 5Different work cultures in workplaces

a. Collaborate Culture (Clan Culture)

- **Focus:** Teamwork, community, and shared values.
- **Workplace Design:**
    - **Open and Flexible Spaces:** Encourage communication and knowledge-sharing through open-plan layouts and flexible workstations.
    - **Collaboration Zones:** Include casual meeting areas, lounges, and brainstorming spaces for group discussions.
    - **Human-Centered Design:** Prioritize comfort and well-being with biophilic design elements (natural lighting, greenery) and ergonomic furniture.

- **Social Hubs:** Design spaces for informal interactions, such as cafés or communal tables, to foster a sense of belonging.

Impact on Design Workplaces:
Encourages co-creation, interdisciplinary collaboration, and a community-driven approach to design projects.

b. Create Culture (Adhocracy Culture)

- **Focus:** Innovation, experimentation, and adaptability.
- **Workplace Design:**
  - **Innovation Labs & Maker Spaces:** Include dedicated areas for prototyping, testing, and experimenting with new ideas.
  - **Flexible Layouts:** Modular spaces that can be reconfigured for different projects and evolving needs.
  - **Creative Zones:** Incorporate design-thinking areas, ideation walls, and immersive tech spaces (AR/VR labs).
  - **Inspiration Spaces:** Designate areas for creative stimulation, such as libraries, galleries, or innovation showcases.

Impact on Design Workplaces:
Promotes rapid innovation, risk-taking, and a forward-thinking design process that adapts to emerging trends.

c. Compete Culture (Market Culture)

- **Focus:** Performance, results, and external competition.
- **Workplace Design:**
  - **Focused Workspaces:** Private offices and quiet zones to support high-concentration work.
  - **Performance Metrics Display:** Digital dashboards or visual displays to track project milestones and achievements.
  - **Client-Focused Areas:** High-quality presentation spaces and meeting rooms for client interactions and showcasing design outputs.

- **Efficient Layout:** Organize spaces for maximum productivity with clear work zones for different project stages.

Impact on Design Workplaces:
Drives efficiency, goal-oriented design processes, and a competitive edge in delivering innovative solutions to clients.

d. Control Culture (Hierarchy Culture)

- **Focus:** Structure, efficiency, and stability.
- **Workplace Design:**
  - **Formal Layout:** Clear departmental divisions and structured workstations to reflect organizational hierarchy.
  - **Design Review Spaces:** Meeting rooms for structured feedback, quality checks, and formal design presentations.
  - **Standardized Workspaces:** Uniform and predictable layouts with designated spaces for different roles and processes.
  - **Archival Areas:** Spaces for document storage, design records, and intellectual property management.

Impact on Design Workplaces:
Ensures quality control, process consistency, and structured workflows for delivering reliable design outcomes

2.4 Collaborative working Spaces

Collaborative workspaces are shared office environments where individuals and companies work under one roof. They range from co-working spaces to maker spaces and incubators, each catering to different needs. The primary goal of collaborative workspaces is to enhance interaction among users, leading to the cross-pollination of ideas and fostering an ecosystem of innovation. These spaces are designed to facilitate flexible working models and accommodate different user preferences, from quiet private areas to dynamic social zones.

2.1 Co-working Spaces

Co-working spaces are flexible environments where freelancers, remote workers, and startups operate in a shared setting. These spaces offer amenities such as:

- **Shared Desks & Private Cabins**: Providing flexibility for various work styles.
- **Networking Opportunities**: Encouraging collaboration between professionals from different industries.
- **Open-Plan Layouts**: Enhancing communication and interaction while maintaining efficiency.
- **Breakout Areas**: Spaces designed for informal discussions and brainstorming sessions.
- **Advanced Digital Infrastructure**: High-speed internet, cloud storage solutions, and interactive smart boards.
- **Hybrid Workspaces**: Incorporation of virtual meeting rooms, video conferencing areas, and podcast studios for remote collaboration.

Advantages of Co-working Spaces

- **Cost Efficiency**: Shared resources reduce operational expenses.
- **Flexibility**: Adaptive layouts allow companies to scale up or down as needed.
- **Enhanced Collaboration**: Encourages social interactions and exchange of ideas.
- **Improved Aesthetics & Well-being**: Natural lighting, greenery, and ergonomic furniture improve productivity.
- **Increased Productivity**: The structured yet relaxed environment fosters greater efficiency compared to home offices.
- **Access to Business Support Services**: Many co-working spaces offer legal, marketing, and financial consultation services.

Challenges

- **Distraction and Noise**: Open layouts can lead to disturbances.
- **Lack of Privacy**: Certain tasks require enclosed spaces.
- **Clutter and Overcrowding**: Poor space management can lead to inefficiency.
- **Dependence on Infrastructure**: Users rely heavily on digital facilities; technical failures can disrupt workflow.
- **Variability in Networking Quality**: The effectiveness of networking depends on the quality and diversity of tenants.

2.2 Inclusive Design for All

Figure 6Inclusive Workplace Design

Inclusive design ensures that workspaces accommodate individuals of diverse abilities, backgrounds, and needs. A truly inclusive workspace is designed not only for accessibility but also to promote a sense of belonging and empowerment for all users.

Key Principles

- **Universal Accessibility**: Compliance with ADA standards, wheelchair-accessible routes, and inclusive restrooms.
- **Ergonomic Furniture**: Adjustable desks, chairs, and screen heights for user comfort.
- **Acoustic Design**: Soundproof rooms for focused work and noise-canceling elements.
- **Wayfinding and Signage**: Braille signboards, digital directories, and color-coded pathways for ease of navigation.
- **Neurodivergent-Friendly Spaces**: Dedicated quiet zones, soft lighting options, and customizable work environments for individuals with sensory sensitivities.
- **Diversity in Spatial Typologies**: Incorporating multi-faith prayer rooms, lactation spaces, and gender.

3. Incubators and Maker Spaces

3.1 Incubators

Business incubators provide startups with resources, mentorship, and office space to accelerate their growth. Incubators play a crucial role in bridging the gap between idea generation and market readiness by offering structured support programs.

Essential Features

- **Startup Office Spaces**: Private workspaces for emerging businesses.
- **Mentorship and Networking**: Programs that connect startups with investors and industry experts.
- **Technological Infrastructure**: High-speed internet, cloud computing, and advanced prototyping labs.
- **Financial Support**: Access to funding, venture capitalists, and grants.
- **Business Development Training**: Workshops and seminars focused on business strategies, marketing, and financial planning.

3.2 Maker Spaces

Makerspaces are collaborative workspaces that facilitate hands-on learning, prototyping, and creative experimentation. These spaces are fundamental in fostering an environment of innovation where users can develop tangible products through rapid prototyping.

Design Considerations

- **Flexible Layouts**: Modular workstations for diverse projects.
- **Power Supply and Ventilation**: Dedicated zones for high-energy equipment such as 3D printers and laser cutters.
- **Safety Measures**: Fire-resistant materials, emergency exits, and protective gear provisions.
- **Material Storage**: Dedicated areas for raw materials, tools, and recycling stations.
- **Integration of Smart Technology**: AI-assisted design tools, IoT-connected devices, and automation in manufacturing processes.

4. User Analysis of an Incubation Center

Figure 7User Analysis of an Incubation Center

An incubation center serves a diverse range of users, each with unique needs that shape the design and functionality of the space. **Founders** require private offices for focused work, presentation areas for investor pitches, and adaptable spaces to scale as their business grows. **Fighters**, the core team members, need open workspaces for collaboration, quiet zones for focused tasks, and breakout areas for relaxation and brainstorming. **Family** members and early supporters benefit from comfortable visitor zones and community hubs that foster informal interactions and public engagement. **Fanatics**, the passionate advocates, thrive in showcase areas and community spaces that allow them to engage with the start-up's innovations through events and product demonstrations.

Faithful supporters, including investors and mentors, require private, professional meeting rooms and secure areas for strategic discussions. **Figures**, such as industry leaders and policymakers, need formal conference rooms and administrative spaces for regulatory collaboration and public announcements. Lastly, **Future** innovators—emerging entrepreneurs and students—benefit from learning spaces, incubation pods, and collaborative labs to foster new ideas. Designing an incubation center that accommodates these diverse groups involves creating flexible, technology-integrated, and community-centric spaces that support innovation, foster collaboration, and drive long-term economic growth.

5. Location Guidelines for an Incubation Center

Selecting the right location for an incubation center is crucial to its success and long-term sustainability. **Accessibility** is a key factor, ensuring the center is well-connected by major transportation routes, including public transit systems, to provide easy access for entrepreneurs, investors, and collaborators. Proximity to **academic institutions** and **research hubs** fosters knowledge exchange and a steady pipeline of innovative talent. Additionally, the center should be located in areas with strong **territorial synergy**—zones that already host technology parks, business clusters, or creative industries—to encourage collaboration and resource sharing. This strategic placement supports partnerships and creates a thriving innovation ecosystem.

Visibility and brand identification play a significant role in establishing the incubation center's presence. A high-profile location with clear signage enhances the center's image and attracts start-ups and investors. **Urban classification** is also essential; positioning the center in mixed-use or commercial zones provides access to essential amenities while offering a dynamic environment for networking. **Plot characteristics** such as size, shape, and future expansion possibilities must be considered to allow for adaptable spaces and evolving infrastructure needs. A well-chosen location balances these factors to create an accessible, collaborative, and future-ready environment that supports entrepreneurship and innovation

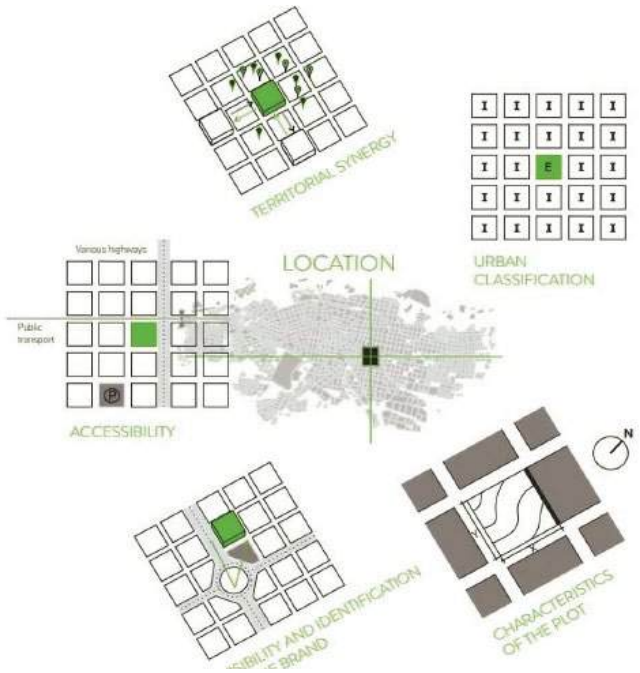


Figure 8Location Guidelines for an Incubator

6. Evolving role of amenities in workplace design

The role of amenities in the workplace has undergone a significant transformation over the years, evolving from a peripheral support function to a central component of workplace strategy. In the past, amenities such as break rooms, cafeterias, and basic recreational facilities were seen as supplementary perks designed to provide employees with a brief respite from their work. These amenities were often simple and utilitarian, aimed at fulfilling basic needs rather than enhancing the overall work experience. The primary focus of workplaces was on productivity and efficiency, with amenities playing a secondary role in supporting these objectives. However, as the nature of work began to shift, particularly with the rise of knowledge-based industries and the increasing importance of employee well-being, the perception of amenities started to change.

Today, amenities are considered an essential part of the workplace ecosystem, closely intertwined with employee satisfaction, engagement, and retention. Modern workplaces now feature a wide array of amenities, including fitness centers, wellness rooms, gourmet cafés, collaborative spaces, and even game rooms, all designed to create a more holistic and enriching work environment. These amenities are no longer just about providing a break from work; they are about fostering a culture of well-being, creativity, and community. Companies recognize that a well-designed workplace with thoughtful amenities can significantly enhance employee morale, attract top talent, and even drive innovation. As a result, amenities have become a strategic tool for organizations looking to differentiate themselves in a competitive market, reflecting a broader shift towards prioritizing the human experience in the workplace.

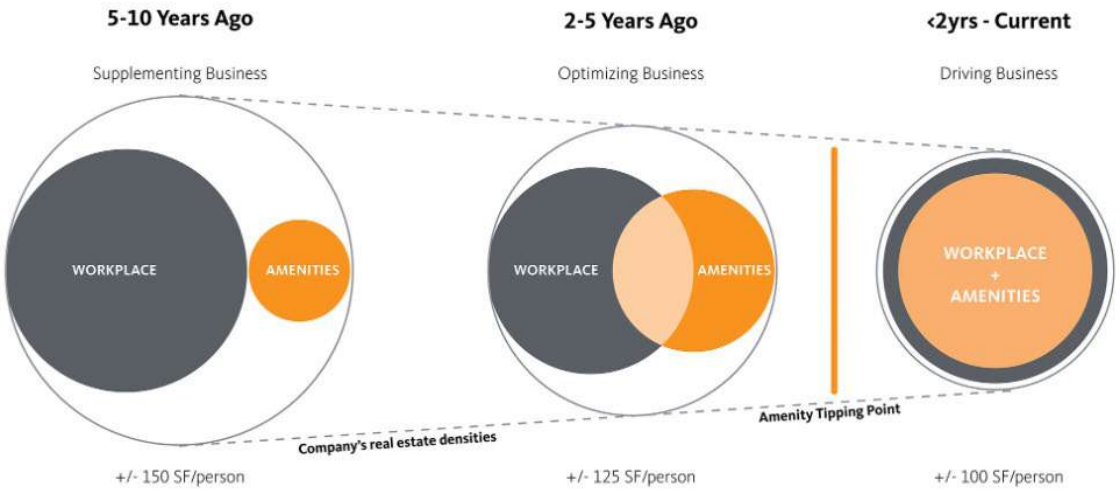


Figure 9 Rising Role of Amenities in Workspaces

7. Supporting Theories for Incubation Center Design

7.1 Propinquity Effect

The propinquity effect is a 1950's social psychology theory that assumes that strangers who encounter one another with some frequency tend to develop friendships. This idea has been implemented by for example Steve Jobs at Pixar. It has resulted in a fairly commonplace in many contemporary workplaces. According to several other research that has been done in the 50's, we can assume that the more we meet and interact with people, the more likely we are to become friends with them. When we meet others regularly we become familiar with each other more easily and find things we like about each other (Hassan, 2018).

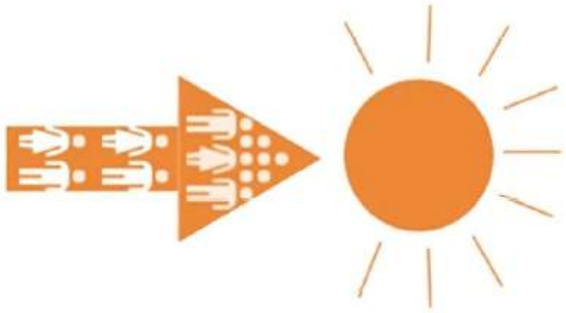


Figure 10Propinquity Concept

Three rules of Propinquity

The rule of proximity

“The closer you are to someone the more likely you are to develop a bond.” Sharing the same physical space (or possibly virtual space) increases our chances that a relationship will develop and that our cultural influences will intertwine.

The rule of frequency

“The more often you connect with someone the stronger that bond will become.” As we develop bonds, they are strengthened by the frequency of our interactions within them. The more often we see, touch and engage each other the more resilient the strands of that bond will become.

The rule of affinity

“The more similarities you share with someone the faster that bond will grow.” This is perhaps the most troublesome rule as it presents within it the risks of unconscious bias. It is our nature to be drawn to and to think only about people and things most like ourselves or our own interests. We seek out and develop fast connections with the people, and ideas that we most intimately and innately understand. As we shape our teams and our workplaces, we must be mindful to create experiences that promote and support a diverse experience for our entire organization, and to consider the needs and affinities of both those most like and unlike ourselves (Good).

7.2 The Eudomonia Machine

The **Eudaimonia Machine** is a conceptual workplace design created by architect David Dewane, inspired by the ancient Greek concept of *eudaimonia*, meaning human flourishing or fulfillment. It is a linear sequence of interconnected spaces designed to facilitate deep work, creativity, and

productivity. The layout includes zones like the gallery (for inspiration), salon (for collaboration), library (for research), office (for focused work), and deep work chambers (for intense, uninterrupted concentration). The design aims to create an environment where individuals can achieve their highest potential by balancing collaboration, learning, and deep, meaningful work. It emphasizes the importance of intentional space design in fostering human flourishing and innovation.

Figure 11 The Eudemonia Machine diagrammatic representation

8. Spatial Organization in an Incubation Centre

We define a space as an activity area with a boundary. It may contain several different activities, either simultaneous or sequential, and its boundary may be more or less substantial. Ease and speed of response to change is now a central design criterion. Businesses must change in order to survive; processes must change and with them worker's roles and relationships. So too must spaces, in order to accommodate the new ways of working, new patterns reverse the old. Workstations are becoming simple purpose, and fitted to the task both for solo activities, small rooms for quiet discussions and tele-conference rooms. Libraries, conference rooms and cafeterias, on the other hand, are now used for wide range of activities. It comes back to economy, workstations must be tailored to support excellent performance; and large spaces cannot site for long parts of the day.

Dividing spaces needed by an organization into

- • Primary: The principal workspaces

- • Circulation: Spaces to do with movement around the office
- • Support/Service: Spaces containing functions to do with operation and maintenance of the building or containing functions that support the work of whole organization
- • Social: Spaces containing functions to do with no work activities of the occupants

8.1. Movement

The Functional and psychological needs of movement are interwoven, and are best looked at together, as are the needs of the individual and of the organization. Patterns of movement: The star, the grid and the ring are the principal patterns of physical movement in an office the first two can be three dimensional, but the last only relates to single floors. Their characteristics are:

A. Star Centralized/ Orientation good/ access good at the center, but poor at the periphery/ only one choice of route easy to control and make secure/major meeting point at the center / isolating, the linear building with a spine is a simplified star.

B. Grid: Decentralized/ Orientation poor access equality good everywhere / multiplicity of routes/hard to control and secure/variety of meeting points integrating.

C. Ring: Peripheral/Orientation reasonable/access moderately good everywhere choice of two ways round/relatively easy to control and secure/ring itself is a linear meeting zone /semi integrating/if combined with several links between floors, takes on some of the characteristics of the grid pattern.

9. Spatial Components in an Incubation Centre

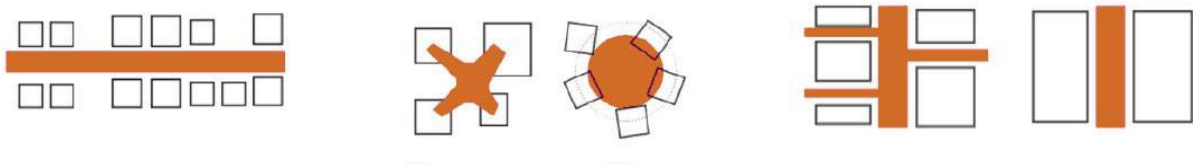


Figure 12Types of Circulation patterns

9.1 Co-Working Space

Fitting an organization into a building means approaching the problem from two directions simultaneously: how much space do a certain number of people need (additive approach), and how many people can the building hold (subtractive).

a. Spaces for Collective Work

Much individual work in offices is found in shared spaces. Many pool areas are private to an organization but others, such as a secretarial area outside a group of executive offices, have a public face.

b. Group Spaces

These are the heart of any business. They are where people meet to talk, listen and together create and implement solutions to the job in hand. They can be open or dedicated to an enclosed room.

- • Meeting Points
- • Team Spaces
- • Boxes
- • Meeting rooms
- • Presentation rooms
- c. Spaces for Solitary Work

The places people need when working alone have particular characteristics. Reflective tasks want no distractions: people nearby can be a disadvantage. The solitary worker is more

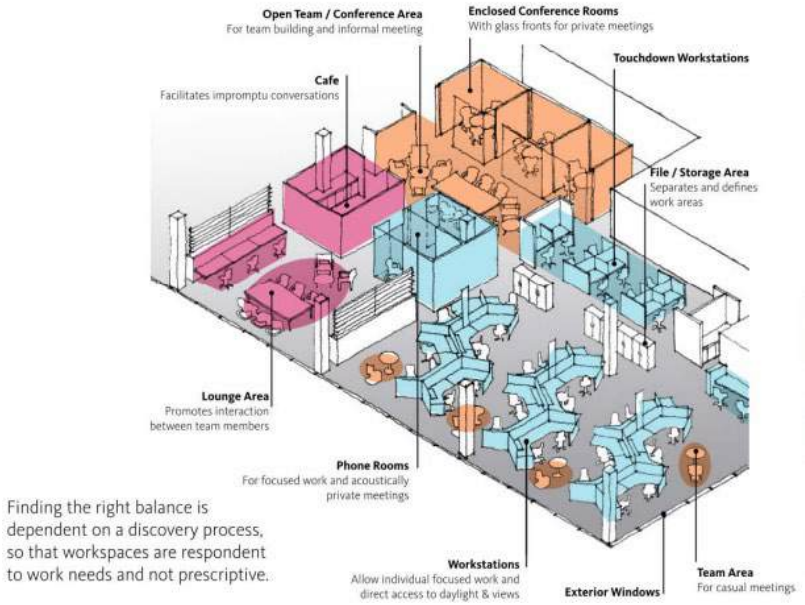


Figure 14Spatial Planning approach

Figure 13Functions within an incubation space, Gesler 2019

c. Focus Areas:

Focus spaces in a working environment are dedicated areas designed to minimize distractions and promote deep concentration. They often feature quiet, ergonomic settings with minimal interruptions, enabling employees to work efficiently and creatively

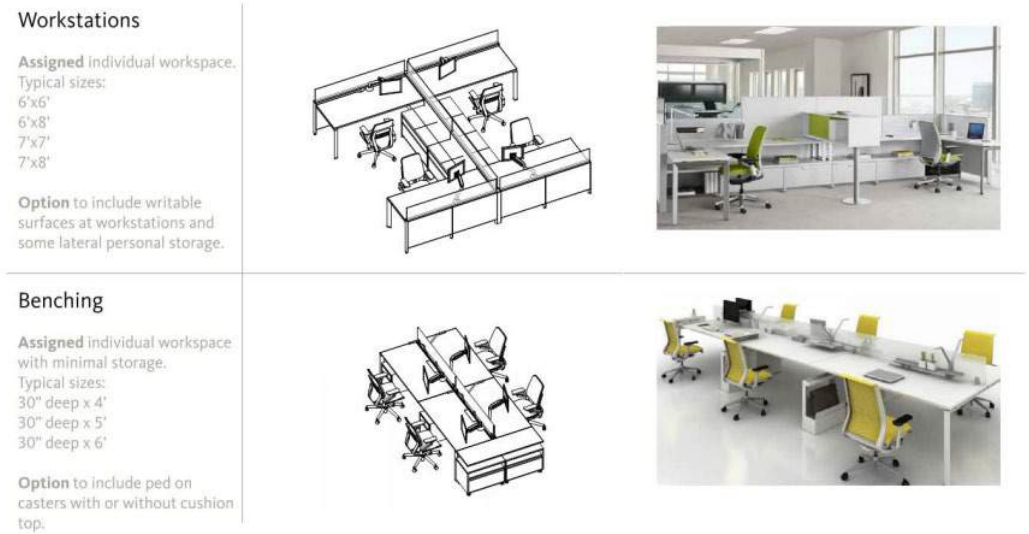


Figure 15Anthropometrics of a workstation

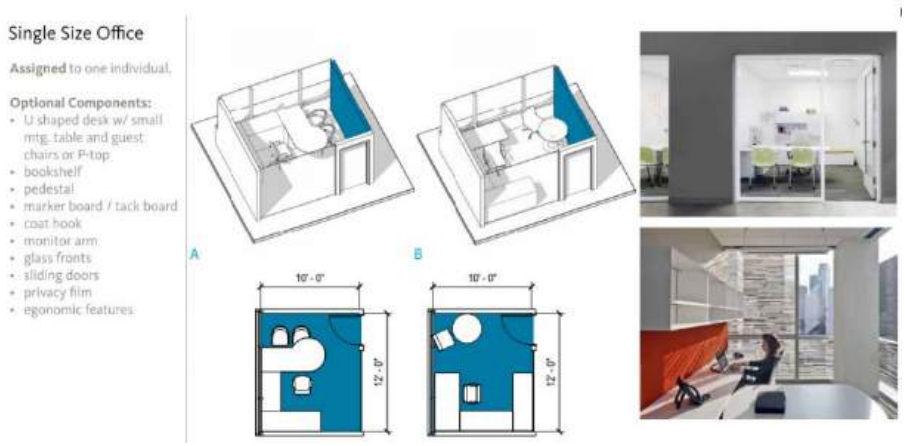
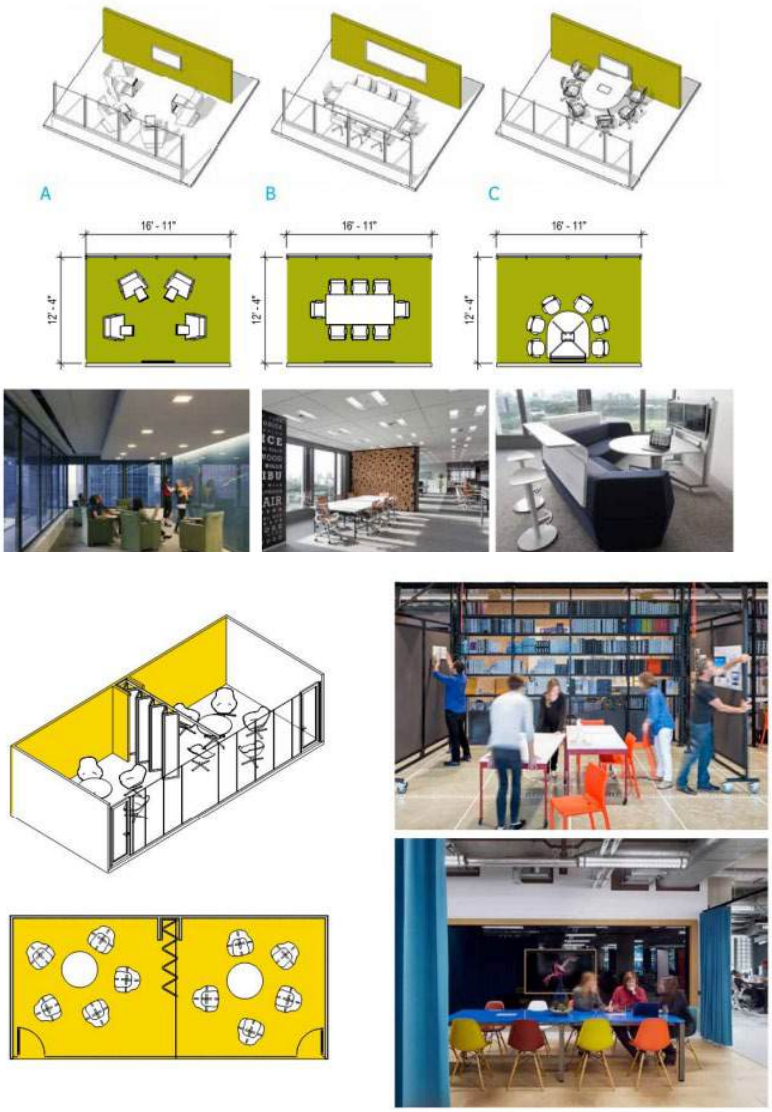


Figure 17Private Office Anthropometrics

Figure 16PhoneBooth Anthropometrics

Collaboration Space:

Collaboration spaces in a working environment are designed to foster teamwork, creativity, and open communication. These areas often feature flexible layouts, comfortable seating, and tools like whiteboards, screens, or brainstorming walls to encourage idea-sharing and problem-solving. By creating an inviting and dynamic atmosphere, collaboration spaces help teams work together more effectively, driving innovation and building stronger connections among employees



e. Socialize Space:

Socialize spaces in a workplace are designed to encourage informal interactions, relaxation, and relationship-building among employees. These areas often include comfortable seating, casual layouts, and amenities like coffee bars or games, creating a welcoming atmosphere for conversations and networking. By fostering a sense of community and belonging, socialize spaces help boost morale, reduce stress, and strengthen team dynamics, contributing to a more vibrant and connected workplace culture.

Le

Figure 18Socializing spaces typologies

f. Learning Spaces:

Learning spaces in a workspace are dedicated areas designed to support skill development, knowledge sharing, and continuous growth. These spaces often feature resources like books, digital tools, or interactive technology, as well as layouts that encourage both individual study and group workshops. By providing an environment conducive to learning, these spaces help employees stay updated, innovate, and adapt to changing industry demands, fostering a culture of curiosity and professional development.

9.2 MakerSpace

A makerspace is a collaborative work space inside a school, library or separate public/private facility for making, learning, exploring and sharing that uses high tech to no tech tools. These spaces are open to kids, adults, and entrepreneurs and have a variety of maker equipment including 3D printers, laser cutters, cnc machines, soldering irons and even sewing machines. A makerspace however doesn’t need to include all of these machines or even any of them to be considered a makerspace (What is a Makerspace?, n.d.).

9.2.1.Design Consideration

Guidelines to create makerspace;

• Identify the ethos

• Design for flexibility and adaptability

• Put it on wheels

• Plan plenty for power

• Plan for makerspace type and material usage

• Create a safe space for exploration

• Work with an expert

(Seven Tips for Designing the Ultimate Makerspace, n.d.)

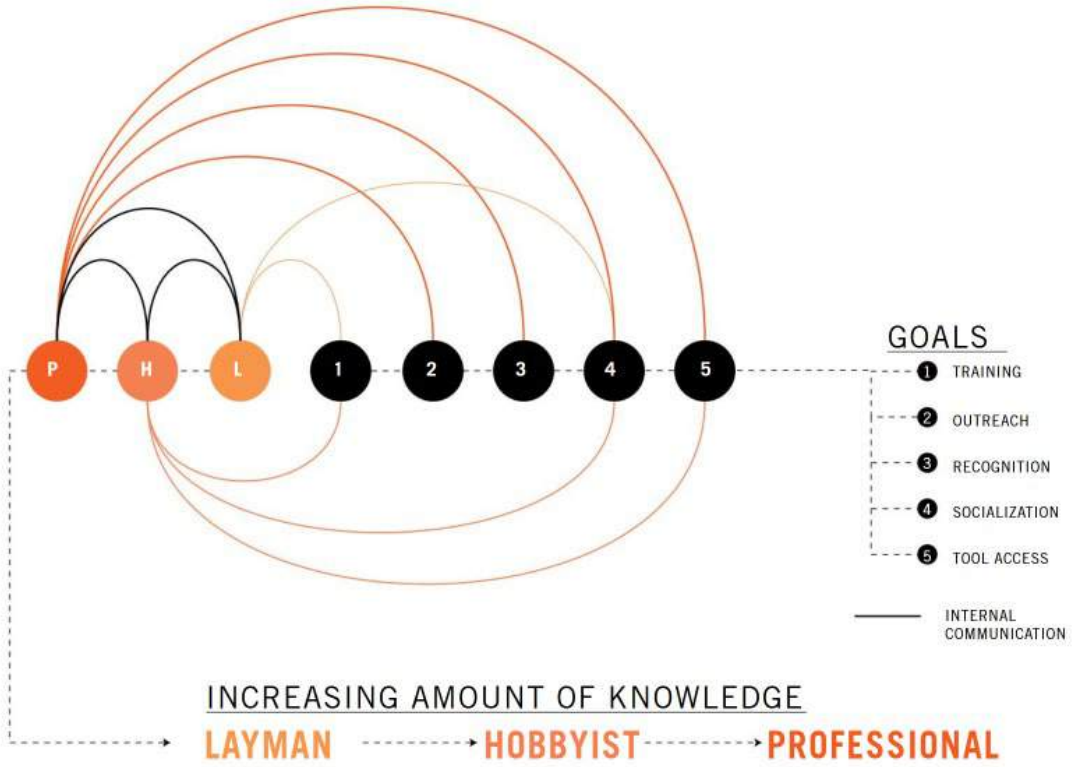


Figure 19Working Dynamics of a makerspace

9.2.2.Ventilation Demands in a MakerSpace

Ventilation demands, especially with respect to exhaust and air exchange rates, must be carefully considered. Experience has shown that the demands on the ventilation system change as the equipment technologies and the tasks performed in the spaces evolve.

• *Energy Conservation – Setbacks* - Air exchange rates where general dilution ventilation is used to maintain acceptable indoor air quality may be decreased by programming setbacks that are activated when the processes that require the higher air exchange are not in use. Air monitoring can be incorporated into the systems to trigger an increase to the air exchange rates when contaminants are detected such as a chemical spill or equipment activation or malfunction.

• *Energy Conservation - Dedicated Areas* - A means to minimize the number of required air changes in a large area is to locate the equipment and processes requiring the higher air exchange rates into smaller dedicated areas.

• *Energy Conservation - Local* Exhaust - Some machines have the capability to be directly connected to exhaust. For equipment such as open desktop 3D printers, enclosures can be purchased or fabricated that can be directly connected to building exhaust or an air filtration system. In some applications such as 3D printing and laser cutting/etching, local capture and scrubbing with high efficiency and carbon filtration with exhaust routed outdoors or back into the facility may be an option (Design Guidelines for Makerspaces, Robotics Laboratories and Student/Research Shops, 2020).

9.2.3 Layout and Machinery Specifications

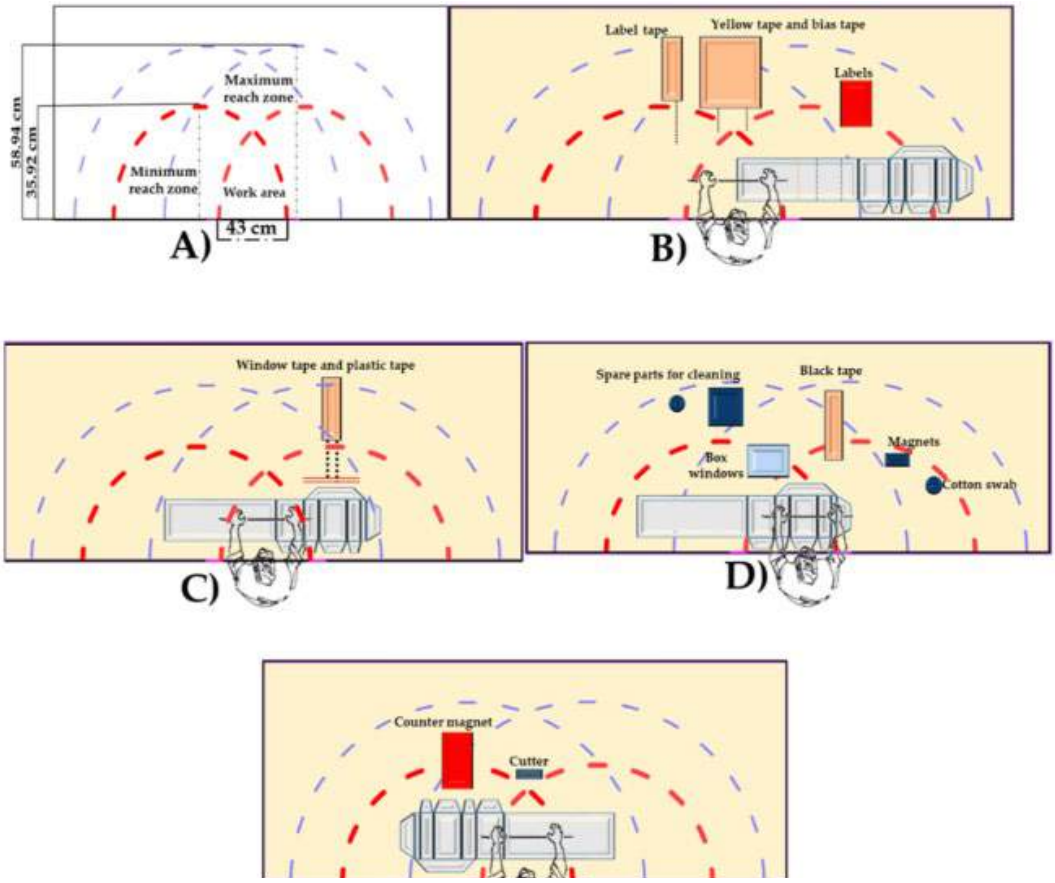


Figure 20Workstation Anthropometry

The following should be considered with respect towards layout of machinery and equipment:

• Place high hazard machines such as table saws, metal and wood working lathes, metal mills, wood and metal CNC machinery, laser cutters and etchers etc. in areas where access can be controlled.

• Only Saw Stop brand table saws may be installed in facilities used by students. Saw Stop table saws are equipped with technology that prevents amputations and minimizes the potential for serious lacerations.

• Provide adequate segregation between machinery and equipment that requires use of personal protective equipment (PPE) such as hearing protection and safety glasses, from areas where tasks are performed that do not require the use of PPE.

• Noisy equipment such as air compressors, CNC routers, power saws, dust collection systems etc. should be isolated, if possible, from other equipment.

• Three feet of clearance must be maintained around electrical equipment that may require servicing such as a circuit breaker panel.

9.2.4. Noise/Vibration Attenuation

• *Noise/Vibration Study* - Consider using an acoustical consultant to evaluate noisy equipment and provide mitigation recommendations. Equipment such as air compressors, dust collection systems, power saws and CNC machine are commonly found in shops and makerspaces. This equipment tends to run for long durations and generate noise and vibration. Carefully evaluate not only the space the equipment resides in, but adjacent spaces that may be impacted as well.

9.2.5. Storage:

Architects report that the most common complaints from end users with respect to what could have been improved in the design of shops and makerspace facilities, is lack of adequate storage. During the design phase, architects/designers tend to include adequate storage space, but it is commonly reduced at the request of end users in favor of programmatic space. This change is commonly regretted. The following storage needs should be carefully assessed:

• *Personal Belongings* – Day use and longer-term lockers for students/users to place backpacks, jackets and other personal belongings in while using the spaces. This is especially important for spaces with machinery and robots. Some state-of-the-art IoT systems use RFID information from school IDs to access the lockers.

• *Raw Materials* – bulk raw materials such as metals, wood, particle board acrylic sheets, foam, etc. Some of these products off-gas volatile organic materials, therefore exhaust ventilation requirements must be considered.

• *Chemicals* – Both processing chemicals and waste must be considered. Penn collects all chemical waste. No chemicals may be disposed of down the drain. Adequate storage for flammable liquids, acids, bases and for chemical waste containers and the required secondary containment must be considered.

• *Finished Products* – Adequate storage must be planned for finished products, especially those that require curing time and may off-gas volatile organic compounds while curing.

• *Personal Protective Equipment (PPE)* – PPE requirements should be understood and storage must be provided to maintain PPE clean and ready for use. Ideal setup is a location near the entrance of the facility where the users can don the equipment on the way in and doff it on the way out. Common PPE required in makerspaces, robotics labs and shops consists of lab/shop coats, eye/face protection (safety glasses, goggles, face shields) and hearing protection including ear canal inserts or muffs.

• Combustible Material Storage - The storage of combustible materials shall be reviewed by the Division of Public Safety – Department of Fire and Emergency Services (FES).

9.3 Incubator & Accelerator

These are spaces aimed at hosting recently created companies in their germinal phase. The objective of business incubators is to support the companies hosted to be able to successfully overcome the first years of activity and to thus improve the survival of companies in the territory.

In addition to a quality space in which to locate their company temporarily at a subsidized price, business incubators offer many other added value services, such as support and follow-up to business projects (project incubation), training actions, networking activities, support to management and internationalization programs. These services are aimed at an area that goes beyond the companies hosted in them, to reach the rest of the newly created companies in the territory. Business incubators offer different forms of hosting, from renting a workplace in a shared space (co working) through to renting one or several modules as independent offices (Singh, 2019).

Location

As an attractor, the incubator

• Has the ability to transform the place in which it is placed,

• Once introduced, it can act as a catalyst for other public and private operations.

9.3.1 Programmed Spaces

a. Personal workspace

This is the area occupied by a typical office workspace—a table with equipment—which is also comparable to a meeting room for three to four individuals or a small documentation archive.

Dimensions

Surface area in the range of 7 to 9 m2. One person's workspace equals to a square measuring around 2.7–3 m on each side, or 7.3–9 m2. This is the area that is thought to be required to house a cozy personal workspace and the related space for movement to make it into a comfortable area.

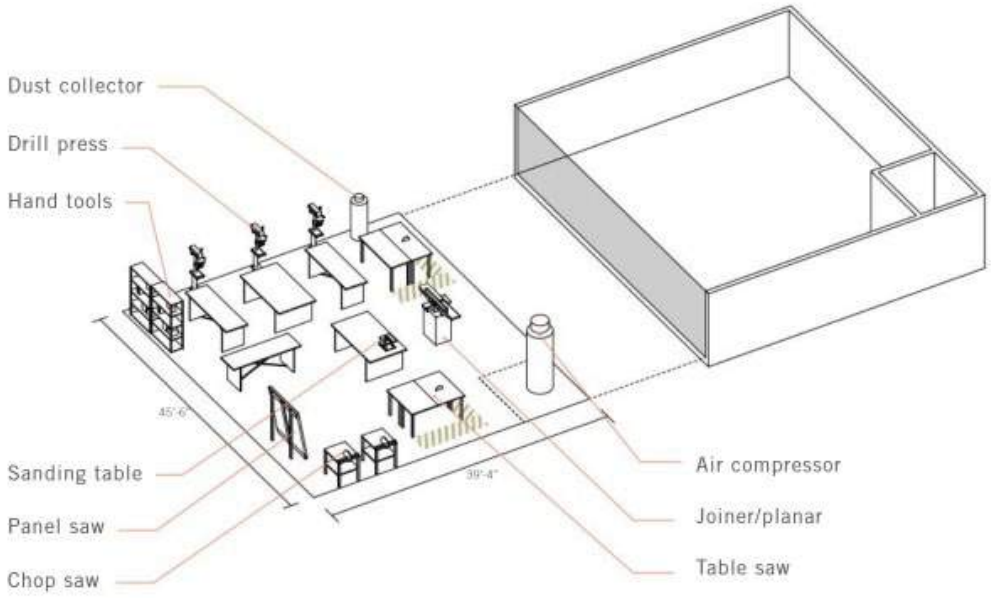


Figure 21 Personal Workspace Anthropometry

Fittings:

The workspace must be capable of holding typical office furniture, including a chair, a worktable (1.80mx80 cm minimum), drawer units, and some shelving.

Characteristics:

It is advised that each area have natural daylight, even if it is indirect, and comply to the best comfort standards for air conditioning and artificial lighting.

Each location should also have access to power and fundamental phone and data telecommunications services (Singh, 2019).

b. Independent office module

This separate area is intended to house a single business and can handle two or more persons working together. Since group work and meetings should take place in the shared and communal spaces designated by the center, the modules are primarily areas for solitary work.

Users:

• Businesspeople and employees of the incubator-hosted enterprises.

Dimensions:

• Surface area roughly ranging from 14 to 52 m2 (from 2 to 6 individual workspaces).

• The modules can be of varied sizes, and it is actually advised that they be. It is a good idea to size them in accordance with the various interior work spaces. The idea consists of at least three standard module sizes, which will be merged in varying degrees in accordance with the center's business strategy.

• Larger modules may be considered in large incubators and executive suites.

Fittings:

There are two possibilities: either the incubator should own the furnishings, or the company should provide it. In the first scenario, the incubator's use is more flexible, and internal module transfers are relatively straightforward (only paper documentation and computers need to be transferred in the case of a move). However, this first choice makes it challenging for businesses to set up their unique "image". The second scenario, however, gives them the option to personalize the areas. Intermediate alternatives can be studied, such as setting up only a certain percentage of the modules or establishing certain regulations and aesthetic criteria in the incubator regulations.

Characteristics:

• First and foremost, the modules must be pleasant because they are places intended for regular work. As a result, it's important to make sure that they have as much

- Access to natural light and ventilation as possible, as well as pleasing proportions and appropriate acoustics. They also need to have the right air conditioning, electrical, artificial lighting, and other fixtures.

•They must also be adaptable to support teamwork or business expansion. One should notice in the project the potential for grouping modules together in order to create larger components.

• It would be a good idea for the divisions between modules to be opaque so that the companies can use them for fittings and customize them; this opacity will also serve to prevent uneasy visual communication that can lead to distractions. Conversely, each module must enable a high degree of interaction with the communal spaces and the spaces for relating with others to guarantee the inherent objective of creating a network in the incubator.

• This feature can become a "showcase" focused out towards the communal circulation spaces. The showcase allows the work that the company develops to be permanently on display and, at the same time, to improve the transparency and connectivity between the workers of the incubator. It also limits the work area without making it opaque, meaning that it turns it into a space that enables the products or services that the company hosted in the center offers to be visible.

• A place should be envisaged for the identification of the company (logo, sign, etc.) on the side of the module facing the circulation spaces and communal spaces (Singh, 2019).

c. Co working module

This is a workplace intended for the temporary hosting of self-employed workers or micro companies, which mainly only require one workspace. These business people coexist with other professionals sharing an incubator room.

however, one or more workspaces can be rented at the same time, with a maximum of 2 to 3 workspaces per company. Depending on the centers, coworking of sole proprietorship companies is segregated from coworking of companies with two or more workers. This kind of space is not found in executive suites.

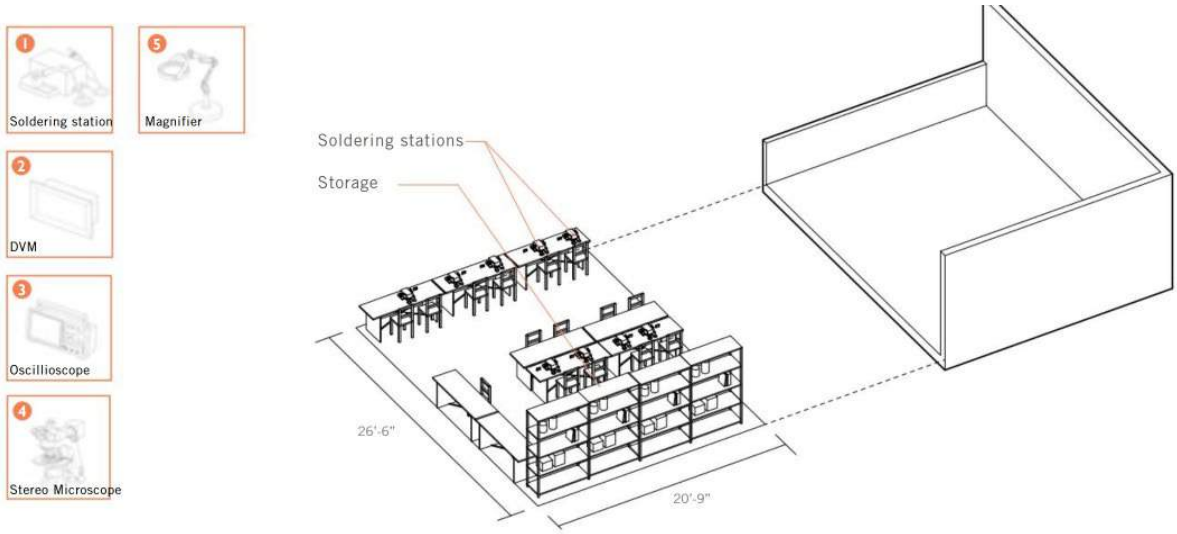


Figure 22Collaborative Workplace

Dimensions:

• Approximate surface area: between 28 and 72 m2 (from four to eight individual work areas).

• Larger surface areas may be accepted, with more individual work areas, in rooms that have good acoustics and have sound absorbing features in the walls, ceiling and/or furniture.

Fittings:

• Coworking is a plug and play space and, therefore, it must be completely fitted out.

• Usually, coworking spaces require a generous worktable (minimum 1.80m x 80 cm), a chair, a cupboard that can be locked and a drawer unit; it is important that the table should be an office table (with a channel for cables, plugs and other connections, etc.).

• With respect to computers, the center should also provide (either free or with a charge) a shared computer and telephone.

• When distributing the furniture in coworking spaces, two different strategies applied: grouping the workspaces to favor networking or giving each area a certain degree of intimacy with features at half height, which favors concentration.

Characteristics:

• As in the case of independent modules, in co working modules, people work every day, meaning that they must be comfortable spaces. Therefore, they should always guarantee, as much as possible, access to daylight and natural ventilation. It is important, above all, to have a room with

good acoustics, meaning that it is advisable to use sound-absorbing materials on the walls and the ceiling.

• All the workspaces must be equipped with a connection to the electrical supply, telephone and data services and Wi-Fi technology.

• As these spaces must be able to adapt to the needs that arise over time, it is recommended to provide them, if possible, with technical flooring, which will offer great flexibility when carrying out temporary modifications to the distribution of workspaces.

- By their very nature, coworking modules are fully compatible with clear divisions that let the activity that is taking place inside be seen. In addition, users of coworking modules, born facilitators, are usually those who make the greatest use of the areas in the center for relating, meaning that it is even more necessary to provide these spaces with transparency and, at the same time, to carefully study how they will be placed with respect to other units of use, in such a way that the coworking atmosphere spreads to the rest of the center.

• A place should be envisaged to identify the companies on the facade, facing the module, facing the circulation spaces and communal spaces.

9.4 Multipurpose Halls

Large Multi-Purpose Hall, which includes facilities for indoor events, seminars, and performances, is the hub of a lot of activity. Other factors that must be considered while looking for a multipurpose hall include determining whether it can be used for events such as college sporting competitions, business meetings, public gatherings, or political rallies. (Find venues, n.d.)

Design consideration

Location

The multipurpose hall should preferably be situated close to the parking lot and the entrance. Visitors, especially clients, must utilize this hall, thus it must be easily seen from the entrance. Additionally, it is utilized to organize events with huge crowds, thus the parking space needed for the hall should be enough and close by. The location of the hall should also be considered in order to prevent noise levels and traffic flow from disturbing office workers.

Hall Volume

Traditionally, the volume of a space for acoustic music will be given as volume per seat. This will typically be in the range of 10 – 12 m3 /seat, even up to 14 m3 /seat in some of the modern vineyard

halls. As the small hall typically will be used with the same size orchestra as in a large hall, it is sensible to define the necessary volume per musician, not seat. The typical number used in recent designs are 100 m3 /musician, implying that the “standard” size romantic symphony orchestra requires a volume on 9000 – 10000 m2, independent of the seat count in the hall.

As the floorplan is set by the seating, this will typically lead to quite high halls, with heights in the 15 - 17 m range.

Stage

The stage size is set by the maximum size of the orchestra. As many of the halls are also used for theater and opera, the basic area of the stage is not a problem, however achieving the sufficient reflecting surfaces for an acoustic orchestra is difficult to combine with the requirements for theatre staging.

One of the typical problems are the overhead reflectors needed for orchestra ensemble reflections, in particular when using the volume calculation described above. These will normally be in the way of theatre lighting bars and other rigging. In other words, it is essential to design a system where the reflectors are easily removed for other performances and put back in the correct place for acoustic music.

Another typical problem is the need to remove all of the theater curtains used for drama and similar performances, when the hall is used for acoustic music. This will normally be done using curtain parking or pockets which are closed off.

Also, the side stage and back stage areas will need to be acoustically closed off for acoustic music. In many cases it is however sufficient to use an “acoustic shell” or separate reflectors standing around the orchestra.

Variable acoustics

Variable acoustic conditions are essential for any kind of multipurpose hall. Even the latest dedicated concert halls have some variable acoustic to accommodate different types of orchestra music. The different schemes for variable acoustics can roughly be divided into two types: ·

• Variable absorption

• Variable volume

(Moller, 2016)

Flexible connectivity interfaces

As the purpose of the room changes, so too does the seating layout. Ensuring that the presenter and the audience can share/present content requires connectivity interfaces to be available at

convenient points in the room. It's usually a good idea to use floor boxes/wall plates with VGA/HDMI connectivity and position them optimally for various scenarios — both individually and in combined mode options. Auxiliary audio and video output plates should be positioned which would allow any third person/ press people to connect their studio camera to record both video and audio. (actis, 2015)

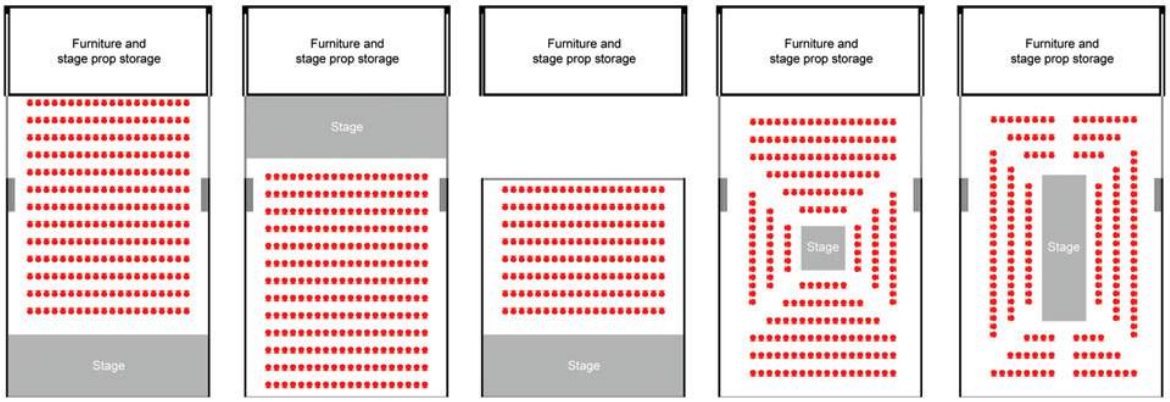


Figure 23Multipurpose area typologies

9.5 Library

A library is a collection of materials, books or media that are accessible for use and not just for display purposes. A library provides physical (hard copies) or digital access (soft copies) materials, and may be a physical location or a virtual space, or both. A library's collection can include printed materials and other physical resources in many formats such as DVD, CD and cassette as well as access to information, music or other content held on bibliographic databases (Lushington).

Design consideration

General space requirements

a. Entry/access areas

• One main entrance and two others are required, preferably separate:

- Main entrance foyer/lobby: (190m2) should be clear and inviting, and be sufficiently spacious to cater both for visitors who have a specific destination and those who may wish to wander around.

• Public out-of-hours entrance: must provide a short and secure access route from the street to the meeting rooms etc. It could be combined with the main entrance, but a lift solely for out of hours use is not acceptable.

• Staff/service entrance: to be a safe and secure area, particularly for staff leaving after dark. Queuing space should be allowed for 40 people to wait (at 0.5 m2/person, 20m2 is required).

b. In-counters (51m2)

There will be one central counter for the whole building, after which customers either will move to other departments, move to customer reception, or leave. Peak hourly levels of customers are approximately 250-300, with a peak hourly level of returns of approximately 1000 items. Space is required for three staff plus computer terminals for customers. The layout must allow for clear and direct flows.

c. Out-counters (38m2)

All items issued or renewed will be from the out-counter and there may be more than one, depending on overall layout. Note that some customers may wish to return to other areas of the library (e.g. the coffee bar) after visiting the out counter. Peak levels are as for the in-counter. Space is required for two staff plus computer terminals for customers. The layout must allow for clear and direct flows: in particular, customers not wishing to borrow items must be able to avoid becoming involved with this area.

d. Enquiry desks

These should be ideally located so that they can serve more than one department at once.

e. Librarian's office (20 m2)

The base for the manager in charge of the whole building, the room must be close to the administrative support and interview rooms. Apart from everyday managerial tasks, people and project work room will be used for small discussions with up to two people and project work.

f. Library manager's office (13m2)

This includes one office for two assistants, shared desk, and also rooms for small meetings of one to three people. Privacy is necessary, although easy access overview is required for counters and customer services. The office should be located near the branch library.

g. Delivery area (16m2)

There will be a daily 'in' delivery of boxes containing books from this library, but returned to other libraries: books requested from other libraries, and new books. The ‘out’ delivery will be of books requested in the sorting office, and books requested by other libraries. This area will also act as a short-term reception and dispatch area for other equipment, furniture, exhibition equipment, etc., and sufficient space should be allowed for this. (Singh, 2019)

9.6 General lighting requirements

a. Illuminance Levels

The goal of lighting in libraries is to facilitate the learning experience by providing adequate and comfortable light levels that can be endured for prolonged periods of time. The main visual tasks in libraries are reading and writing texts, differing in size, shapes and contrast levels. An illuminance level of 300-500 lux is recommended for reading rooms." Both the stacks areas and the general reading areas require top lighting. The stacks need top lighting because the book shelves block light coming from the sides. For the general reading area, it is also recommended to have uniform lighting in order to allow for flexibility of use of the space (Lushington).

b. Light Uniformity

Uniform light is the most widely used form of illumination in libraries. Such a strategy provides ideally the same illuminance level for the entire work plane where a specific visual task is performed. In practice this is not always possible and, inevitably, there is always variation in illuminance levels on the same work plane and between work planes.

While it is impossible to obtain uniform illumination through side windows, it may be possible to obtain more uniformly distributed natural light using a number of top daylighting strategies. Due to the dynamic quality of daylight, light levels are constantly changing according to the time of

day and seasons. As a result, the distribution may be uniform but the daylight levels are never constant throughout the day (Lushington).

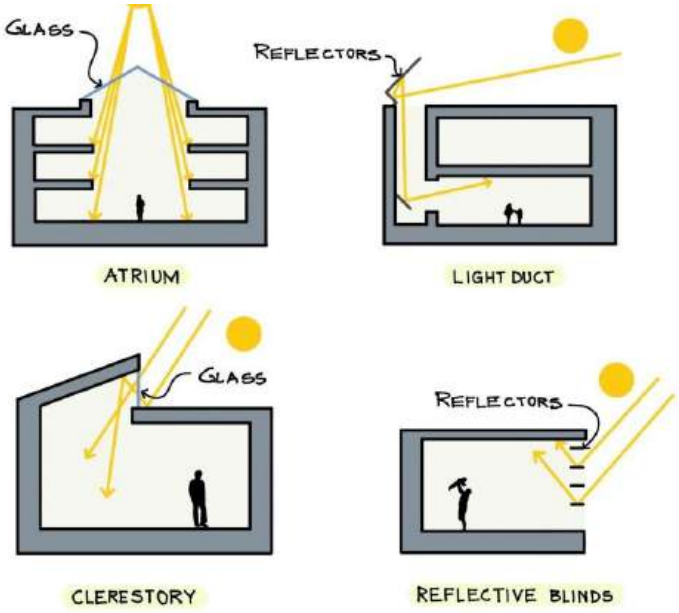


Figure 24 Lighting Approaches in indoor space

Shelving System

Shelving system types are cantilever style, case style, high-density and automated retrieval. Cantilever and case style are commonly used in all libraries and design requirements refer primarily to these types. High-density and automated-retrieval storage have individual requirements specific to their system.

Shelving systems, be they cantilever or case style, are modular and consist of multiples of a single shelf unit. The dimensions of the single unit (SFU, single-faced shelving unit) as stand-alone or placed back to back with another unit (DFS, double-faced shelving unit) form the basis of the shelving system. Heights depend on the numbers of shelves per unit, with units seven shelves high at typical stacks. In reference areas shelving units may be two to three shelves high. The characteristics of these units Impact the design of many different aspects of the library; book capacity, structure, layout, lighting, egress.

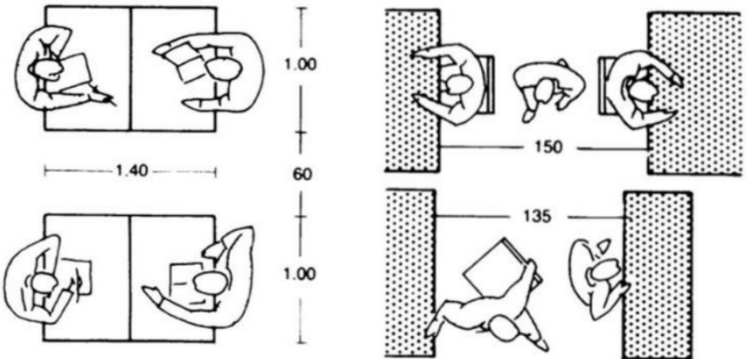


Figure 25Reading Tables Anthropometry

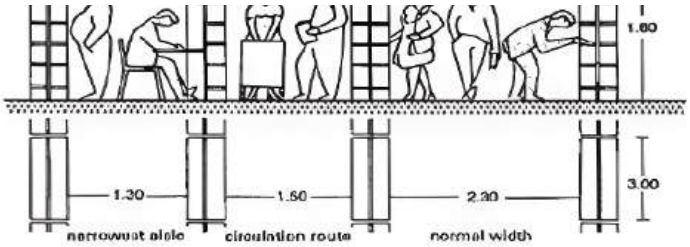


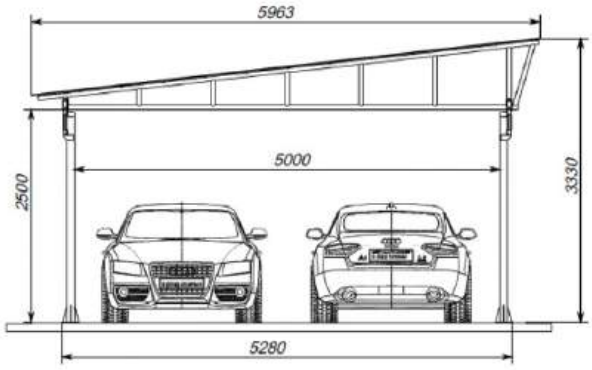
Figure 26Bookshelves anthropometry

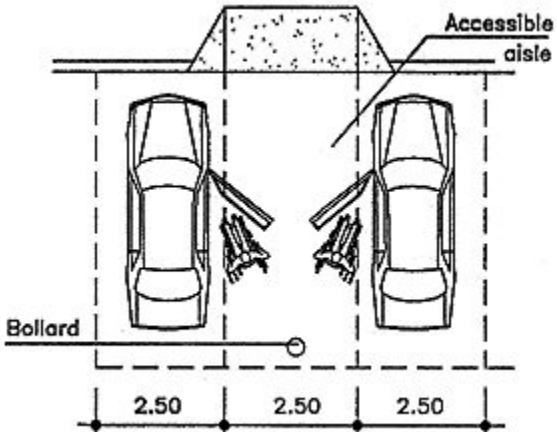
While book capacity is important, human comfort is of equal importance in shelving layouts. Repetitive shelving ranges are, in fact, densely positioned walls and, depending on the aisle width and shelving height used, they impact the psychological perception of the space. In heavily trafficked urban libraries, for example, a shelving aisle of minimum width could be perceived as less inviting than a wider one. Similarly, shelving ranges of more than six shelves in length (each shelf at 1.2 m) comply with travel distances but may be perceived as oppressive or even threatening in some situations. Shelving heights (or numbers of shelves per unit height) are determined as a compromise of volume capacity and the atmosphere created by such height. Seven-shelf high shelves are most efficient in terms of book storage, but their height renders the top shelves inaccessible for universal reach. Allowing also for the advantage of organizing oversized volumes within the running order of the collection (requiring greater spacing of the shelves), shelving height in publicly accessible libraries is typically limited to six shelves or even five shelves. (Lushington).

10. Parking

Parking considerations and design guidelines for an institutional incubation center are critical to ensure accessibility, convenience, and efficiency for users, including entrepreneurs, mentors, and visitors. The parking area should be designed to accommodate a mix of vehicles, including cars, two-wheelers, and bicycles, with provisions for electric vehicle charging stations to promote sustainability. Adequate space allocation, clear signage, and well-marked pedestrian pathways are

essential to ensure safety and smooth traffic flow. Accessibility must be prioritized, with reserved parking spots for differently-abled individuals and proximity to the main entrance. Additionally, the design should incorporate green spaces or permeable surfaces to manage stormwater runoff and reduce the heat island effect. Efficient lighting, security measures like CCTV cameras, and a user-friendly layout further enhance the parking experience. By integrating these considerations, the parking facility can support the incubation center's mission of fostering innovation while ensuring a seamless and sustainable experience for all stakeholders.





Vehicle Type	Length * Breadth	Height	Turning Radius
Motorcycle	2.20m x 0.70m	1.80m	1.00
Car: Standard Small Large	4.70m x 1.70m 3.60m x 1.60m 5.00m x 1.90m	1.50m 1.50m 1.50m	5.75m 5.00m 6.00m
Bicycle	1.80m x 0.6m	1.00m – 1.25m	0.70m
Pick Up Trucks	4.37m x 1.64m	1.90m	5.00m

Figure 27 Parking Anthropometric data

3. CASE STUDY

3.1. National Case Study

3.1.1. Impact Hub, Lalitpur

Figure 28Impact Hub

Location: Pulchowk, Lalitpur

Established Date: 2015, previously known as Nepal Communitere

After 2021, Impact Hub, Kathmandu

Site Area: 2.5 Ropanis

Number of blocks: 6

Number of floors: 2

Site topography: Contour

Site Orientation: South

Construction Typology: RCC Frame structure and container architecture

Target group: All ages, specially 16-35

Building usage: Offices, rental spaces, maker spaces, co-working spaces, incubator, conference spaces, café

Objective: Support social entrepreneurs and innovators in building global impact

Programs: Fablab Nepal, I Cube Business Incubation Program, Kathmandu Mini Maker Faire, American Art -Nepal, Tourovation Hub, Renewable Energy Solutions in Agriculture Incubation Program.

Impact Hub Kathmandu has been a catalyst for entrepreneurial and impactful action for 7+ years. It is a part of the Impact Hub global network – one of the biggest of its kind in the world – made up of 24,250 people driving change, 100+ communities in 60+ countries across 5 continents. Previously, it was known as Nepal Communitere which was non-profit based organization formed after devastating earthquake for supporting sustainable disaster recovery. Along with disaster recovery program it also served as incubator for startups entrepreneurs to foster their ideas. After collaboration with Impact Hub in 2021 it is known as Impact Hub Kathmandu.

3.1.1.1 Site Context

Impact Hub is located in Pulchowk, Lalitpur just a minute walk from Kupondole-Jawakhel road. The site is surrounded by similar office spaces and incubators. The site is surrounded by numbers of cafes and restaurants by all sides that enhances the networking approaches for it.

3.1.1.2 Architectural Expression

Impact hub contains two types of architectural blocks. The main block housing the main office is an adapted residential block. The other blocks are made out of cargo containers.

Main block

This block was previously used as a residential block. It was adapted after the ownership of Nepal Communitere in 2015. Overall planning of this block is based around the courtyard space. The courtyard is the major architectural expression of this block, which acts as the main interacting space connecting all the activities between floors.

Cargo Blocks

All the other remaining blocks except main blocks are made out of cargo container which is the major architectural character of impact hub. The cargos are stacked one over other to form multiple floors housing various activities. These boxes are painted with various paintings by the local painters. The paintings can also be seen in main blocks.

The containers forming these blocks were donated by UN and with little interventions to these boxes, economic and functional spaces are created.

3.1.1.3. Planning

The overall planning of Impact Hub is based on the existing main block with the courtyard. The courtyard plays main role in the communication and interaction between the various members. It acts as visual connection between ground floor and first floor, waiting areas for visitors, gathering space for social time, meeting space for sharing ideas, etc. the courtyard space acts as the heart of overall planning giving life and fun to the spaces.

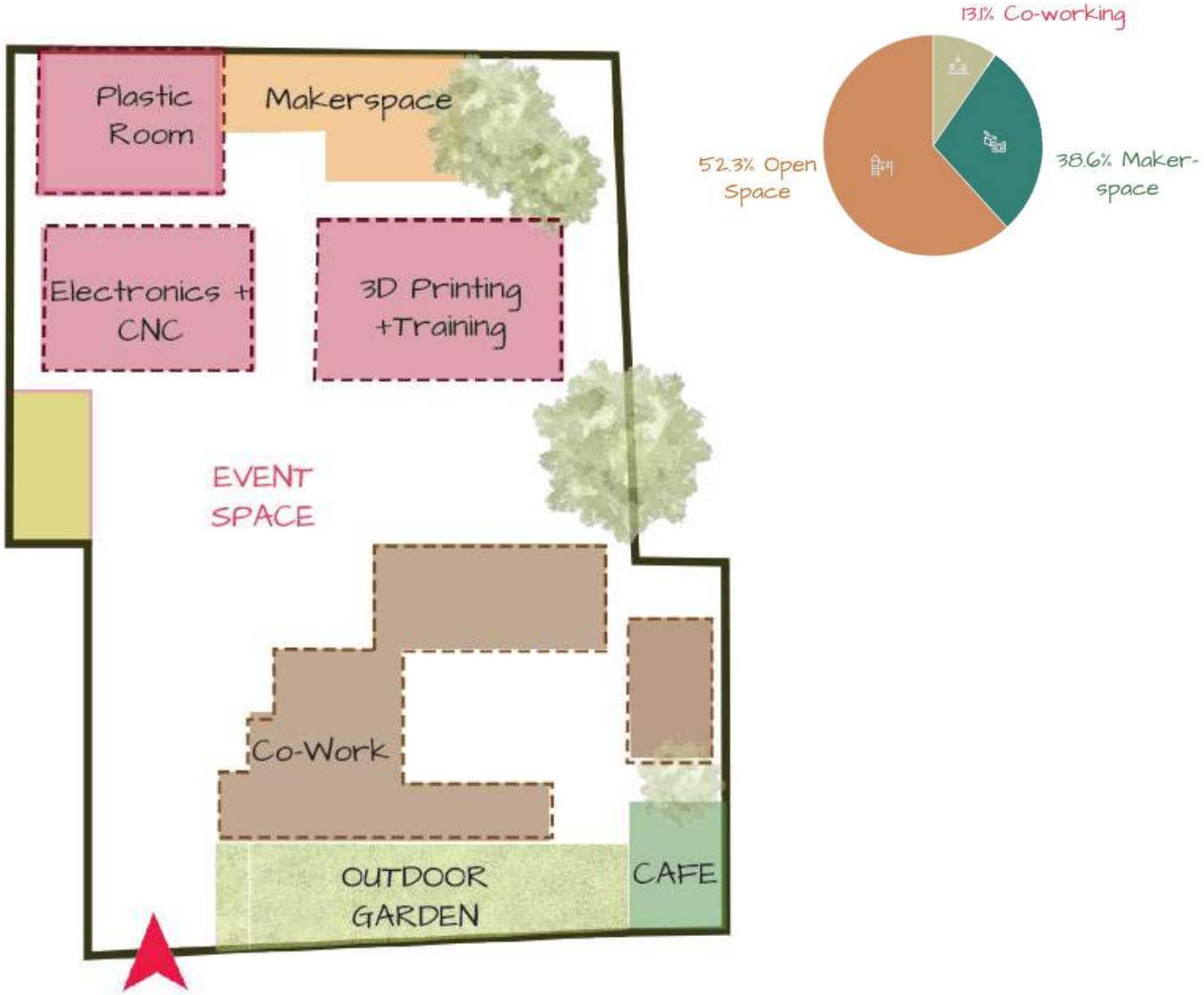


Figure 29 Functional Planning of spaces in Impact Hub

	Total Area in sq. m. (approx.)	Machinery / Occupants
Electronics Room	56.56	Computer Stations 5 functioning 3D Printers
Plastic Lab (with storage)	34.68	Compressing Machine (8' x 6')
CNC Fabrication Lab	33.43	CNC Router (4' x 8')
Wood & Metal Makerspace	108.78	Woodcutting Grinder 6 individual workstations 2 Private prototyping station
3D Printing & Prototyping Space	50.6	3 Printers
Training & Presentation Room	60	40 Occupants

Figure 30Sizes of different sub-division of makerspace

Main Block

The block consists of two floors and is based on courtyard planning. The circulation of upper floor occurs through balconies that allows interaction to the ground floor. The courtyard connects all the function within the building and with other spaces around it. This block contains the following spaces;

- Impact Hub Office
- Shared Kitchen
- Co-working spaces
- Courtyard
- Incubator
- Design Studio
- Conference Room
- Toilets

Cargo Container Blocks

All the other block besides main block is made out of containers. The blocks are stacked one over other to make two storey structure. The cargo blocks form six blocks;

• Fablab Reception

• Two numbers of Fablab workspace

• Makers Space

• Co-working Space

• Café

Figure 31Cargo Container Boxes stacked above one another

3.1.1.4 Analysis & Reference

• All spaces exist independently but act as a single unit when it comes to collaboration

• Spaces like courtyard, co-working space, café, garden, etc. boost collaboration and networking

• Collaboration and networking are the heart of any incubation spaces

• Multifunctional spaces like courtyard and co-working spaces are more suitable

• Thermal and sound insulation are major concerns for makerspaces

3.1.2. the 100 Spaces

Figure 32the 100 spaces building

Location:
Baneshwor, Kathmandu

Completion: 2021 AD

Architecture: Adaptive Re-Use

Orientation : South

Type: Mixed-Use Building Complex

Site Area: 508 sq.m. (1 ropanies)

Total Co-working Units: 50

Programs: Co-Working Space, Multipurpose Outdoor Training Space, Content Creater Booth

Intent of Study: To comprehend the planning & typologies of a coworking space.

The 100 Spaces in Baneshwor, Kathmandu, is a vibrant co-working space designed to cater to freelancers, startups, and professionals seeking a collaborative and productive environment. It offers flexible seating arrangements, high-speed internet, meeting rooms, and modern amenities to support creativity and efficiency. With its central location and community-focused atmosphere,

The 100 Spaces fosters networking, innovation, and growth, making it an ideal hub for entrepreneurs and remote workers in Kathmandu

3.1.2.1. Planning

The space is divided into Block A and Block B, each with distinct floors and functional areas to support a variety of work and collaboration needs.

Block A - Ground Floor features a versatile layout with a Reception area (38.9 sqft) welcoming visitors, a Cafeteria (38.9 sqft) for casual dining, and a Pantry (48.43 sqft) for refreshments. The Innovation Room (111.02 sqft) and Meeting Room (117.21 sqft) provide spaces for brainstorming and formal discussions, while the Individual Room (165.78 sqft) offers private workspaces. The Washroom (312.15 sqft) is spacious and accessible, and the Stage and Backyard (895.97 sqft) serve as areas for events or relaxation. The Front Yard (699.48 sqft) and Rock Garden add aesthetic appeal, while the Parking area (551 sqft) ensures convenience for visitors.

First Floor includes multiple Individual Rooms ranging from 86.37 sqft to 275.16 sqft, catering to different workspace needs. A Balcony (35.35 sqft) provides an outdoor break area, and a Washroom (41.46 sqft) is available for convenience. The layout emphasizes privacy and flexibility for users.

Block B - Ground Floor features a Pantry (101.10 sqft) and Individual Rooms (156.19 sqft and 71.31 sqft), along with a Guest Area (71.31 sqft) for visitors. The Washroom (23 sqft) is compact yet functional, ensuring basic amenities are met. First Floor mirrors the ground floor with a Pantry (101.10 sqft), Individual Rooms (156.19 sqft and 67.62 sqft), and a Washroom (204.51 sqft). A Balcony (63.22 sqft) offers an outdoor space for relaxation.

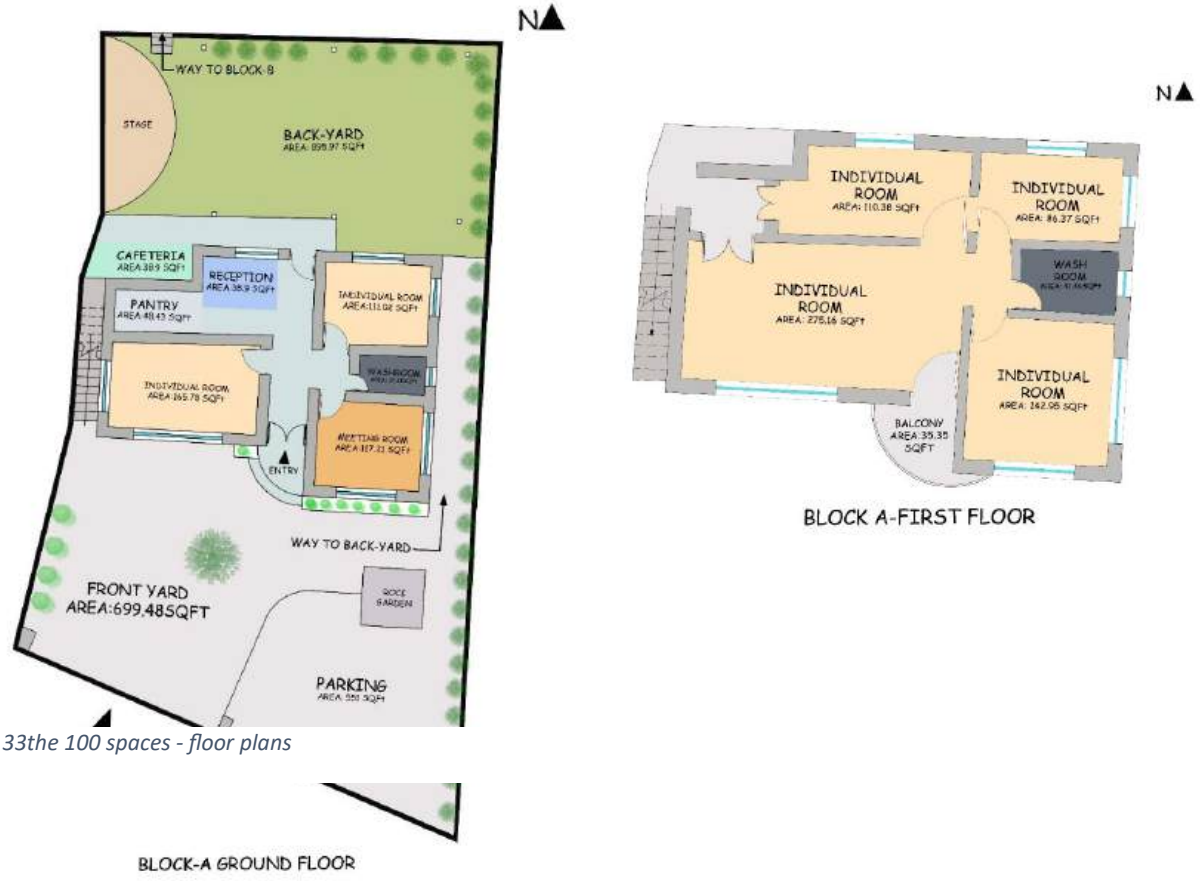


Figure 33the 100 spaces - floor plans

3.2.2.2 Analysis & Inferences

1. Need & importance of intermediate breakout spaces.

2. Adaptability of a co-working & incubation space to recent needs.

3.1.3. Bikalpa Art Center

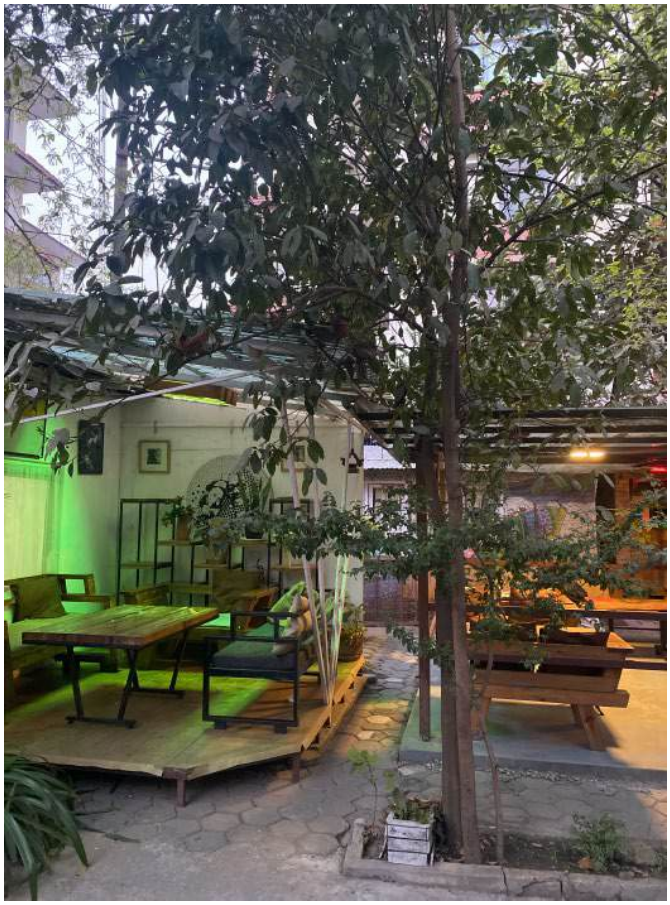


Figure 34Bikalpa Art Center

Location: Pulchowk, Lalitpur

Established Date: 2013,

Site Area: 2 Ropanis

Building usage: Exhibition space, Offices, rental spaces, co-working spaces, café

Objective: Introduce art to the general public.

Programs: Cafe, Exhibition Space, Co-working Studios, Makerspace, Training & Event Areas.

Intent of Study: To understand the functional planning, and juxtaposition of inderdisciplinary spaces.

Bikalpa Art Centre as the name suggest is a non-governmental and non-funded organization established for the promotion of art among the general public by increasing access and providing innovative art experience for a variety of audiences.

As of current situation it does more than promoting art as it helps startups providing space and networking opportunities. It serves startups and individual by providing working space in peaceful environment, co-working space, rental space and exhibition space for displaying their works.

Bikalpa Art Centre gives the rustic vibes with the custom rustic furniture, ropes, the hanging lights, etc. The café space lies in the middle of the site which steals the spotlight. The site is covered with lots of trees and vegetations giving feeling of calmness and closeness to the nature.

3.1.3.1 Site Context

BIkalpa Art Centre is located in Pulchowk, Lalitpur beside of M&S tower. It is located less than a minute walk from Kupondole-Lagankhel road. The area is surrounded by commercial activities and corporate offices.

3.1.3.2 Planning

It follows the functional planning strategy which highlights the central café areas with additional functions add around it. The central area contains café, beer bar, stage for live music and circulation spaces. The central café spaces are kept open with steel columns and CGI roofs. The light and shadows effect created by vegetations in the central space provides unique feelings while enjoying the nature.

All the other spaces are arranged around the central café space. These spaces increase the importance of café area as they are oriented toward center and uses the central area for circulation.

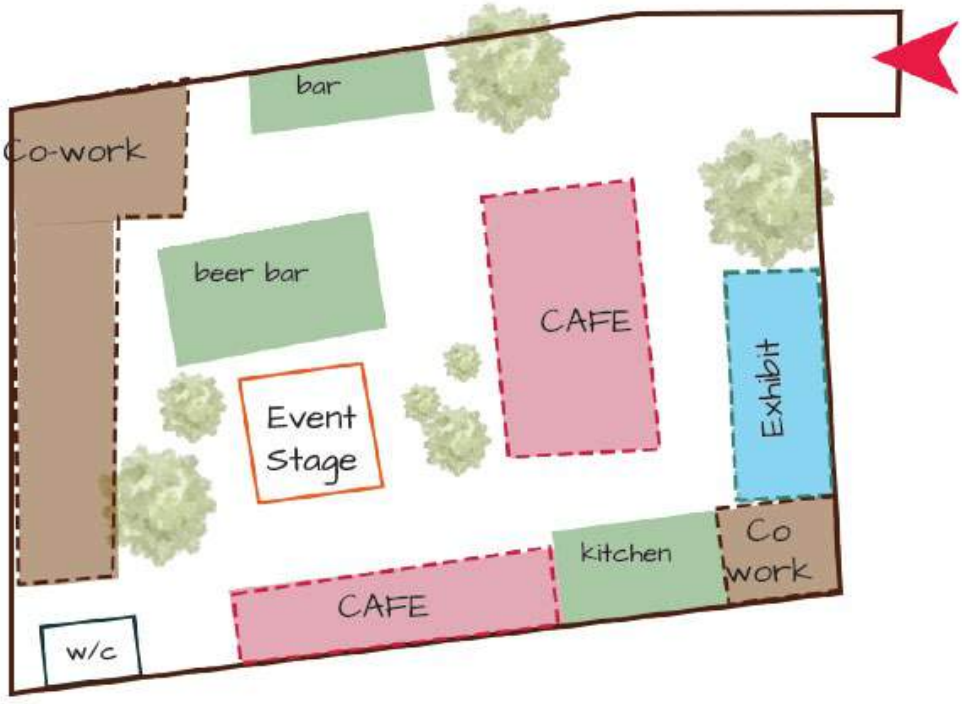


Figure 35 BAC - Plan

	Dimensions
Exhibit Space	59.64 sq .m (4.5 x 13.3)
Co-Working Space 1. Individual Desk Models 2. Collaborative desks Model 3. Art Studio Table	 15 6 5
Café / Restaurant	More than 80 seating spaces
Event Space	150 sq .m

Figure 36Tabulated spatial datas

3.1.3.3.Spatial Activities

a) Café and Bar

It lies in the centre of the site and is the major focus of overall planning. Being the public space, it is the first space when one enters the property. It consists of café areas, beer bar and a stage.

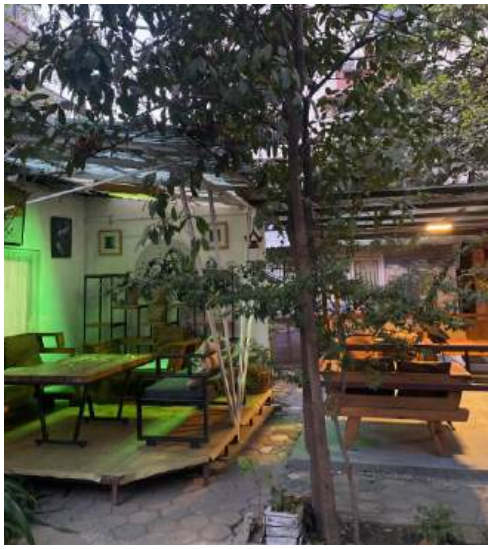


Figure 37 BAC - Cafe Space

b) Co-working space

Co-working space is located in the south-east side of the café area. It is a multipurpose hall with open floor plan without any furniture. When anyone decides to come and work in the space, furniture will be arranged according to their needs.

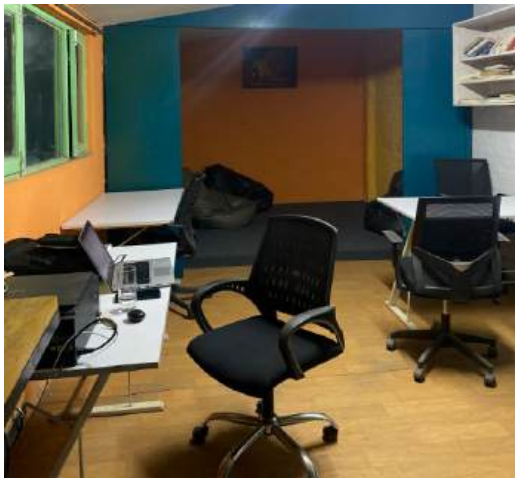


Figure 38BAC - Co-working Space

c) Rental spaces

Rental spaces are located around the café area. These spaces are not visible from the central café areas but utilize café area for circulation. Major part of the rental areas is located towards the west with one being in the east near the gallery area. Currently, these areas are rented by architecture design studio and IT offices.

d) Gallery

This space is located next to the entrance of the BAC. It is the major highlight of the space as it helps to promote art which is the major objective of the BAC. It is an exhibition space with open floor plan and can be utilized for various purpose like art display, workshop, etc.

Figure 39BAC - Gallery Space

e) Kitchen and Office space

The kitchen and bar face the café area and are located in northern and southern part. The office of Bikalpa Art Centre is located in the north west portion of the site. The office is not visible from the café area and is not accessible to the public.

•

f) Landscape

The landscape of BAC is very rich in natural environment. There are more than 50 trees present within the site. These trees are preserved perfectly and the built environment are created integrating this natural environment. Besides trees, there are many small vegetations that increases the richness of the environment. All the built spaces are elevated focalizing them when one enters the space.

3.1.3.4. Analysis & Inference

- Integrating nature and built environment increases the quality of space

Figure 40BAC - Event Space

• Public space and private space are properly distinguished providing both privacy and openness

• Flexibility of space helps to boost the function of the space.

3.2 International Case Study

3.2.1. CIIE.CO – Center for Innovation, Incubation & Entrepreneurship

Figure 41CIIE Building

Location: Ahmedabad, India

Completion: 2020 AD

Architecture: Institutional Building

Orientation : North-East

Type: Institutional Building

Site Area: 2000 sq.m. (3 ropanies)

Programs: Co-Working Space, Digital Incubation Space

Intent of Study: To study zoning strategies merging private, semi-public & public spaces, and to understand spatial requirements for modern start-up incubation.

The CIIE.CO (Centre for Innovation, Incubation, and Entrepreneurship) in Ahmedabad is situated in a dynamic and strategic location that fosters innovation and entrepreneurship. Located within the Indian Institute of Management Ahmedabad (IIMA) campus, CIIE.CO benefits from being part of one of India's premier academic and research institutions. This proximity to IIMA provides access to a rich ecosystem of intellectual resources, including faculty expertise, research facilities, and a network of students and alumni who are actively engaged in entrepreneurial activities.

Ahmedabad, as a city, is a thriving hub for startups and business innovation in India. Known for its entrepreneurial spirit and industrial heritage, the city offers a supportive environment for new ventures, with access to investors, mentors, and industry leaders. The location of CIIE.CO within

Ahmedabad places it at the heart of this ecosystem, enabling startups to connect with local and global markets. Additionally, the city's infrastructure, including transportation links and business-friendly policies, further enhances the appeal of CIIE.CO as a center for innovation.

The site itself is designed to inspire creativity and collaboration, with modern facilities that cater to the needs of startups, including co-working spaces, incubation labs, and meeting rooms. The integration of CIIE.CO within the IIMA campus also allows for seamless interaction between academia and industry, fostering a culture of knowledge-sharing and innovation. Overall, the site context of CIIE.CO in Ahmedabad provides a fertile ground for nurturing entrepreneurial ideas and transforming them into impactful businesses.

3.2.1.2. Planning

1. Co-Working Spaces

- Open-plan Offices: The building has large, flexible, and open co-working spaces where multiple startups can work alongside each other. These spaces are designed to encourage collaboration and idea exchange.
- Private Cabins/Offices: Some areas are designed to offer privacy for teams that need a more focused and isolated working environment. These spaces are flexible and can be adjusted to accommodate small teams or individual entrepreneurs.

Figure 42Co-working Space

2. Meeting Rooms

- Dedicated Meeting Rooms: The building includes various sizes of meeting rooms, each designed for different group sizes, ranging from small huddle rooms to larger meeting spaces for presentations and discussions.

- Collaborative Zones: These rooms are equipped with modern AV systems to support virtual meetings and presentations, helping startups engage with mentors, investors, or clients globally.

3. Event and Conference Spaces

- Auditorium: A large space for hosting conferences, talks, workshops, and pitching events. It is designed to accommodate a larger audience, with advanced sound and lighting systems.
- Workshop Rooms: Flexible spaces designed for hands-on workshops, training sessions, and seminars. These rooms can be reconfigured to suit various formats and activities.

4. Networking Areas

- Lounge and Café Areas: Informal spaces like lounges and a café encourage networking and social interactions. Entrepreneurs, investors, and mentors can engage in relaxed conversations, fostering collaboration outside formal settings.
- Common Areas: Spacious open common areas allow startups to meet, exchange ideas, and collaborate in a casual environment, promoting a sense of community.

5. Breakout and Relaxation Spaces

- Casual Break Areas: These spaces are intended for employees to unwind and relax, offering comfortable seating and informal environments to recharge during the day.
- Outdoor Spaces: The building incorporates green outdoor spaces where individuals can step out to refresh themselves or have informal meetings in a more relaxed setting.

Figure 43CIIE - Breakout Space

6. Innovation Labs and R&D Spaces

- Maker Spaces: Dedicated areas for prototype development, product testing, and R&D activities. These are specially designed for startups involved in hardware, tech innovations, or product prototyping.
- Technology and Resource Labs: Equipped with the latest technology, these labs provide access to tools and resources that support tech startups in research and development activities.

7. Admin and Support Spaces

- Administrative Offices: These spaces house the building management team and the CIIE.CO staff who provide support to incubated startups.
- Support Services: The building includes spaces for essential services such as a reception area, mailroom, and other administrative functions that support the daily operations of the facility.

8. Investor and Mentor Rooms

- Investor Meeting Spaces: Specialized rooms where entrepreneurs can meet with potential investors in a formal but comfortable environment. These rooms are designed to facilitate presentations and one-on-one discussions.

- Mentor Spaces: These rooms offer spaces where mentors and entrepreneurs can have in-depth discussions or coaching sessions.

9. Conference and Seminar Rooms

- Training Rooms: These spaces are used for educational sessions, professional development workshops, and seminars focused on building entrepreneurial skills.
- Multi-Use Seminar Rooms: Versatile rooms that can accommodate seminars, group discussions, and other community events.

Figure 44Meeting Rooms

-

10. Support and Utility Spaces

- Storage and Archive Spaces: The building includes storage areas for the startups to keep their materials and equipment organized. These spaces are designed to be easily accessible yet discreet.
- Utility Rooms: These spaces are designed to manage the building's operations, including HVAC systems, electrical panels, and other infrastructure-related areas.

11. Parking and Transportation Facilities

- Parking Spaces: The building provides parking for staff, visitors, and residents of the incubator, with easy access to public transportation for greater convenience.
- Bike Racks and Pedestrian Access: There is consideration for eco-friendly commuting options like bike racks, supporting sustainable transportation practices.

12. Green and Recreational Spaces

- Outdoor Green Spaces: The building integrates landscaped areas for relaxation and informal meetings. These spaces provide a break from the indoor environment and promote the well-being of the occupants.
- Terraces: Some sections of the building feature terraces or rooftop gardens, which can be used for both relaxation and hosting informal events or brainstorming sessions.

Figure 45Juxtaposition between indoor & outdoor spaces

3.2.1.3 Inference & Analysis

- Spatial Layout
- Connectivity of space.
- User Experience & Working Efficiency.

3.2.2. Station F

Figure 46station F building, Paris, France

Location:

Outskirts of Central Paris, France

Completion: 2017 AD

Architecture: Institutional Building

Type: Adaptive Re-Use

Site Area: 33,034 sq.m. (65 ropanies)

3.2.2.1 Planning

1. The Main Building (La Halle Freyssinet):

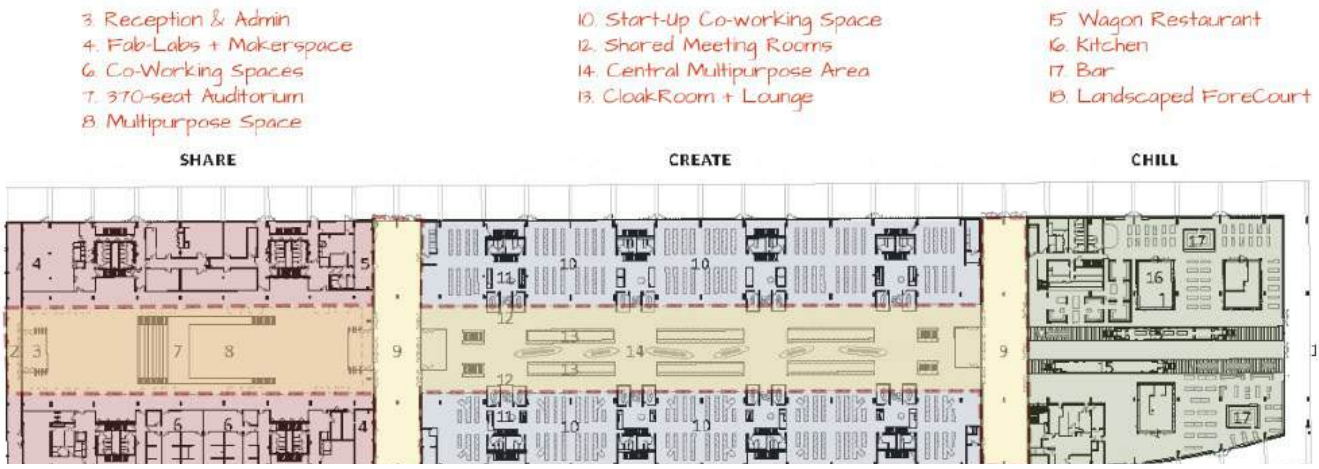


Figure 47Floor Plan - Station F

- Historical Industrial Architecture: The building itself is a former railway depot, which has been carefully transformed while preserving its historical, industrial character. It retains its steel and glass structure, with large, open spaces and high ceilings that create a sense of openness and light.
- Spacious Open Floors: The main hall is vast, spanning about 34,000 square meters. It is a massive, open floor plan, with minimal internal walls to allow flexibility for the varied needs of startups.
- Natural Light and Airflow: Large windows along the walls and skylights in the roof allow abundant natural light, creating a bright and welcoming environment for its users.

2. Workspaces:

Figure 48Private & Public workspace blend at Station F

- Hot Desks and Dedicated Offices: Station F is designed to cater to both individuals and teams, offering a combination of hot desks and private offices. The flexibility of the workspace allows companies of different sizes to operate efficiently, from small teams to larger startups.
- Co-working Areas: The layout includes open co-working spaces where individuals or small groups can work alongside others. These areas are designed for collaboration and community engagement, with a variety of seating options such as communal tables, lounges, and meeting pods.
- Event Spaces: There are dedicated spaces for events, talks, and presentations. These spaces can accommodate large audiences, fostering networking and knowledge-sharing opportunities for the startups in residence.

3. Meeting Rooms and Conference Areas:

- Private Meeting Rooms: Several private meeting rooms are scattered throughout the campus. These rooms range in size and are equipped with the latest technology to facilitate virtual and in-person meetings.
- Flexible Conference Spaces: Larger conference areas are designed to host events and gatherings, providing an ideal space for networking and learning. These rooms are equipped with high-tech audio-visual equipment and can be reconfigured to suit different types of events.

4. Innovation Spaces:

- Laboratories and Tech Hubs: Station F hosts specialized innovation spaces for technology-driven startups. These areas are equipped with cutting-edge resources and tools, such as prototyping labs, hardware facilities, and testing spaces for engineers and developers.
- Collaborative Spaces: The layout of the campus promotes cross-collaboration between startups, investors, and other stakeholders. Informal meeting areas and lounges are strategically placed to encourage spontaneous interactions.

5. Cafes and Dining Areas:

- Cafes and Bars: Station F includes various cafes, restaurants, and bars, providing spaces for relaxation, casual meetings, or socializing. These spaces are designed to be informal, providing a balance between work and social interaction.
- Food Court: A large food court offers a variety of meal options for workers, ranging from healthy foods to more indulgent options, ensuring that there's something for everyone.

6. Startups and Support Spaces:

- Dedicated Startup Areas: The campus has dedicated zones for startups in different stages of development. Startups can rent offices or desks in these zones based on their needs and growth trajectory.
- Incubator and Accelerator Programs: The facility houses incubators and accelerators, offering not just space but also mentorship, funding opportunities, and access to key industry players. These spaces are crucial for the growth of startups.

7. Additional Features:

- Community Zones: Station F is more than just a workspace; it's a community hub. Special areas are designed for relaxation and informal gatherings, such as lounges and open areas with comfortable seating.
- Outdoor Spaces: Some of the campus's design also incorporates outdoor spaces for recreation or events, creating a holistic environment for workers to thrive in.
- Fitness and Wellness: There are fitness centers and wellness areas within the building, designed to keep the campus vibrant and promote a healthy work-life balance for its occupants.

Figure 49coworking modules in station F

8. Design Aesthetic:

- Industrial and Modern Blend: The design of Station F beautifully merges industrial heritage with modern design. Exposed steel beams, brickwork, and open ceilings give the space a raw, authentic feel, while sleek modern furniture and high-tech amenities enhance its functionality.
- Green Spaces: Incorporating sustainable design principles, there are green spaces, plants, and greenery scattered throughout the campus. This promotes a healthy atmosphere and provides a visually stimulating environment for workers.

9. Public and Private Zones:

- Private Offices for Larger Companies: Station F includes areas specifically designated for larger companies and their needs, offering privacy and exclusive spaces while still fostering collaboration with the startup ecosystem.
- Publicly Accessible Areas: Parts of the campus, especially the cafes and event spaces, are designed to be open to the public, enhancing the campus's role as a vibrant community hub for innovation.

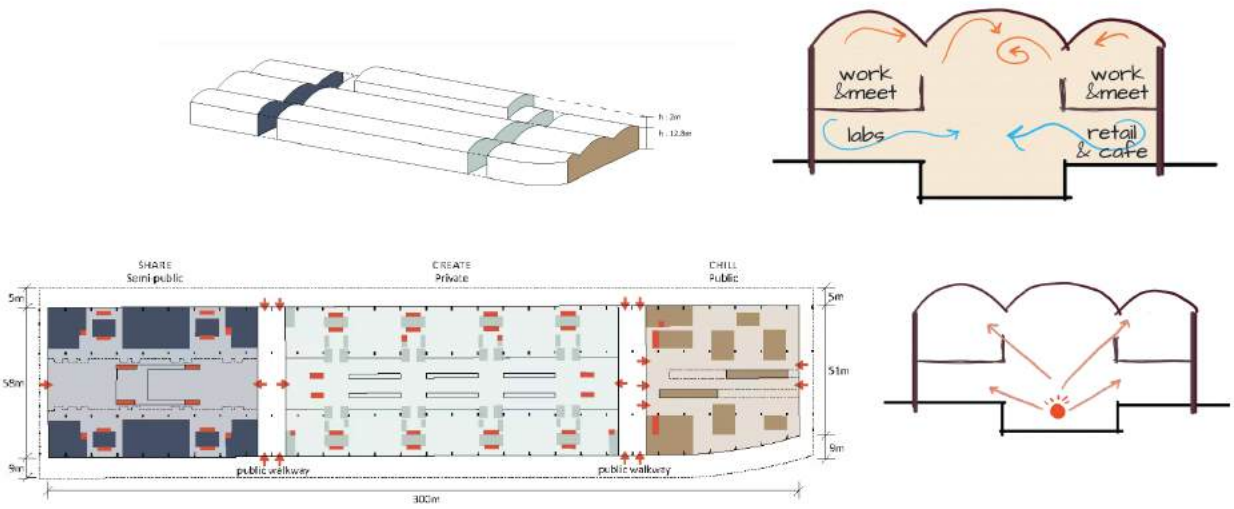


Figure 50Functional Planning & Stack Effect

3.2.2.2. Architectural Character

Station F in Paris, located in the former Halle Freyssinet, is a striking blend of industrial heritage and modern design. Originally constructed in 1929 as a railway depot, the building showcases early 20th-century reinforced concrete and steel engineering, with Art Deco influences evident in its use of glass and steel. This industrial past is preserved in the vast, open spaces supported by large arched steel trusses, giving the building its unique character.

In the mid-2010s, the building was transformed into the world’s largest startup campus by entrepreneur Xavier Niel. The renovation preserved its industrial charm while introducing a minimalist, modern interior. Large open-floor plans, designed for flexibility and collaboration, now house offices, event spaces, and meeting areas for entrepreneurs, startups, and freelancers.

One of the building's most distinctive features is its expansive glass façade, which allows natural light to flood the interior, creating a bright and welcoming atmosphere. The open atrium at the center of the campus serves as a social hub, fostering communication and interaction among the various startups. The space emphasizes sustainability, incorporating energy-efficient technologies and sustainable materials throughout the building.

Station F is also strategically located in the 13th arrondissement of Paris, near major landmarks like the Bibliothèque François-Mitterrand, making it easily accessible by public transport. This location not only facilitates access for entrepreneurs but also integrates the campus into Paris’s vibrant innovation ecosystem, hosting events and workshops that encourage collaboration with the broader community.

3.2.2.3. Passive Design Strategies

Station F in Paris incorporates several passive design strategies aimed at enhancing energy efficiency and sustainability. The building's large glass façade allows for ample natural light to penetrate the interior, reducing the need for artificial lighting during the day. The expansive open spaces and high ceilings also facilitate natural ventilation, promoting airflow and reducing reliance on mechanical cooling systems. Additionally, the building's heavy concrete and steel structure acts as thermal mass, helping to regulate indoor temperatures by absorbing heat during the day and releasing it at night. These strategies contribute to reducing the building’s overall energy consumption, aligning with modern principles of sustainable design

3.2.2.4. Analysis & Inference

Variations in Co-Working Modules.

Optimized Working Environment.

3.2.3. MIT Media Lab

Figure 51MIT Media Lab Building

Location: Masachusetts, USA

Completion: 2020 AD

Architecture: Institutional Building

Orientation : North-East

Type: Institutional Building

Site Area: 500,000 square feet (46,451 square meters)

Programs: Office Workspace, Incubation & Training Space

3.2.3.1. Architectural Character

Figure 52Staircase Color coding in the MIT Building

The architectural character of the **MIT Media Lab**, housed within the **Ray and Maria Stata Center**, is a striking example of contemporary design, blending bold, unconventional aesthetics with functional innovation. Designed by renowned architect **Frank Gehry**, the building showcases his signature approach to deconstructivist architecture, characterized by fragmented forms, dynamic angles, and the use of non-linear, organic shapes. The design challenges traditional architectural conventions, embracing a sense of chaos and unpredictability that aligns with the cutting-edge, interdisciplinary nature of the Media Lab itself.

The building’s exterior features a mix of materials, including metal, glass, and concrete, creating a visually stimulating contrast between smooth, reflective surfaces and rough, textured elements. The asymmetrical shapes and jagged angles give the structure a sense of movement and energy, reflecting the innovative and forward-thinking spirit of the lab. Gehry’s use of curving walls, slanted roofs, and irregular forms reflects the fluidity and creativity inherent in the work being done inside.

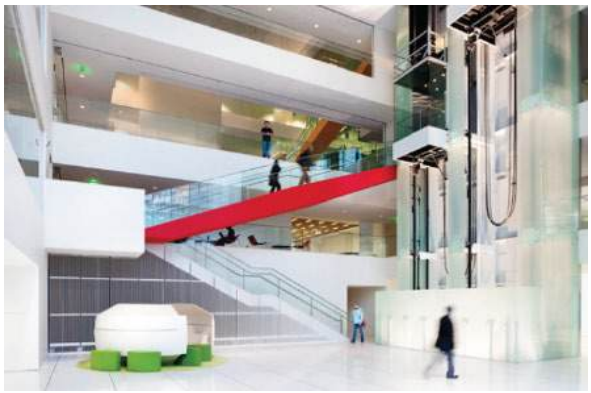


Figure 53central atrium with molti-leveled floor connection

Inside the building, the architectural design prioritizes openness and flexibility, creating collaborative spaces that encourage interaction and cross-disciplinary work. The interior is marked by large, open floor plans, high ceilings, and expansive glass walls that enhance connectivity between different spaces. The open, adaptable spaces and dynamic environment foster an atmosphere where technology, design, and creativity intersect, reinforcing the lab's mission to push the boundaries of innovation in media and technology.

3.2.3.2.Planning & Circulation

At the core of the planning is the open floor plan that promotes collaboration across different research groups. The interior spaces are organized around large, open, flexible areas that can be easily adapted to various needs. These open spaces encourage spontaneous interaction and interdisciplinary exchange, a key feature of the Media Lab's philosophy. The design also includes modular spaces, allowing for quick reconfiguration to accommodate evolving projects and team dynamics.

The building’s multi-level layout includes dedicated floors for specific functions. The upper levels contain research labs and studios, providing researchers with the necessary space for experimental work and technological development. These areas are equipped with state-of-the-art facilities for prototyping, testing, and creative experimentation. The lower levels are home to communal spaces, including large gathering areas, a cafe, and event spaces that encourage informal meetings and networking.

Large, glass walls throughout the building create visual connections between the different spaces, enhancing the flow of movement and allowing occupants to feel connected to the broader activities within the lab. The use of glass also maximizes natural light, contributing to an open and inviting atmosphere.

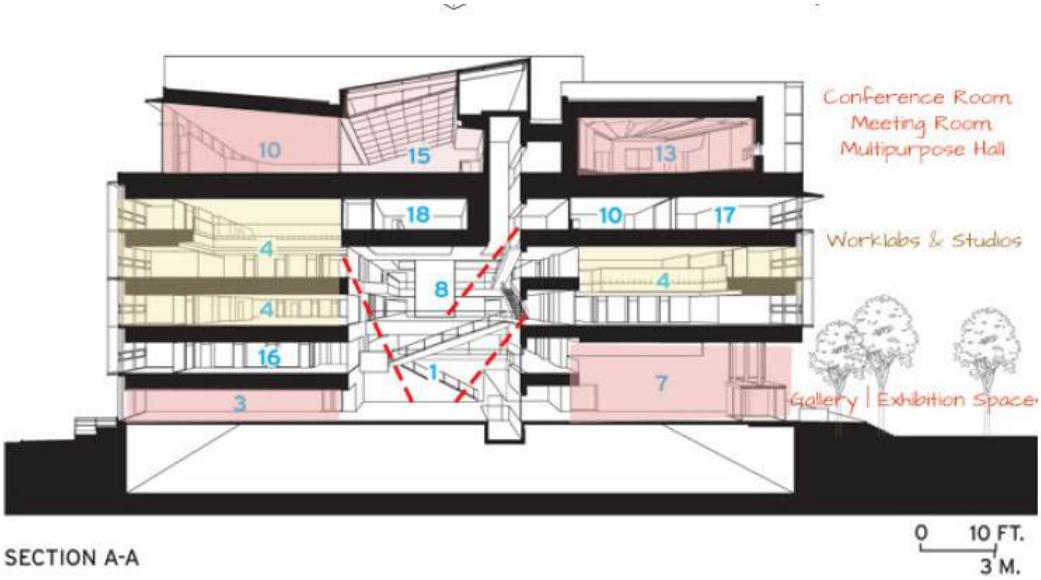


Figure 54 Section showing intra-building zoning

3.2.3.3. Analysis & Inference

Spatial Requirements & Zoning of a makerspace.

Need of natural elements & multiple connectivity within a makerspace.

3.2.4. Titan Integrity Campus

Figure 55Natural elements in the Titan Office Workspace

Location:

Bangalore, India

Completion: 2017 AD

Architects: MindSpace Architects

Orientation : North-East

Type: Office Building

Site Area: 390000 sq.ft. (72 ropanies)

Programs: iOffice Workspace, Incubation & Training Space.

3.2.4.1. Architectural Characteristics

The Titan Integrity Campus in Bangalore, India, is a contemporary corporate campus designed with a focus on sustainability, functionality, and innovation. The campus serves as the headquarters for Titan Company Limited, one of India's leading lifestyle brands, and is built to foster a productive and collaborative work environment while maintaining a connection to nature and modern architectural trends.

Figure 56Key Design elements in Titan Integrity Campus

1. Sustainable and Green Design

One of the standout architectural characteristics of the Titan Integrity Campus is its commitment to sustainability. The building is designed with several eco-friendly elements, such as energy-efficient systems, rainwater harvesting, and solar panels. The campus is optimized for natural lighting, reducing the need for artificial lighting during the day and enhancing energy efficiency. Its design also incorporates the use of high-performance insulation and low-energy cooling systems to minimize environmental impact, making it a green building that adheres to sustainable construction standards.

Figure 57Funelling & Stack effect as a passive cooling strategy

2. Modern and Minimalistic Aesthetic

The Titan Integrity Campus reflects a modern, minimalistic aesthetic characterized by clean lines, open spaces, and a neutral color palette. The design focuses on creating a seamless flow between indoor and outdoor spaces, with the use of large glass windows and facades that enhance transparency and openness. This architectural style not only contributes to the campus's sleek and contemporary look but also fosters a sense of openness and connection to the natural surroundings.

3. Open and Flexible Workspaces

The

Figure 58Titan Integrity Campus - Floor Plans

campus is designed with flexible workspaces that encourage collaboration, interaction, and creativity. The interiors feature open-plan offices, modular workstations, and collaborative zones, allowing for easy reconfiguration based on changing needs. Breakout spaces and informal meeting areas are strategically placed throughout the campus to support both structured work and spontaneous conversations. The design supports a fluid and dynamic work culture, enabling teams to come together in an environment that adapts to their work styles.

4. Integration with Nature

Nature plays a central role in the architectural design of the Titan Integrity Campus. The campus features landscaped gardens, outdoor seating areas, and green courtyards, creating tranquil spaces for relaxation and enhancing employee well-being. The large open spaces and the integration of green elements within the building’s design encourage a harmonious relationship between the built environment and the natural surroundings. The design promotes the idea of work-life balance, with ample outdoor spaces for recreation and a connection to nature.

5. Technology Integration

The campus incorporates state-of-the-art smart technologies to improve operational efficiency and enhance the experience of its occupants. Features such as automated lighting, climate control systems, and advanced security systems are integrated seamlessly into the design to provide a high level of comfort, safety, and energy efficiency. The use of technology also extends to the campus’s infrastructure, supporting modern business needs and helping employees stay connected in a dynamic and fast-paced work environment.

6. Aesthetic and Functional Landscaping

The landscaping within and around the Titan Integrity Campus is not only aesthetically pleasing but also serves functional purposes. The outdoor areas are designed to encourage outdoor activities, with walking paths, green spaces, and seating areas integrated into the layout. The landscaping is designed to create a serene and engaging environment that supports both social interaction and individual reflection.

3.2.4.2. Passive Design Strategies

The Titan Integrity Campus in Bangalore incorporates several passive design strategies aimed at enhancing sustainability and energy efficiency. The building maximizes natural ventilation through open layouts and strategically placed windows, reducing the need for mechanical cooling. Large glass facades and skylights allow ample daylighting, minimizing the use of artificial lighting during the day. The use of high-performance insulation and materials with good thermal mass helps regulate internal temperatures, reducing the need for artificial heating and cooling. Additionally, landscaped gardens and green courtyards create a cooler microclimate around the campus, mitigating heat island effects and contributing to overall environmental comfort. These strategies work together to create an energy-efficient, comfortable, and sustainable workspace.

3.2.4.3. Inference & Analysis

Cost-effectiveness

Location

- **Site Address**: Bhelpa, Lalitpur, Bagmati, Nepal
- **Municipality**: Lalitpur Municipality
- **Proximity**:
    - 1.1 km from Patan Industrial Estate
    - 500 m from National Academy of Science & Technology (NAST)
    - 200 m from Little Angels School

Figure 59Location Map

Site Area & Orientation

- **Total Area**: 15,258.74 sq.m. (29-7-0-6)
- **Orientation**: North to South

Topography & Vegetation

- **Terrain**: Mostly flat with gentle contour from west to east
- **Vegetation**: Fertile farmland used for crops

Current Land Use

- Agricultural (farming)
- Temporary built structures

Figure 60 Course of Karmanasha River over the years

The site is strategically positioned in Lalitpur Municipality with a total area of 20,118.32 square meters (equivalent to 39-8-2-3 in Nepali land measurement). It is oriented along the north-south axis. The terrain of the site is mostly flat with a gentle contour descending from west to east, making it suitable for various development possibilities. The site's vegetation primarily consists of fertile farmland used for crop cultivation. At present, the land is primarily used for farming and contains some temporary built structures.

One of the significant natural features adjacent to the site is the Karmanasha River, which includes a designated 20-meter corridor for buffer and environmental protection. The elevation across the site ranges from 4162 feet to 4305 feet, with specific contour points at 4162 ft, 4177 ft, 4189 ft, 4200 ft, 4294 ft, and 4305 ft. The floodplain height in the area ranges from 0.75 meters to 1.5 meters above the riverbed. Based on the analysis, the area is categorized as a low hazard zone, with elevations less than 1 meter above the river level. To mitigate flood

risks, the plan includes a 20-meter construction buffer zone and protective retaining walls along vulnerable edges.

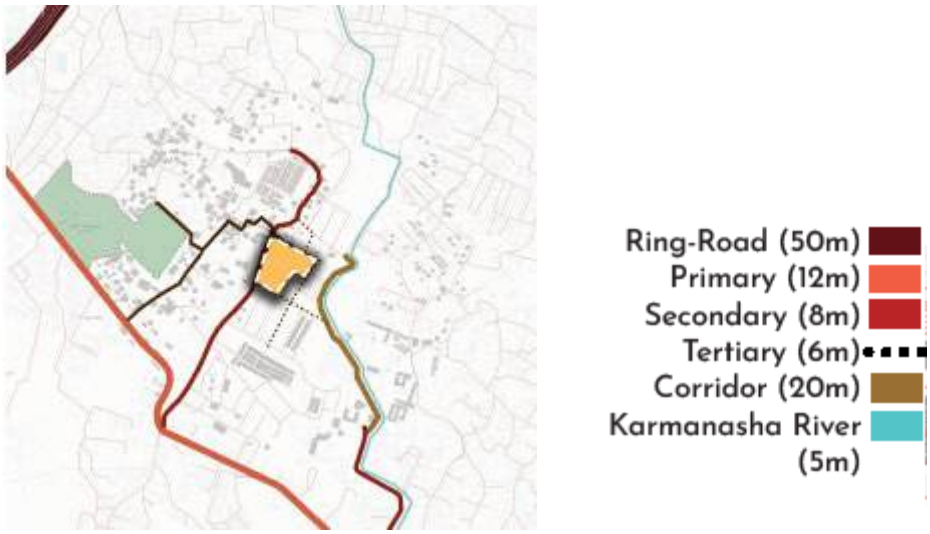


Figure 61Road accessibity

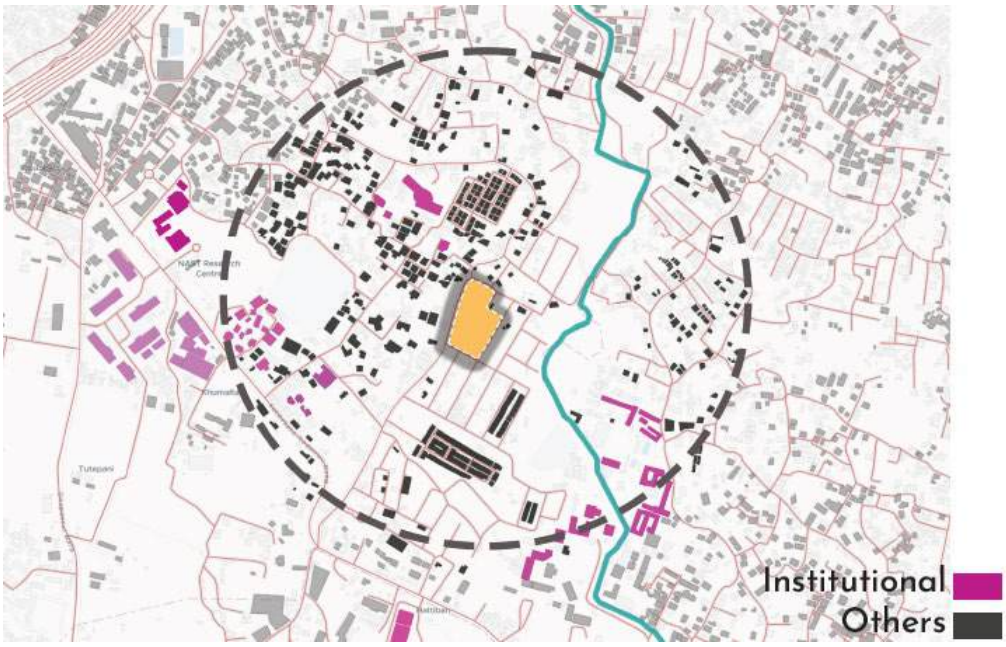


Figure 62Institutional Buildings nearby

Figure 63Built Area around the site

According to the seasonal and long-term flooding behavior of the Karmanasha River, the average monthly rainfall discharge peaks in August at 14.5 m², with significant precipitation from June to September, indicating a strong monsoon influence. Flooding tendencies over the years 2000 to 2080 show fluctuating elevation levels, with a notable peak in 2081 reaching 3600 meters. The floodplain height in the river-adjacent zone ranges between 0.75 m to 1.5 m above the riverbed, classifying areas below 1 m as low hazard zones. As a mitigation measure, a 20-meter-wide corridor is under construction, alongside planned retaining walls for additional protection. Importantly, while the site offers visual connectivity to the Karmanasha River from multiple vantage points, it remains safe from direct flooding impact as the floodplain does not extend to the site, which is situated 40 meters away and shielded by the developing corridor infrastructure.

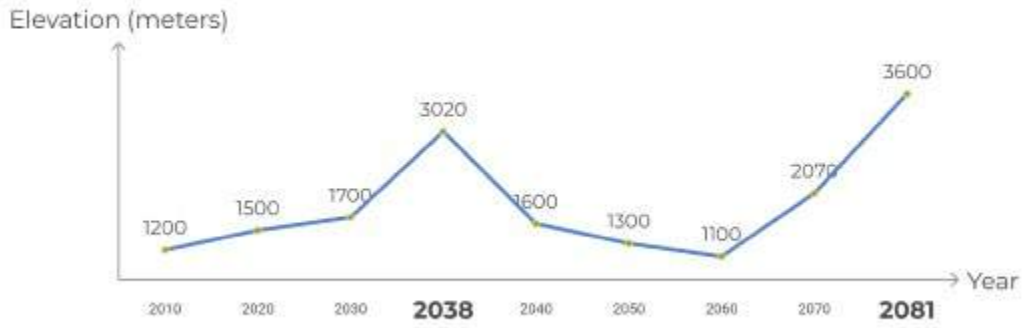


Figure 64Flooding Tendency of Karmanasha River

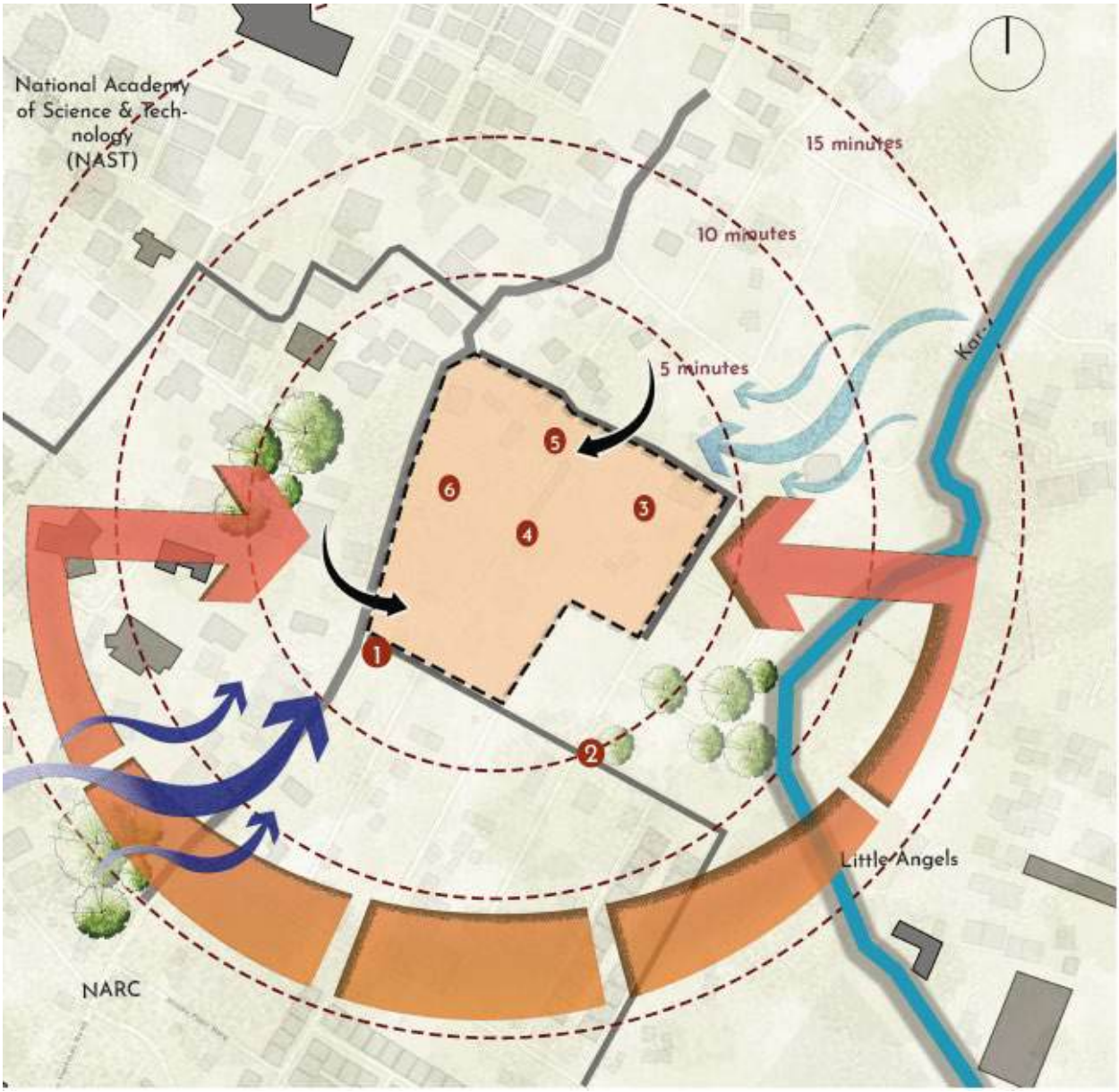


Figure 65 Site Analysis Diagram

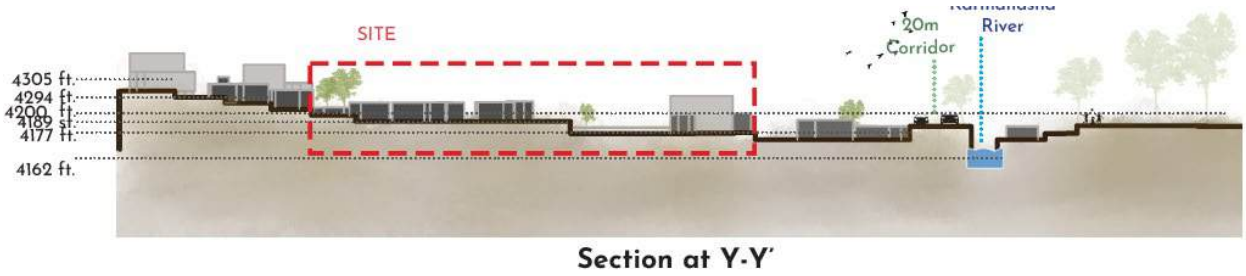


Figure 66site section

In terms of accessibility, the site is well connected to the urban transport network. It lies approximately 1.1 kilometers from the Patan Industrial Estate, 500 meters from the National Academy of Science & Technology (NAST), and just 200 meters from Little Angels School. Major roads in the area include the 50-meter-wide Ring Road, 12-meter-wide primary roads, 8-meter-wide secondary roads, and 6-meter-wide tertiary roads. Internally, a 20-meter corridor and a 5-meter riverside path further enhance access to and within the site.

The SWOT analysis of the site reveals several key insights. Strengths include its strategic and scenic location, accessibility, and institutional support from surrounding academic and industrial entities. Opportunities lie in the creation of urban green spaces, implementation of sustainability initiatives, and the potential for site expansion. However, the site does face weaknesses such as exposure to environmental risks and noise pollution due to its proximity to active urban zones. Threats include potential climate change impacts, flooding tendencies of the Karmanasha River, and possible regulatory changes that may affect development.

Land use in and around the site includes agricultural zones, built-up areas, vegetated zones, and patches of bare ground. The overall built density is currently low, consisting mostly of temporary structures and nearby institutional developments. Furthermore, a proximity analysis shows the site is located within a dense network of educational and industrial institutions, highlighting its viability for future urban or academic expansion.

Historical and projected flood data from 2000 to 2080 illustrate the increasing flooding tendency of the Karmanasha River, reinforcing the importance of resilient planning and infrastructure development in this area.

Figure 68Site Photograph 1

Figure 67Site Photograph 2

Figure 70Site Road Condition

Figure 69Site Land Topography

4. Program Formulation & Area Distribution

In response to the requirements outlined by the Nepal Government for an incubation program focused on promoting digitalized start-ups—alongside subsidiary initiatives such as the revitalization of traditional technologies, training camps for clay and wood work, and innovation opportunities in handmade crafts—I have developed a formulated program that aligns with these national priorities. By analyzing case studies from other countries and their successful incubation models, this project emerges with a clear purpose: to address the pressing need for a strong networking and collaborative environment while providing meaningful exposure and growth opportunities for youth engaged in both modern and traditional creative industries.

The tabulation of the program is as follows:

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Collaborative Co-Working Space				
1.	Open Co-Working WorkStations	3	25	3.14	235.5
2	Training Halls	4	30	2.18	261.6
4	Mentor's Room	3	10	1.85	55.5
5	Meeting Rooms	4	12	2.21	106.08
6	BreakOut Areas	3	10	4.77	143.1
7	Media Rooms	3	12	2.9	104.4
8	Private Offices Spaces	6	8 each	2.33	111.84
9	Lobby	1	12	6.25	75
10.	Pantry	1	4	1.4	5.6
11.	Toilet			30	30
	Total				**1129.34**

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Administration				
1.	Reception	1	10	2.05	20.5
2	Accounts	1	3	3.3	9.9
4	Manager's Office	1	3	4.3	12.9
5	Director's Office	1	3	6	18
6	Workstation	1	15	4.76	71.4
7	Pantry	1	4	1.4	5.6
8	Toilet				10
	Total				**148.3**

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Entrance				
1.	Entry Platform	1		50	50
2	Collab Plaza	1		100	100
4	Cafe / Exhibit Space	1	40	10m2 per person	400
5	Toilet (M) 2u-2wc-2wb	1		15	15
6	Toilet (F) 3wc - 2wb	1		12	12
	Total				**582**

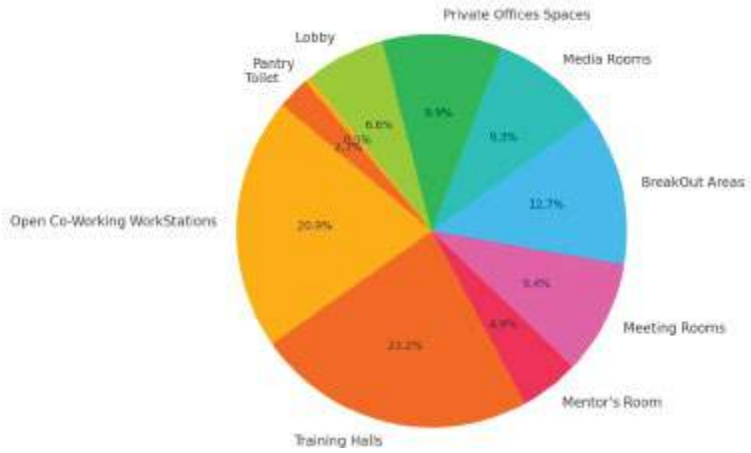


Figure 71Pie-chart showing area distribution in co-working Space

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Library				
1.	Front Desk	1	10	2.02	20.2
2	Media Center	1	10	1.48	14.8
3.	Reading Area	1	10	1.52	91.2
4.	Book Aisle	1	10	5.46	54.6
	Restaurant				
1.	Restaurant	1	75	3.55	266.25
2.	Kitchen	1	10	8.33	83.3
3.	Outdoor Dining	1	10	6.63	66.3
	Miscellaneous				
1.	Exhibition Area	1	200	1.22	244
2.	Pop-Up Stores | Retails	10	5	2.37	118.5
	Total				**1085.35**

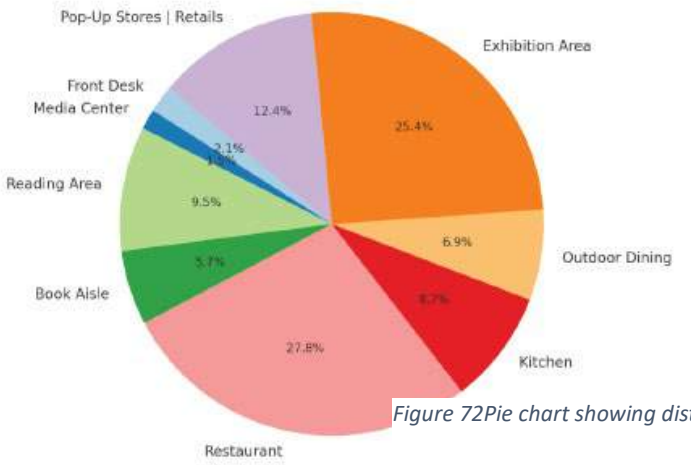


Figure 72Pie chart showing distribution of supporting space

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Incubator & Accelerator Space				
1.	Pitch Desk	1	30	1.82	54.6
2	Briefing Area	1	25	2.26	56.5
4	Meeting Rooms	2	10	1.85	37
5	Group Work Areas	1	20	2.51	50.2
6	Store	1			15
7	Pantry	1	2	3.35	6.7
8	Toilet				15
	Total				**235**

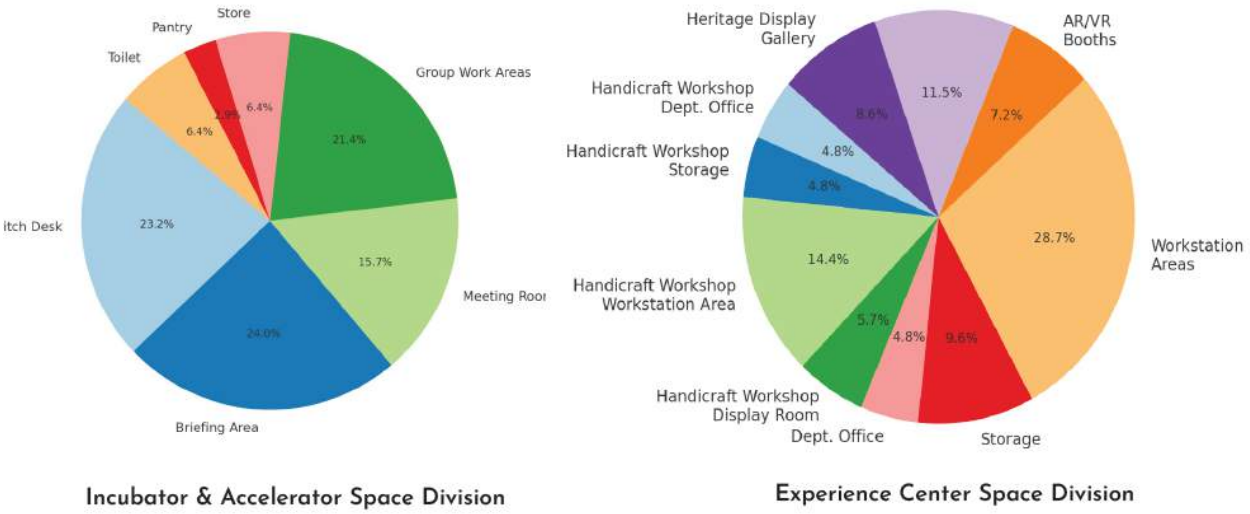


Figure 73 Pie Chart showing distribution of space in Incubation center & Experience CENTER

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Makerspace | Workshops				
1.	Molding/Casting Space	1	10	13	130
2	Electronic Room	1	10	5	50
4	Wood Workshop	1	10	10	100
5	Metal Workshop	1	10	10	100
6	Storage Spaces	1			150
7	Laser Cut/ CNC Room	1	10	7	70
8	3D Modelling Room	1	10	5.2	52
9.	Media Lab / Photography	1	10	4.6	46
10.	Clay Modelling	1	10	4.6	46
11.	Testing Area	1	10		150
12.	Toilet				30
	Total				**924**

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Experience Center				
	Traditional Technology				
1.	Department Office	1	10	5	50
2.	Storage	1	10	10	100
3.	WorkStation Areas	3	10	10	300
4.	AR/VR Booths	1	30	2.5	75
5.	Indigenous Technology Documentation Lab (recording, scanning, archiving)	1	30	4	120
6.	Heritage Technology Display Gallery	1	20	4.5	90
	Total				**735**

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Experience Center				
	Handicraft Workshop				
1.	Department Office	1	1	25	50
2.	Storage	1		50	50
3.	WorkStation Area	2	15	50	150
4.	Display Room	2		30	60
		1			
	Total				**310**

5. CONCEPT DEVELOPMENT

“Coming together is a beginning. Keeping together is progress. Working together is success.” — Henry Ford

The central vision of the incubation center is framed around the metaphor of **"The Urban Tetris"**, which emphasizes adaptive, flexible, and community-integrated design. This metaphor implies a built environment that functions like a modular, interlocking system — responsive to context, collaboration, and communal interaction. The approach fosters innovation by designing spaces where users can **build, work, connect, play, socialize, share, and collaborate**—harmonizing the physical layout with social needs.

The proposed architectural design for the Innovation Center centers on a fundamental belief: innovation thrives where people interact, nature inspires, and environments adapt. The core design concept is grounded in the integration of **intermediate social spaces and buffer zones**—transitional areas at every level of the building that enable seamless communication, spontaneous collaboration, and moments of reflection.

These **interspaces** are not mere circulation routes but **active social corridors**, semi-open terraces, shared green balconies, and open lounges that function as connective tissue—fostering dialogue between formal workspaces and informal communal settings. The goal is to soften the boundary between working in solitude and engaging in shared experiences.

In doing so, the building cultivates a **"spectrum of collaboration"**: from public nodes designed for collective brainstorming and workshops to private nooks and focus pods for individual work—all intertwined with **natural elements** such as vertical gardens, daylight wells, and landscaped atriums that reduce mental fatigue and encourage well-being.

The programmatic flow also demands high functionality. Institutional services like **legal aid, financial consulting, and administrative assistance** are **strategically embedded** into the plan—readily accessible near co-working zones and social nodes, ensuring that support is never far from ideation. The adjacency of these support services to informal spaces allows quick turnarounds and integrated guidance during the incubation process.

Ultimately, this innovation center is envisioned not just as a building, but as a **living framework**—a place where structure and nature, solitude and synergy, institution and intuition, coexist. It is a spatial ecosystem that supports a community of creators, thinkers, and makers, designed with the understanding that **the space between work is where the next idea is born.**

5.1 Story Sequence & Concept Realization

An integral dimension of the Incubation Center's design lies in its **narrative-driven spatial framework**, where each zone is metaphorically named to reflect the emotional journey of a newborn idea—from its fragile beginnings to its moment of readiness for the world. This storyline does more than guide circulation; it **poeticizes the architecture**, aligning emotion with environment and giving purpose to form. The masterplan is organized into **four conceptual phases**, each echoing a distinct moment in the incubation of ideas.

The journey begins with **"Uncertainty"**—a space of curiosity, ambiguity, and introspection. This phase is articulated through the **entry sequence**, where a **broad, open forecourt narrows** as users approach the core buildings, representing the gradual sharpening of a raw concept into something more defined. Architectural gestures like **sunken stairways and underground elements** are used to evoke a descent into the unknown, symbolizing the unease, introspection, and quiet momentum that often accompany early ideation.

From there, the two most prominent built forms—the **Co-working Block** and the **Incubation Block**—stand in intentional opposition, **oriented away from one another rather than facing inwards**. This spatial tension is named **"The Friction"**, representing the **clash, competition, and convergence of ideas** that refine innovation. Instead of centralizing social activity between them, the distance creates **open buffer zones**, encouraging informal interactions in shared green courtyards and semi-open walkways, while allowing each block to retain spatial independence and programmatic focus.

These opposing blocks are held together by a central communal space: a **semi-circular amphitheatre**, supported by **pilotis and a semi-covered platform**, designed as a venue for dialogue, critique, and public sharing. This space becomes the **core of collective experience**, where ideas are stress-tested and celebrated. It is accessed via a **centralized linear axis** extending from the entry and terminating at this open node. This guiding element is called **"The Spine"**, acting as a **connective gesture**—a symbolic thread weaving together disparate functions and philosophies within the center.

The final stage of the journey is represented by **"The LaunchPad"**. Though not a discrete space in the masterplan, it emerges as a **design logic**: both key blocks are oriented to the **North**, optimizing **diffused daylight** for creative and technical work. The elevational expression responds to this with an **upward sweeping form**, suggesting the rising trajectory of a matured idea preparing to launch. The architectural crescendo in the facade captures the spirit of lift-off—the culmination of incubation and the beginning of real-world impact.

Together, these narrative spaces transform the Incubation Center into more than a workplace—they shape it into a **storyscape**, where spatial design nurtures emotional experience, and every step in the journey of innovation is given both **form and feeling**.

5.2. Conceptual Architecture Design Strategies

1. Stepped Design

The design of the incubation center follows a **stepped approach** that harmonizes with the site’s natural topography. This allows the built form to flow organically with the terrain, enhancing aesthetic appeal and ensuring minimal disruption to the natural landform. It supports zoning of functions according to levels—placing public, semi-public, and private programs at different elevations—while maintaining visual and functional connectivity throughout the center.

2. Flood Mitigation Strategies

Given the site's proximity to the Karmanasha River and its flood-prone nature, **flood mitigation is a core strategy**. This is addressed through a **stepped riverfront development**, where natural vegetation, green embankments, and contour-adaptive landscaping act as both ecological buffers and recreational zones. These strategies reduce surface runoff, prevent erosion, and increase safety, all while enhancing the spatial experience for users.

3. Community Engagement

A strong relationship with the surrounding community is embedded in the design. **Community engagement** is not just a byproduct but a driving factor. Open plazas, interactive streets, exhibition areas, and informal gathering nodes encourage local involvement. The design thus facilitates **social inclusivity** and **mutual learning** between incubator users and neighborhood residents, ensuring the center becomes an integrated part of the local urban fabric.

4. Flexible Buffer Space

The plan includes **flexible and buffer spaces** that can adapt to various needs over time. These spaces act as breathing zones within the dense layout—allowing for pop-up events, casual meetings, workshops, or even emergency extensions. Landscaped courtyards, terraces, and open-air zones provide natural ventilation, psychological comfort, and the ability to adapt to changing user demands.

5. Reintegration of nature into Urban Fabric

In a context dominated by dense urbanization, the incubation center aims to **reintegrate nature** through green corridors, shaded pathways, urban forests, and biophilic design elements. These green inclusions promote biodiversity, improve microclimate, and offer tranquil experiences for reflection and recreation, reinforcing the well-being of users and visitors alike.

5.2 Program Context & Incubation Process

The functional programming follows a **progressive incubation process** structured into four contextual pillars:

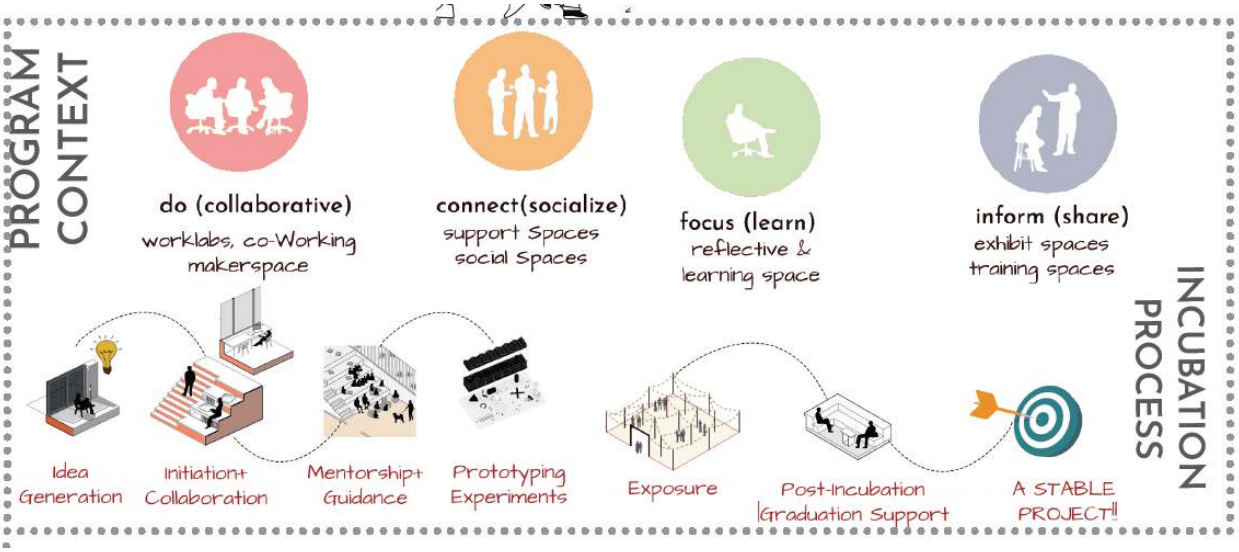


Figure 74PROGRAM CONTEXT

- **Do (Collaborative Spaces)**: Includes work studios, coworking zones, and makerspaces that support collaboration and hands-on creation.
- **Connect (Socialize)**: Social spaces such as cafes, informal lounges, and event venues that encourage interpersonal interaction.
- **Focus (Learn)**: Quiet zones, classrooms, or reflective corners designed for learning and development.
- **Inform (Share)**: Spaces like exhibition halls and training rooms that allow users to share results, ideas, and feedback.

This framework supports a lifecycle of innovation starting from **idea generation**, moving through **collaboration, mentorship, prototyping**, and leading to **exposure and post-incubation support**, culminating in **stable project realization**.

5.3. Form and Mass Development

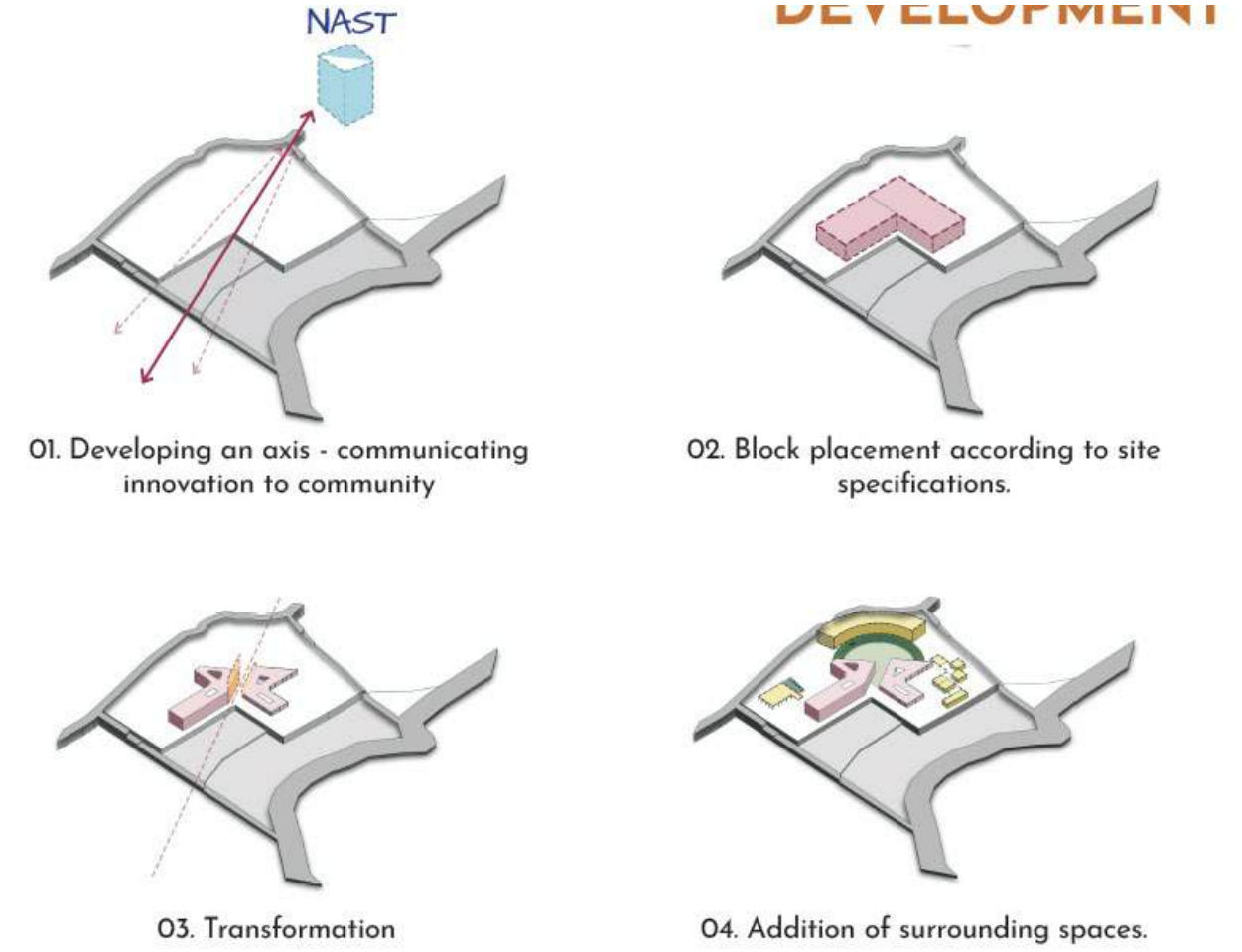


Figure 75MASSING CONCEPT

01. Developing an Axis

The spatial design begins by establishing a **visual and spatial axis** that connects the innovation hub to the broader community—symbolically and functionally communicating the purpose of the center. This axis becomes a spine along which key functions align.

02. Block Placement According to Site Specifications

Built blocks are positioned considering site-specific constraints such as sunlight, wind, circulation, and topography. The placement reflects zoning logic and allows seamless internal and external transitions.

03. Transformation

Initial massing undergoes **form evolution** through the integration of terraces, recesses, and expansions, responding to programmatic needs and creating a dynamic spatial experience.

04. Addition of Surrounding Spaces

Finally, the form is enhanced by **layering public amenities and green elements**. This includes play areas, buffer greens, water management systems, and transitional open zones—thus blurring the boundary between built space and the urban ecosystem.

Figure 76Final Masterplan Zoning

5.3 MASTERPLAN DEVELOPMENT

The masterplan presented is a well-articulated layout for an **Incubation Center**, designed with a focus on functionality, community engagement, environmental integration, and architectural sensitivity to the natural context. The plan is structured in a manner that creates zones of activity, interaction, innovation, and recreation—all connected by a thoughtful circulation system and enhanced with public and green spaces. Below is a comprehensive explanation of the masterplan and its spatial components:

Overall Planning Strategy

The masterplan reflects a **modular yet organic organization** of space, divided into key programmatic blocks and social nodes. The design respects the natural topography and takes advantage of the site's proximity to the Karmanasha River. The arrangement promotes walkability, visual connectivity, and an immersive experience as one moves from enclosed built forms to semi-open and open spaces. It also integrates environmental buffers and flexible outdoor zones to foster collaboration, creativity, and sustainability.

Spatial Zoning and Breakdown

1. Exhibition Area

Located at the upper-left corner of the site, the Exhibition Area serves as a dynamic space for showcasing ideas, prototypes, models, and public exhibitions. It is positioned strategically near the entrance, allowing both visitors and users to engage immediately with the essence of the incubation centre. It is led to by the stepped down stairs that open up to a green buffer space. The design enables flexibility for temporary installations and multi-format displays.

2. Experience Center / Display Area

Adjacent to the exhibition zone is the Experience Center, which functions as an interactive space for demonstrations and immersive user experiences. This space bridges the gap between concept and application, helping innovators simulate their ideas in real-time and share them with external audiences. It is also a hub for digital storytelling and technological displays.

3. Administration Block

This is the core management and coordination area of the center. The Administration Block houses staff offices, reception services, and operational infrastructure. It is placed just next to the entrance, so that people can navigate easily. It provides oversight and support to the rest of the incubation functions, ensuring seamless operations and resource management.

4. Co-Working Collaborative Workspace

This space is designed for **startups, entrepreneurs, freelancers, and project teams**. It encourages interaction and co-creation through modular furniture, shared desks, breakout spaces, and quiet work zones. The key design of the co-working space is the gradually increasing stepped green bets rising from the ground all the way to the roof connecting the building at different floors. This design strategy allows the users to have ample leisure spaces for work-life balance, and also the segregation of private, semiprivate and public space on necessity. This design element also helps in accentuating the

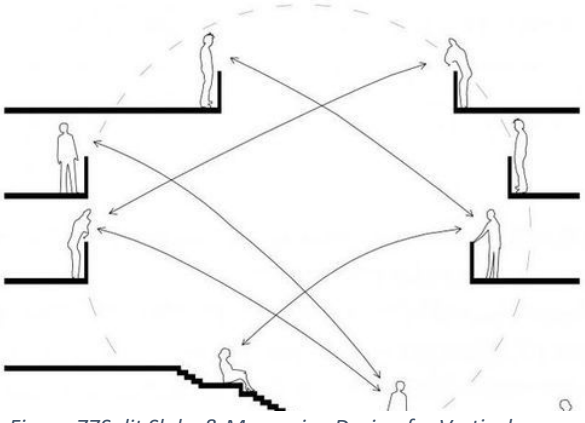


Figure 77Split Slabs & Mezzanine Design for Vertical Connectivity

entrance and guides the users within the space. The co-working area is connected to both formal and informal spaces indoors too, allowing users to switch between focused work and social collaboration fluidly, within the building block.

5. Sunken Social Staircase

A key feature of the masterplan, the **Sunken Social Staircase** acts as a connective transition between different levels of the site while also doubling as a social gathering zone. It functions as an informal amphitheater, a hangout space, and a pathway. This design element blurs the boundary between circulation and congregation, embodying the collaborative spirit of the center.

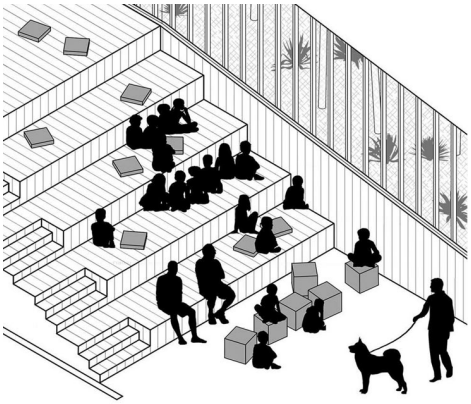


Figure 78Sunken Staircase in co-working block

6. Meeting Hall + Training Space

This space is intended for workshops, training programs, seminars, and formal gatherings. The hall supports varied formats—from panel discussions to bootcamps—and is essential for skill development, mentorship sessions, and institutional meetings. Its adjacency to workspaces ensures easy access and encourages knowledge exchange.

7. Sunken Amphitheater

The large **Sunken Amphitheater** forms the heart of the site. It is designed to host public lectures, presentations, performances, and community events. With circular seating and open-air design, it promotes inclusivity and participation. It also visually anchors the central axis of the masterplan, reinforcing spatial hierarchy.

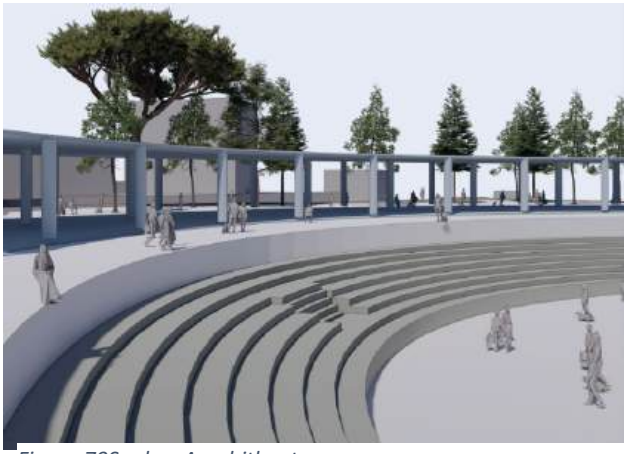


Figure 79Sunken Amphitheatre

8. Cafeteria / Eatery

Positioned behind the amphitheater and connected by green buffer zones, the cafeteria offers informal spaces for eating, resting, and social interaction. This facility enhances user experience, encouraging extended stays and casual networking. It also serves as a passive node for community engagement, inviting outsiders into the daily rhythm of the center.

9. Physical Makerspace

Located on the eastern wing of the site, the **Makerspace** is a highly functional area designed for physical prototyping, fabrication, and testing. Equipped with tools and materials, it caters to innovators building tangible solutions. Its separation from quiet zones ensures safety and minimal disturbance while still remaining accessible to all users.

10. Riverfront Park Space – The Idea Field

A landscaped park forms the southern boundary of the masterplan, creating a transition between built form and the river ecosystem. The **Riverfront Park Space** serves as a recreational, reflective, and ecological zone, offering walking trails, shaded sitting areas, and bioswales. It promotes mental well-being and reinforces the site's commitment to sustainability.

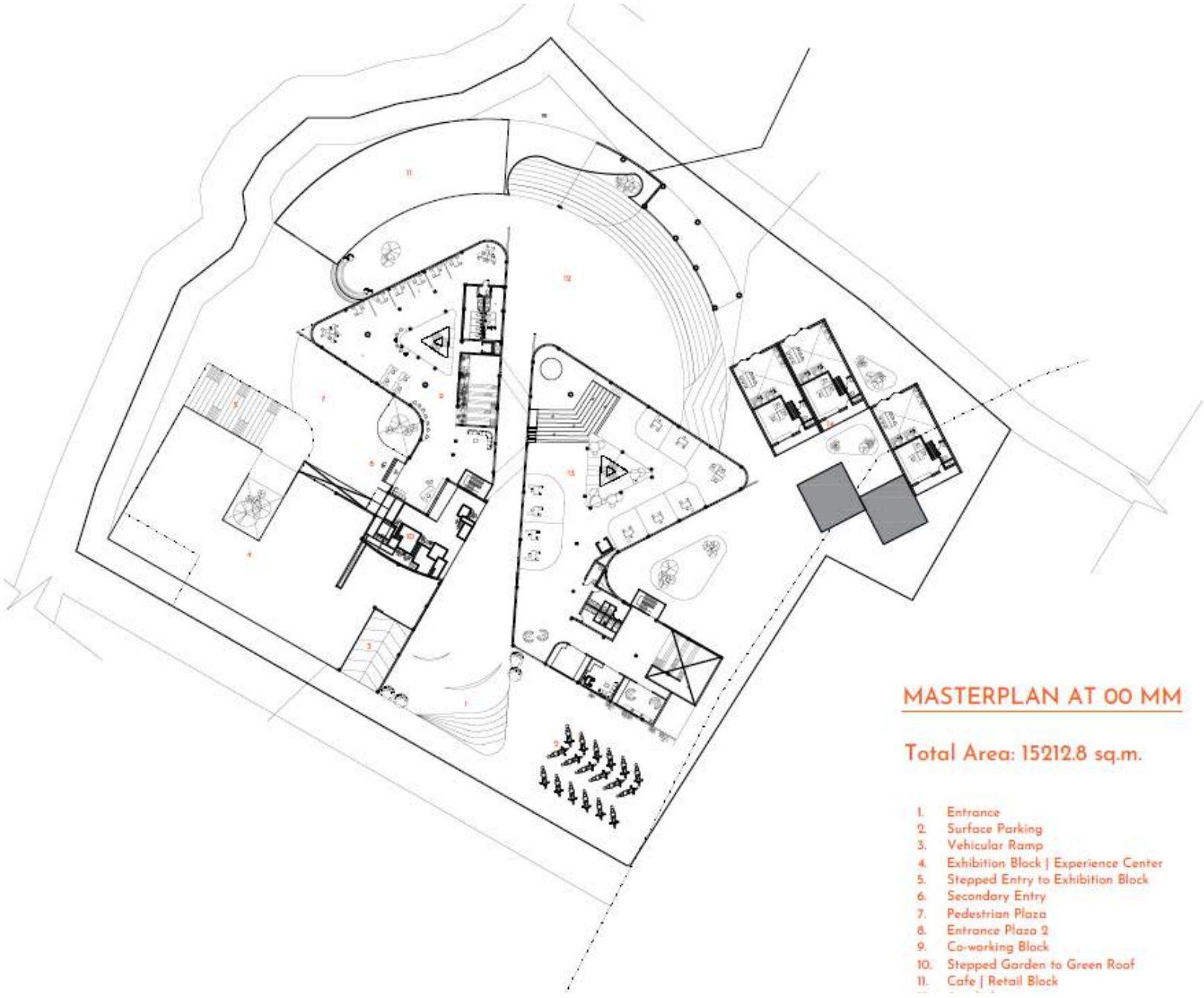
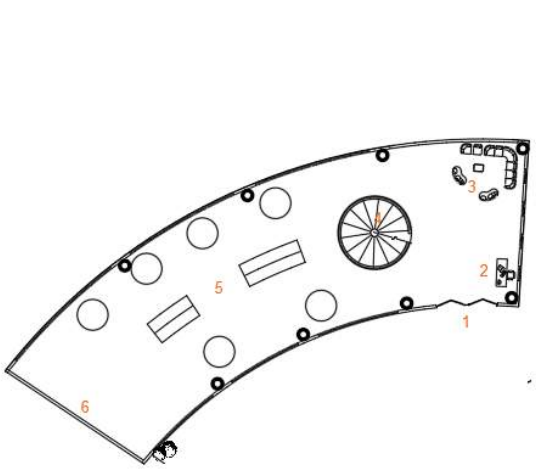


Figure 80Masterplan Development



Cafeteria Block

1. Entrance
2. Reception
3. Lounge | Spill Area
4. Circular Staircase
5. Product Display Area
6. Representative | Display | Mural Wall

Figure 82Restaurant | Retail Plan

Admin Block

Area: 485.6 sq.m.

1. Director's Office
2. Assistant's Office
3. Finance Section
4. HR | Admin Office
5. Security Control Room | Office
6. Maintainance Office
7. Manager's Office
8. Accounts Section
9. Reception Desk
10. Pantry
11. Waiting Lobby
12. Lobby (Event Management)

Figure 81Admin Block Plan

8. Café Space

The ground floor of this semi-circular café popup block seamlessly integrates with the adjoining amphitheatre, functioning as an organic extension of the event space to enhance interaction, fluidity, and user experience. Designed to blur the boundaries between performance and leisure, this level invites users to transition effortlessly from audience to café-goer within a dynamic spatial continuum. Above, the first floor—accessible directly from the 00 level of the site plan—hosts a public cafeteria that welcomes all visitors, fostering inclusivity and casual gathering. Architecturally, the form embraces curvature and openness, allowing framed views and natural light to cascade through glazed surfaces, while materials and textures are carefully curated to celebrate warmth, tactility, and contextual harmony. The juxtaposition of levels, openness of form, and landscaped transitions create a spatial rhythm that not only supports the program but elevates the architectural experience

9. Admin Block

The Admin Block of the incubation center unfolds as a fluid, low-ceilinged volume, where spatial compression is balanced through a rhythm of pocket spaces and visual relief. Despite the modest 7' floor height, the layout invites movement and interaction, with softened transitions and articulated nodes that resist monotony. At the heart of the plan, a circular incubation portal anchors the space—both symbolically and functionally—serving as a digital threshold to inter-provincial collaboration. The plan prioritizes porosity, daylight access, and intuitive zoning, allowing the administrative core to operate efficiently while remaining visually and experientially engaging. Material warmth, curved geometries, and the interplay of scale contribute to a sense of grounded openness, making the block feel more expansive than its constraints suggest

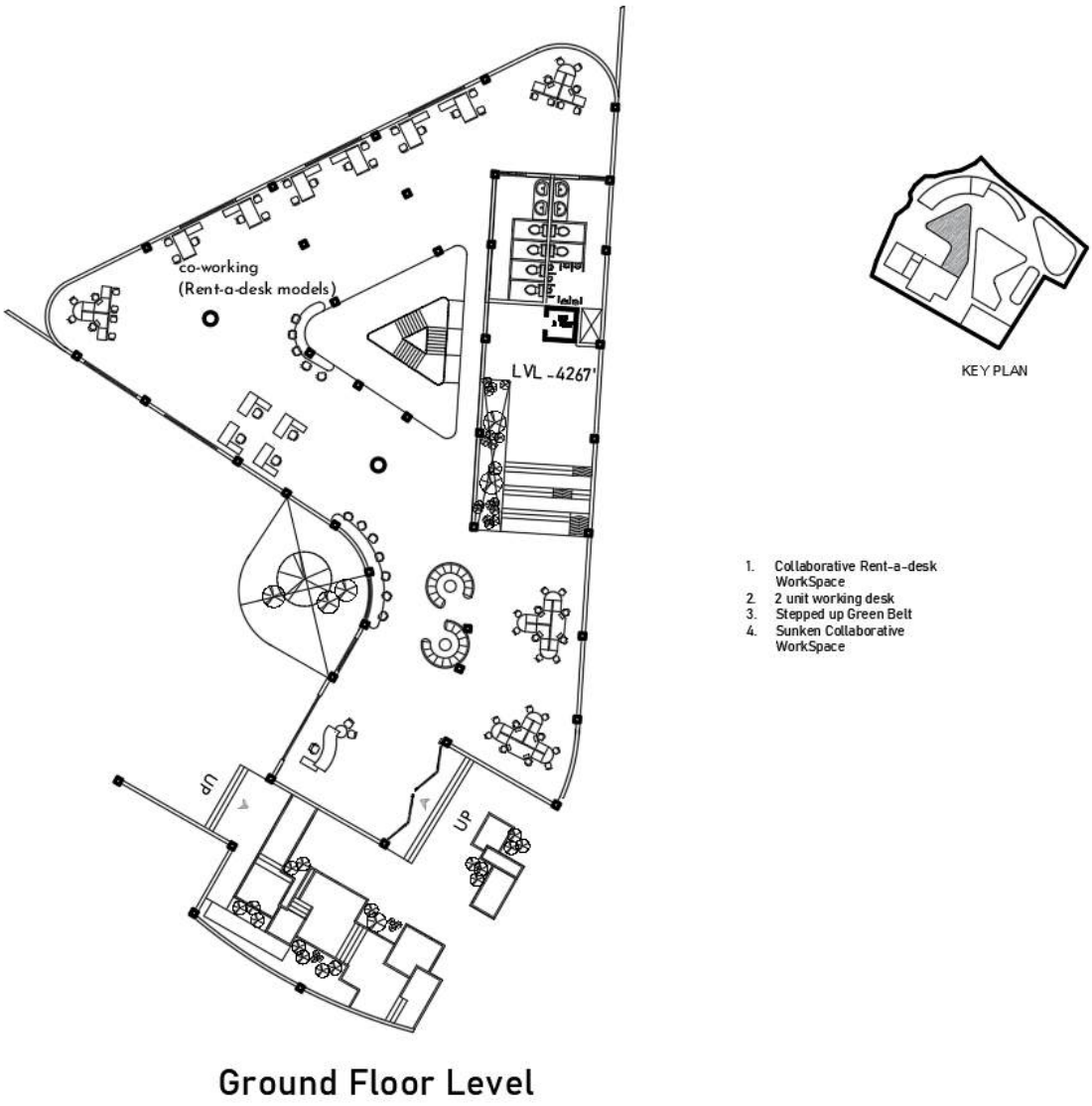


Figure 83Co-Working Interior Floor Plan

The ground floor of the incubation center has been carefully designed to encourage flexibility, collaboration, and interaction among users. The overall layout adopts a non-linear, triangular geometry that breaks away from rigid orthogonal structures, allowing for a more fluid and dynamic spatial experience. At the heart of the floor plan lies a central spiral staircase, serving both as a vertical connector and a symbolic anchor—drawing people inward and guiding movement throughout the space.

The plan primarily supports a **co-working rent-a-desk model**, which is distributed along the edges of the layout. These workstations cater to individuals or freelancers looking for a flexible, modular workspace. Interspersed within the layout are **two-unit working desks**, placed in pairs to accommodate team collaboration while maintaining a balance between interaction and focus.

These paired desks are particularly concentrated toward the central and bottom-right zones, enabling different working styles across the floor.

A unique feature is the **sunken collaborative workspace** located centrally around the spiral stair. This lowered area creates an intimate, circular environment that fosters open dialogue, brainstorming, and informal gatherings—ideal for early-stage ideation or group discussions. Adjacent to this is a **stepped-up green belt**, which introduces nature into the interior and acts as both a biophilic element and a physical transition. It subtly separates programmatic zones without enclosing them, maintaining openness while creating varied levels of privacy.

Other key spaces include informal lounge seating, café-style tables, and organically shaped conversation zones that allow users to shift easily between focused work and relaxed dialogue. The placement of restrooms and service areas to the top-right ensures convenience without disrupting the openness of the workspace. Circulation is naturally woven into the plan, encouraging movement through and around functional clusters rather than through formal corridors, thus enhancing spontaneous interaction.

Overall, the design of this floor emphasizes **layered collaboration**, **biophilic engagement**, and **adaptive usage**. It supports different working modes—from solitary focus to dynamic teamwork—while embedding nature and movement into the everyday experience of the user.

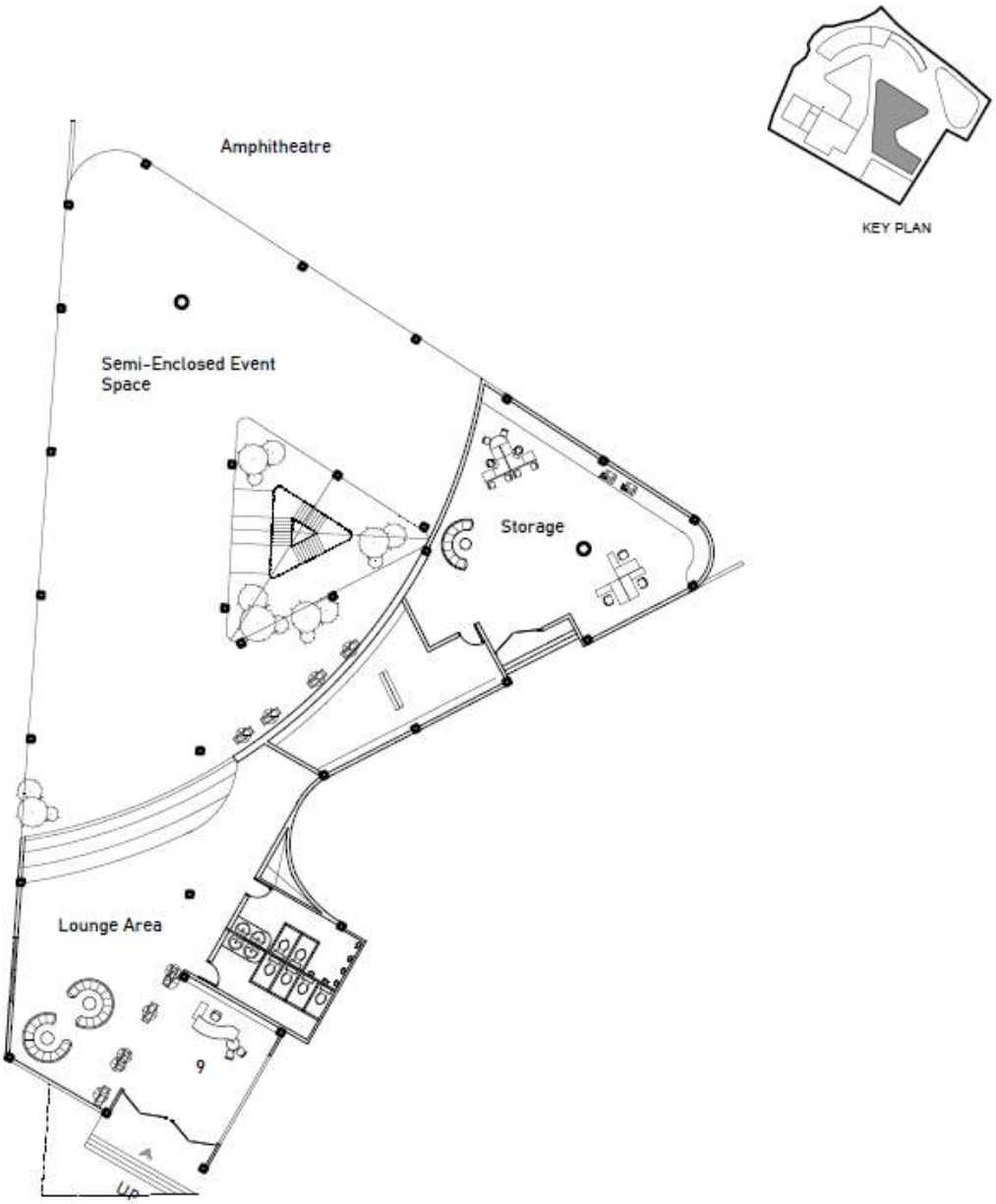


Figure 84Incubation Block Ground Floor

The Incubation Block draws indoor outdoor connection by extending its indoor space as a semi-enclosed event space. This allows people to use social spaces within the building seamlessly and help blend in the building with its surrounding. It also fosters the concept of prospect and refuge within the built form.

Figure 85Referenced Pilotis for Indoor-Outdoor Connection

6. MakerSpace Design

The makerspace within the incubation block was envisioned with a modular and adaptive design ethos—one that aligns with the evolving nature of innovation and entrepreneurship. Given its role within a national network of incubation centers, the building was conceived not as a static shell, but as a scalable system—able to expand, contract, or even disassemble entirely in response to future demands. Modularity allowed for efficient construction, cost-effectiveness, and ease of relocation, while also embedding sustainability at the core of the architectural language. By prioritizing demountable components and flexible structural logic, the space becomes a long-term, responsive asset rather than a rigid, time-bound facility.The

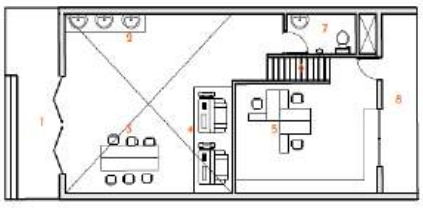


Figure 86Makerspace Module 1

accompanying diagram expresses the spatial and experiential strategy behind the form-making. It begins with a simple building block, which is then carved to introduce double-height

volumes—offering spatial generosity and fostering collaboration. A strategic corner splice allows natural light to penetrate deeper into the interiors, minimizing dependency on artificial lighting. The roof form is punctuated with carefully placed skylights, oriented and angled to capture soft daylight without causing glare, particularly in work-intensive zones. Finally, the sectional cut illustrates how the building nestles into the landscape, with visual and physical connections to the outdoors, ensuring the space breathes and interacts with its context—an approach that reinforces its human-centered and future-ready character.

Inspired by BV Doshi's pattern of industrial building design and use of natural elements for energy within the building, the microclimate facilitates cross ventilation between the space, ample natural lighting for work without glare along with visual connectivity between the different levels.

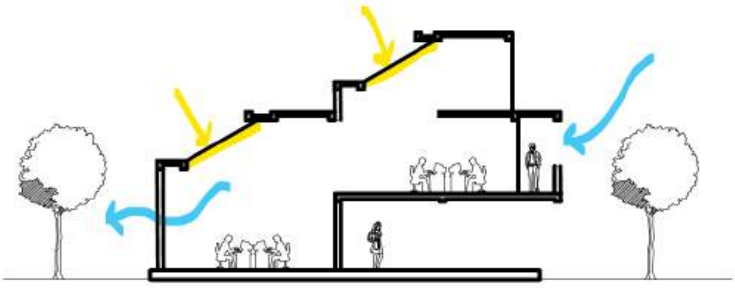


Figure 88Microclimate in MakerSpace Module

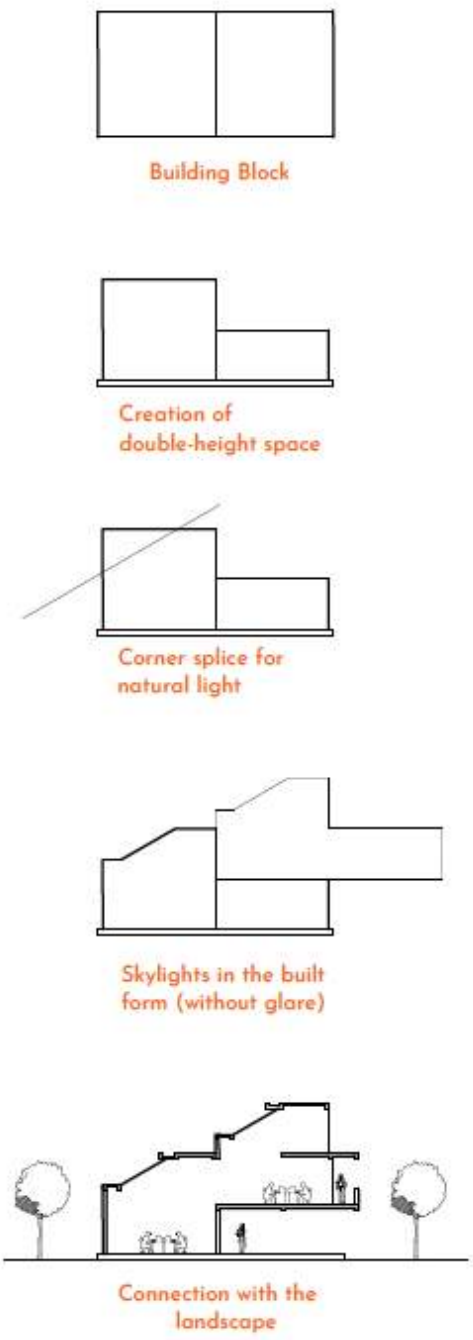


Figure 87Makerspace Module Form Development

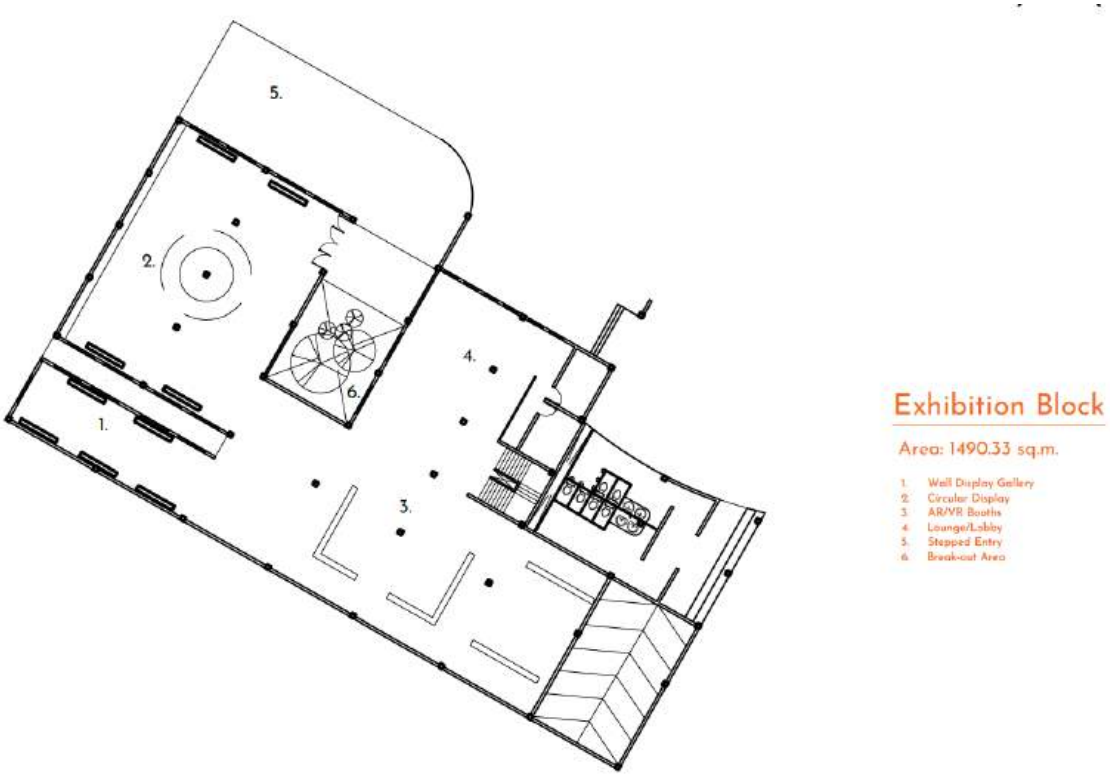


Figure 89Exhibition block planning

Figure 90 Exhibition Block Section

The exhibition block unfolds as a spatial journey, gently guided by a series of descending steps that lead visitors into immersive zones dedicated to AR, VR, and cutting-edge innovation displays. This subtle drop in level not only amplifies the vibrancy and focus of the experiential areas but also creates a sense of theatrical reveal—drawing users into a world of interaction and discovery. Complementing this, an open-air exhibition platform sits above, seamlessly integrated into the rooftop and accessible directly from road level. This dual-level strategy

activates the building both internally and externally, allowing for a continuous, layered engagement with innovation in all its forms.

7. Elevation Treatment & Materials Used

In line with the design concept and to enhance the building’s functionality, workspaces are oriented toward the north to take advantage of diffused natural light. Consequently, the elevation gently rises in that direction, giving the structure a dynamic form that echoes the idea of launching a business. The building utilizes a thoughtful combination of bricks, concrete, glass, and wood—each chosen for its functional and environmental benefits, as well as its ability to blend with the urban surroundings. Bricks offer excellent thermal mass and durability, concrete provides structural strength and fire resistance, glass allows for natural lighting and visual connection with the outdoors, and wood brings warmth while being a renewable resource. Together, these materials promote sustainability and energy efficiency. Additionally, the integration of passive cooling strategies and a green roof further contributes to thermal comfort and enhances the building’s performance and usability.

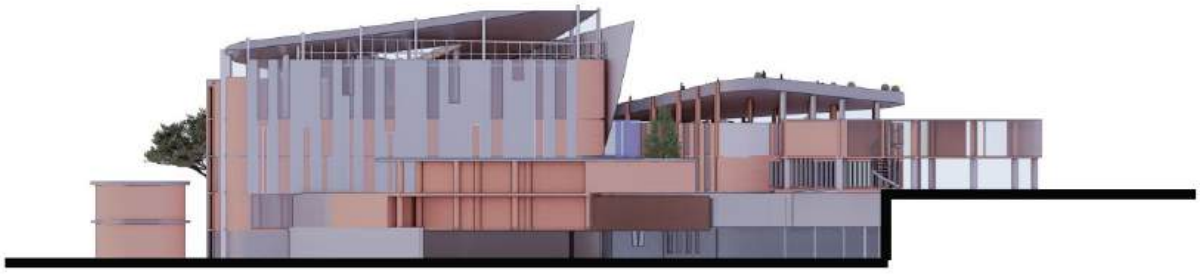


Figure 91East Street Elevation

Figure 92Entry Way - Main Elevation

Figure 93Jaggered Windows | West Elevation

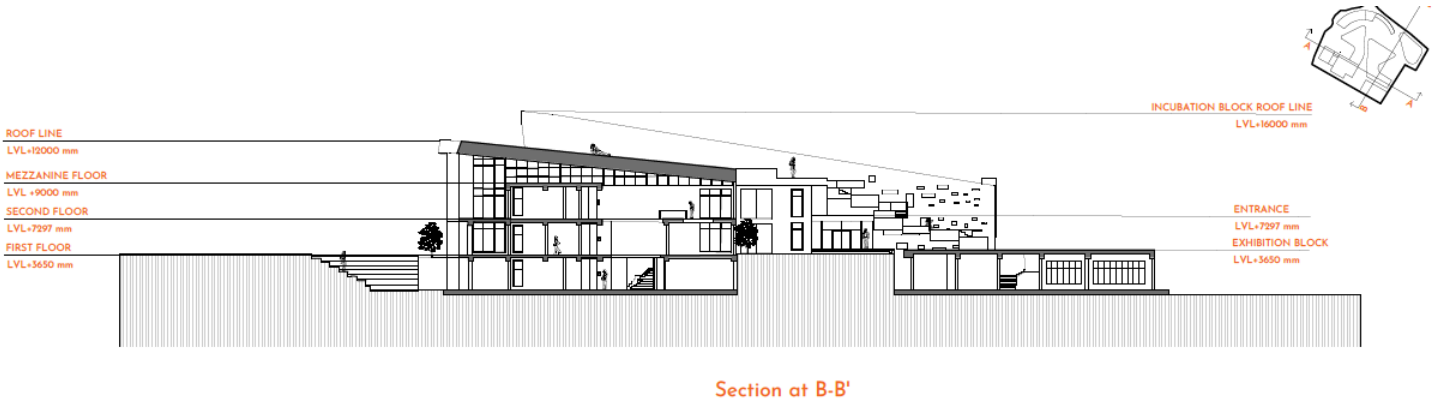


Figure 94Building Section through two major blocks

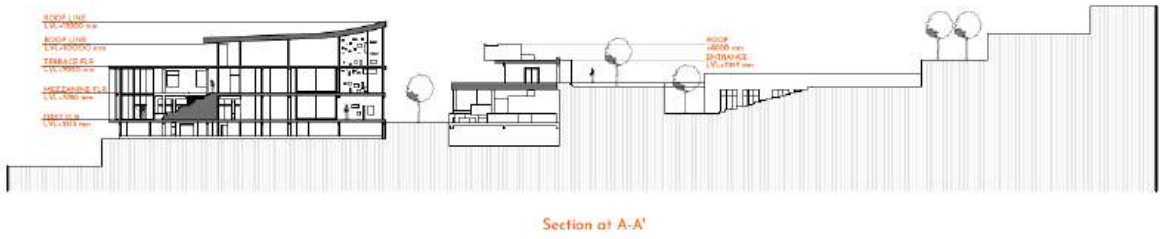


Figure 95 Building Profile Section 2

8. Green Roof and Stepped Green Garden

Green roofs and stepped green gardens serve as both ecological and architectural assets in buildings. They improve insulation, reduce heat gain, manage stormwater, and promote biodiversity. In incubation and co-working spaces, these green interventions offer vital breakout zones, enhance user well-being, and foster informal collaboration. Stepped gardens, in particular, create visual and physical connections across levels, integrating landscape into the built form while softening the rigidity of work environments with accessible, nature-rich terraces.

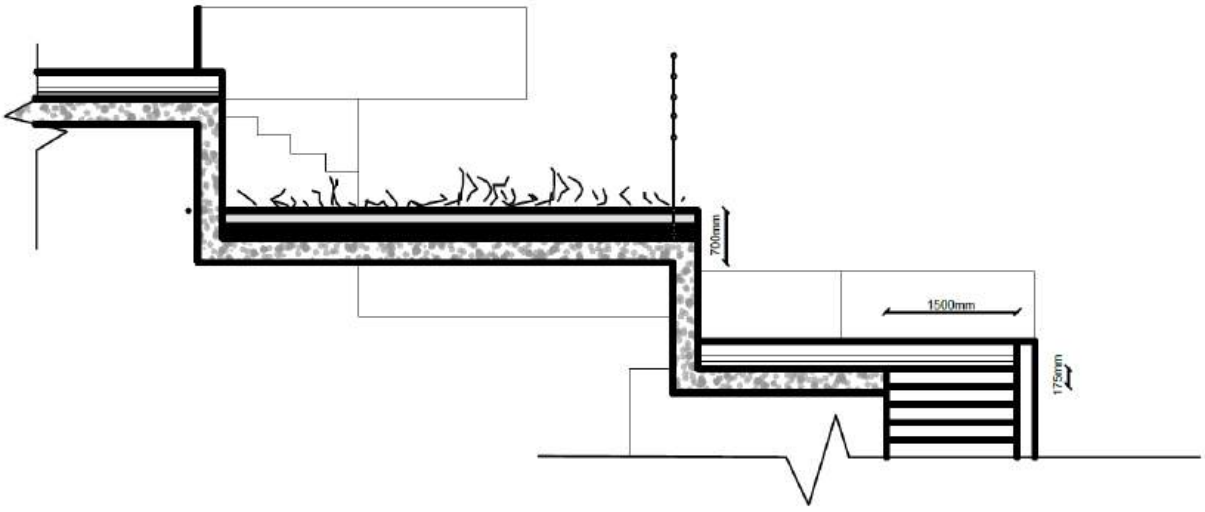


Figure 96Stepped Roof B;low-Up Section

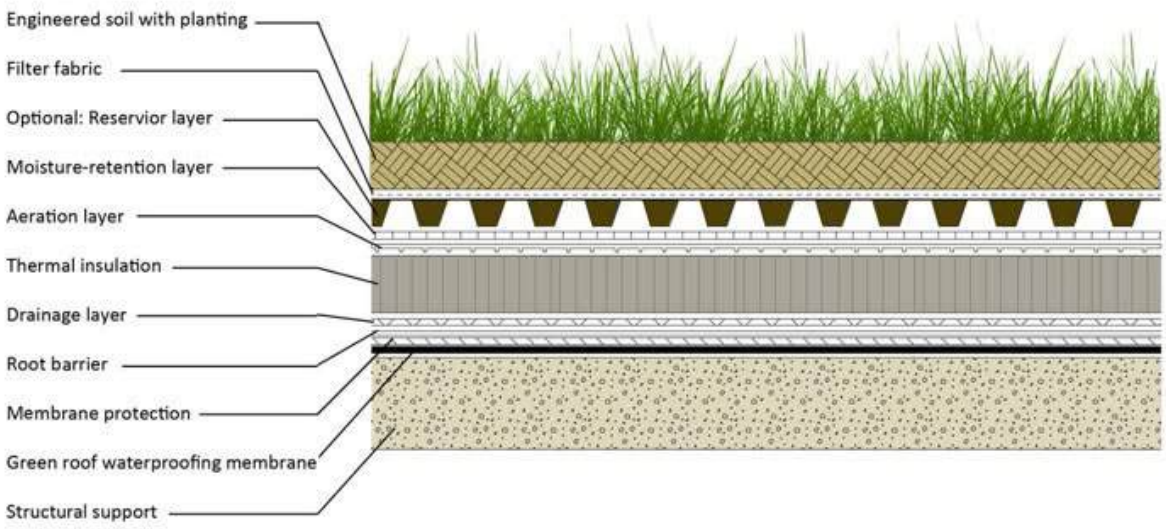


Figure 97Layers of a Green Roof

Figure 98 Stepped Green Roof connecting different floors

9. Conceptual Renders & Space Visualization

Figure 99Green Roof in Co-Working Block

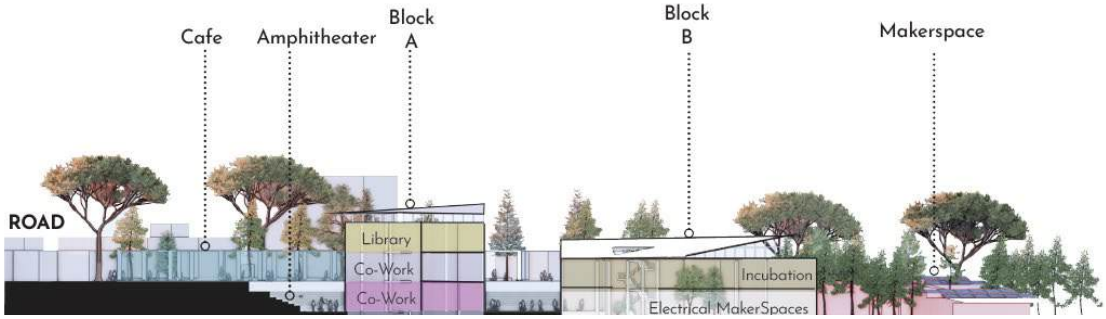


Figure 100Zoning Conceptual Building Section

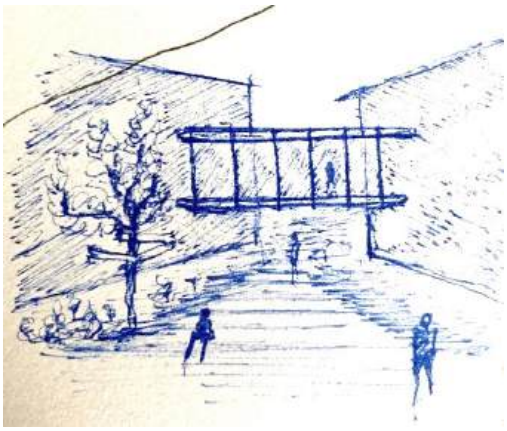


Figure 102Conceptual Sketches for SkyBridge in 'The Spine'

Figure 101Conceptual Render for 'The Spine'

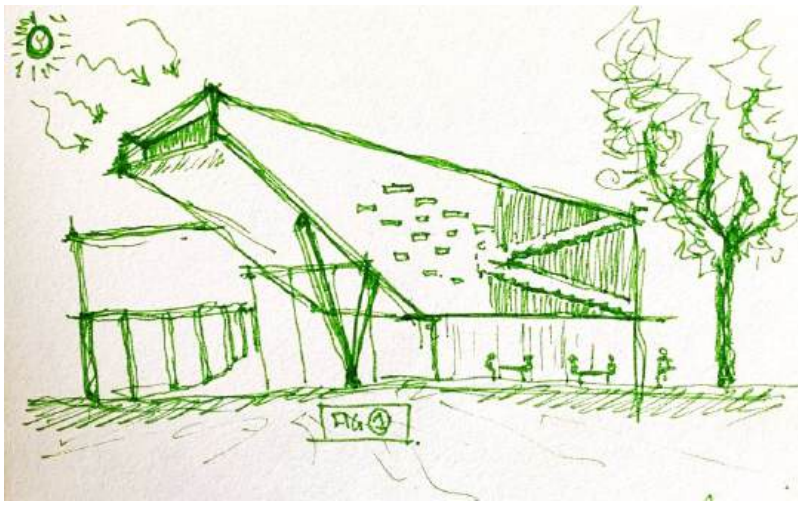


Figure 103Conceptual 3D elevational sketch

Figure 104Conceptual Atrium Space

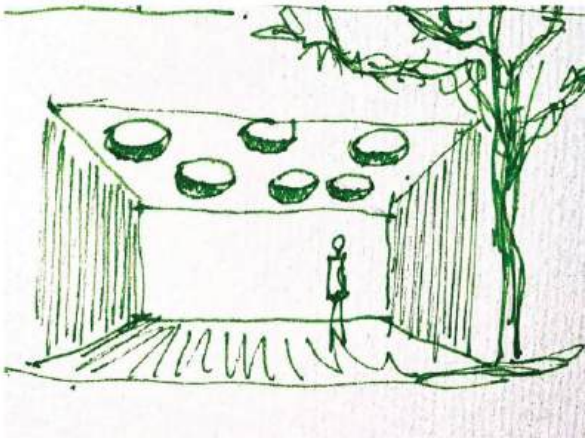


Figure 105Conceptuals for Modular MakerSpace

Figure 106Conceptual Axonometric 3d Block Form

Figure 107 Traction walll in the Incubation Block

Figure 108Mezzanine Space in Pitch Theatre

10. Water Demand Calculation

Adequate water supply is required for fulfilling the basic needs as well as emergency requirements. Water is stored at an overhead tank from the water source, while the overhead tank will distribute the water within the site.

Water Demand calculations

Expected number of daily use: 100

Average water consumption (NBC 208: 2003) = 15 liters per person (capita) per day or lpcd

Total amount of water required = Consumption × User / 100

= 15 × 100 / 100

= 1.5 cubic meters

For firefighting = 20% of 1.5 cu.m

= 0.30 cu.m

For extra storage = 20% of 1.5 cu.m

= 0.30 cu.m

Total water demand per day = 1.5 + 0.30 + 0.30 = 2.1 cu.m

Therefore, a tank of minimum capacity of 2100 liters will be provided.

11. Solid Waste Management

Managing the sewage produced from the buildings is an important aspect in every design project. Sewage generated from the building is treated on site and only treated water is passed to the municipality sewer line. The grey water from the kitchen, sinks and the black water from toilets are collected separately via waste pipe and soil pipelines. The water from toilets is first collected in a septic tank and sent to soak pit which ultimately channels the water to the municipality drainage.

Septic tank calculation

Expected number of daily use: 100

Average water consumption (NBC 208: 2003) = 15 liters per person (capita) per day or lpcd

Total amount of water required:

= (15 × 100) / 1000

= 1.5 cubic meter

Average waste production (q) = 80% of water required

= 0.8 × 1.5

= 1.2 cubic meter

For septic tank:

Retention time (t): 1–3 days

Height: 2m

Volume of Septic Tank = q × t

= 1.2 × 3

= 3.6 cubic meter

Area of Septic Tank = 3.6 / 2

= 1.8 m^2

A septic tank of size 1.25m × 1.5m can be used. Adding 0.5m freeboard, the total dimension of the tank is 1.25m × 1.5m × 2.5m.

10. CONCLUSION

In conclusion, this literature study on anthropometric data for spaces like co-working areas and makerspaces, complemented by national and international case studies, has been an incredibly enlightening and rewarding experience. Delving into the intricacies of human dimensions and how they influence the design of functional and comfortable workspaces has deepened my understanding of the importance of design tailored to human needs. The case studies from various contexts have provided valuable insights into how these principles are applied across different cultures and environments. This research has not only broadened my knowledge but also fueled my passion for creating spaces that truly serve and inspire their users. It’s been a truly fruitful journey, one that has reinforced the power of thoughtful, human-centered design in shaping the future of workspaces.

Also, selection of site and its process has been challenging but fun at the same time. I had to go o different government offices, interview people so this process was really engaging and I loved every bit of it.

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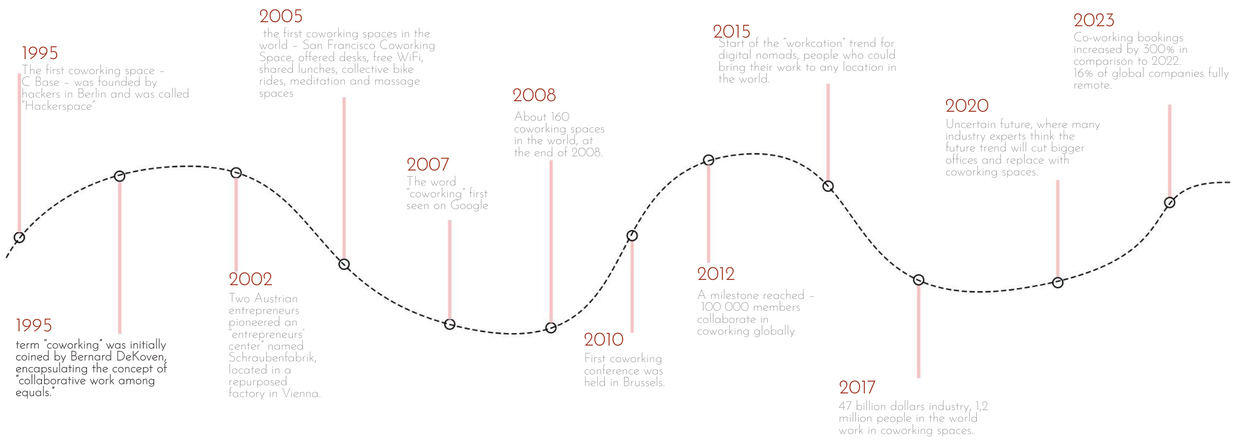
THE URBAN TETRIS: A COLLABORATIVE, CO-WORKING MODEL FOR NETWORKING

Collaborative Co-working spaces are shared work environments designed to accommodate individuals and businesses from diverse backgrounds, fostering collaboration, flexibility, and networking. Unlike traditional office settings, these spaces offer an open and interactive atmosphere where freelancers, startups, entrepreneurs, and remote workers can operate independently while benefiting from a communal work culture.

These spaces typically provide essential amenities such as workstations, meeting rooms, high-speed internet, and recreational areas, along with opportunities for skill-sharing, networking, and professional development. The rise of co-working spaces reflects a shift in work culture, promoting flexibility, innovation, and cost efficiency through shared resources. By integrating technology, comfort, and a sense of community, co-working spaces redefine the modern workplace, making it more dynamic and inclusive.



PROBLEM STATEMENT

1. Limited spaces for entrepreneurship, prototyping, research, and collaboration restrict the growth of innovative ventures.

2. Lack of emphasis on work-life balance and minimal integration of nature and recreation affect employee well-being.

3. The absence of public multidisciplinary spaces reduces opportunities for collaboration and innovation.

SCOPE & LIMITATIONS

1. Trend-setting of team-working and networking, rather than heirarchial working system.

2. Reformed collaborative workspace, fostering interaction and networking that uplifts the economy of users by the concept of 'shared economy.'

3. Focuses on the role of physical spaces in promoting interactions, and uplifting the work-life quality of individuals.

4. Project won't include the inside workings of an office or divisions of work within an office.

OBJECTIVES

1. Facilitate networking across multidisciplinary fields.
2. Develop a program for an ideal networking complex.
3. Analyze the impact of physical spaces on work, interaction and leisure.
4. Design a model integrating efficient exposure and social spaces within work environments.
5. Propose a cost-efficient module to foster the concept of 'shared economy'.
6. Nurture good work-life balance to meet the current global trends.

USER-BASED TARGETED OPPORTUNITIES

OPPORTUNITIES FOR NETWORKING

1. Collaborative Co-working Spaces
2. Work Pods
3. Media Rooms & Group-Work Areas
3. Pitch Decks & Meeting Rooms
4. Library

EXPOSURE SPACES

1. Auditoriums & Training Halls.
2. Public Exhibition Spaces.
3. Retail & Pop-Up Spaces.

RECREATIONAL SPACES

1. Indoor Games Stations
2. Fitness Centres & Meditation Spaces.

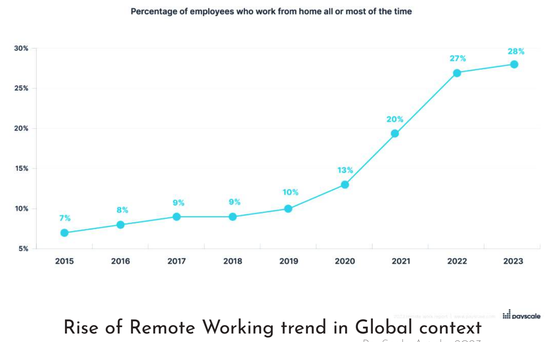
EXPERIMENT OPPORTUNITIES

1. Worklabs
2. Makerspaces
3. Studios

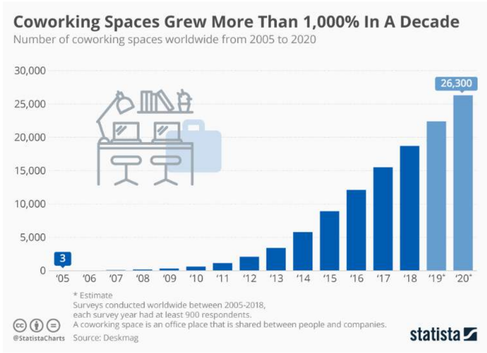
LIVE-WORK OPPORTUNITIES

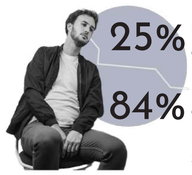
1. Housing & Accomodations.

GLOBAL



Rise of Remote Working trend in Global context
PayScale Article, 2023



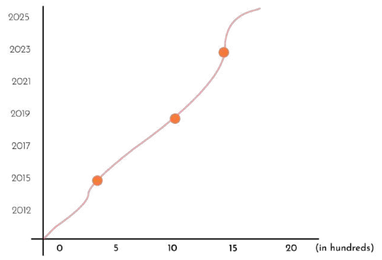


25% (approx.)of remote workers in a survey feel anxious, anti-social and lonely at the cost of Work From Home jobs!!
Hubble Headquarters Annual Survey2023

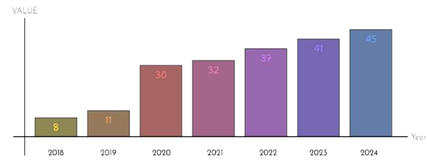
84% of remote workers say they are motivated and have their social network expanded in co-working spaces.
Ergonomic Trends 2023, Smart Works Office

would gladly take a pay cut just to have the option of working remotely!
Owl Labs & Global Workplace Analytics Survey, 2024

NEPAL



Rise of Start-up Scene in Nepal's context
Start-up Nepal Index, (2023)

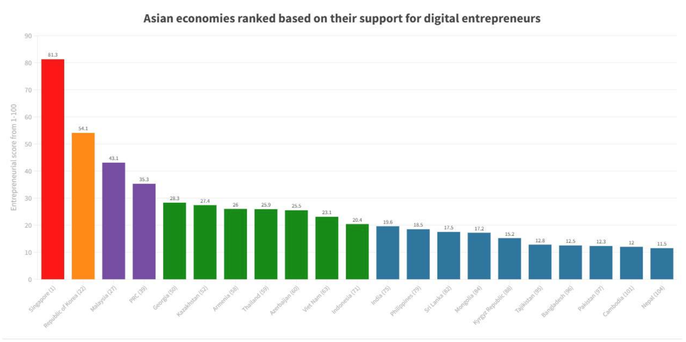


Digital Adoption in Nepal's landscape
Report by McKinsey & Company (2023)

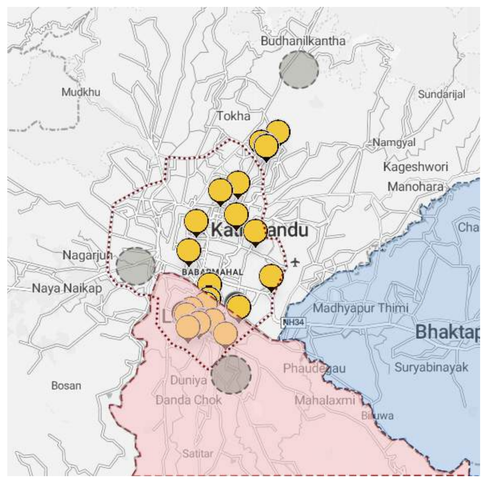
attendees in the Nepal Start-up Summit, 2023!!
Start-up Nepal, 2023

58% rise in number of start-ups in Nepal the last **five** years!!
Report by Nepal Young Entrepreneurs' Forum- NYEF (2023)

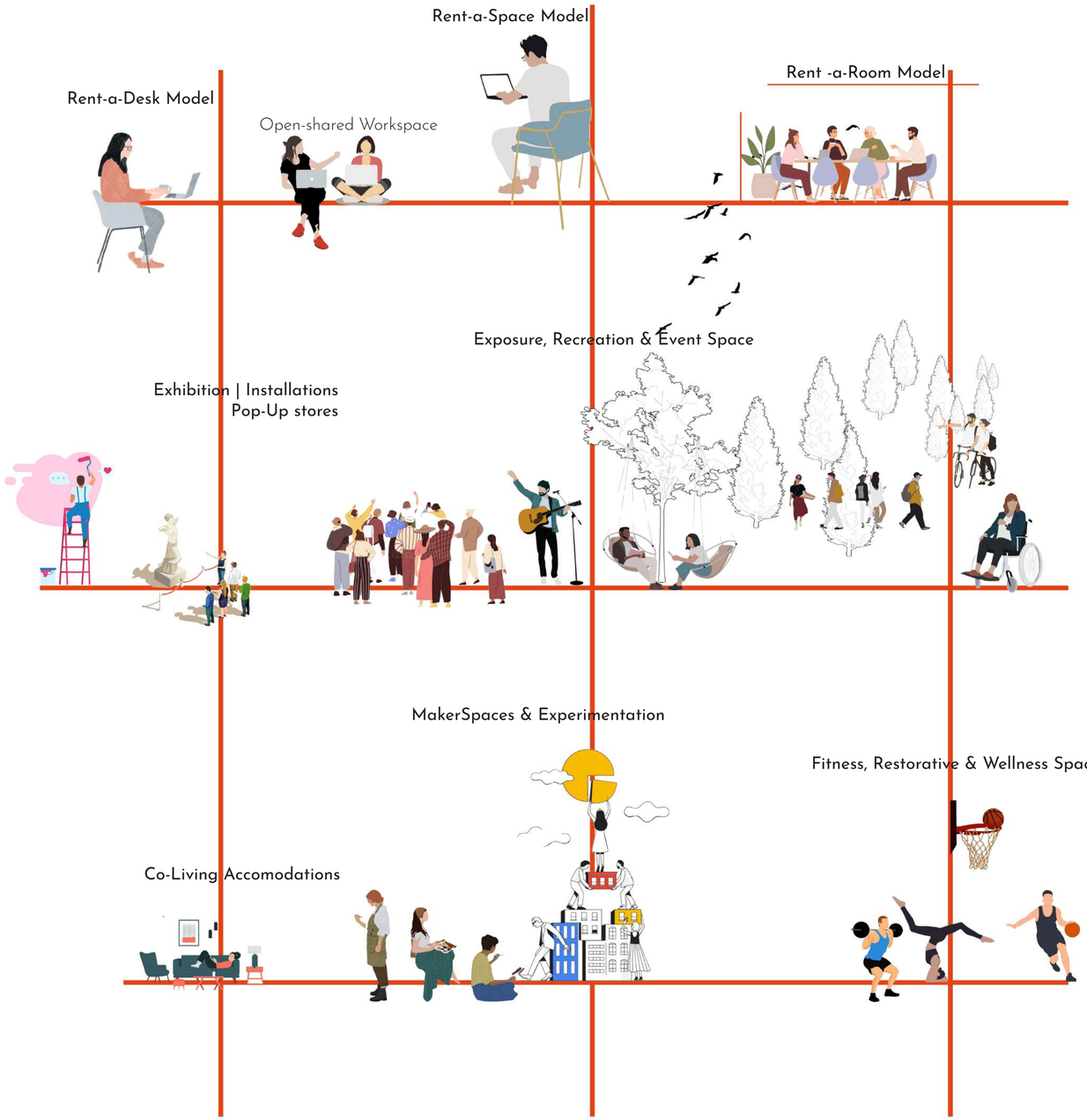
27% more jobs are created by start-ups in Nepal in the last **five** years!
Report by success of Entrepreneurs, World Bank



KATHMANDU



33 total co-working spaces in Nepal as of 2023
coworker.com



TENTATIVE PROGRAM FORMULATION

A. CO-WORKING AREAS

1. **Module-wise :** Rent-a-desk common working spaces
   Rent-a-room working Spaces
   Collaborative Open-Shared Workspaces
   Private Work-Pods Spaces
2. **Incubation Spaces:** Common Pitch Deck Spaces
   GroupWork Areas
   Meeting Rooms
3. **Library & Studios**

B. SOCIAL / EXPOSURE SPACES

4. Auditoriums
5. Outdoor Event Spaces (eg. amphitheatres)
6. Multipurpose halls | Training Halls
7. Exhibit Spaces (Semi-private & Outdoor)
8. Retail Spaces | Pop-up Stores Spaces

C. RECREATION

9. Fitness Centres | Sports Facilities
10. Meditation & Wellness Spaces

D. MAKERSPACES

11. Molding, Casting Spaces (Clay, Textiles)
12. Workshop Spaces (Wood, Metal, Automobiles)
13. Lasers, CNC, 3D Printing Spaces
14. Media Labs & Studios (Photography | Arts | Textiles | Content Creation)

E. ADMINISTRATIVE SPACES

F. LIVING ACCOMODATIONS (targeted to out-of-valley immigrants)

POTENTIAL CASE STUDIES

A. LOCAL

1. **Impact Hub, Pulchowk, Lalitpur**
2. **the 100 Spaces, Baneshwor, Kathmandu**
3. **Innovation Hive, Pulchowk**
4. **REM Work, Chandol, Kathmandu**

B. DOMESTIC| SUPPORTING

4. SENSA The Urban Sanctuary, Sanepa, Lalitpur
6. Bikalpa Art Center, Patan

C. ASIA

9. Titan Integrity Campus, Bangalore
10. WeWork Galaxy, Bengaluru
11. Earthitects and Evolve Back Resorts Workspace, Bengaluru
10. Kibi Kogen N Square by Kengo Kuma,Kibichuo, Japan
11. CUE, Osaka, Japan

D. INTERNATIONAL

11. Station F, Paris, France
12. Sun & CO., Spain
13. NewLab's Co-working Community for Hardware Manufacturers
13. The Assemblage Nomad, New York, United States

THE URBAN TETRIS:

A DESIGN & TECHNOLOGY INCUBATOR FOR START-UPS

1950s - 1960s
industrial revolution

1950s - 1960s
Balatvia Incubation Center

1980s - 1990s
rise of silicon valley

1990s - 2000s
around 1000 incubation centres worldwide

Early 2000s
emerge of informal business incubation centres in nepal

Late 2000s
UNDP introduces entrepreneurship programs in Nepal

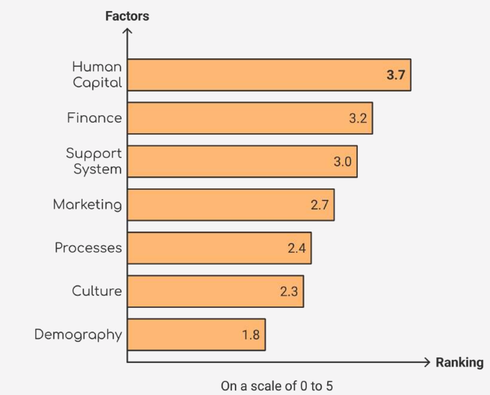
Early 2013
establishment of Nepal Entrepreneur's Hub (NeHUB)I

2014
Nepal Youth & Entrepreneurship Policy

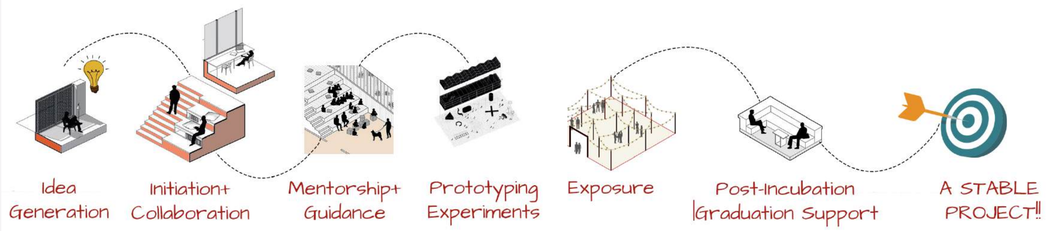
2015 earthquake
focus on re-building & social entrepreneurship

2020
Covid-19, and heavy digital adaption, rise of start-ups

2024
rise of start-ups by 150% in the last 10 years



Causes of start-up failures in Nepal



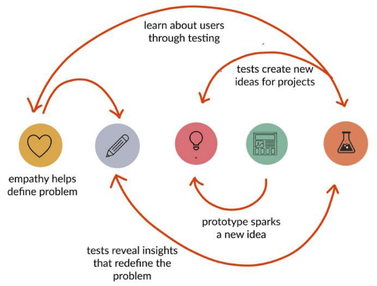
The Incubation Process

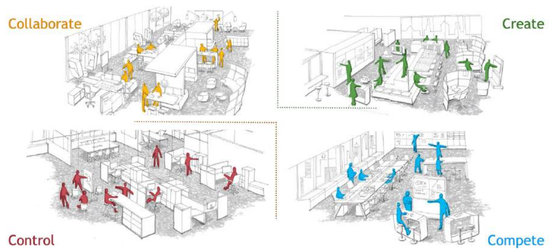
Source Business Incubation Process for Start-Ups, Tiffany Fong, 2022.

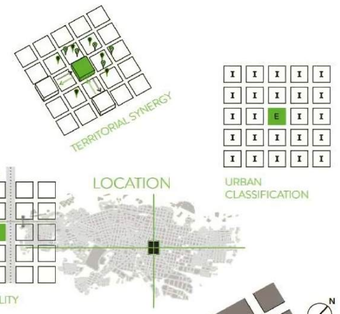
A design and technology Incubation center is a dynamic hub fostering:
innovation and entrepreneurship by providing essential programs and spaces for start-up businesses, architecturally integrating

- co-working spaces for collaborative work environments.
- exposure spaces to showcase emerging ideas.
- digital and physical makerspaces equipped for prototyping and technological development and support.
- socializing and experience spaces play a crucial role in facilitating knowledge exchange, networking, and interdisciplinary collaboration.

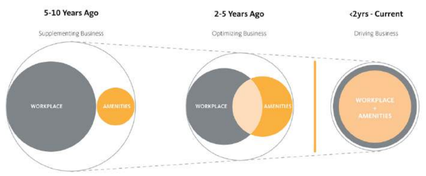
These diverse environments are essential to cultivate creativity, accelerate business growth, and reflect the evolving practices of design and technology incubations.

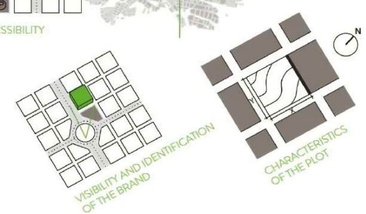




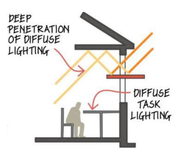


the evolving role of amenities

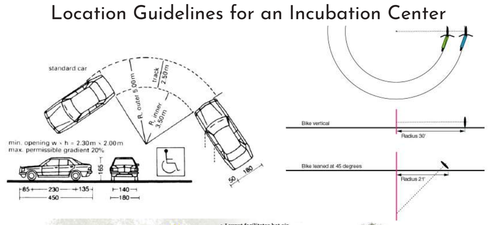


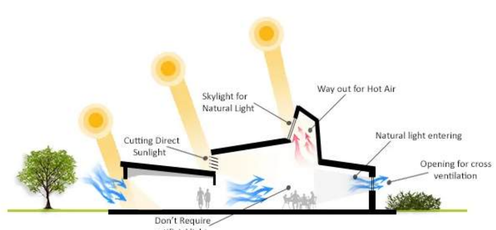


Location Guidelines for an Incubation Center

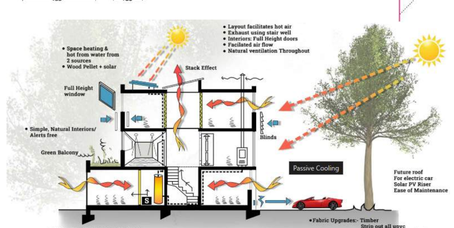


Vehicle Type	Length * Breadth	Height	Turning Radius
Motorcycle	2.20m x 0.70m	1.80m	1.00
Car: Standard	4.70m x 1.70m	1.50m	5.75m
Small	3.60m x 1.60m	1.50m	5.00m
Large	5.00m x 1.90m	1.50m	6.00m
Bicycle	1.80m x 0.6m	1.00m - 1.25m	0.70m
Pick Up Trucks	4.37m x 1.64m	1.90m	5.00m





Sources of daylight in a building



Passive Design Strategies

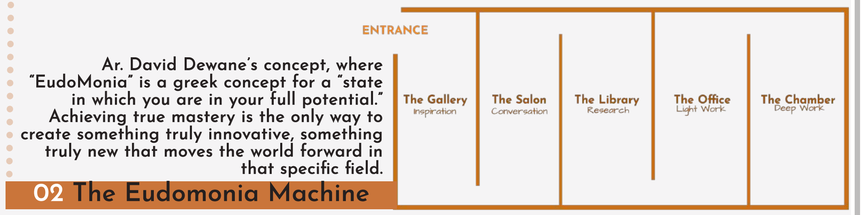
User Analysis of an Incubation Center (7F PRINCIPLE)

> *"Creativity comes from **spontaneous meetings**, from random discussions, along **private spaces for focus**. If a building doesn't encourage that, you'll lose a lot of innovation and the magic that's sparked by serendipity."*
>
> *Isaacson, 2011. Steve Jobs*

supporting theories

02 Propinquity Effect

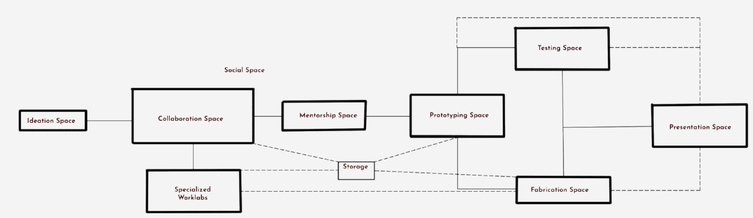
To ensure you meet up, arrange your life so you repeatedly 'bump into' them (Schachter and Back, 1950). In order to stimulate and enhance social interaction, we have to improve the more public and common spaces, by increasing the number of casual interactions one has in this place.



Ar. David Dewane's concept, where "EudoMonia" is a greek concept for a "state in which you are in your full potential." Achieving true mastery is the only way to create something truly innovative, something truly new that moves the world forward in that specific field.

02 The Eudomonia Machine

do(collaborative)



Space Organization Diagram of a MakerSpace

PURBANCHAL UNIVERSITY
DEPARTMENT OF ARCHITECTURE
KHWOPA ENGINEERING COLLEGE
LIBALI, BHAKTAPUR

UNDERGRADUATE THESIS

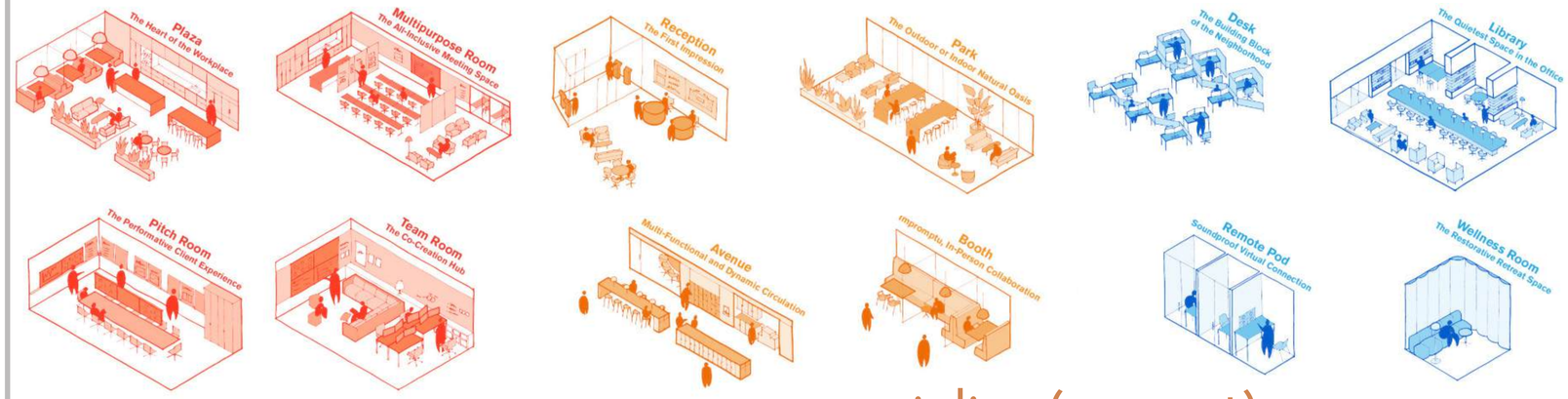
TITLE: LITERATURE REVIEW

PRESENTED BY: PRASOON SHRESTHA
ROLL: 760128

DATE: 05 MAR, 2025

01. Co-Working

the 12 building blocks of the new workplace

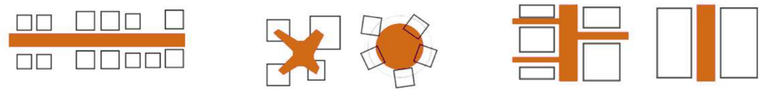


"**Red Rooms**" include the most active & high-energy spaces within the workspace - Plaza, Multipurpose, Pitch & Team Rooms.

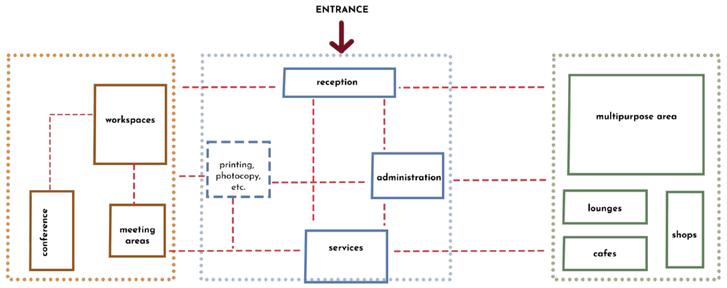
"**Orange Rooms**" along the energy spaces are transitory rooms that create in-between spaces. The Reception, Park, Booth and Avenue.

"**Blue rooms**" are the cool rooms and relatively dim in the energy spectrum that are design to support an individuals functioning & well-being, includes - Desk, Library, Remote Pod & Wellness Room.

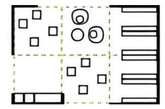
circulation patterns



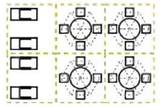
socialize (connect)



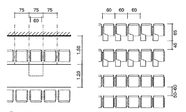
Space Organization Diagram of a co-working space



Break Room + Reading Space: 36-54 sq.m.



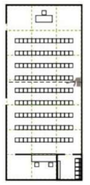
Outdoor Break Room: 80-100 sq.m.



Space Requirement for conference & training rooms.

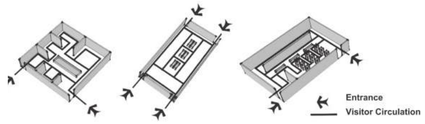
Informal meeting area: 7-9 sq.m.

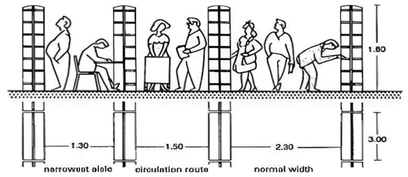
Meeting Room / Classrooms: 30-36 sq.m.

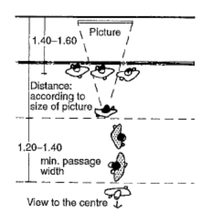


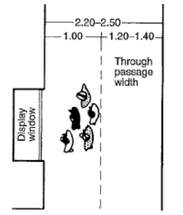
Conference Hall: 160-200 sq.m.

Inform (share)



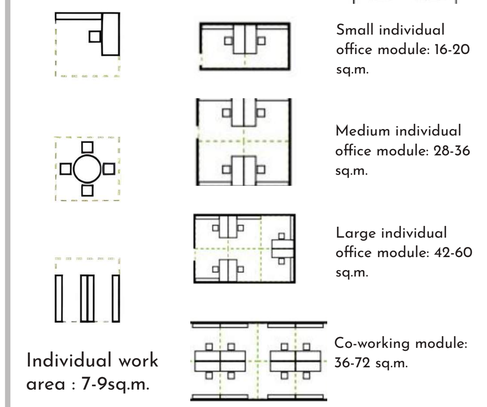






9 Pictures on the wall: viewing and traffic 10 Space in front of display cabinet

Work Modules



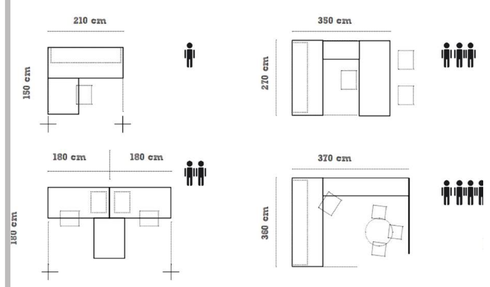
Small individual office module: 16-20 sq.m.

Medium individual office module: 28-36 sq.m.

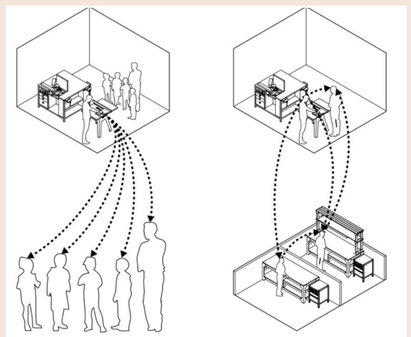
Large individual office module: 42-60 sq.m.

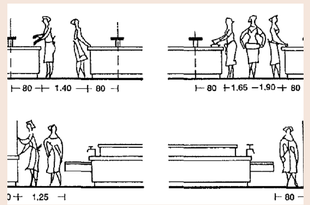
Individual work area : 7-9sq.m.

Co-working module: 36-72 sq.m.



02. Makerspace





	Quantity	Individual sq.ft.
Wood makerspace	1	2000
Robotics Makerspace	1	2000
Electrical Makerspace	1	1500
Digital Fabrication (inc. CNC Machine)	1	4000
Metal Makerspace	1	2000
Individual Studio Spaces	25	25 x 100 = 2500
Jewellery Studio	6	6 x 180 = 1100
Casting & Molding Studio	1	160
Motor Makerspace	1	1200
Wet Studio	2	2 x 190 = 375
Mechanical Makerspace		12 x 12 = 144 (indiv)
Leasable + Administrative storage	1	4200
Locker Room	1	1200
Waste Storage	1	2000

	Average Area per worker(sq.m.)
Clothing	11
Research & Development	13
Electrical components & assembly	17.5
Leather work	19.25
Metals, goods, jewellery, small tools	24.25
Textiles (bags)	28.75
Stationery, printing	32.5
Pottery, glass	36.75
Motor repairs, reprographic services	45.5

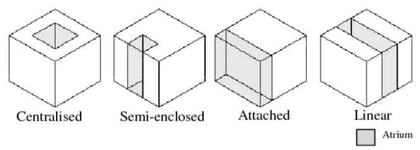
Focus (learn)

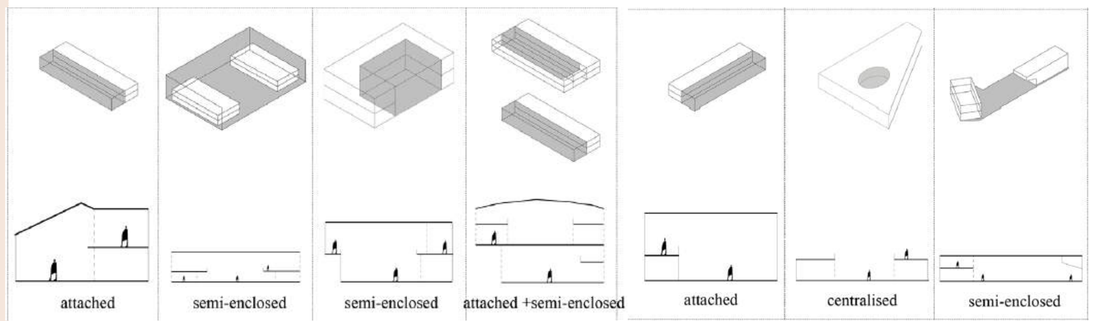
Nap Rooms
Phone Booths
Focus Pods
Restorative spaces
Rest Areas

Two-person meeting space

Typology of Atriums

SOURCE: YUNUS, AHMAD, & ZAIN-AHMED (2010)





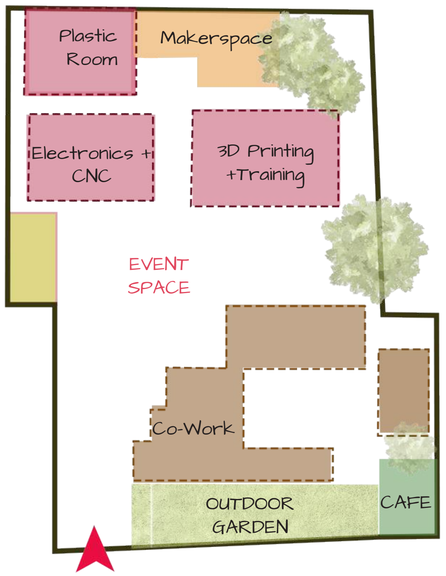
Atriums Vs Collaboration within

IAAC, TU Delft, MIT, ETH, Princeton, KTH, Nantes

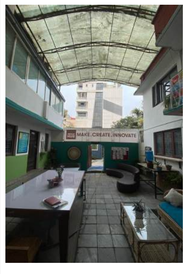
MAKERSPACES: ANALYSIS AND DESIGN STRATEGIES SE YAN, HING-WAH CHAU, CLARE NEWTON AND HIRAN GENG (2020)

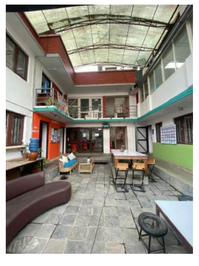
01. Impact Hub
National Case Study

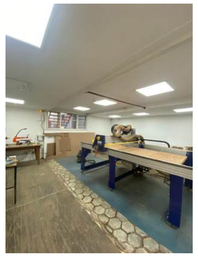
Location: Pulchowk, Lalitpur
Completion: 2015 AD
Architects: MetalWood Nepal
Orientation : South
Type: Mixed-Use Building Complex
Site Area: 1270 sq.m. (2.5 ropanies)



Programs: Co-Working Space, Rental, Office, Training Space, FabLab, MakerSpace
Intent of Study: To understand the spatial planning needs of a start-up in a co-working space.

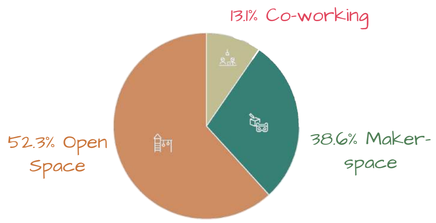




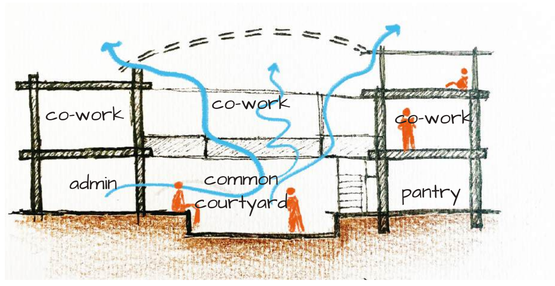


co-working modules

1. Around the table - rent a desk
2. 2-seater desks
3. 4-seater desks
4. 6- seater desks
5. 20 occupants meeting areas



	Total Area in sq. m. (approx.)	Machinery / Occupants
Electronics Room	56.56	Computer Stations 5 functioning 3D Printers
Plastic Lab (with storage)	34.68	Compressing Machine (8' x 6')
CNC Fabrication Lab	33.43	CNC Router (4' x 8')
Wood & Metal Makerspace	108.78	Woodcutting Grinder 6 individual workstations 2 Private prototyping station
3D Printing & Prototyping Space	50.6	3 Printers
Training & Presentation Room	60	40 Occupants

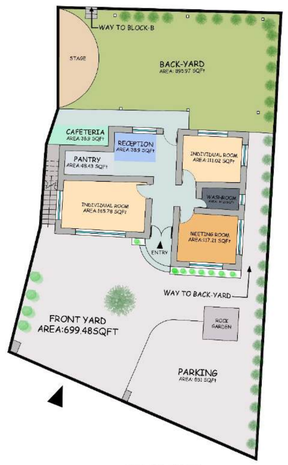


Inferences:
1. Accessibility of space from a major urban network.
2. Need for a flexible, adaptable layout.
3. Clear functional zoning of spaces.
5. Necessity of additional co-working and incubation space.

Programs: Co-Working Space, Multipurpose Outdoor Training Space, Content Creater Booth
Intent of Study: To comprehend the planning & typologies of a coworking space.

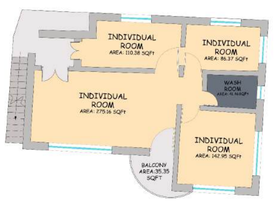
02. the 100 Spaces
National Case Study

Location: Baneshwor, Kathmandu
Completion: 2021 AD
Architecture: Adaptive Re-Use
Orientation : South
Type: Mixed-Use Building Complex
Site Area: 508 sq.m. (1 ropanies)
Total Co-working Units: 50

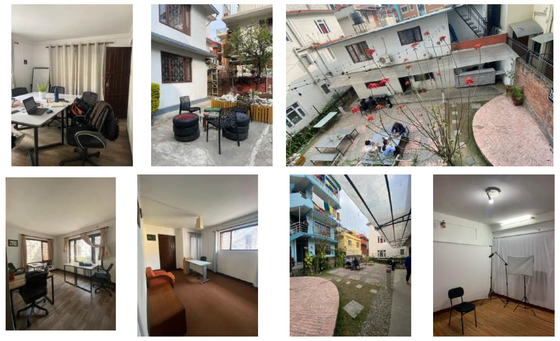


BLOCK-A GROUND FLOOR

transition between public, private & semi-private spaces



BLOCK A-FIRST FLOOR

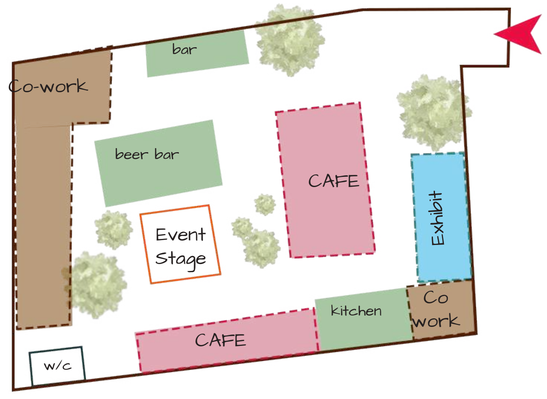


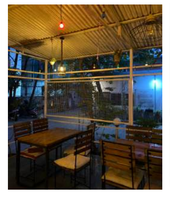
Inferences:
1. Need & importance of intermediate breakout spaces.
2. Adaptability of a co-working & incubation space to recent needs.

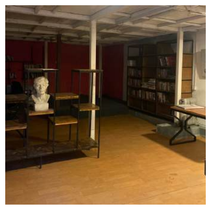
03.Bikalpa Art Center
National Case Study

Location: Dhobighat, Lalitpur
Completion: 2013 AD
Orientation : East
Site Area: 1018 sq.m. (2 ropanies)

	Dimensions
Exhibit Space	59.64 sq .m (4.5 x 13.3)
Co-Working Space 1. Individual Desk Models 2. Collaborative desks Model 3. Art Studio Table	 15 6 5
Café / Restaurant	More than 80 seating spaces
Event Space	150 sq .m



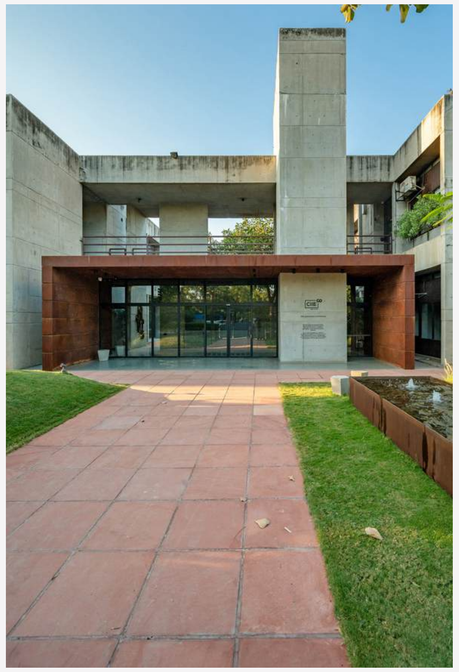




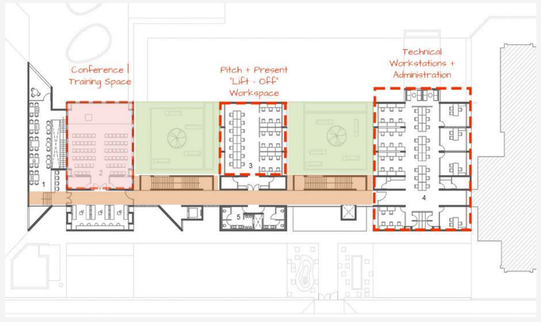
Programs: Cafe, Exhibition Space, Co-working Studios, Makerspace, Training & Event Areas.
Intent of Study: To understand the functional planning, and juxtaposition of inderdisciplinary spaces.

Inferences:
1. Multidisciplinary Collaboration.

a. CIIE.CO
Regional Case Study



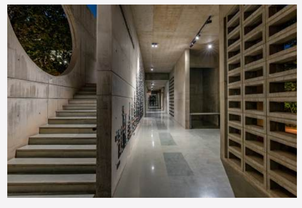
Location: Ahmedabad, India
Completion: 2020 AD
Architecture: Institutional Building
Orientation : North-East
Type: Institutional Building
Site Area: 2000 sq.m. (3 ropanies)

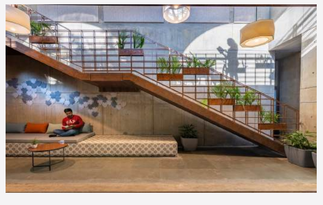


Programs: Co-Working Space, Digital Incubation Space

Intent of Study: To study zoning strategies merging private, semi-public & public spaces, and to understand spatial requirements for modern start-up incubation.

Inference:
- Spatial Layout
- Connectivity of space.
- User Experience & Working Efficiency.



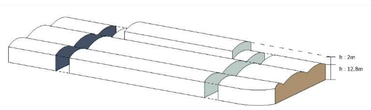


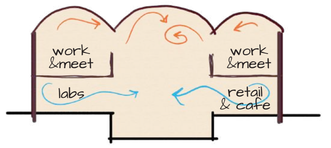
Visual connectivity & strategic placement of perforations & semi-private walls for efficient zoning.

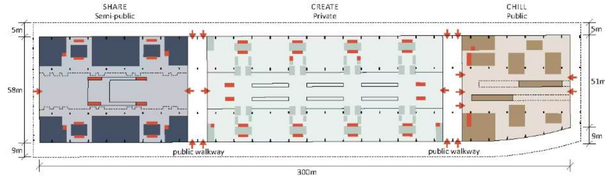
b. STATION F
International Case Study

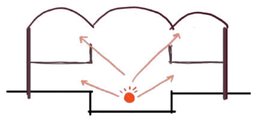
Location: Outskirts of Central Paris, France
Completion: 2017 AD
Architecture: Institutional Building
Type: Adaptive Re-Use
Site Area: 33,034 sq.m. (65 ropanies)

Functional Spatial Zoning

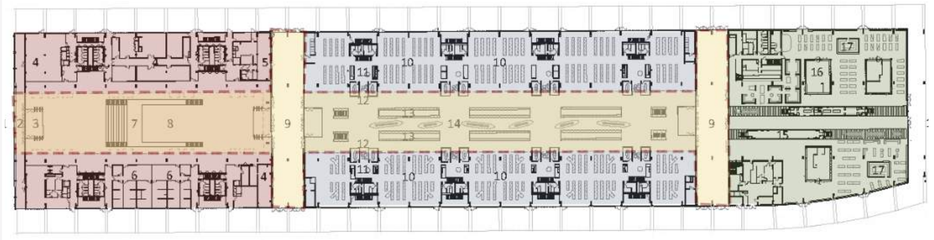






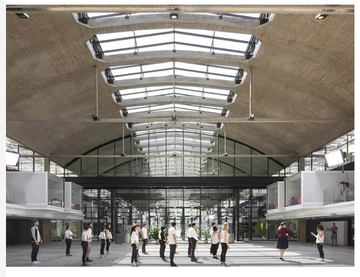


3. Reception & Admin
4. Fab-Labs + Makerspace
6. Co-Working Spaces
7. 370-seat Auditorium
8. Multipurpose Space
10. Start-Up Co-working Space
12. Shared Meeting Rooms
14. Central Multipurpose Area
13. CloakRoom + Lounge
15. Wagon Restaurant
16. Kitchen
17. Bar
18. Landscaped ForeCourt



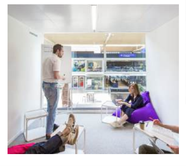
co-working modules in station F

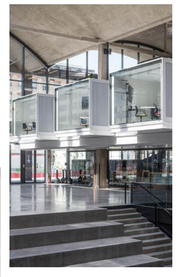
Inference:
- Variations in Co-Working Modules.
- Optimized Working Environment.

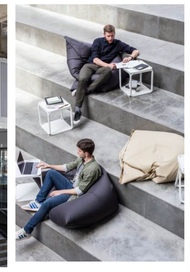


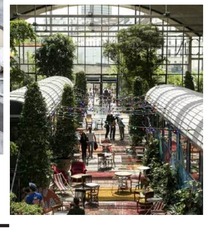
work-wall

O-cube





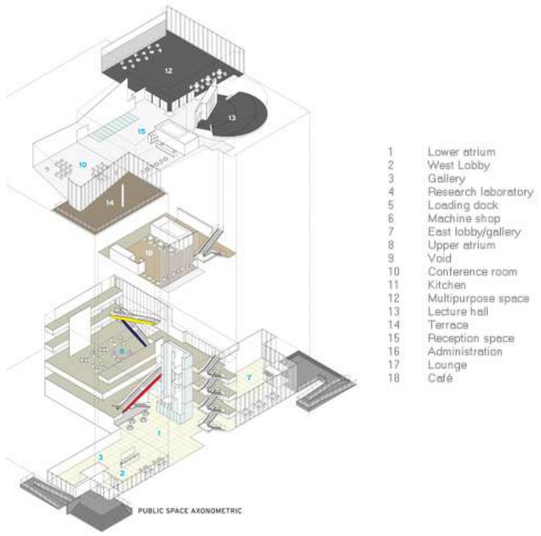




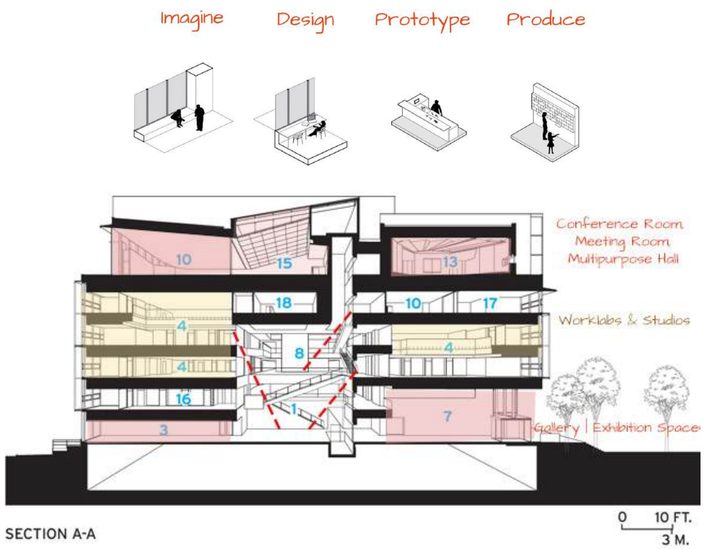
d. MIT Media Lab

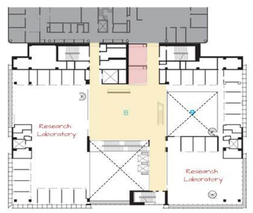
International Case Study

Location: Ahmedabad, India
Completion: 2020 AD
Architecture: Institutional Building
Orientation : North-East
Type: Institutional Building
Site Area: 2000 sq.m. (3 ropanies)



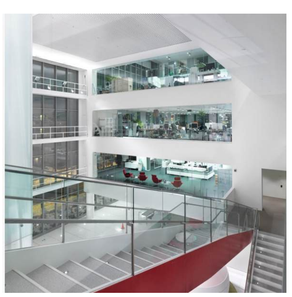
1 Lower atrium
2 West Lobby
3 Gallery
4 Research laboratory
5 Loading dock
6 Machine shop
7 East lobby/gallery
8 Upper atrium
9 Void
10 Conference room
11 Kitchen
12 Multipurpose space
13 Lecture hall
14 Terrace
15 Reception space
16 Administration
17 Lounge
18 Café

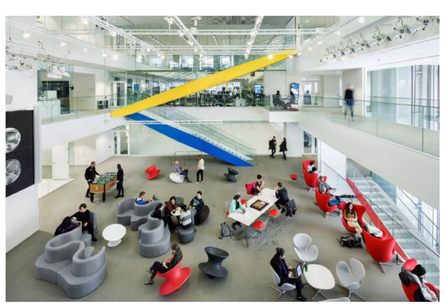




Programs: Office Workspace, Incubation & Training Space

Inferences:
- Spatial Requirements & Zoning of a makerspace.
- Need of natural elements & multiple connectivity within a makerspace.

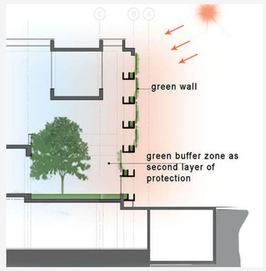


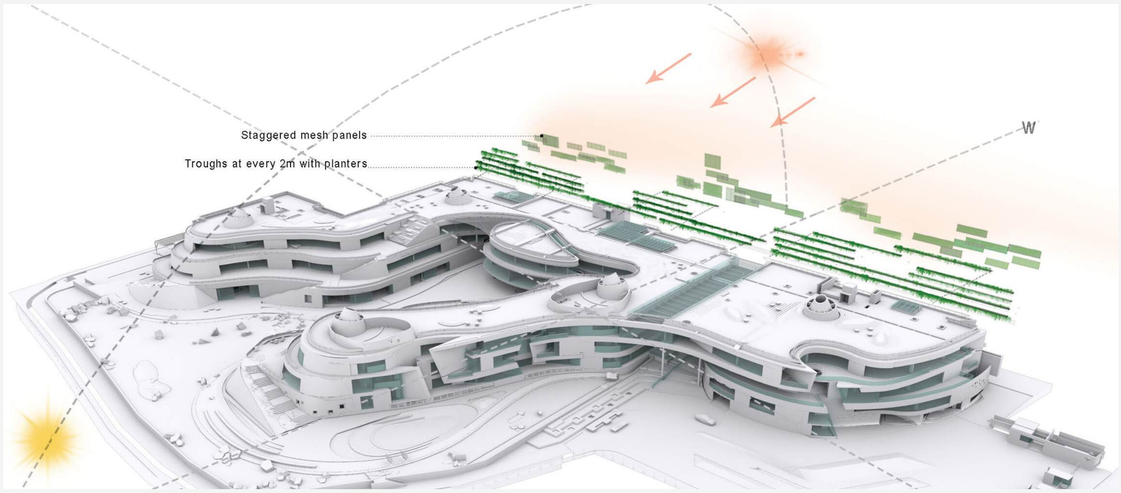


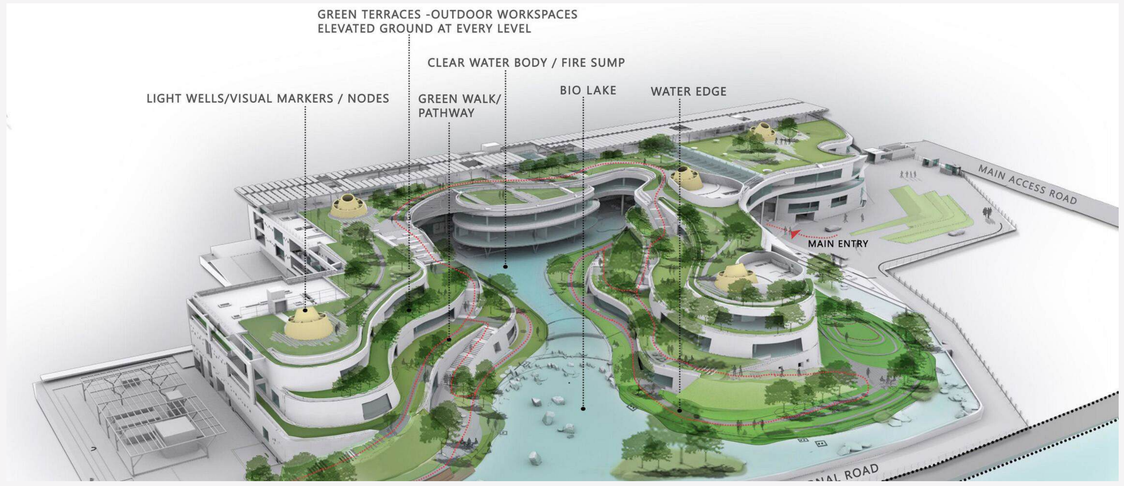
d. Titan Integrity Campus

Regional Case Study

Location: Bangalore, India
Completion: 2017 AD
Architects: MindSpace Architects
Orientation : North-East
Type: Office Building
Site Area: 390000 sq.ft. (72 ropanies)



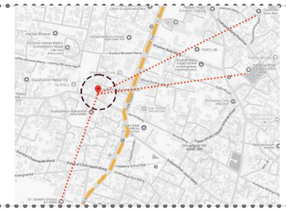
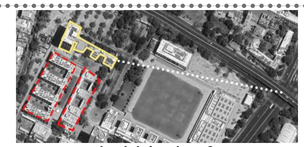
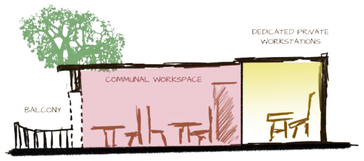
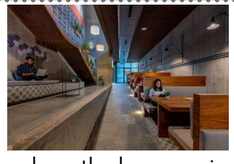
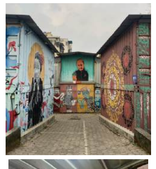
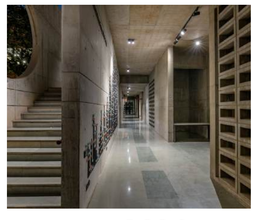
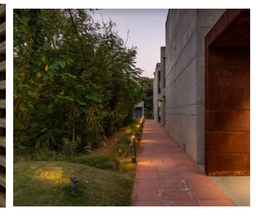




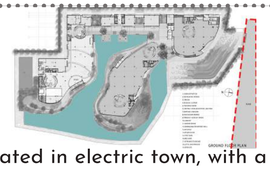
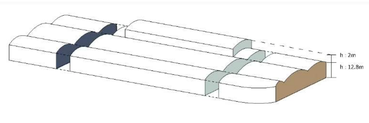
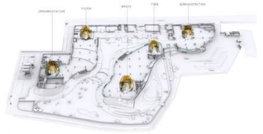
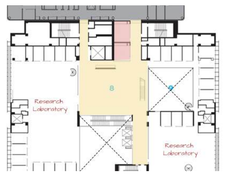
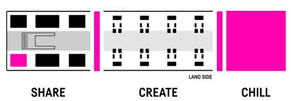
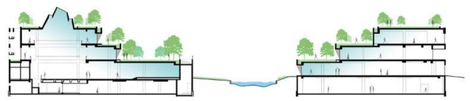
Programs: Office Workspace, Incubation & Training Space

Inferences:
- Cost-effectiveness
- Passive Design Strategies

Case Studies : Comparative Analysis

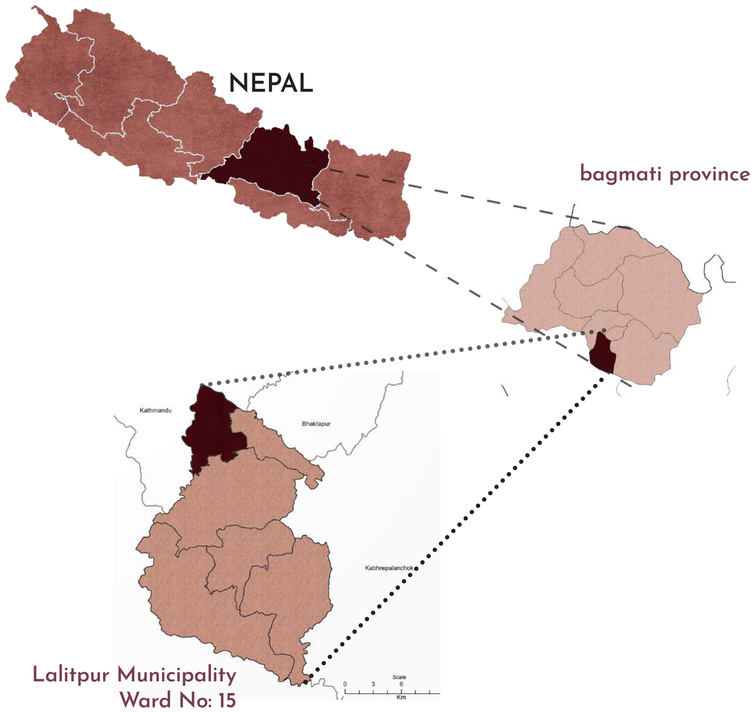
basis	literature	Impact Hub	the 100 spaces	CIIE.CO	Inferences
Site context, surrounding & orientation	proximity to commercial areas, development offices , research and higher educational centres.		in-between residential area because it was formerly used as a residential property.	 extended block of IIM, Ahmedabad by Louis Kahn	accessible distance near main hub areas.
Site Context & orientation	E-W orientation for maximum solar gain.	N-S Orientation	E-W Orientation	South-East Orientation	E-W for maximum solar gain N-S to bring in glare-free natural light
User Occupancy & Space Standards		70-75 users at a time, 17 staff members	50 co-working units, 11 staff members	300 startups, 35-40 staff members	
Site Zoning	Zoning according to levels of privacy, and noise. Segregation of hot and cold zones	 Zoning according to semi-public and private spaces.	 no specific zoning but trasitory spaces can be seen.	 private workspaces, semi-private buffer space and public circulation space.	distinct separation of zones for better effficiency of spaces.
Planning & Movement	planning that optimizes collaboration by strategically placing sectors, and balance open & built spaces.	Co-working: segragated courtyard & visual connectivity between floors. Makerspace: Network planning with intermediate open spaces.	 compact planning with pass through circulation.	linear planning with intermediate workspace and buffer zones.	Zoning for better work-life balance, emphasizing connectivity and well-being.
Circulation & Area Division	open & easily navigable floor plans for maximum visibility and movement efficiency.	 courtyard with central circulation.	lack of visual connection and buffer between spaces.	 along the longer axis.	clear, distinct circulation provisions.
Materiality & Open Space Components	Resilient building materials with building passive design guidelines.	   RCC + cargo containers - overheating & no proper workspace ventilation.	RCC Structure.	  RCC Structure: concrete with terracota and wood finish.	Massive need for a proper ventilation route, immediate open spaces and resilient materials.

Case Studies : Comparative Analysis

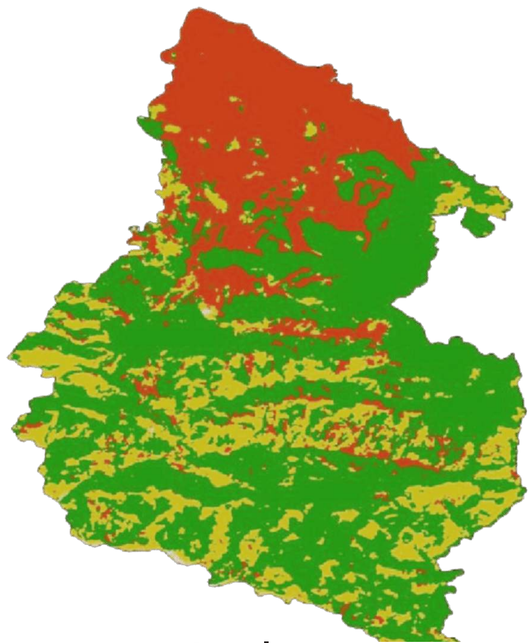
basis	literature	Station F	MIT Media Lab	Titan Integrity Campus	Inferences
Site context & surrounding	proximity to commercial areas, development offices , research and higher educational centres.	 well-connected via public transport - metroline 6 & 14.	 extension of the existing MIT Building.	 located in electric town, with a lake on the east & road towards north.	accessible distance near main hub areas.
Site orientation	E-W orientation for maximum solar gain.	E-W orientation	N-W orientation	N-S orientation	E-W for maximum solar gain N-S to bring in glare-free natural light
User Occupancy		3000 desk spaces, 34000 sq.m facility	6 floors totalling 16,300 sq.m.	1200 employees, 6.5 acre site.	
Site Zoning	Zoning according to levels of privacy, and noise. Segregation of hot and cold zones		vertical zoning: public spaces in the center and semi private, private spaces surrounding them.	 semi-private, creative zones in proximity to nature.	Zoning for better work-life balance, emphasizing connectivity and well-being.
Planning & Movement	planning that optimizes collaboration by strategically placing sectors, and balance open & built spaces.				balance between work spaces, public spaces & open spaces.
Circulation & Area Division	open & easily navigable floor plans for maximum visibility and movement efficiency.	 linear with branches	central with services around.	 fluidic & organic between departments.	functional efficiency and clear, easily navigable circulation routes.
Materiality & Open Space Components	Resilient building materials with building passive design guidelines.	 RCC Construction with vaults and prefabricated partitions for sub-zoning.	 RCC with distinct functional color codes.	 Local stone cladding, AAC blocks & passive design strategies	

site analysis

Location: Bhelpa, Lalitpur

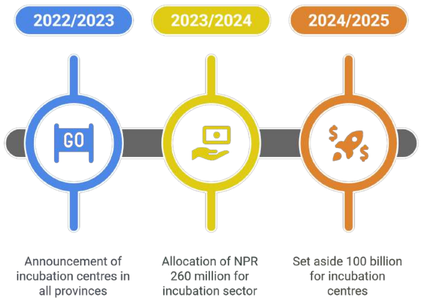


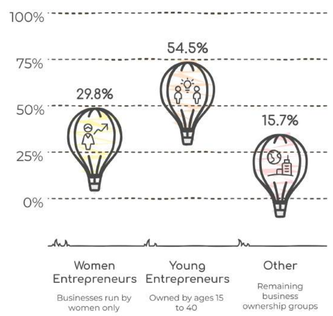
Lalitpur Municipality
Ward No: 15



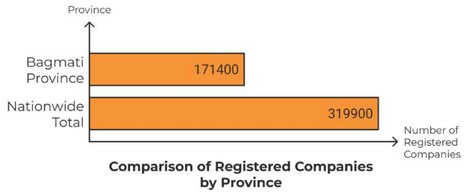
Land-use map
Lalitpur Municipality

- Bare Ground
- Vegetation
- Agriculture
- Built Area

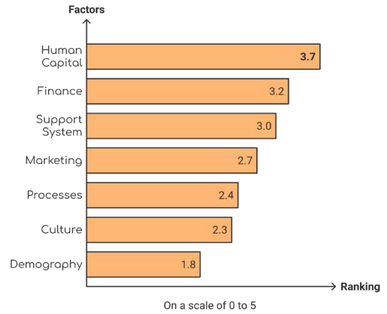




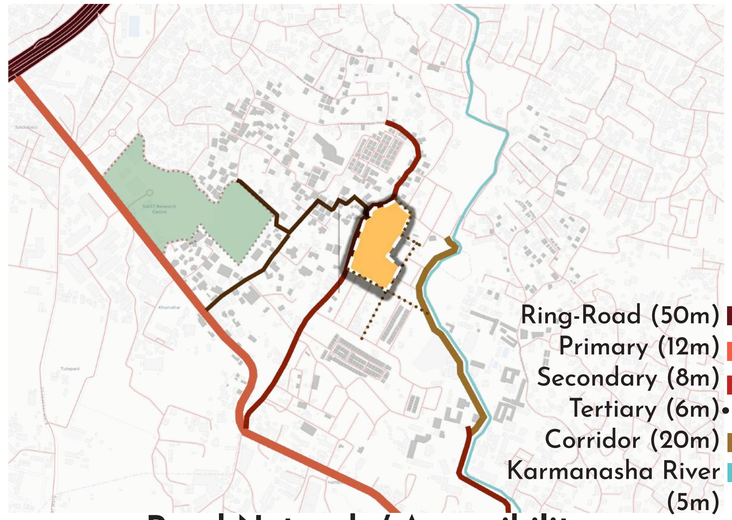
Ownership demographic of start-up businesses Report (2023)



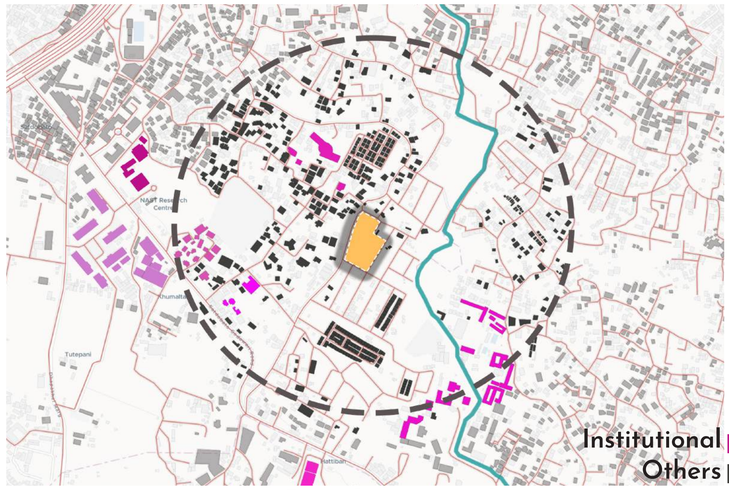
Nepal's Office of Company Registrar Report (2024)



Causes of Start-up failures in Nepal



Road Network / Accessibility



Institutional Buildings in the vicinity

site information

Site Area: 19634.28 sq.m.
Orientation: N - S
Vegetation: Fertile Farmland | Crops
Site Level: Mostly Flat / Gentle contour from west to east
Current Use: Farming / Temporary Built Structures


patan durbar square

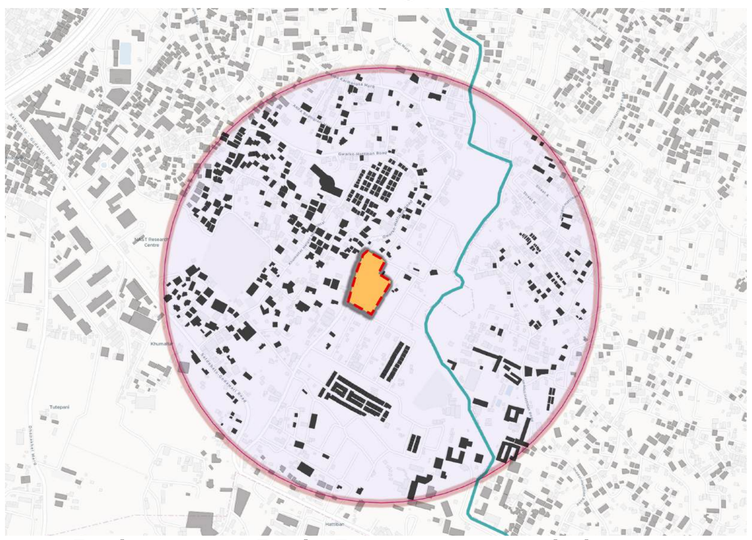

patan industrial estate


NAST


Kirat Minghim

proximity analysis

1.1 km from Patan Industrial Estate
500m from National Academy of Science & Technology (NAST)
200m from Little Angels School, Hattiban
600m from Nepal Agricultural Research Centre (NARC)



Built Area / Built Density around the site

PURBANCHAL UNIVERSITY
DEPARTMENT OF ARCHITECTURE
KHWOPA ENGINEERING COLLEGE
LIBALI, BHAKTAPUR

UNDERGRADUATE THESIS

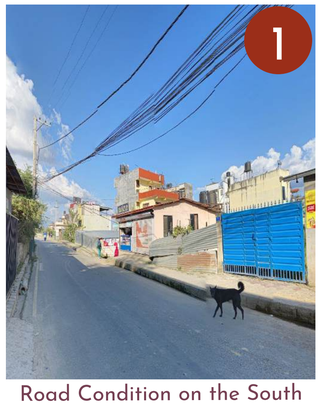
TITLE: SITE ANALYSIS

PRESENTED BY: PRASOON SHRESTHA
ROLL: 760128

DATE: 02 APR, 2025

building bye-laws

Location of site in an institutional zone.
G.C.R.= 60% [Plots > 250 sq.m.]
F.A.R. = 3.5
ROW = 3m , 2m in case of geographical constrains
Setback= 3m (B. height 10 - 17m) , 5m (B. height > 17m)



Road Condition on the South Road Condition

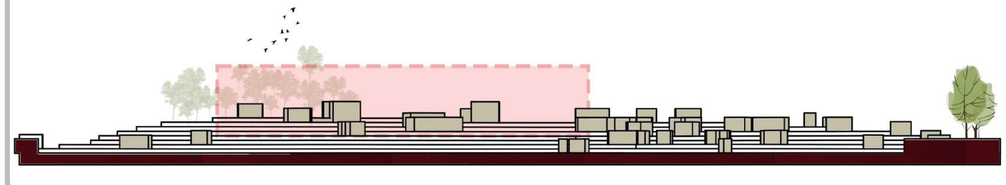
View of the polluted riverside

Temporary Play & Open Space nearby the river.

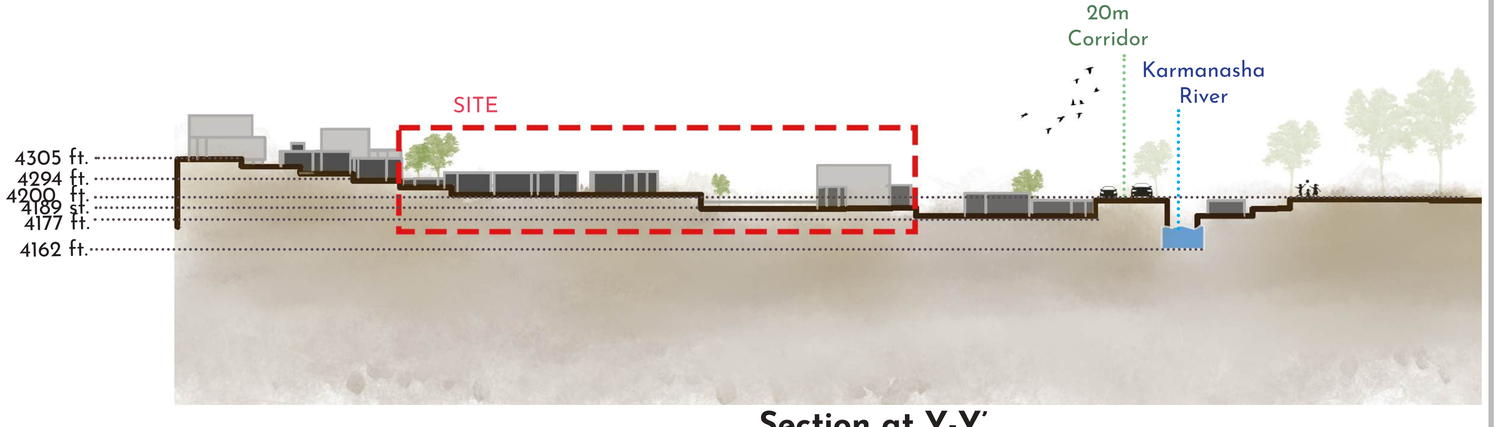
Existing small scale textile, stonework, and woodwork manufacturers in the site.

Existing Buildings & agricultural land

Flood Line reached by the Karmanasha River



Section at X-X'



Section at Y-Y'

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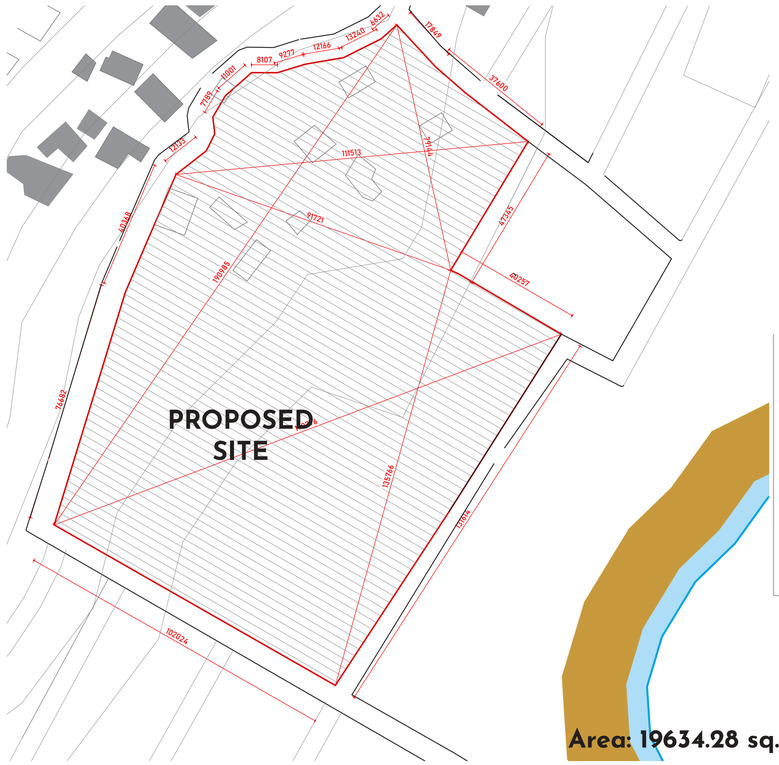
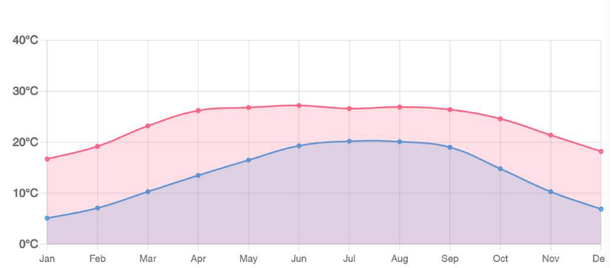
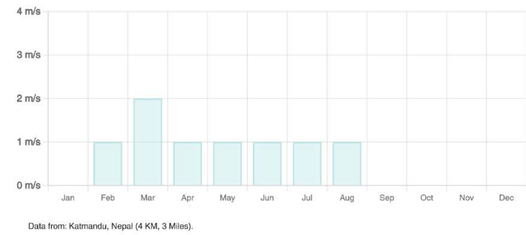
PRESENTED BY: PRASOON SHRESTHA
ROLL: 760128
DATE: 02 APR, 2025

proposed site

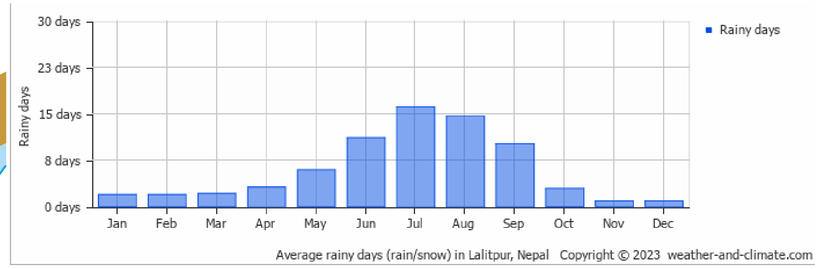




Average Temperature



Wind Pattern



Rainfall Data

peculiar orchid species of Hattiban, Phulchowki diversity

previously found medicinal herb: *Centella asiatica (Ghodtapre)*

site history

Contrary to conventional flow of river in N-S orientation, Karmanasha moves South- North.

This has held a sort of negative connotation amongst the people.

2005

2010

2016

2023

S

Strategic & Scenic Location
Institutional Zone / Support
Accessibility

W

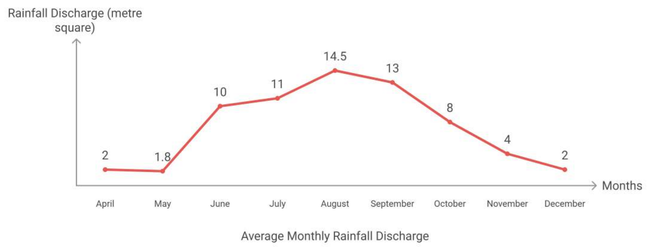
Environmental Risks
Noise Pollution

O

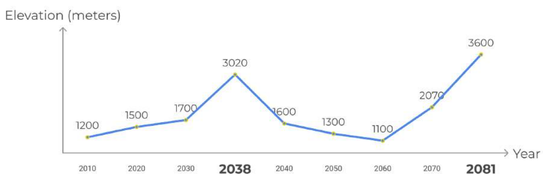
Urban Green Space Creation
Sustainibility Initiatives
Expansion Opportunities
Community Engagement

T

Riverside Proximity
Climate Change Impacts
Regulatory Changes



Average Rainfall in Karmasha River



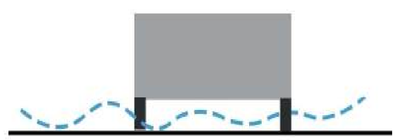
Flooding Tendency of Karmanasha River 2000 - 2080

FLOODING AREA:

Floodplain height in the area is at 0.75m to 1.5m from river bed.

Low Hazard Zone < 1m

Floor Control Structures: 20m corridor construction plan, plus the area to be protected by retaining walls.



PURBANCHAL UNIVERSITY
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TITLE: SITE ANALYSIS

PRESENTED BY: PRASOON SHRESTHA
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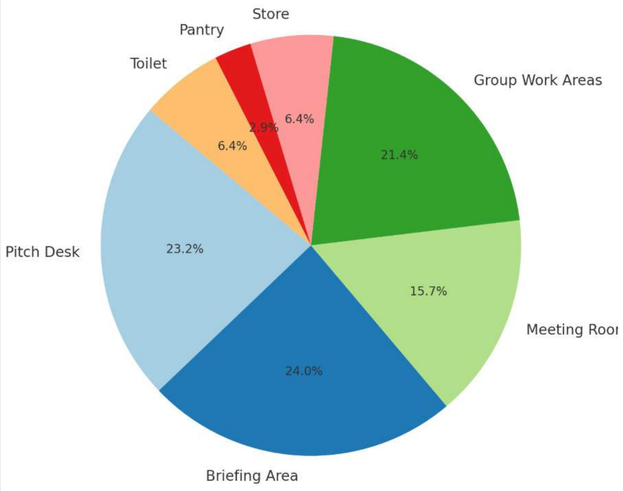
DATE: 02 APR, 2025

Program Formulation: The Urban Tetris - Incubating through Collaboration and Community

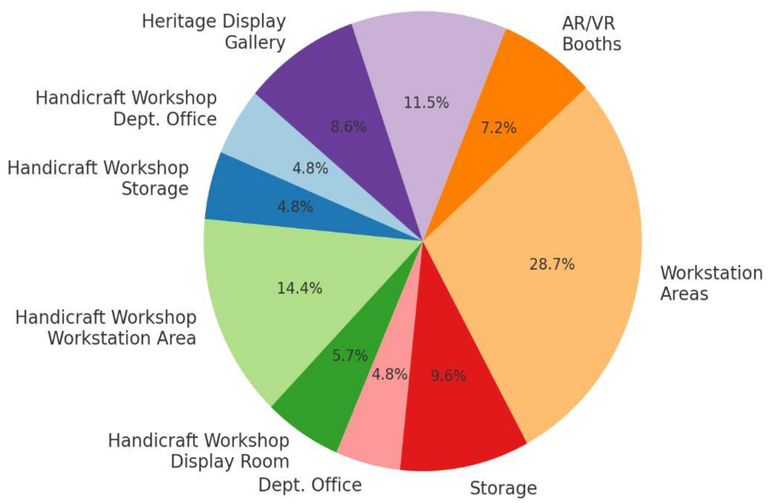
S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Incubator & Accelerator Space				
1.	Pitch Desk	1	30	1.82	54.6
2	Briefing Area	1	25	2.26	56.5
4	Meeting Rooms	2	10	1.85	37
5	Group Work Areas	1	50	2.51	125.5
6	Store	1			15
7	Pantry	1	2	3.35	6.7
8	Toilet				15
	Total				**310.3**



Incubator & Accelerator Space Division

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Makerspace | Workshops				
1.	Molding/Casting Space	1	10	13	130
2	Electronic Room	1	10	5	50
4	Wood Workshop	1	10	10	100
5	Metal Workshop	1	10	10	100
6	Storage Spaces	1			150
7	Laser Cut/ CNC Room	1	10	7	70
8	3D Modelling Room	1	10	5.2	52
9.	Media Lab / Photography	1	10	4.6	46
10.	Clay Modelling	1	10	4.6	46
11.	Testing Area	1	10		150
12.	Toilet				30
	Total				**924**

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Experience Center				
	Handicraft Workshop				
1.	Department Office	1	1	25	50
2.	Storage	1		50	50
3.	WorkStation Area	2	15	50	150
4.	Display Room	2		30	60
		1			
	Total				**310**



Experience Center Space Division

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Experience Center				
	Traditional Technology				
1.	Department Office	1	10	5	50
2.	Storage	1	10	10	100
3.	WorkStation Areas	3	10	10	300
4.	AR/VR Booths	1	30	2.5	75
5.	Indigenous Technology Documentation Lab (recording, scanning, archiving)	1	30	4	120
6.	Heritage Technology Display Gallery	1	20	4.5	90
	Total				**735**

TOTAL BUILT-UP AREA: 5224.29 SQ.M.

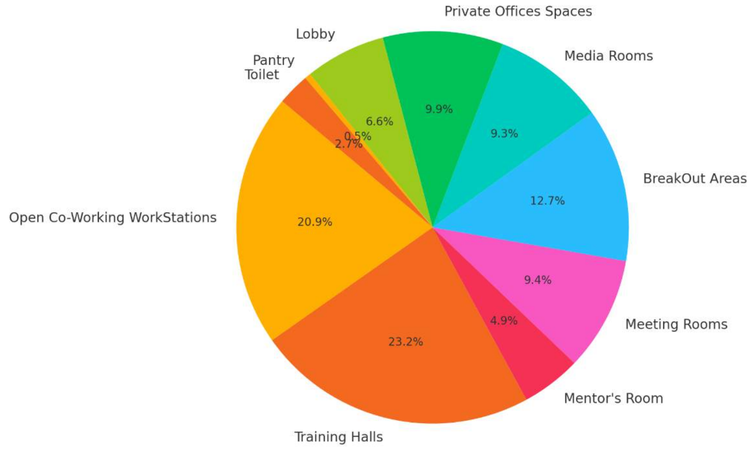
PARKING: 1044. 858 SQ.M. (20%)

OPEN AREA: 6000 SQ.M. (> 50%)

TOTAL: 12269 SQ.M. (Around 25 ropanis)

Program Formulation: The Urban Tetris - Incubating through Collaboration and Community

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Collaborative Co-Working Space				
1.	Open Co-Working WorkStations	3	25	3.14	235.5
2	Training Halls	4	30	2.18	261.6
4	Mentor's Room	3	10	1.85	55.5
5	Meeting Rooms	4	12	2.21	106.08
6	BreakOut Areas	3	10	4.77	143.1
7	Media Rooms	3	12	2.9	104.4
8	Private Offices Spaces	6	8 each	2.33	111.84
9	Lobby	1	12	6.25	75
10.	Pantry	1	4	1.4	5.6
11.	Toilet			30	30
	Total				**1129.34**

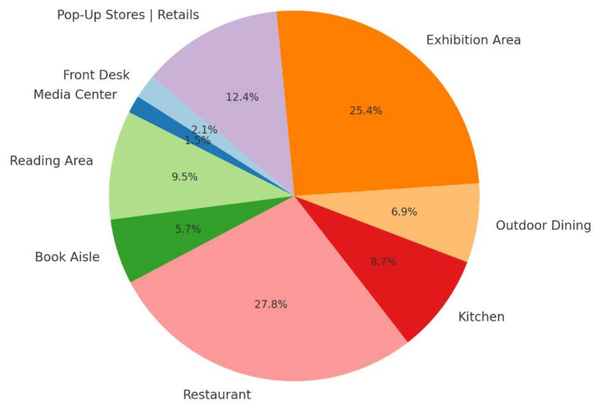


Area Distribution in Collaborative Co-working Space

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Administration				
1.	Reception	1	10	2.05	20.5
2	Accounts	1	3	3.3	9.9
4	Manager's Office	1	3	4.3	12.9
5	Director's Office	1	3	6	18
6	Workstation	1	15	4.76	71.4
7	Pantry	1	4	1.4	5.6
8	Toilet				10
	Total				**148.3**

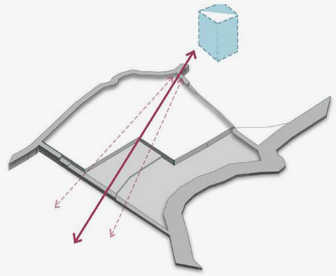
S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Entrance				
1.	Entry Platform	1		50	50
2	Collab Plaza	1		100	100
4	Cafe / Exhibit Space	1	40	10m2 per person	400
5	Toilet (M) 2u-2wc-2wb	1		15	15
6	Toilet (F) 3wc - 2wb	1		12	12
	Total				**582**

S.N.	Description	Unit (No. of spaces)	Capacity (No. of users)	Area per person (sq.m.)	Total Area (sq. m.)
	Library				
1.	Front Desk	1	10	2.02	20.2
2	Media Center	1	10	1.48	14.8
3.	Reading Area	1	10	1.52	91.2
4.	Book Aisle	1	10	5.46	54.6
	Restaurant				
1.	Restaurant	1	75	3.55	266.25
2.	Kitchen	1	10	8.33	83.3
3.	Outdoor Dining	1	10	6.63	66.3
	Miscellaneous				
1.	Exhibition Area	1	200	1.22	244
2.	Pop-Up Stores | Retails	10	5	2.37	118.5
	Total				**1085.35**

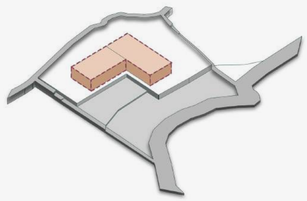


the urban tetris

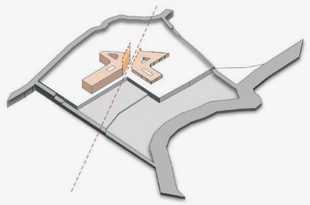
Incubating through
Collaboration & Community



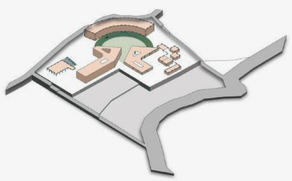
01. Developing an axis - communicating innovation to community



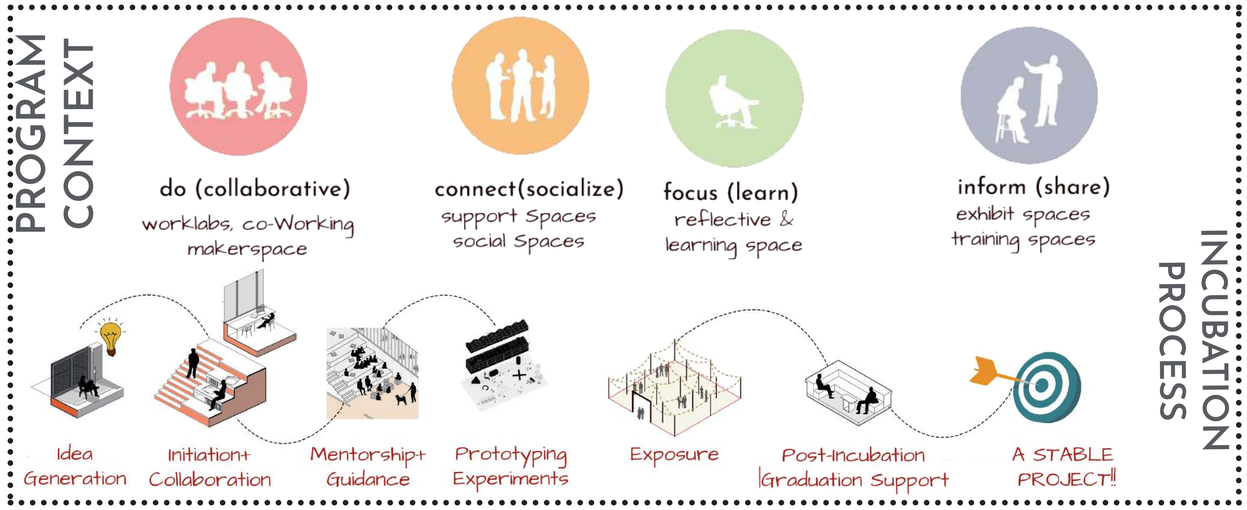
02. Block placement according to site specifications.

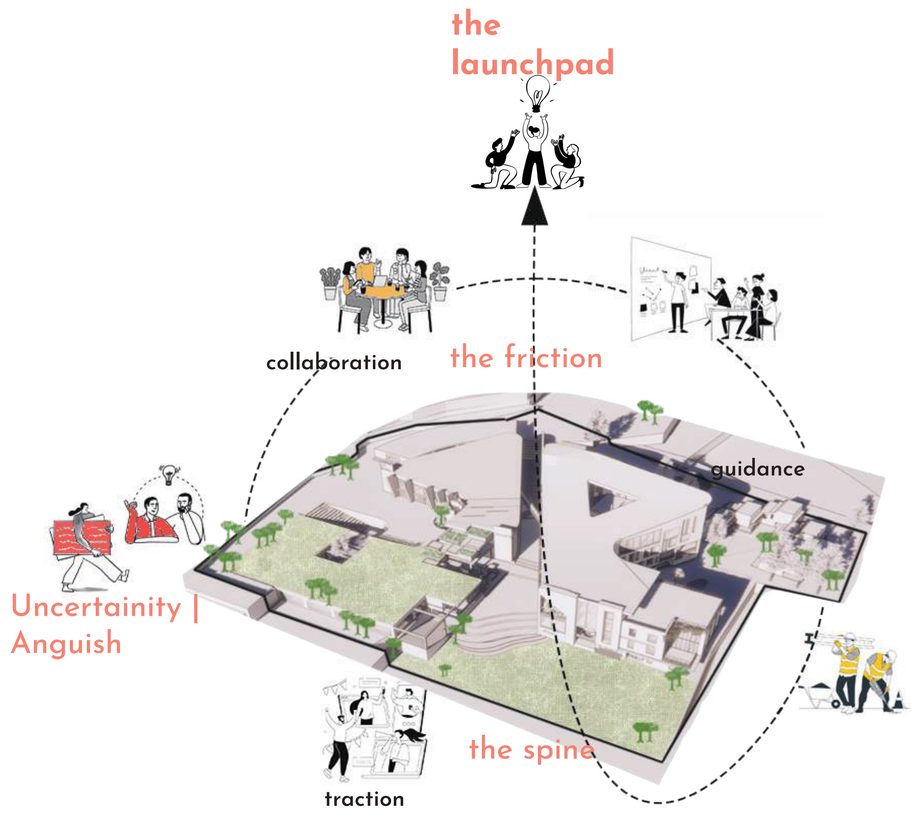


03. Transformation of building block



04. Addition of surrounding spaces

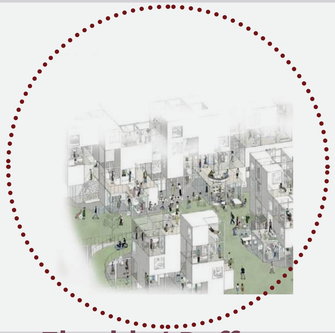




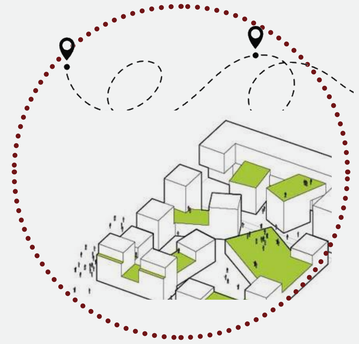
01.Stepped Design

Functional Placement harmonizing with site topography.

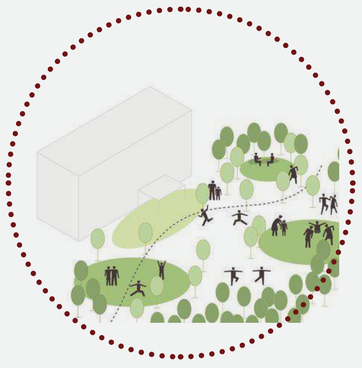
03.Community Engagement



04. Flexible/ Buffer spaces



01.Reintegration of nature into the dense Urban Fabric



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FINAL PRESENTATION
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PRESENTED BY: PRASOON SHRESTHA
ROLL: 760128

DATE: 08/04/2025

Incubating through Collaboration & Community

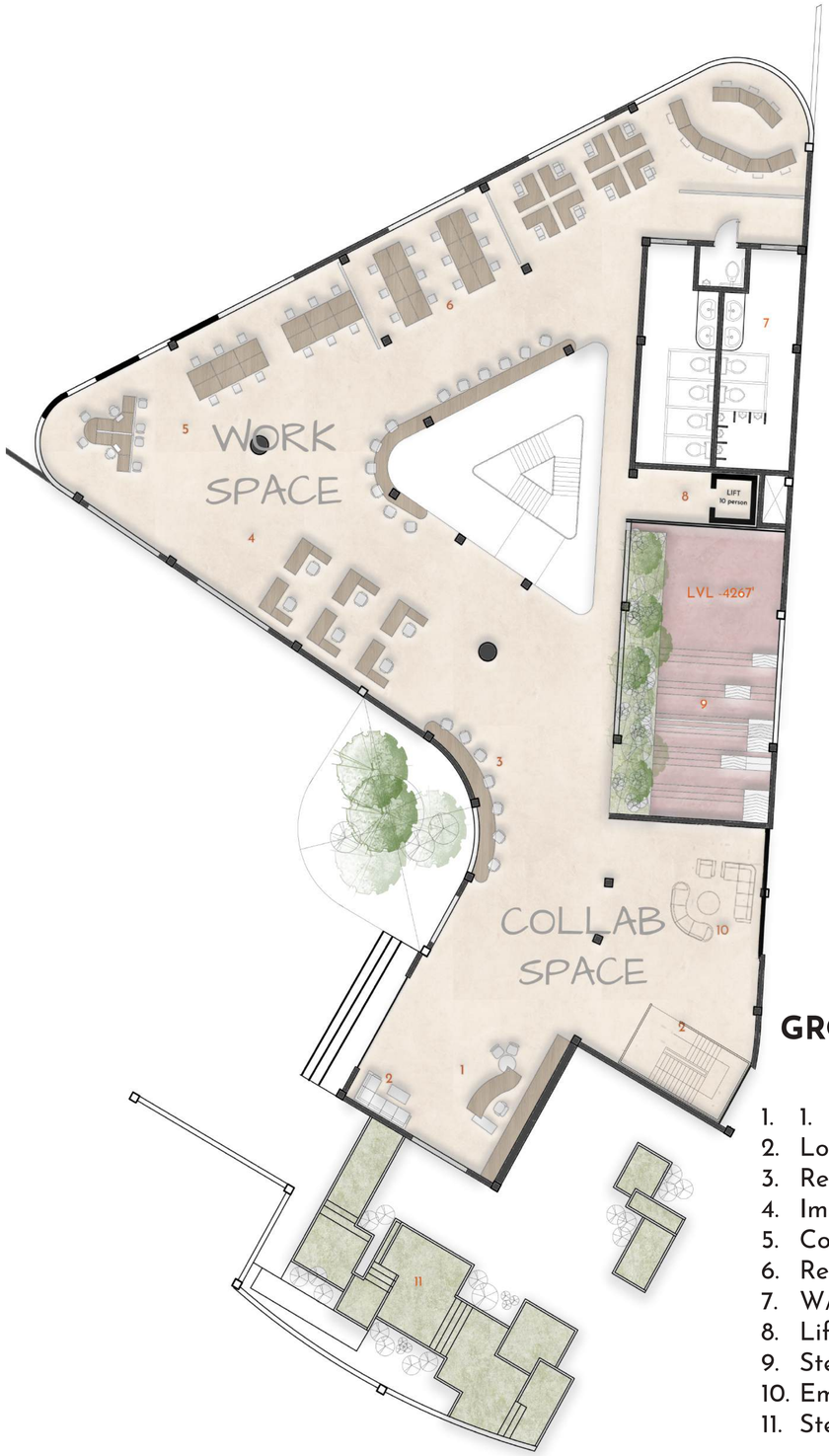
Bhelpa, Lalitpur

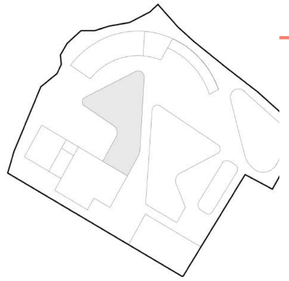
MASTERPLAN at 00 mm

Scale: 1:400

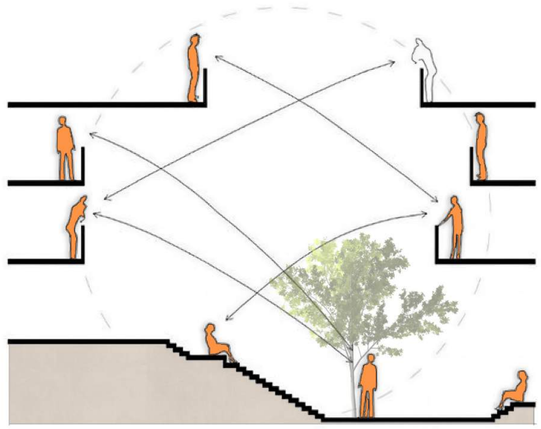
Total Area: 15212.8 sq.m.

1. Entrance
2. Surface Parking
3. Vehicular Ramp
4. Exhibition Block | Experience Center
5. Stepped Entry to Exhibition Block
6. Secondary Entry
7. Pedestrian Plaza
8. Entrance Plaza 2
9. Co-working Block
10. Stepped Garden to Green Roof
11. Cafe | Retail Block
12. Amphitheatre
13. Incubation Block
14. MakerSpace

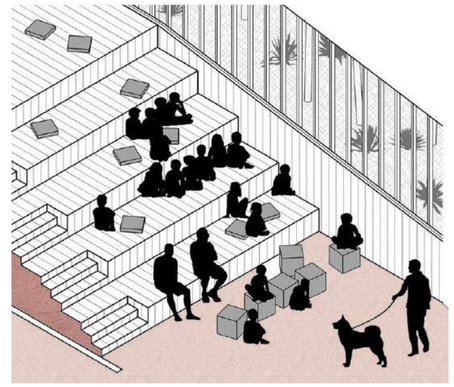




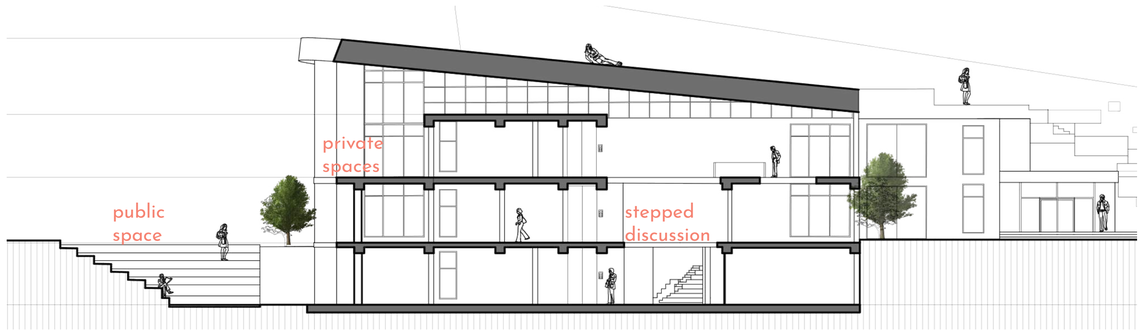
KEY PLAN



INTERFLOOR CONNECTION



STEPPED SEATINGS

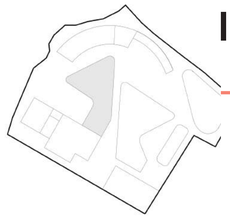


SECTION AT B-B'

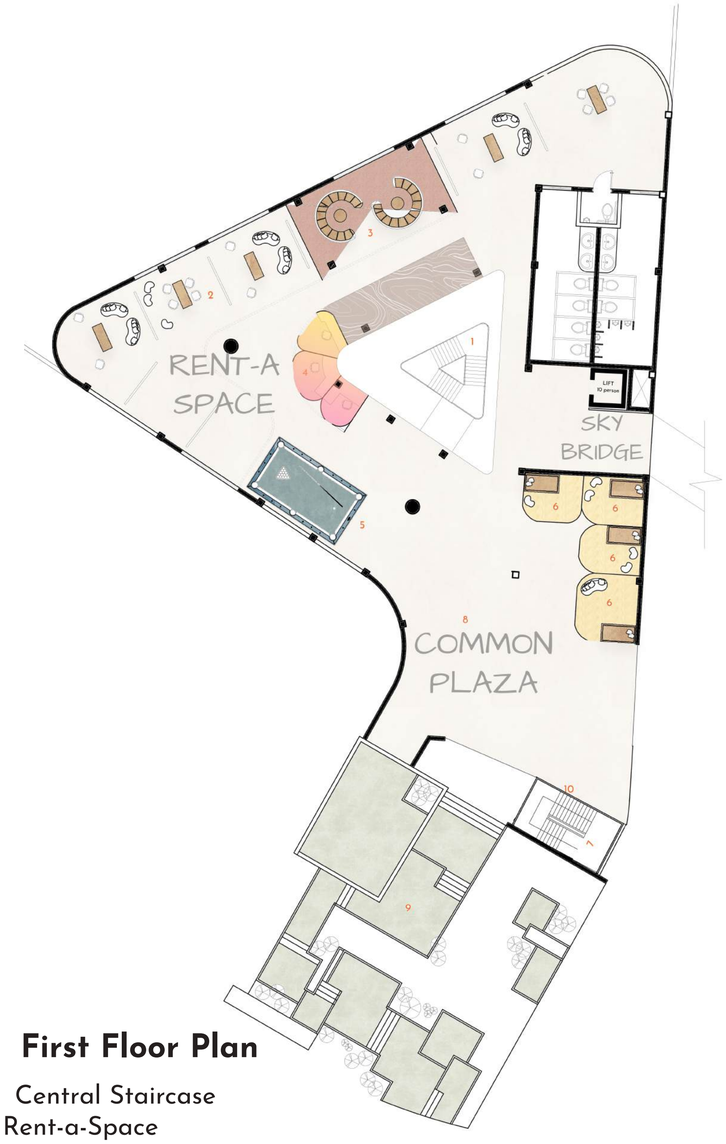
GROUND FLOOR PLAN

Total Area: 1020.7 sq.m.

1. 1. Reception
2. Lobby
3. Rent-a-desk model
4. Im-promptu 1-1 meeting space
5. Common Working Space
6. Rent-a-desk module 2
7. W/C
8. Lift Lobby
9. Stepped discussion space
10. Emergency Staircase
11. Stepped Garden

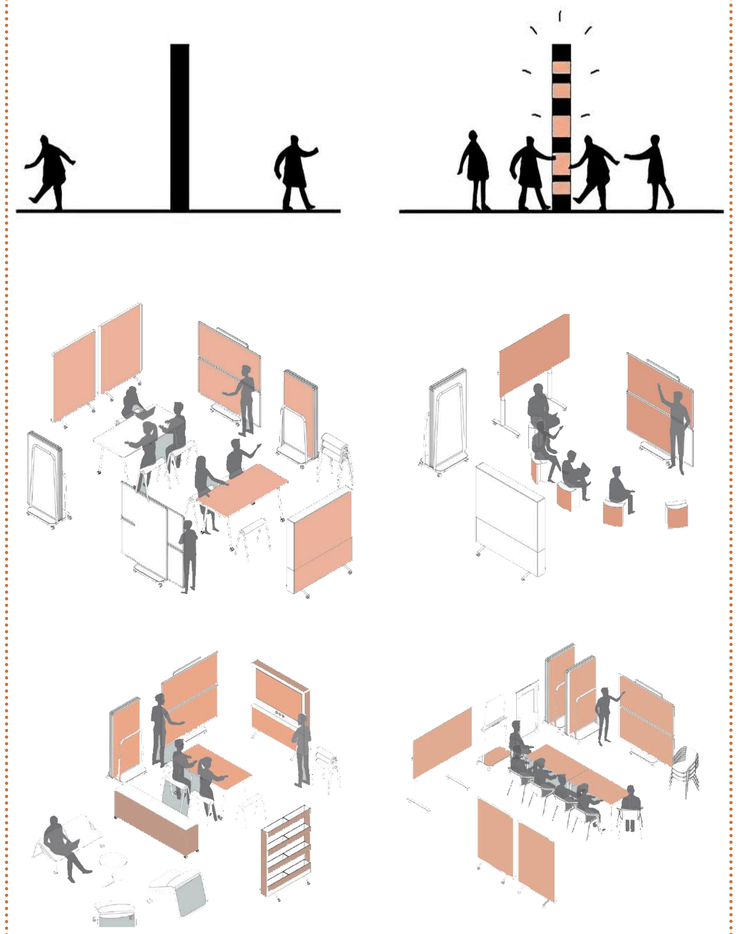


KEY PLAN

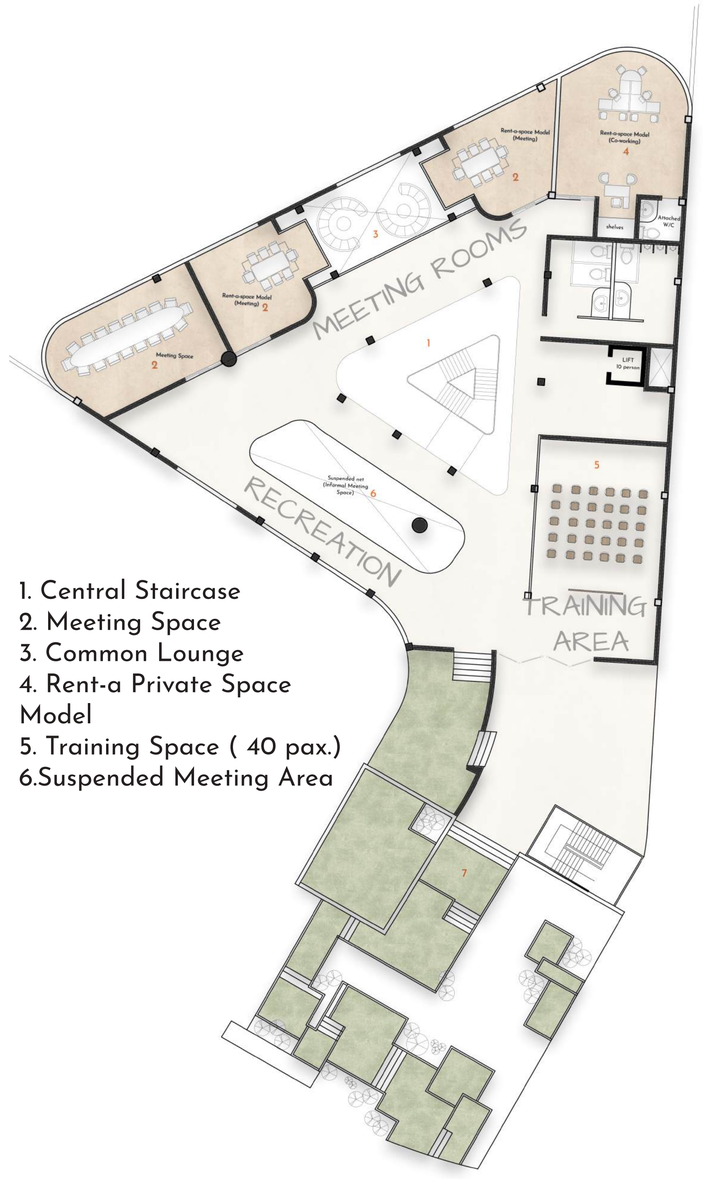


First Floor Plan

1. Central Staircase
2. Rent-a-Space
3. Common Lounge
4. Phone Booths
5. Recreation
6. Nap Pods
7. Emergency Staircase
8. Common Lounge
9. Spill-Out Space



"ideas generate through simultaneous interactions"



1. Central Staircase
2. Meeting Space
3. Common Lounge
4. Rent-a Private Space Model
5. Training Space (40 pax.)
6.Suspended Meeting Area

Second Floor Plan

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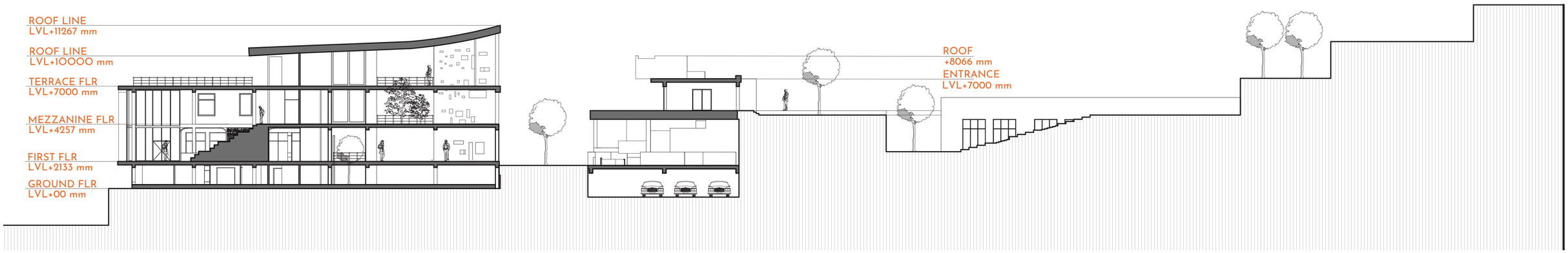
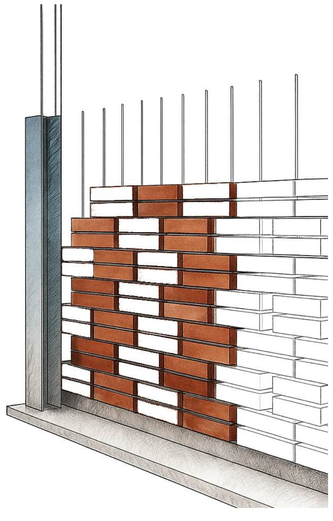
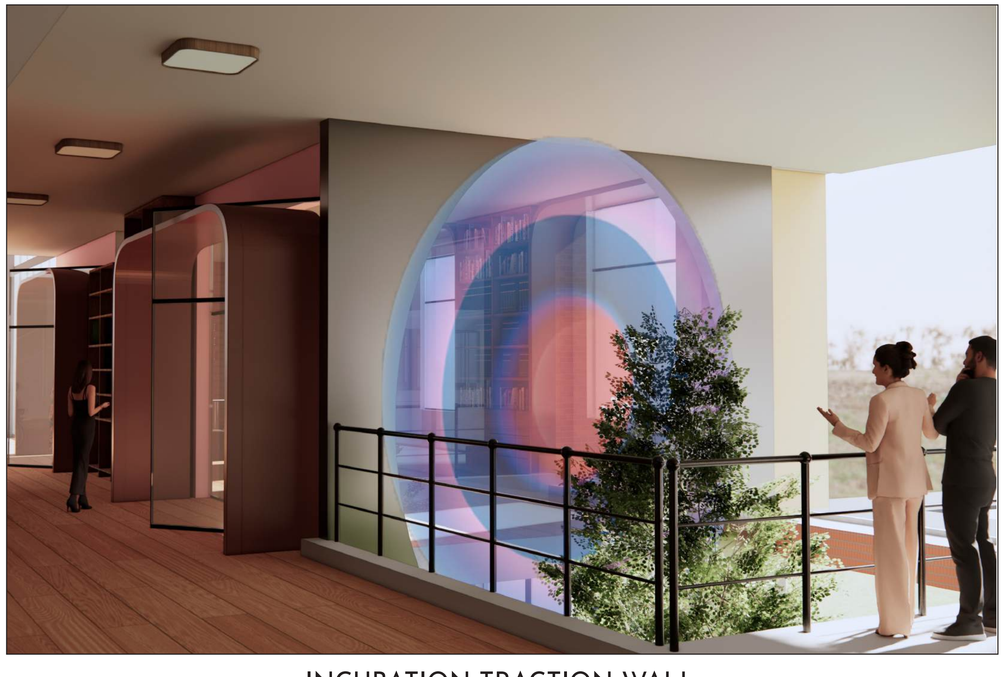


SECTION AT A-A'



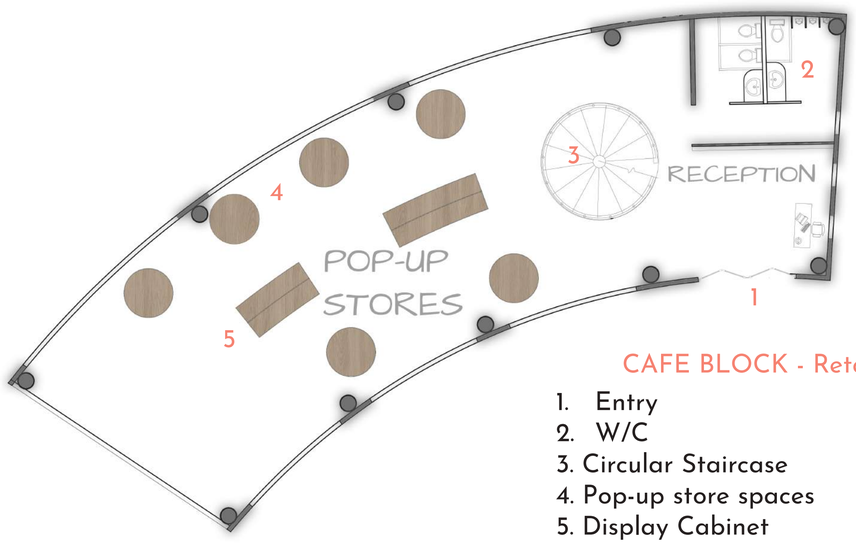
jali wall design in the south facade to block the sunlight but allow wind flow into the reading space



INCUBATION TRACTION WALL -
Connecting incubation centres in 7 different provinces

West facade - ENTRYWAY
Sunshading elements with facade treatment similar to it's sister building - NAST

CAFE BLOCK
Total Area: 571.39 SQ.M.

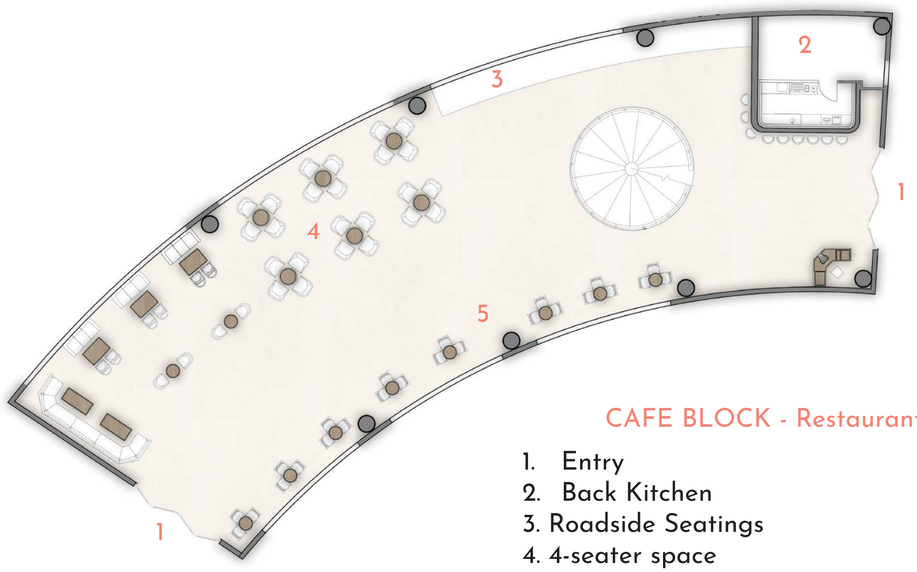


CAFE BLOCK - Retail Space

1. Entry
2. W/C
3. Circular Staircase
4. Pop-up store spaces
5. Display Cabinet

PEDESTRIAN ENTRANCE

SKYBRIDGE + INDOOR OUTDOOR CONNECTION



CAFE BLOCK - Restaurant

1. Entry
2. Back Kitchen
3. Roadside Seatings
4. 4-seater space
5. Amphitheatre facing seatings

POP-UP | RETAIL SPACE

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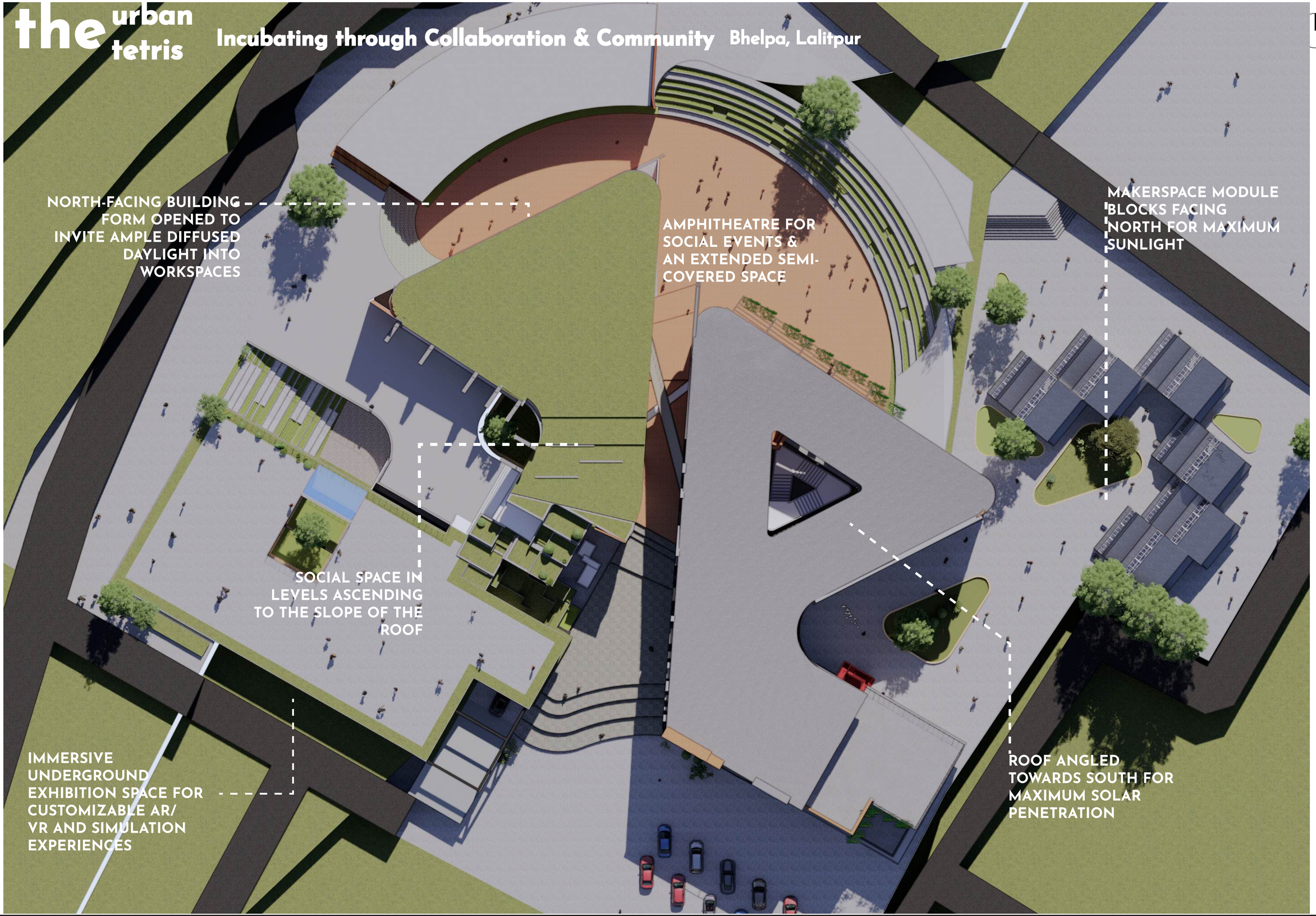
the urban tetris

Incubating through Collaboration & Community

Bhelpa, Lalitpur



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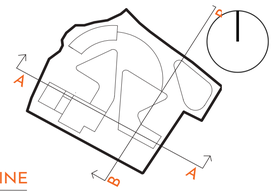
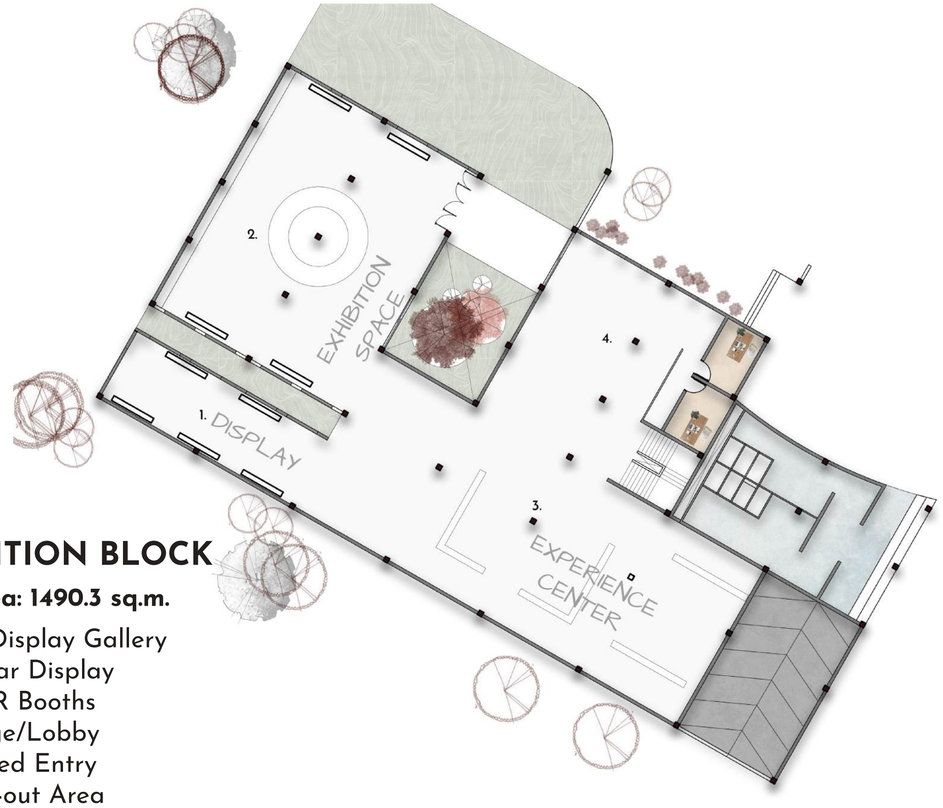
MASTERPLAN at -4267mm

Scale: 1:400

1. Entrance
2. Surface Parking
3. Elevated Entry Area
4. Vehicular Ramp
5. Exhibition Block | Experience Center
6. Stepped Garden to the Green Roof
7. Pedestrian Plaza
8. Co-Working Block
9. Incubation Block
10. Common Amphitheatre
11. MakerSpace Prototypes
12. Drop-Off Area
13. Shaded Drop-Off Station
14. Extended pavement seatings



SECTION AT B-B'



EXHIBITION BLOCK

Total Area: 1490.3 sq.m.

1. Wall Display Gallery
2. Circular Display
3. AR/VR Booths
4. Lounge/Lobby
5. Stepped Entry
6. Break-out Area

SECTION AT C-C'

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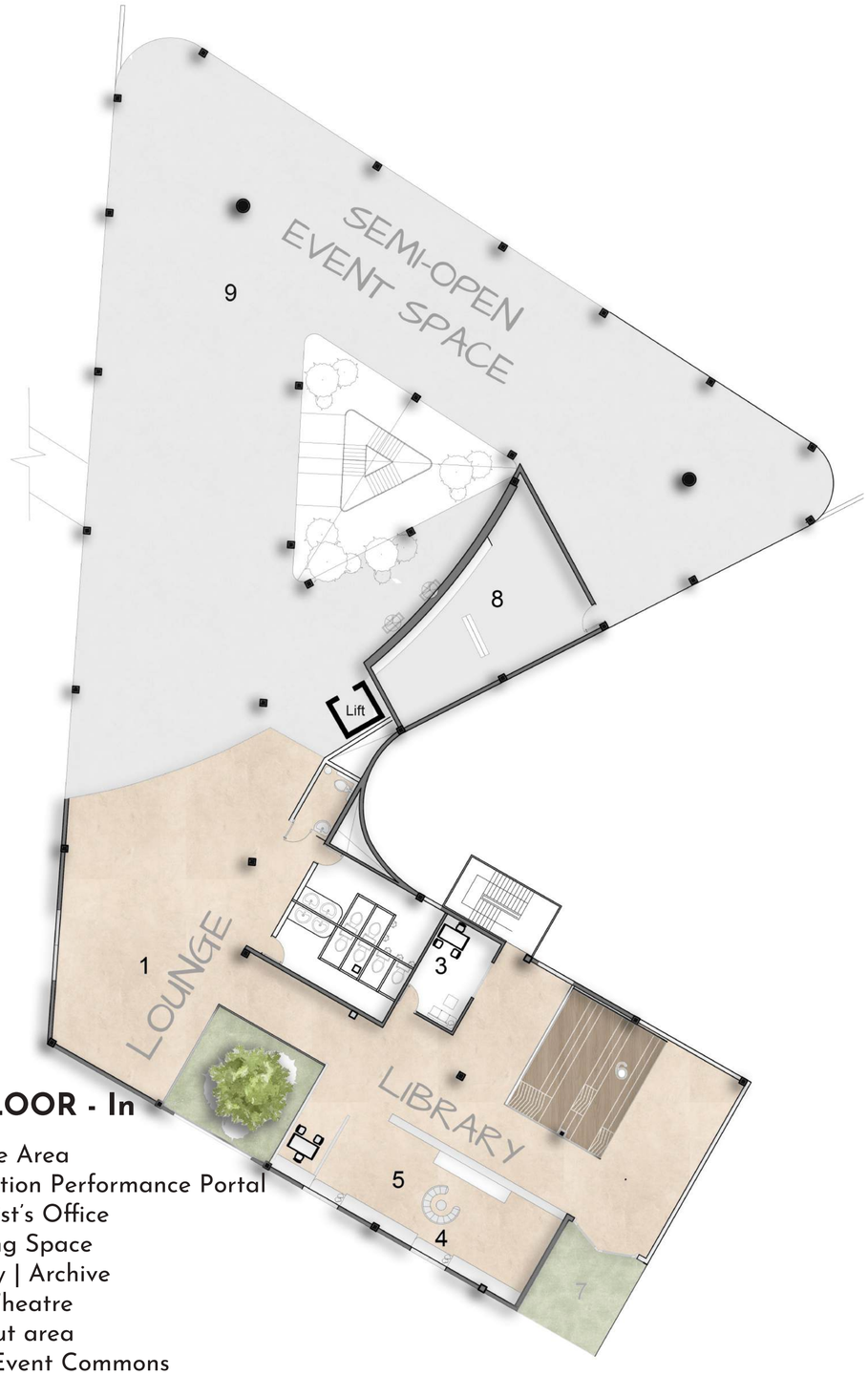
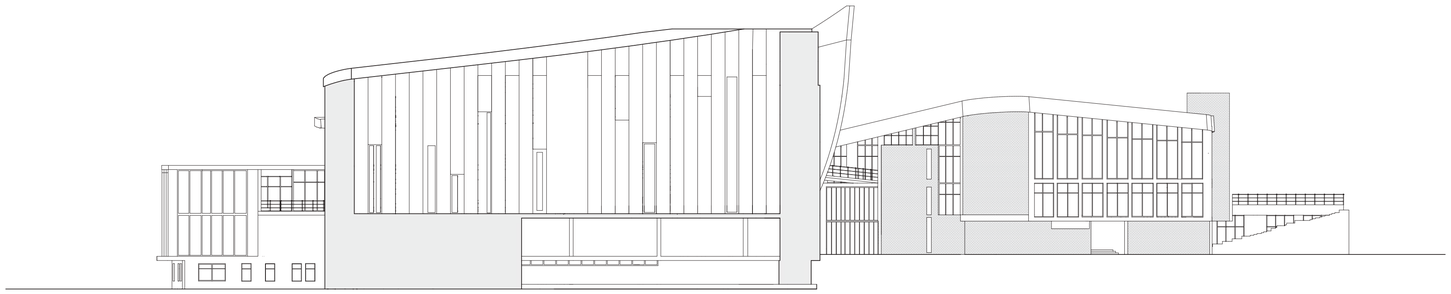


FIRST FLOOR - In

1. Lounge Area
2. Incubation Performance Portal
3. Archivist's Office
4. Reading Space
5. Library | Archive
6. Pitch Theatre
7. Spill-out area
8. After-Event Commons
9. Event Space



NORTH ELEVATION

Maximum fenestration facing north

Amphitheatre to semi-enclosed open space

'The Pitch Theatre'

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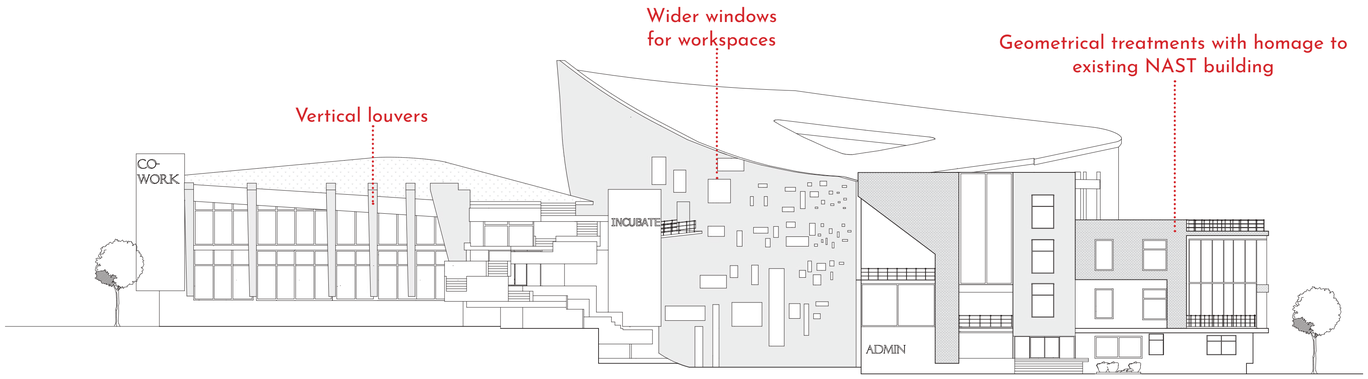
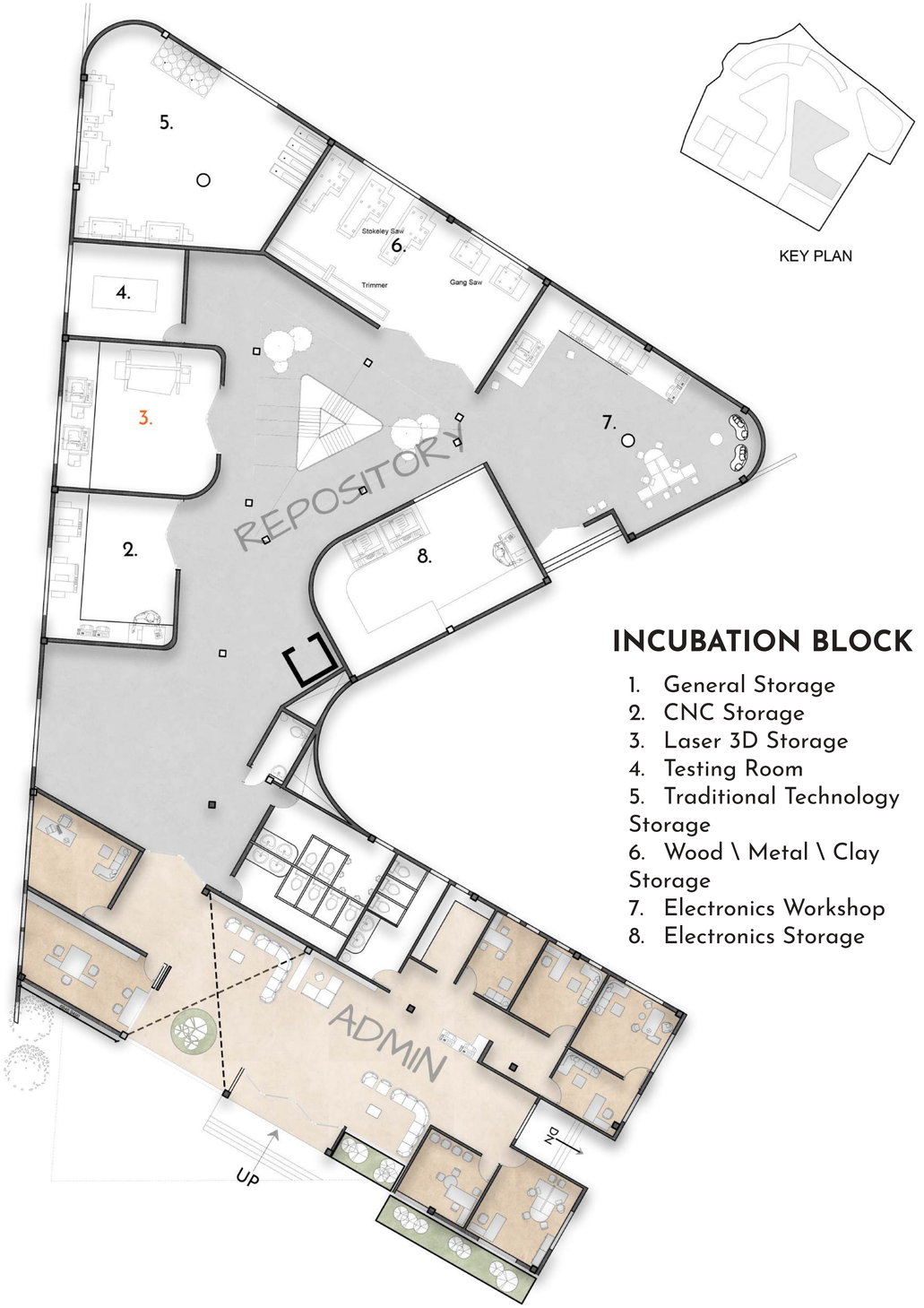


SOUTH WEST ELEVATION

Recessed balconies & Vertical Elements



KEY PLAN

INCUBATION BLOCK

1. General Storage
2. CNC Storage
3. Laser 3D Storage
4. Testing Room
5. Traditional Technology Storage
6. Wood \ Metal \ Clay Storage
7. Electronics Workshop
8. Electronics Storage

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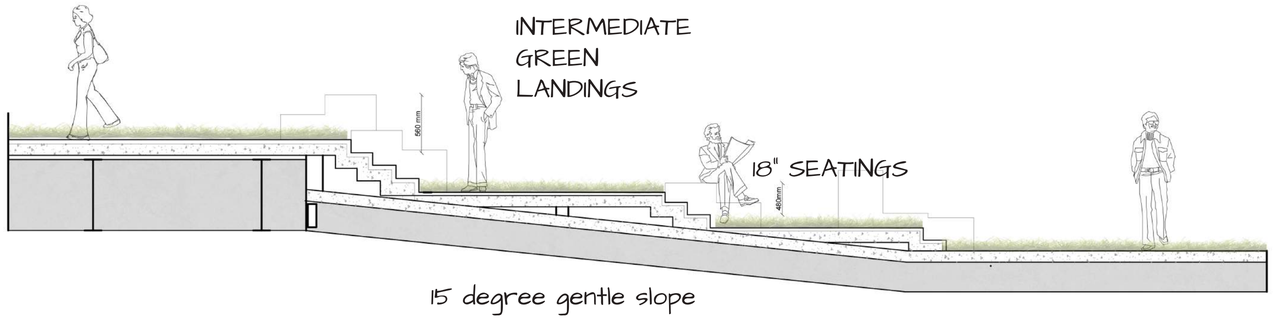
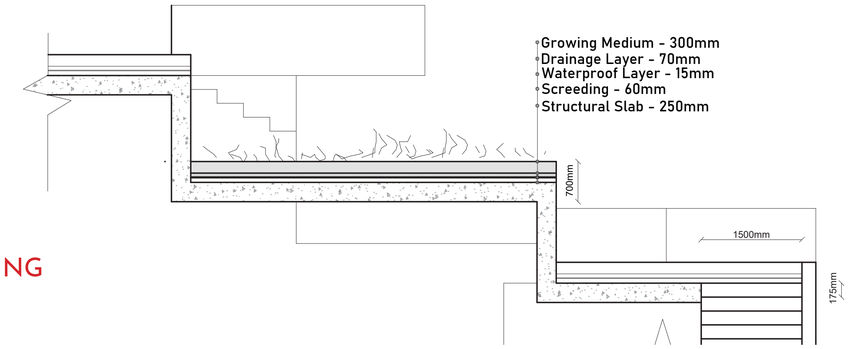
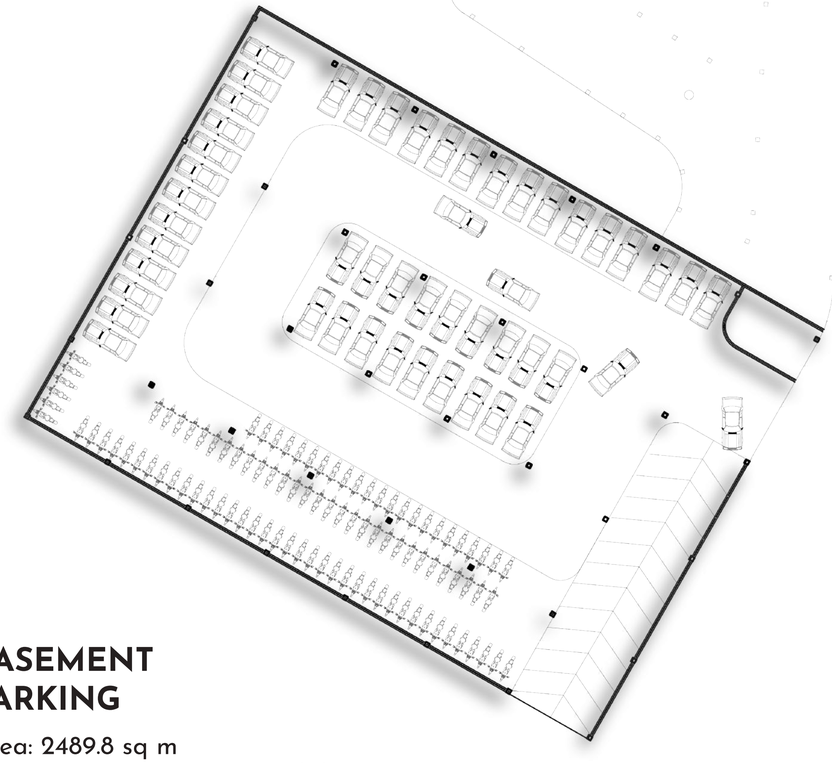


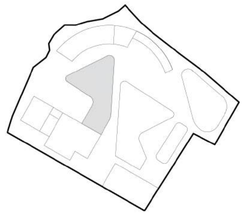


BLOW-UP SECTION (COWORKING STEPPED GARDEN)

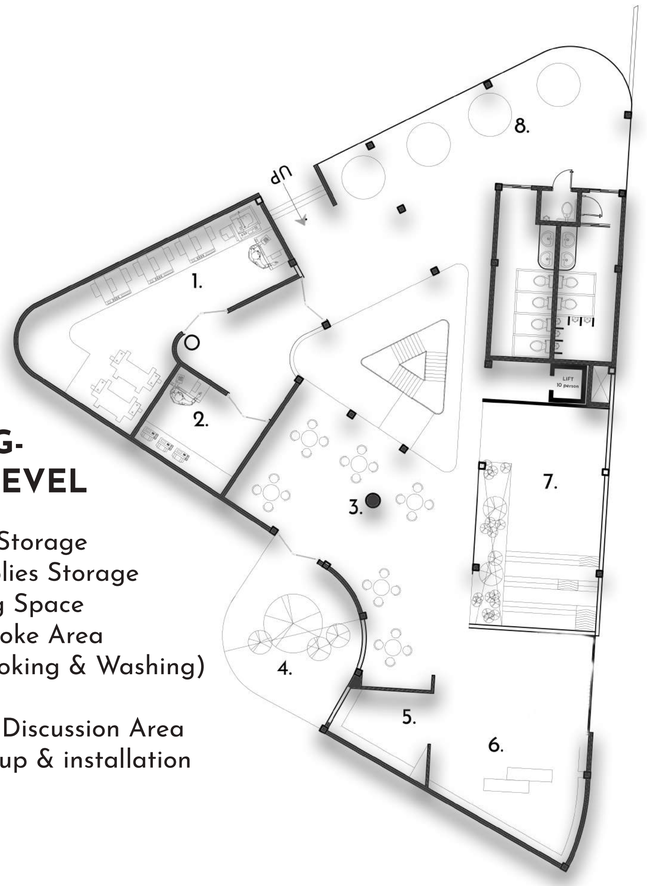


BASEMENT PARKING

Area: 2489.8 sq m
Capacity : 49 cars, 96 motorbikes



KEY PLAN



CO-WORKING- BASEMENT LEVEL

1. Maintainance Storage
2. Technical Supplies Storage
3. Dining | Eating Space
4. Break-out | Smoke Area
5. Wet Area (Cooking & Washing)
6. Pantry
7. Stepped-down Discussion Area
8. Extended pop-up & installation Space

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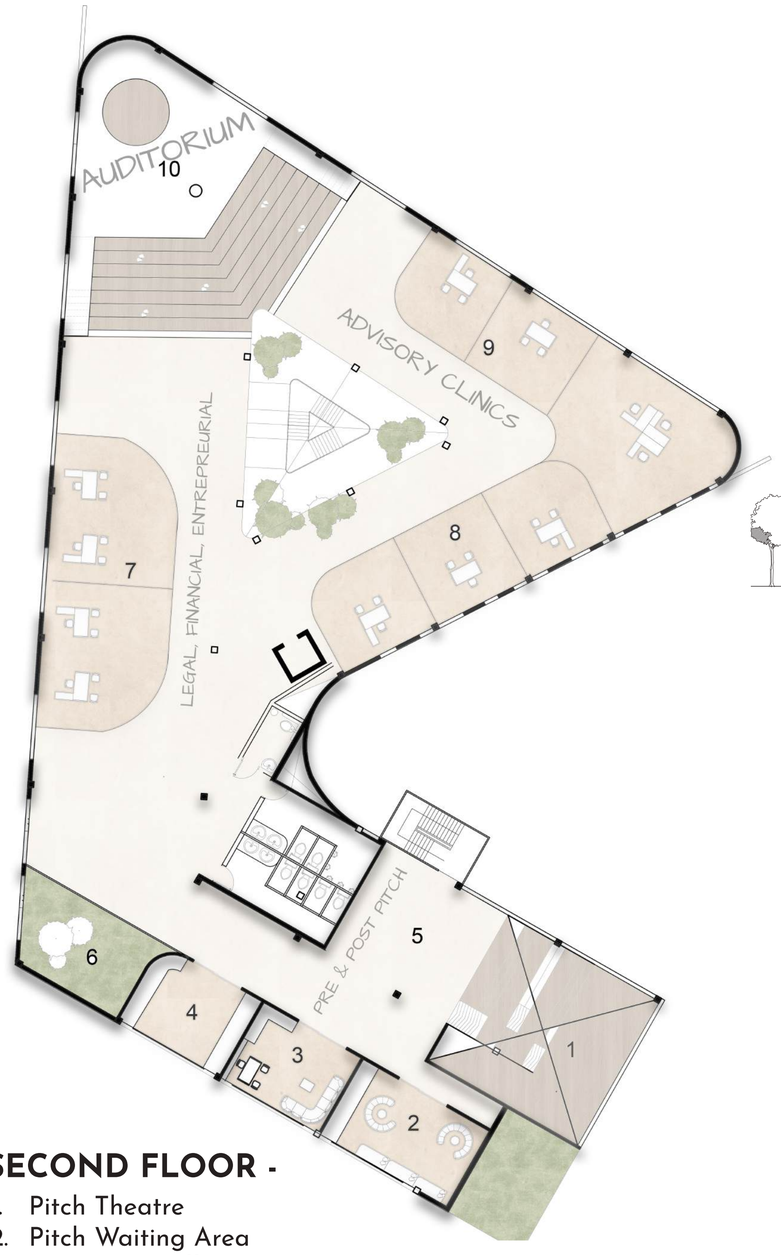
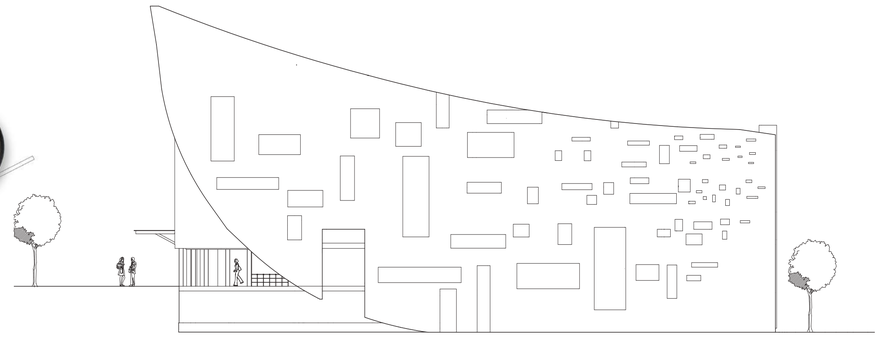


SECOND FLOOR -

1. Pitch Theatre
2. Pitch Waiting Area
3. Manager's Office
4. Cloak Room
5. Extended Seating Area
6. Recessed Garden Area
7. Investors Mentorship Clinics
8. Financial Advising Clinics
9. Legal Advising Clinics



Friction of Ideas in Incubation

WEST FACADE

ENTRANCE

"The Spine" - connecting the users to the social space amidst co-work & incubation

THIRD FLOOR - In

1. Auditorium
2. Control Room
3. Cloak Room | Waiting Area
4. Equipment Storage
5. Indoor Spill-Out Area
6. Outdoor Spill-Out Area
7. Break-Out Area
8. Rentable Recording Space
9. Individual Rentable Booths
10. Control Room (Studio)
11. Live Room (Rentable)

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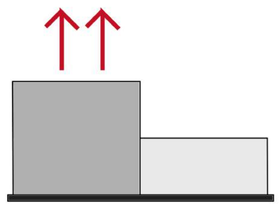
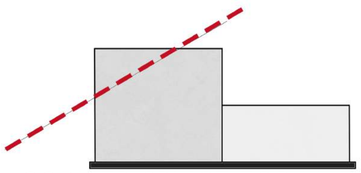
building module

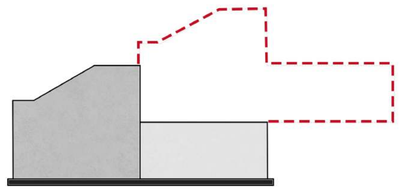
BUILDING BLOCKS



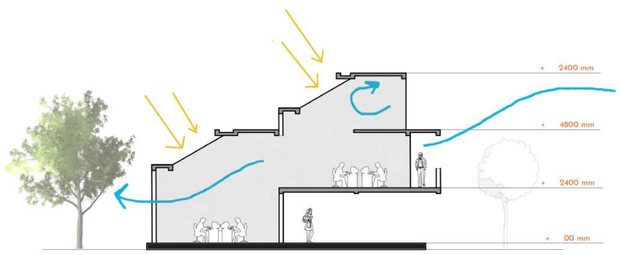
CREATION OF DOUBLE-HEIGHT SPACES



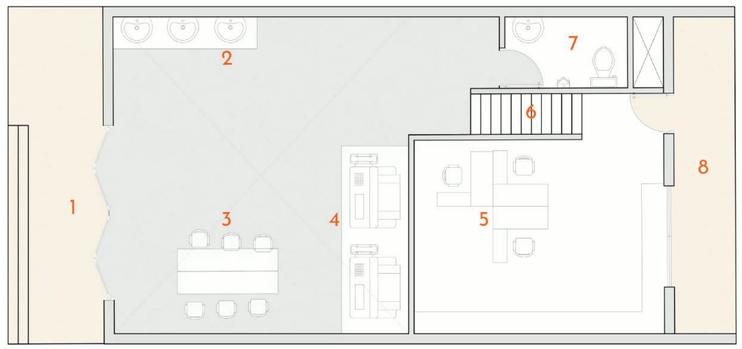
CORNER SPLICE FOR NATURAL LIGHT



SKYLIGHTS IN THE BUILT FORM



CONNECTION WITH THE LANDSCAPE



MAKERSPACE MODULE

Total Area: 217.04 sq.m.

1. Entry
2. Wet Area
3. Physical Work-Space
4. Machineries
5. Digital Work-Space (Individual)
6. Staircase
7. W/C
8. Spill Area

rectangular form for higher replicability

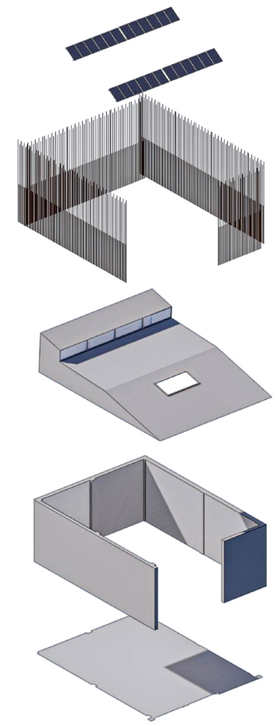
solar panels southern face of the slope

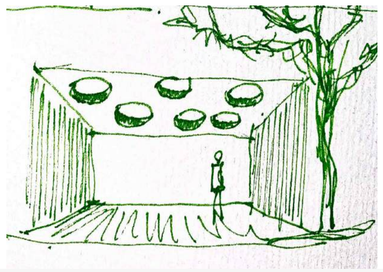
exterior bamboo panel cladding - added insulation privacy

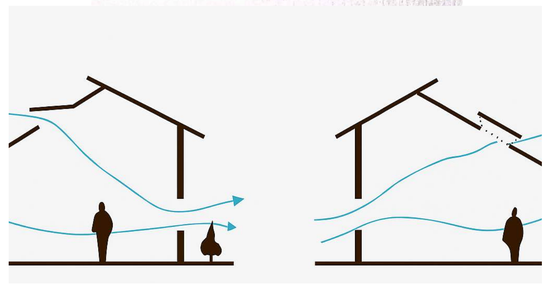
exterior banboo panel cladding - added insulation privacy

High-Pressure laminate (HPL) gypsum board or melamine face MDF prefab walls

smart kinetic energy flooring -foot movement into electricity







principles of stack ventilation

Overall 3d

South facade with sun shading elements

Aerial View

Indoor Outdoor connection with the amphitheatre

Entryway + Stepped Garden to the roof

Entrance facade