

## ***TENUN FASHION HUB: A CIRCULAR SYSTEM-BASED FASHION INNOVATION CENTER IN SOUTH JAKARTA WITH EXPRESSIONIST ARCHITECTURE APPROACH***

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**Abstract.** Fashion serves as a medium of self-expression and identity, yet rapid industrialization has accelerated *fast fashion* cycles that generate 2.3 million tons of textile waste annually in Indonesia 12% of total household waste. As Jakarta's fashion epicenter, South Jakarta hosts prestigious events like Jakarta Fashion Week and houses traditional weaving industries (Soe Jakarta, CTI), but lacks dedicated infrastructure for sustainable innovation. Responding to this gap, the Tenun Fashion Hub integrates circular economy principles, extending product lifecycles through recycling and repair, with revitalization of traditional weaving as a *slow fashion*. The project adopts expressionist architecture to translate weaving motifs into kinetic facades and organic forms, symbolizing cultural sustainability while creating an iconic landmark in this dynamic district. Functioning as a hybrid space, it combines: (1) a production center for upcycled textiles; (2) collaborative studios for designers and artisans to preserve Indonesia's weaving heritage (Tengku Ryo Rizqan, 2019); and (3) educational workshops promoting eco-friendly techniques. By merging closed-loop systems with cultural narratives, the hub establishes a prototype for sustainable urban fashion districts that combat environmental damage while empowering local craftsmanship.

**Keywords:** *fast fashion, sustainable fashion, circular economy, expressionism, textile waste, traditional weaving*

### **INTRODUCTION**

The relentless acceleration of fast fashion has triggered a dual crisis in Indonesia, where environmental damage and cultural erosion converge with alarming urgency. Annually, the nation discards 2.3 million tons of textile waste - equivalent to 12% of all household

waste - contaminating waterways and overwhelming landfills while releasing microplastics into ecosystems (Waste4Change, 2023). Simultaneously, intricate weaving traditions like *Batik Kawung* and *Tenun Ikat* face extinction despite their recognition by UNESCO as



Green Base Coefficient : Minimum 20%  
 Building Border Lines : 15m from western arterial road (Jl. H.R. Rasuna Said), 10m from other boundaries

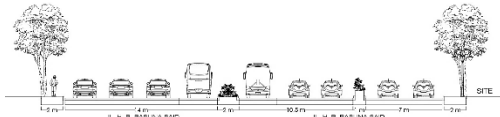


Figure 2 Road Section

## CONTEXTUAL ASPECT APPROACH

### Climatology Analysis

#### 1) Analysis

- Elevated temperatures occur due to limited shading, primarily caused by the eight-story Australian Embassy building obstructing low-angle eastern sunlight.
- Thermal discomfort persists despite minimal shading from high-rise structures across the arterial western road (notably the Ministry of Health building), with heat amplified by vehicular activity and paved surfaces.
- Prevailing west-to-east winds are strategically harnessed for cross-ventilation throughout the complex.

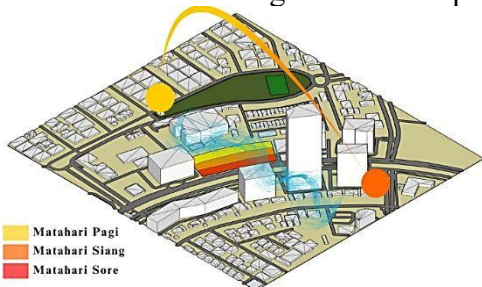


Figure 3 Climatology Analysis

#### 2) Response

- Implement strategic glazing and operable apertures to harness morning sunlight penetration while controlling glare through angular light shelves.
- Minimize fenestration and deploy vegetated buffer zones combined with

phase-change material cladding to mitigate solar radiation and reduce heat gain.

- Locate textile drying facilities in western sectors to capitalize on prevailing cross-ventilation patterns for optimized fabric curing efficiency.



Figure 4 Climatology Analysis Response

### Accessibility Analysis

#### 1) Analysis

- Implement a dedicated ride-hailing drop-off zone to streamline passenger circulation and reduce curb congestion.
- Establish physically separated entry/exit lanes distanced from the Granadi Building and Noice Space to prevent traffic bottlenecks in high-activity areas.



Figure 5 Accessibility Analysis

#### 2) Response

- Position main entry/exit points along the western and central zones of the site to align with arterial road connectivity and traffic flow patterns.
- Implement dedicated service lanes with separate access gates for logistics and maintenance operations to

eliminate cross- conflict with visitor pathways.

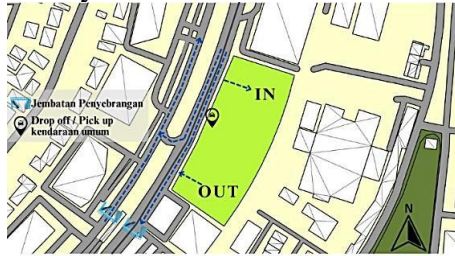


Figure 6 Accessibility Analysis Response

### Urban Infrastructure and Utility Networks

#### 1) Analysis

- a) Existing power grids, telecommunication cables, and drainage systems are fully operational. The drainage infrastructure features a closed-type system beneath the southern pedestrian pathway, with an approximate width of 3 meters.
- b) Adequate LED street lamps are installed along all walkways, meeting Illuminating Engineering Society (IES) standards for public spaces.
- c) The municipal water system (PDAM) serves all freshwater needs. Compliance with government regulations requires large-scale developments like this project to utilize PDAM sources exclusively, preventing groundwater depletion per Jakarta Provincial Regulation No. 7/2020.

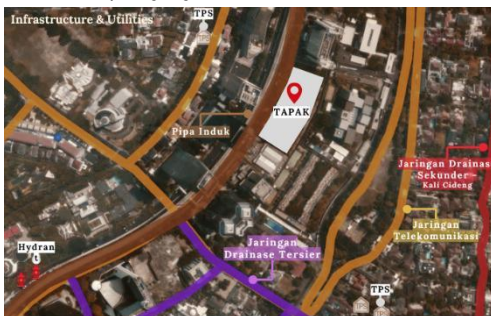


Figure 7 Urban Infrastructure & Utility Networks Analysis

#### 2) Response

- a) Install dedicated on-site fire hydrants compliant with NFPA 14 standards to ensure immediate access for emergency response teams.
- b) Implement a 2-3% continuous slope from the rear (northern) to front (southern) perimeter of the site to facilitate natural stormwater runoff toward municipal drainage infrastructure.



Figure 8 Urban Infrastructure & Utility Networks Analysis Response

### View Analysis

#### 1) Analysis

- a) Offers dynamic urban vistas toward Prof. Dr. Satrio Road, characterized by high-density commercial developments that define the central business district skyline.
- b) Optimal internal site exposure is achieved from southwest, west, and northwest approaches due to uninterrupted sightlines along major arterial roads, enabling
- c)



Figure 9 View Analysis

#### 2) Response

- a) Placing the visible mass of the building in a dynamic design.
- b) Cultivating public area to create views within the site.

- c) Adding sculptures as focal points in open spaces and visual complements to the building.



Figure 10 View Analysis Response

### Noise Analysis

#### 1) Analysis

- a) High noise levels are found on the west side of the site, originating from vehicle traffic passing through the site.
- b) Low noise levels originate from *Northern boundary*: Shielded by the Granadi Building's massing; *Southern boundary*: Acoustically mitigated by Noice Space's low-emission operations; *Eastern boundary*: Protected by the Australian Embassy's security setback and landscape barriers.

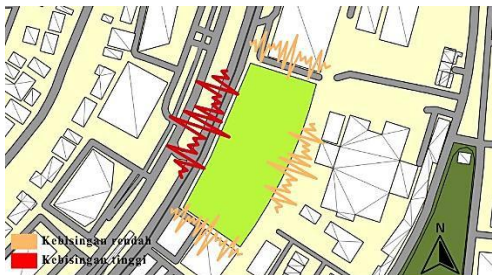


Figure 11 Noise Analysis

#### 2) Response

- a) Implement a 15m-wide public greenbelt along Jl. H.R. Rasuna Said, combining earth berms and dense vegetation.
- b) Deploy tiered tree barriers (minimum 8m mature height) along northern, eastern, and secondary southern boundaries, leveraging broadleaf canopies for low-frequency noise absorption where ambient levels remain below 55 dB.

- c) Position noise-sensitive production and administrative functions within the site's acoustically shielded eastern quadrant, maintaining a 150m separation from major noise sources to ensure operational tranquility.



Figure 12 Noise Analysis Response

### Vegetation Analysis

#### 1) Analysis

Plants serve as shade, boundary markers, protection from sunlight, protection from wind, filters for pollution and noise, separators between activities, and strengthen the flow of traffic between vehicles and pedestrians.



Figure 13 Vegetation Analysis

#### 2) Response

- a) A reception garden serves as both visitor orientation space and visual buffer, establishing 15m of permeable landscape depth between the arterial road and building entrance to manage sightlines while reducing urban heat gain.
- b) Ground surfaces employ hybrid paving—prioritizing grass pavers for pedestrian circulation and reinforced turf for green zones—maintaining over 50% soil

permeability to support stormwater infiltration and microhabitat connectivity.



Figure 14 Vegetation Analysis Response

## ARCHITECTURAL ASPECT APPROACH

Expressionist architecture is an architectural style that developed in Europe in the early 20th century. This style first emerged in Germany as an expressionist movement and in the Netherlands, particularly at the Amsterdam School between 1910 and 1925. In the Tenun Fashion Hub building, the application of the expressionist architectural approach lies in the creativity of the architect, who adopted woven elements in the composition of the building's mass. The concept of weaving expression in modernization and visionary design also plays a crucial role in the realization of the Tenun Fashion Hub through the expressionist architectural approach.

### a. Mass Composition

The mass composition translates expressionist principles into organic forms that abstractly embody weaving traditions. Building volumes dynamically reinterpret textile patterns through fluid contours and asymmetrical geometries, creating a sculptural silhouette against Jakarta's skyline. Modern materials and sustainable systems ensure contextual alignment with the urban CBD, while strategic zoning clusters functions: public zones feature fluid, open-plan exhibition areas; production and administrative activities are housed in segmented volumes with controlled access;

and cultural spaces center around a "weaving core" with kinetic façades. This approach fuses traditional tenun motifs with futuristic forms, deliberately avoiding literal imitation to create a contemporary architectural statement.



Figure 15 Mass Composition

### b. Exterior Expressionism

Inspired by early 20th-century European expressionism, the façade innovates through four key strategies: undulating concrete planes that evoke textile drapery create distorted forms; recycled brick-concrete composites demonstrate visionary materiality through digital fabrication; parametric screens cast tenun-inspired shadow patterns for cultural abstraction; and curtain walls mimic wind-swept linen to achieve organic fluidity. This design navigates the tension between heritage symbolism - such as Batik Kawung patterns - and circular economy requirements by incorporating 70% recycled aggregates in structural concrete, merging cultural resonance with sustainable innovation.



Figure 16 Detail Architecture Exterior

### c. Interior Spatial Strategy

The interior spatial strategy integrates expressionism throughout key surfaces: ceilings feature sculpted wood panels with embossed weaving motifs and integrated LED tracks that trace circulation paths; walls employ material hybridity through structural

concrete carved with traditional motifs, glass partitions for visual connectivity, and recycled brick for thermal buffering—collectively functioning as interactive "textile walls" with embedded digital displays; flooring varies by zone with polished granite and inlaid brass "thread lines" in public areas, anti-fatigue recycled vinyl in workshops, and slip-resistant ceramic tiles mimicking woven textures in galleries, creating a cohesive yet functionally diverse environment.



Figure 17 Detail Architecture Interior

## PRE-DESIGN RESULTS

The following are the results of the pre-design of Tenun Fashion Hub in South Jakarta with Expressionist Architecture Approach:

### a. Siteplan

The building is divided into functional groups to avoid being too large, allowing for natural lighting and good ventilation in the rooms. In addition, dividing the building mass into functional groups is also an effort to minimize fatal damage that can occur, especially in the event of a fire, as the fire will not easily spread from one point to another.

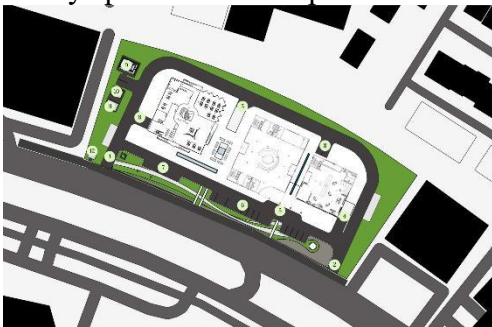


Figure 18 Siteplan

Vehicle movement in the area can be divided into three categories:

- Visitor and management vehicle movement, limited to the front section only.
- Fire department and service vehicle movement, which nearly surrounds the entire area.
- Pedestrian movement, entering through the front area or main road, then able to circulate around the entire building

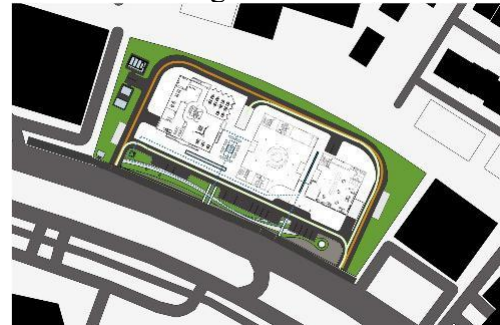


Figure 19 Circulation

### b. Situation

The design concept is inspired by the composition and arrangement of songket fabric, which is taken from the background of the design and the functions of the activities to be accommodated. The use of curved roofs is inspired by the pattern of lungsin (vertical threads) and pakan (horizontal threads) on traditional weaving tools.

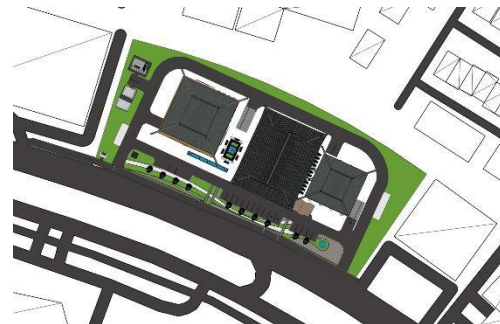


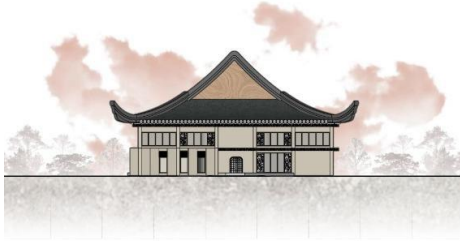
Figure 20 Situation

### c. Area View

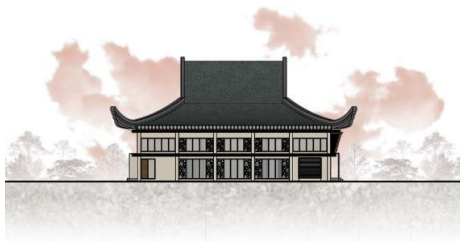
The building area view is a photo that shows how an area looks as a whole consisting of all buildings that stand in the area and the environment around the area.

The view of the area shows from four points of view, namely from the East, North, West and South.

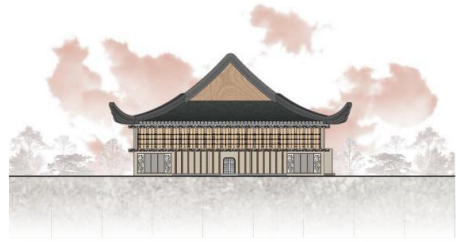
*Production Building*



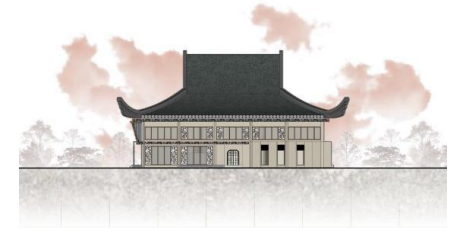
**Figure 21** East View



**Figure 22** North View

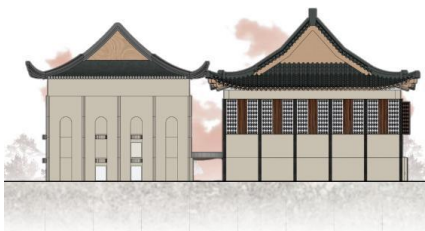


**Figure 23** West View

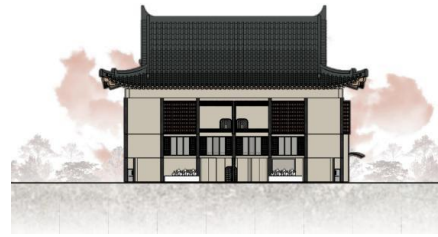


**Figure 24** South View

*Exhibition & Workshop Building*



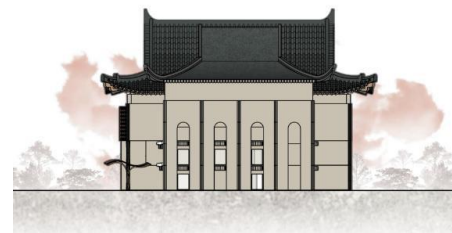
**Figure 25** East View



**Figure 26** North View



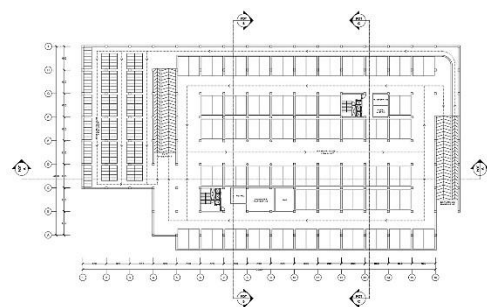
**Figure 27** West View



**Figure 28** South View

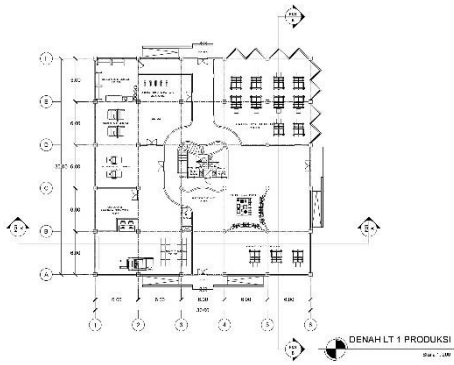
d. Floor plan

Floor plan is a two-dimensional drawing of a building or area viewed from above (as if the roof of the building is opened because the image seen on the floor plan is an image of the building cut vertically with a distance of usually 1 meter from the surface of the building). The plan serves to show the spatial layout in the building. The following are drawings of building plans in the Tenun Fashion Hub area, including:

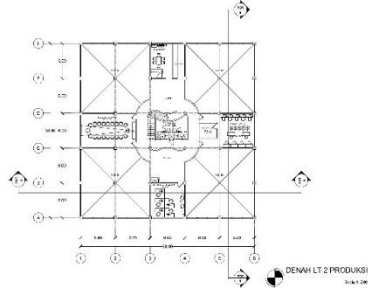


**Figure 29** Basement Floorplan

*Production Building*

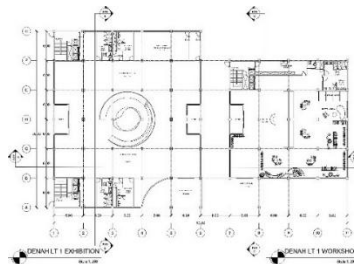


**Figure 30** 1<sup>st</sup> Floor plan Production Building

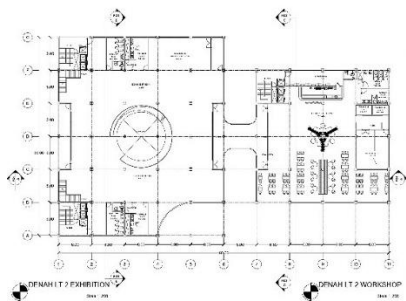


**Figure 31** 2<sup>nd</sup> Floor plan Production Building

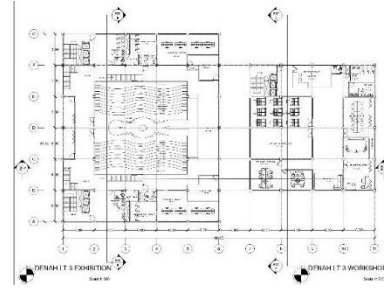
*Exhibition & Workshop Building*



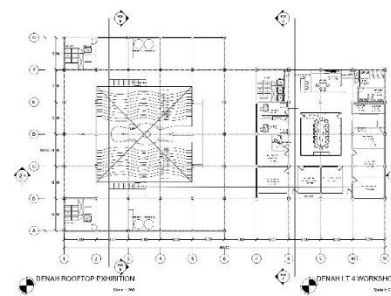
**Figure 32** 1<sup>st</sup> Floor plan Exhibition & Workshop Building



**Figure 33** 2<sup>nd</sup> Floor plan Exhibition & Workshop Building



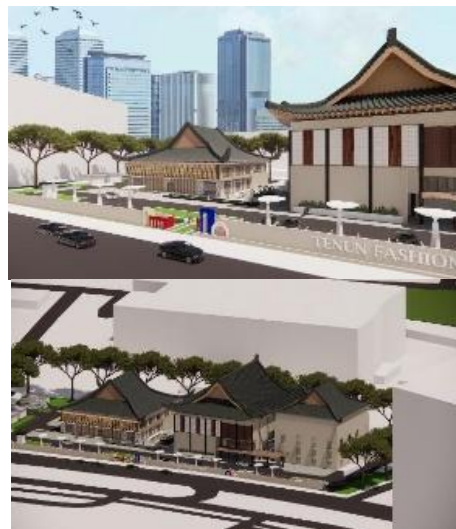
**Figure 34** 3<sup>rd</sup> Floor plan Exhibition & Workshop Building



**Figure 35** 4<sup>th</sup> Floor plan Exhibition & Workshop Building

e. Exterior Perspective

Exterior perspective drawing is a three dimensional (3D) illustration that shows the outer appearance (exterior) of a building or area based on a human point of view. The function of exterior perspective drawings realistically visualizing helps in how the building or area looks from the outside after construction is complete.



**Figure 36** Perspective Exterior 1

#### f. Interior Perspective

An interior perspective is a three-dimensional (3D) drawing that displays the interior view of a space, seen from a human perspective. This drawing helps to realistically visualize how the space inside a building will look.



Figure 37 Perspective Interior 5

#### CONCLUSION

The Tenun Fashion Hub embodies Circular Expressionism, a synthesis of Expressionist architecture and the circular economy of textile waste (2.3M tons/year) and eroding weaving heritage. By transforming traditional motifs into kinetic façades, recycled-material systems, and biophilic spaces, the design creates a regenerative cultural landmark where waste becomes

artistry, heritage fuels innovation, and architecture serves as both ecological infrastructure and an emotional storyteller. This project establishes a prototype for urban fashion districts that harmonize environmental responsibility, cultural vitality, and visionary design.

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