



# Design of JUWANA CREATIVE HUB

DESIGNING FOOD CREATIVE SPACE USING RE-OCCUPANCY ASSESSMENT TOOL V3.0  
IN JUWANA

DESIGN PROPOSAL  
SALMA YOANI MUSFIRATUN  
17512094

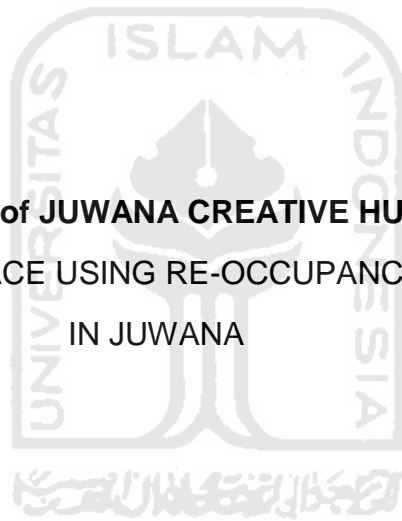
SUPERVISOR  
Dr. Ir. Arif Wismadi, M. Sc.

FINAL ARCHITECTURAL DESIGN STUDIO  
DEPARTMENT OF ARCHITECTURE  
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**DESIGN TITLE**

**Design of JUWANA CREATIVE HUB**  
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IN JUWANA





## AUTHENTICATION SHEET

Final Architectural Design Studio Entitled :

**Design of JUWANA CREATIVE HUB**

**Designing Food Creative Space Using Re-Occupancy Assessment Tool V3.0 in Juwana**

Student's Full Name : **Salma Yoani Musfiratun**  
Student's Identification Number : **17512094**  
Has been evaluated and agreed on : **Yogyakarta, 16 July 2021**


Supervisor

Jury 1

Jury 2

  
Dr. Ir. Arif Wismadi, M. Sc.

  
Ir. Tony Kunto Wibisono, M. Sc., IAI

  
Dr. -Ing. Ilya Fadjar Maharika, IAI

Acknowledge by

**Head of Architecture Undergraduate Program**



  
Dr. Yulianto P. Prihatmaji, S.T., M.T., IPM, IAI



## STATEMENT OF AUTHENTICITY

**By signing this form, I**

Name : **Salma Yoani Musfiratun**

Student Number : **17512094**

Study Program : **Architecture (International Program)**

Faculty : **Faculty of Civil Engineering and Planning**

University : **Universitas Islam Indonesia**

Title : **Design of JUWANA CREATIVE HUB: Designing Food Creative Space Using Re-Occupancy Assessment Tool V3.0 in Juwana**

I solemnly declare that the final project report I have produced is actually my own work, not a plagiarized collection of other people's writings or ideas that I acknowledge as my own results or ideas. I am willing to take punishment if it is confirmed or can be proven in the future that this undergraduate final report is the result of complete plagiarism.

Yogyakarta, July 16, 2021



Salma Yoani Musfiratun

## PREFACE

Assalamualaikum wr. wb.

All praise and gratitude goes to Allah Almighty for all the abundance of His love, grace, and will so that the Final Architectural Design Studio project with the title Juwana Creative Hub: Designing Food Creative Hub Using Re-Occupancy Assessment Tool V3.0, can be completed properly. The completion of this final project could not be separated from the guidance, help, and prayers from various parties. I would like to take this opportunity to thank all those who have helped in the making of this work. A big thank you to the honorable:

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The author recognizes that the report's preparation, both in terms of language, preparation, and writing, is far from faultless. Without the support, assistance, and prayers of numerous parties, the process will not go well or smoothly. Therefore, the writer anticipates constructive criticism and suggestions in order to improve

the author's experience in the future. I hope that everyone who reads this report, including the author, finds it informative. May Allah SWT always bless us with His mercy and guidance, Ameen.

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Yogyakarta, July 16, 2021

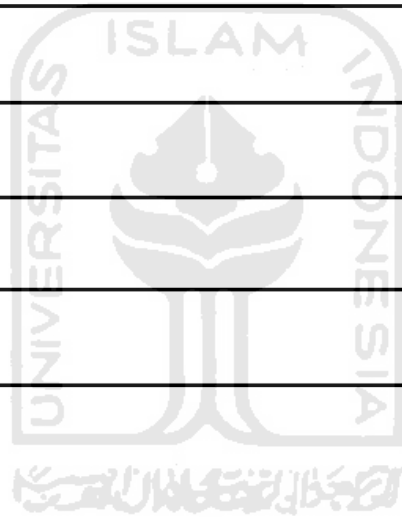


Salma Yoani Musfiratun



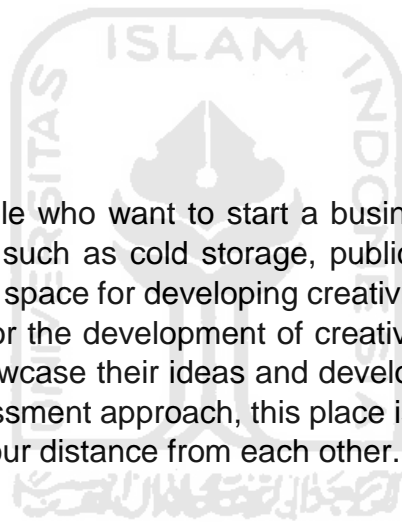
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## PREMISE DESIGN

Juwana Creative Hub is a place for people who want to start a business in the frozen and canned food sector. Equipped with adequate facilities such as cold storage, public kitchen, storage room, packaging room, canning room, marketing room, and space for developing creativity such as recipe development, and food testing. This place will be a center for the development of creativity in frozen food processing and a gathering place for creative people to showcase their ideas and develop them into a product that will then be marketed. By considering the Re-assessment approach, this place is designed to be used even in times of a pandemic which requires us to keep our distance from each other.





## **Design of JUWANA CREATIVE HUB**

Designing Food Creative Space Using Re-Occupancy Assessment Tool V3.0 in Juwana

**Salma Yoani Musfiratun | 17512094**

Department of Architecture, Faculty of Civil Engineering and Planning

Universitas Islam Indonesia

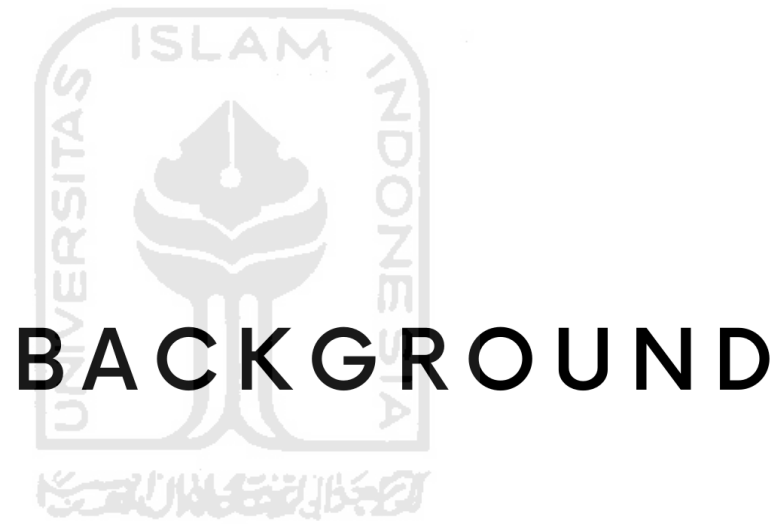
Email : [17512094@students.uii.ac.id](mailto:17512094@students.uii.ac.id)

### **ABSTRACT**

Juwana is a sub-district in Pati Regency, Central Java. Pati Regency itself supports the maritime industry in Central Java as much as 32%. Although currently there is fish processing at the Juwana TPI, but based on this the Regency Government wants to increase productivity by offering a fishing industry center on the Juwana coast. Currently, the construction of a ship berth in Juwana has begun, with a capacity of over 30 gross tons that can accommodate about 800 ships. This proves that the potential of Pati as a fish producer can be even better. In addition, the construction of road infrastructure to the location of the fishing industry on the coast of Juwana has already begun. The area of land for the fishing industry in Juwana is approximately 12.5 hectares which is designated for the construction of ship docks, moorings, and other supporting facilities. With this facility, it is very possible for residents who have lost their jobs due to the impact of the Covid-19 virus to develop their own MSME-scale businesses. However, this needs to be supported by adequate facilities so that business beginners can market their business more broadly. For this reason, a Creative Hub is needed that can accommodate their creative ideas and can also facilitate needs that they cannot fulfill, such as machines that are quite expensive and also storage space. This Creative Hub is focused on developing creative ideas in terms of packaging design and marketing strategies. However, there is a major problem, namely the spread of the Covid-19 virus which needs to be reviewed so that this building can continue to be used even during the pandemic. This Creative Hub will use the Re-Occupancy Assessment Tool V3.0 as a building controller. In addition, TRIZ is also used as a building design method that will resolve contradictory problems.

*Key words : Creative Hub, Frozen Food, Covid-19, Re-Occupancy Assessment Tool V3.0*

# 1



## BACKGROUND

## BACKGROUND

### During the Pandemic, Unemployment in Pati Raised 19.6 Percent

Head of the Regional Development Planning Agency (Bappeda) Pati, Pujo Winarno, revealed that the number of unemployed people during the Covid-19 pandemic had increased. In 2020 there were 30,244 people. This figure is 5,932 people (19.6%) more than in 2019, namely 24,312 people.



The proportion of unemployed in 2020 is dominated by high school graduates with 52.76%, junior high school 17.07%, SD 11.78% and universities 18.39%. "The impact of the 2020 pandemic has also reduced the poverty rate which continues to decline. The number of poor people was originally 118 thousand (2019), it turned out to be 127 thousand, or an increase of 8 thousand," he said, Tuesday (23/3).

Pujo Winarno emphasized that the impact of the Covid-19 pandemic did not only affect the rate of national economic growth, but also felt in the regions. "During the Covid-19 pandemic, economic growth contracted. However, the agricultural and manufacturing sectors are experiencing positive growth," said Pujo Winarno.

Asked about the impact of the Covid19 pandemic on the inflation rate, Pujo Winarno stated that the conditions in Pati 2.51 were still below the national 2.51 and Central Java 2.81.

One of the sectors that was particularly hard hit by the Covid-19 pandemic was Usaha Mikro Kecil Menengah (UMKM), which also boosted the decline of the national economy. This is understandable because UMKM have a very large contribution to the national economy.



According to data from the Ministry of Cooperatives, Small and Medium Enterprises (KUKM), there were 64.2 million UMKM players in Indonesia in 2018, accounting for 99.99 percent of all business actors. The UMKM workforce has a total absorption capacity of 117 million workers, or 97 percent of the total absorption capacity of the business world workforce. Meanwhile, UMKM supplied 61.1 percent of GDP to the national economy, with the remaining 38.9% coming from significant business players, whose total number was only 5,550, or 0.01 percent of all business actors.

Micro business players account for 98.68 percent of UMKM, with a labor absorption rate of roughly 89 percent. Micro firms, on the other hand, contribute just about 37.8% of GDP.

The COVID-19 pandemic raises several problems for UMKM players, on the other hand there are opportunities that also arise. UMKM players can take advantage of information and communication technology, given that electronic commerce in 2020 will reach US \$ 130 billion. Electronic trading transactions have drastically increased during the COVID-19 pandemic. Products whose sales have increased include health products by 90%, hobby support products by 70%, food by 350%, and herbal foods by 200% (Tempo, 27 April 2020)

Many consumers today want convenience in the middle of this epidemic predicament. This holds true for food as well. As a result, the frozen food industry offers prospects. Global and Asia-Pacific (APAC) markets, in particular, are seeing development in everything from frozen desserts to appetizers. According to industry surveys and research, the frozen food market in APAC was valued at \$ 57.02 billion in 2018 and is expected to grow to \$ 83.46 billion by 2023, with a CAGR of 7.92 percent from 2018 to 2023.

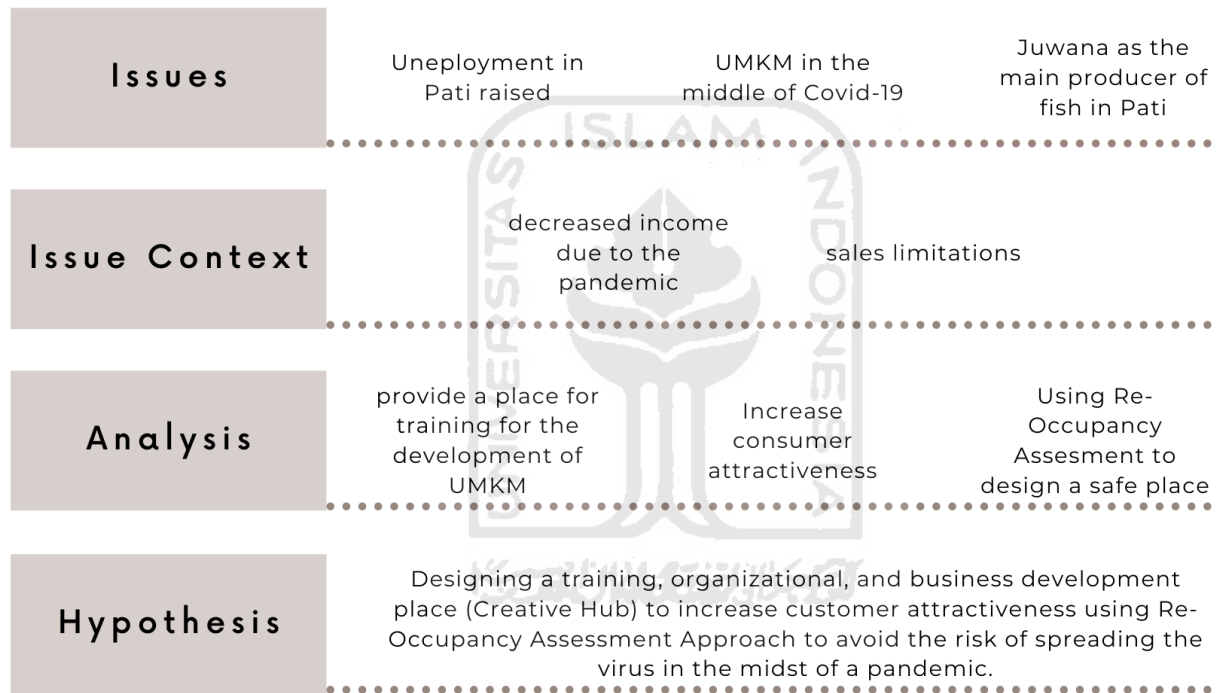
The following are the important trends that will drive this market this year:

- Convergence of Health and Comfort

Even if today's consumers are health-conscious and prefer to cook at home to consume less processed food, convenience continues to be in demand. Customers are becoming more interested in frozen items that are high in protein, low in calories, low in fat, and meet specific dietary criteria such as dairy, vegan, sugar-free, gluten-free, plant-based products. Frozen food companies will be able to overcome some of the difficulties that have previously prevented consumers from making a purchasing decision.

- Natural and preservative-free products are in high demand.
- The desire for fresh, natural ingredients and organically farmed/grown products continues to rise. These items, on the other hand, have a shorter shelf life and are more prone to deterioration and waste formation without preservatives and stabilizers. However, these additions lower the product's nutritional value. As a result, freezing is quickly becoming a viable alternative to preservatives. Fresh food can sit in transportation or supermarket shops for days, losing nutrients and freshness. Advanced freezing technologies like IQF (Individual Quick Freezing) keep the nutrients from newly selected produce intact.
- In reality, two recent studies compared the nutritional content of frozen fruits and vegetables to that of fresh fruits and vegetables and concluded that frozen fruits and vegetables were nutritionally superior or comparable to fresh fruits and vegetables.
- Millennials are more likely to adopt new technologies.
- Sales volume has increased for the first time in five years, according to a report by RBC Capital Markets. According to Reuters, millennials spent 9% more money on frozen food last year than any other generation. One of the main reasons millennials choose for frozen meals is that they lack the time to prepare complete meals with fresh meat and fruit. Plus, frozen dinners are a great method to keep amounts under control and waste to a minimum.

## PROBLEM MAP



## **PROBLEM FORMULATION**

Based on the background of the problem that has been described, the problem is formulated as follows:

### **General Problem**

How to design a Creative Hub using Re-Occupancy Assessment Approach?

### **Specific Problem**

1. How to design Creative Hub that can support the activities of UMKM?
2. How is the application of the Re-Occupancy Assessment concept in designing forms and envelopes the Creative Hub building?
3. How are the spatial arrangements and building sites in order to create a safe area in the midst of a pandemic?

### **Aims**

1. Creating a creative hub design with Re-Occupancy Assessment concept.
2. Overcoming the contradictions that occur when applying the Re-Occupancy concept to buildings.
3. Designing spatial plans that support the activities and activities of UMKM at Juwana during a pandemic.

### **Objectives**

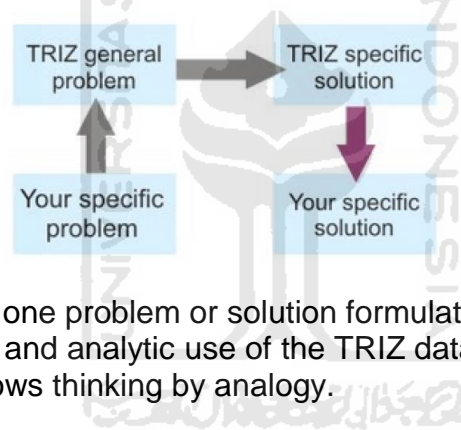
To find out how to integrate a supportive layout economic activity in the midst of a pandemic.

## DESIGN METHOD

The problem-solving method used is wrong one application of thought, namely TRIZ (Theory of Inventive Problem Solving). TRIZ has proven its effectiveness and efficiency in solving contradictory problems (Zhang et al., 2003). Terms the determination of the problem must have two opposing / conflicting requirements on the same element or condition, one side has the aim of improving or improving certain aspects and side others reduce or worsening certain aspects (Pokhrel, 2013).

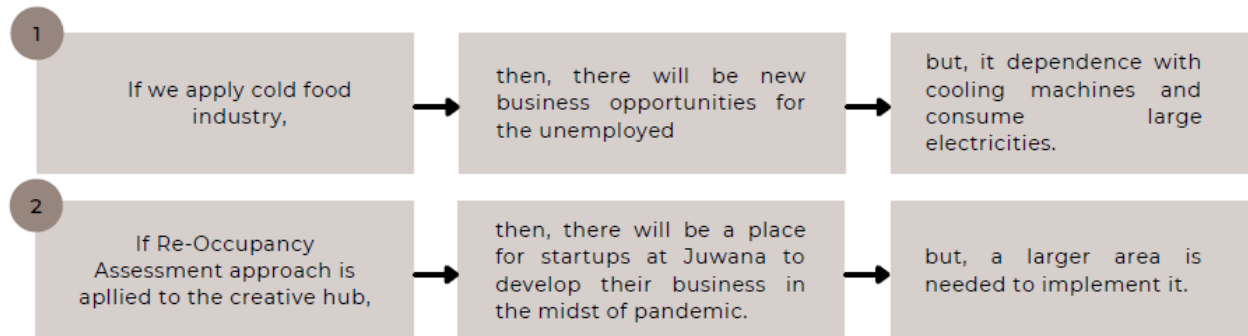
$$\text{IDEAL} = \frac{\text{IMPROVING}}{\text{WORSENING}}$$

In general, the way this method works is to find specific solution of a problem obtained from contradiction the specifics of a problem. As for the general description of the solution. The problems with the TRIZ method are:



The arrows reflect the transition from one problem or solution formulation to another. The grey arrow denotes problem analysis and analytic use of the TRIZ database. To construct the precise solution, the purple arrow shows thinking by analogy.

## CONTRADICTION





# TRIZ PARAMETER

Feature to Improve : Productivity

Feature to Preserve : Area of Stationary

Improve this one without making this one worse

**39 Technical Parameters**

Parameter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39														
1 Weight of moving object	-	15	9	15	29	29	2	8	13	10	14	13	15	29	27	34	52	30	37	45	16	16	22	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39														
2 Weight of stationary object		-	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1													
3 Length of moving object	15	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1													
4 Length of stationary object	20	14	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
5 Area of moving object	21	14	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1												
6 Area of stationary object	21	14	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1											
7 Volume of moving object	23	15	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										
8 Volume of stationary object	23	15	10	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									
9 Speed	13	10	10	10	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1									
10 Force (load)	13	10	10	10	10	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1								
11 Mass or pressure	13	10	10	10	10	10	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1							
12 Stiffness	13	10	10	10	10	10	10	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
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14 Accuracy	13	10	10	10	10	10	10	10	10	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
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35 Reliability	13	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
36 Reliability	13	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
37 Reliability	13	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	-	1	1	1	1	1											

## INVENTIVE DESIGN (Contradiction 1)

### 28. Replace Mechanical System

- Replace a mechanical means with a sensory (optical, acoustic, taste or smell) means.
- Use fields in conjunction with field-activated (e.g. ferromagnetic) particles.

Architectural Arrangement :

How the space will replace the mechanical energy into electromagnetic or sensoric.

Preseden Study : Bahrain World Trade Center

Architects : Killa Design

Area / Year : 150 m2 / 2004

Wind turbines work on a simple principle: instead of using electricity to make wind—like a fan—wind turbines use wind to make electricity. Wind turns the propeller-like blades of a turbine around a rotor, which spins a generator, which creates electricity. The aerodynamic force of the rotor blades, which act similarly to an airplane wing or helicopter rotor blade, converts wind energy into electricity in a wind turbine. The air pressure on one side of the blade lowers when wind blows across it.



Source : [arch20.com](http://arch20.com) (left), [syscrappercenter.com](http://syscrappercenter.com) (right)

## 29. Pneumatic and Hydraulic

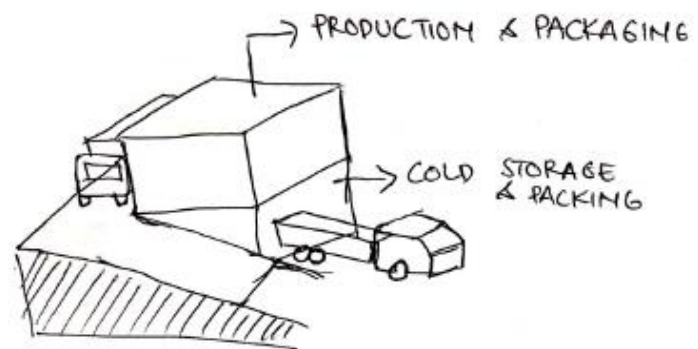
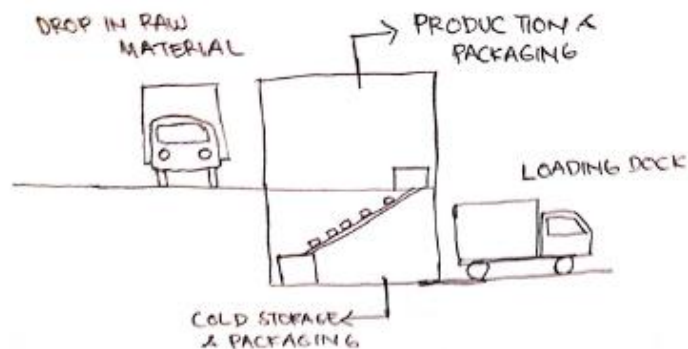
- Use gas and liquid parts of an object instead of solid parts (e.g. inflatable, filled with liquids, air cushion, hydrostatic, hydro-reactive).

Architectural Arrangement :

How the space will store the energy by using gravity instead of lift to move the production result.

Preseden Studies : Pneumatic Tube System

are systems that propel cylindrical containers through networks of tubes by compressed air or by partial vacuum. They are used for transporting solid objects, as opposed to conventional pipelines, which transport fluids.



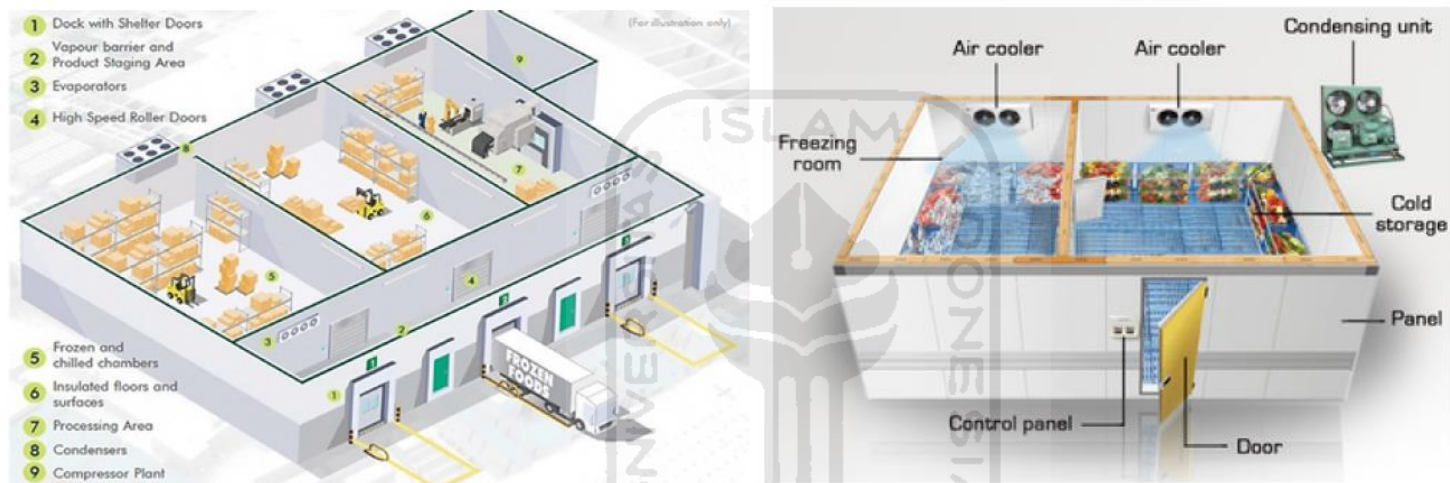
## 9. Preliminary Actions

Perform, before it is needed, the required change of an object (either fully or partially).

Pre-arrange objects such that they can come into action from the most convenient place and without losing time for their delivery.

Architectural Arrangement :

How the space will arrange considering by the day and night, how many people will come, and what the room will be used for.



Source : [cbr.us](http://cbr.us) (left), [refrigeration-forum.com](http://refrigeration-forum.com) (right)

Cold-storage warehouses require a lot of specialized equipment that is not found in “dry” warehouses. That’s why refrigerated facilities can cost two to three times more to build and operate.

Some important things that must be considered in planning the manufacture of Cold Storage :

1. The first step of what products or materials will be stored in Cold Storage, This is very important to later determine what temperature should be applied.
2. After it can be determined the temperature required for the product to determine the thickness of the panel Insulation panel which plays an important role in inhibiting temperature transfer.
3. The design of the floor is very important in one of the calculations for making cold storage so as to avoid structural damage due to the shrinkage or expansion process caused by loads because the floor receives cold temperature loads that will enter the foundation of the foundation.

## INVENTIVE DESIGN (Contradiction 2)

### 10. Preliminary Actions

Perform, before it is needed, the required change of an object (either fully or partially).

Pre-arrange objects such that they can come into action from the most convenient place and without losing time for their delivery.

Architectural Arrangement :

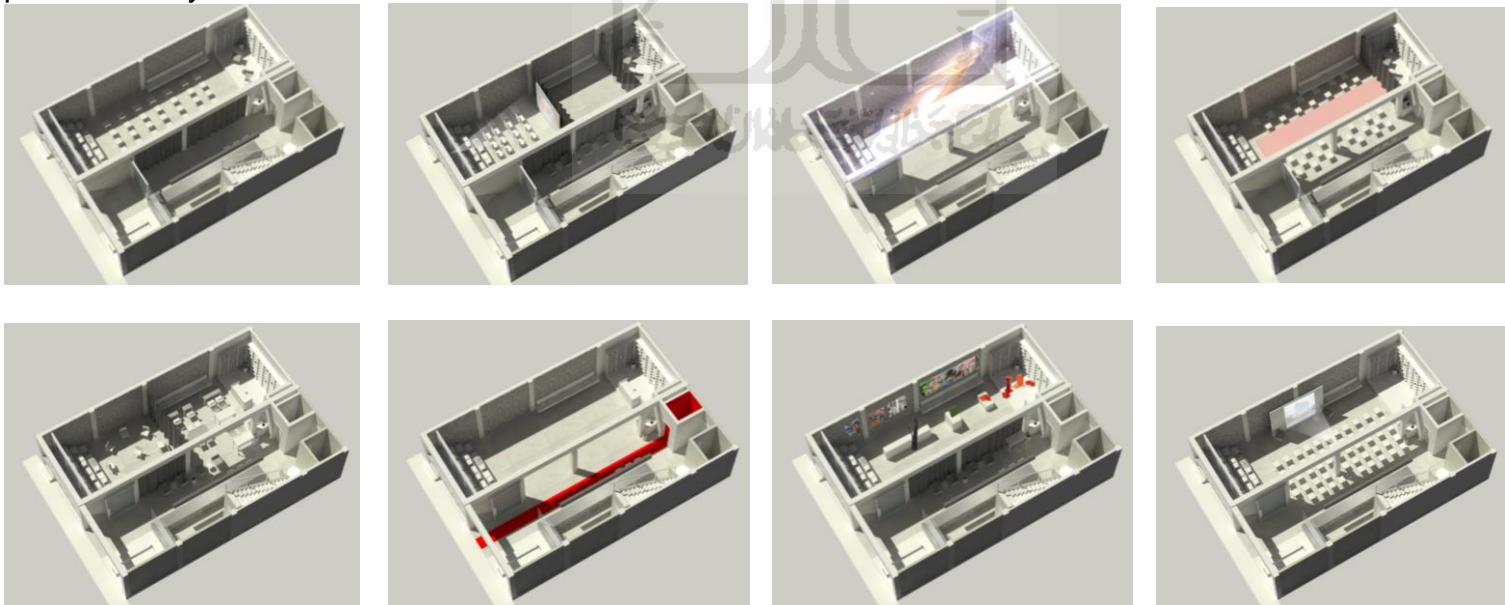
How the space will arrange considering by the day and night, how many people will come, and what the room will be used for.

Preseden Study : Tujuhari Coffee

Architects : Studio Kota Architecture

Area / Year : 150 m<sup>2</sup> / 2019

The productivity chamber is a versatile and multi-orientation environment that can accommodate a variety of programs. A little amphitheatre, working space, artist feature wall, small performing stage, vinyl station, and bookshop are all part of this facility. The productivity chamber can host a variety of events, including movie screenings, book launches, music parties, business pitch meetings, art exhibitions, and charity events. The productivity chamber's furniture is all lightweight, mobile, and stackable. Because of the furniture's mobility, different seating arrangements can be seen every day depending on the event taking place that day.



Source : [archdaily.com](http://archdaily.com)

## 7. Nested Doll

Place one object inside another; place each object, in turn, inside the other.  
Make one part pass through a cavity in the other.

Architectural Arrangement :

Nice Function Without Additional Spaces: Creating space between space, the main reason is because of the privacy.

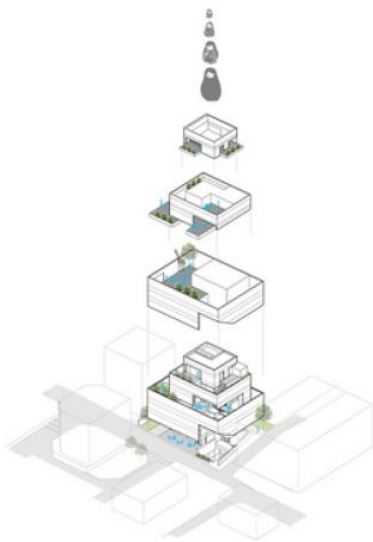
Preseden Study : Nonhyun Matryoshka

Architects : L'EAU design

Area / Year : 280 m2 / 2016

Due to setback requirements, the site is rectangular with a pyramidal frame, tapering at the top. The inside space has been made more flexible by the construction of a hard crust. This crust transforms into a structure with a boundary within a border that gets smaller and overlaps at the top. It's a recurring and overlapping "thing within a similar object," comparable to the Russian doll Matryoshka.

This flexible layer of air provides not only a space to generate private tales on a constant basis within its breadth, but also the seclusion requested by both this building and the surrounding residences. As if parallel mirrors place us within an eternal infinite interaction, this creates a mise en obyme that keeps building a box-in-a-box and a story-in-a-story. Although a building can be said to constitute an outward border, self-enclosed and distinct from adjacent buildings in a residential area, it must also become a "Matryoshka," with its own private landscape.



Source : [archdaily.com](http://archdaily.com) (left), [astromesin.com](http://astromesin.com) (right)

### 35. Parameter Change

Change an object's physical state (e.g. to a gas, liquid, or solid.)

Change the degree of flexibility.

Change the temperature.

Architectural Arrangement :

Changing the Architectural Element: by changing the wall and plafon to create bigger space in such a small area.

Preseden Study : Hey! A Lovely Tiny Space

Architects : A'Lentil Design

Area / Year : 49 m2 / 2017

Designers open up space, allow sunlight into spaces, and make inner rooms appear brighter and larger to decrease aisles and corners. In addition, the designer incorporates the needs of the owners to create a more functional design, and changes the second bedroom into a living area to maximize space. Furthermore, creating a cloakroom from an aisle not only meets the hostess's requirement, but it also makes use of fractional space to create lovely under-stair storage. For the color scheme, the entire space is white, but a lemon yellow dot runs from the entryway to the living room, and the main bedroom is painted in a bright Macaron hue to relieve stress from work.



Source : [archdaily.com](http://archdaily.com)

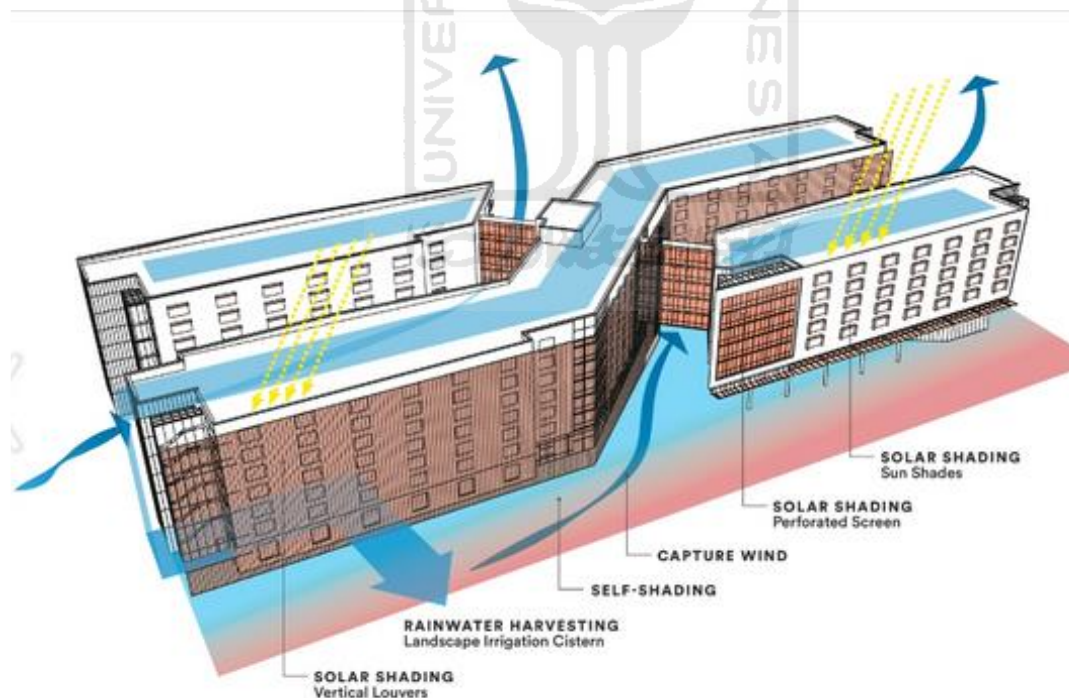
## 17. Another Dimension

To move an object in two- or three-dimensional space.  
Use a multi-story arrangement of objects instead of a single-story arrangement.  
Use 'another side' of a given area.

Architectural Arrangement :  
Moving into Z Dimension: by arranging the building mass.

Preseden Study : Tooker House  
Architects : Solomon Cordwell Buenz  
Area / Year : 458.000 m<sup>2</sup> / 2017

The southern façade features U-shaped visors and an array of perforated vertical louvers that were developed and positioned using a sophisticated algorithm to provide visual appeal while also guaranteeing proper daylight control for each window's location on the façade. Wind movement is also aided by the massing, which is primarily westerly and flows through the interior, shaded courtyards, and between the building's masses. The building's bridges and breezeways include perforated metal panels that allow air to circulate through them.



Source : [archdaily.com](http://archdaily.com)



## DESIGN HYPOTHESIS

<b>Object</b>	Designing a Creative Hub in Juwana using Re-Occupying Assessment Approach			
<b>Study</b>	UMKM Activity	Re-Occupying Assessment	Creative Hub	Site Context
<b>Architectural Aspects</b>	Standard Activities	Creative Hub Typology	Space Arrangement	Shape arrangement, opening, and orientation
<b>Criteria</b>	Space Needed	KDB, KLB	can be use during pandemic situation	Mass order
<b>Problem</b>	How to design Creative Hub that can support the activities of artists and UMKM?	How is the application of the Re-Occupancy Assessment concept in designing forms and envelopes the Creative Hub building?		How are the spatial arrangements and building sites in order to create a safe area in the midst of a pandemic?
<b>Concept</b>	a co-working space that can facilitate UMKM activities	considering each point of the Re-Occupancy Assessment Tool V3.0 as Design Test		the mass order that maintains security during the pandemic

## ANALYSIS OF USER ACTIVITIES AND SPACE REQUIREMENTS

Space requirements in creative hub can be classified into:

- Production Facilities (kitchen, packing room, storage room)
- Marketing Facilities (working space, co-working space, exhibition room)
- Supporting Facilities (toilet, lobby, drop off, etc)

Activities	Users	Facilities	Character	Space Needs
<ul style="list-style-type: none"> <li>• cooking</li> <li>• packing</li> <li>• storing</li> </ul>	<ul style="list-style-type: none"> <li>• UMKM actors</li> </ul>	<ul style="list-style-type: none"> <li>• Production Facilities</li> </ul>	<ul style="list-style-type: none"> <li>• semi public</li> <li>• slightly crowded</li> <li>• cozy</li> <li>• accessible</li> </ul>	<ul style="list-style-type: none"> <li>• public kitchen</li> <li>• packing space</li> <li>• wash room</li> </ul>
<ul style="list-style-type: none"> <li>• meeting</li> <li>• co-working</li> <li>• buy and sell</li> <li>• exhibition</li> </ul>	<ul style="list-style-type: none"> <li>• UMKM actors</li> </ul>	<ul style="list-style-type: none"> <li>• Marketing Facilities</li> </ul>	<ul style="list-style-type: none"> <li>• semi public</li> <li>• comfort</li> <li>• calm</li> <li>• accessible</li> </ul>	<ul style="list-style-type: none"> <li>• co-working space</li> <li>• gift shop</li> <li>• exhibition room</li> </ul>
<ul style="list-style-type: none"> <li>• eat/drink</li> <li>• leisure</li> <li>• monitoring</li> <li>• sanitation</li> <li>• storing goods</li> </ul>	<ul style="list-style-type: none"> <li>• management officer</li> <li>• building management</li> </ul>	<ul style="list-style-type: none"> <li>• Supporting Facilities</li> </ul>	<ul style="list-style-type: none"> <li>• private</li> <li>• cozy</li> <li>• accessible</li> <li>• hidden</li> </ul>	<ul style="list-style-type: none"> <li>• canteen</li> <li>• management office</li> <li>• MEE room</li> <li>• storage room</li> </ul>

2



## DESIGN STUDIES

### RE-OCCUPANCY ASSESSMENT TOOL V3.0

#### Introduction

The following assessment tool is based on the "Guidance on Preparing Workplaces for COVID-19, OSHA Document 3990-03-2020" from the Occupational Safety and Health Administration. This planning advice is based on both traditional infection control and industrial hygiene methods, and it is both advisory and informative in nature. The evaluation tool's goal is to define how to limit the risk of occupant exposure to SARS-CoV-2, the virus that produces COVID-19 illness cases, in workplaces and public accommodations. The following factors are crucial to the evaluation process:

Creating plans for infectious disease preparedness and response.

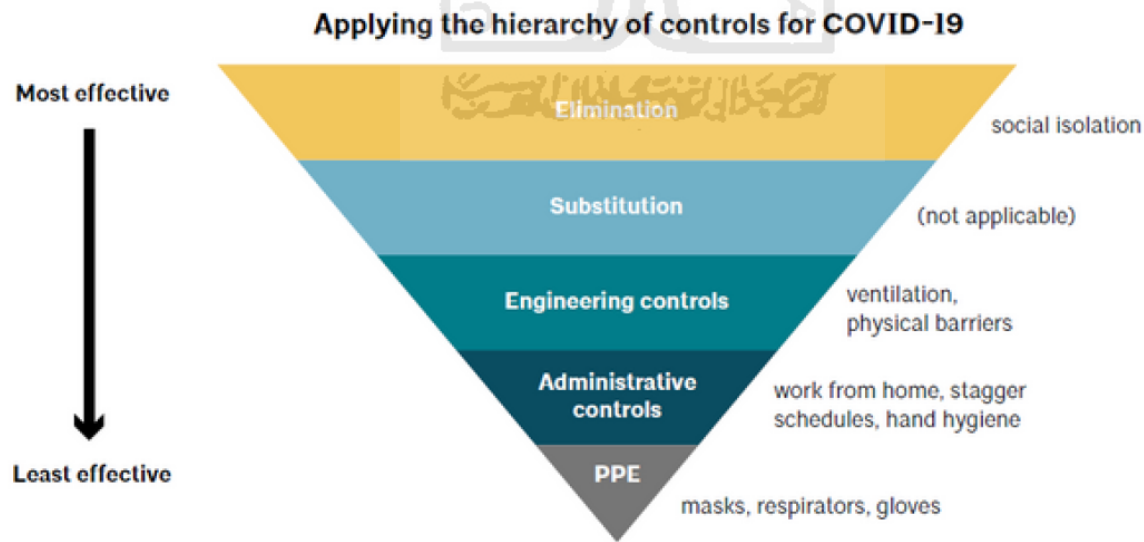
Preparation to put basic infection control measures in place.

Developing rules and procedures for identifying and isolating symptomatic people as soon as possible, if necessary.

Flexibility and protections in the workplace are being developed, implemented, and communicated.

Putting in place workplace controls.

To choose approaches to control workplace dangers, the evaluation tool employs the CDC's "hierarchy of controls" concept. It claims that the best method to control hazards is to remove them in a systematic manner rather than depending solely on workers or the general public to decrease their own exposure. In the vast majority of cases, a mix of control measures will be required.



Source : [aia.org](http://aia.org)

## RE-OCCUPANCY ASSESSMENT TOOL V3.0 AS A BUILDING CONTROL

The evaluation tool does not specify required interventions, but it does offer controls that are relevant to a wide range of building types and operational scales. Non-essential facilities that are to reopen with required constraints (short-term) and eventually function without imposed restrictions may be subject to the controls (long-term). Not all controls are appropriate for all building types in all circumstances, and additional controls may be required. In order to prioritize, the applicable controls might be classified as "vital" or "desirable."

### 1. First priority: Elimination

Isolate yourself from other people. Inhabitants should work or undertake other activities from home whenever possible. This should involve reorganizing tasks to reduce the number of people who must physically be present.

### 2. Second priority: Substitution

Remove the hazard and replace it. Because there is no substitute for COVID-19, the control measure is ineffective.

### 3. Third priority: Architectural and engineering controls

Persons who have been exposed to SARS-CoV-2 should be isolated. These controls, when used appropriately, decrease danger exposure without relying on occupant behavior and can be implemented at a low cost.

#### 3.1 Programming

- To reduce quarantine fatigue, provide distributed, temporary work surfaces for outdoor working/dining.
- As an alternative to indoor seating, provide outdoor seats.
- Include outdoor retail space.

#### 3.2 Space Planning

- Seating density should be reduced and/or seating spacing should be increased.

#### 3.3 Non-Structural Partitions and Openings

- Automatic door openers and proximity sensors are available.
- Install service windows for drive-thru and/or pick-up.

#### 3.6 Mechanical and Passive Ventilation

- Utilize operable windows for natural ventilation if possible.
- Ensure ventilation systems operate properly and provide acceptable indoor air quality for the current occupancy level for each space.

#### 3.7 Electrical, Lighting, and Communication

- Utilize IoT technology (RFIDs/key fobs) to reduce touch points. (touch-free door locks, touch-free turnstiles, touch-free time cards).
- Replace light switches with motion sensor controls or phone-based application controls.

### 3.9 Finishes and Furnishing

- Utilize temporary, movable partitions to subdivide large working spaces.
- Modify restroom stalls/partitions to make partitions floor to ceiling where fire safety and proper ventilation isn't an issue.

### 3.10 Site Work

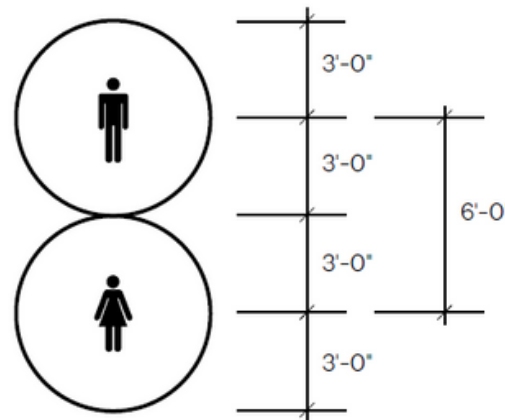
- Reconfigure parking and/or access lanes to accommodate curbside pickup.
- Provide entry queuing area with ample spacing that also minimizes exposure to inclement weather including wind, sun, and precipitation.
- Ensure the designated building/space ingress and egress pathways support clearly separated directional traffic that also provide ADA accessibility.
- Consider providing outdoor heating and/or shading to support exterior programming.

### Occupancy Evaluation

The six-foot physical distancing and related square footage per person reviews below are meant to highlight the implications of existing building regulations' allowable occupancy levels when the recommended six feet physical distance is followed. The goal of this research is to better educate government officials and property owners on how many people should be allowed in a given space on a general basis.

The CDC advises establishing a six-foot space between yourself and others during the COVID-19 outbreak.

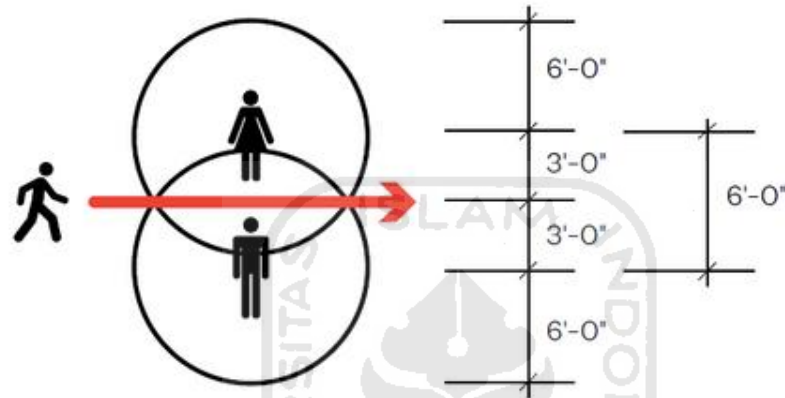
A popular illustration is a 3-foot radius circle with the person in the center:



Source : [aia.org](http://aia.org)

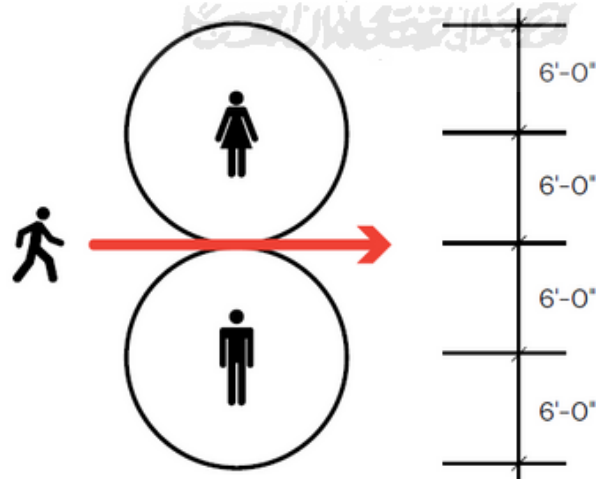
When only a 3-foot radius circle is used, the physical distancing region remains static. Only when individuals are standing in a line or seated six feet apart can it be employed. It adheres to a set of guidelines. It doesn't consider how people move around in different environments.

Physical distancing is broken while people travel through space if each person's physical distance is exactly six feet, because a person going through space will only have three feet of physical distance between two persons who are six feet apart.



Source : aia.org

At the perimeter/circumference of the physical distance circle generated by the six-foot radius, people can travel through and traverse an area with a six-foot radius. This encourages individuals to move around in a dynamic manner in a room.

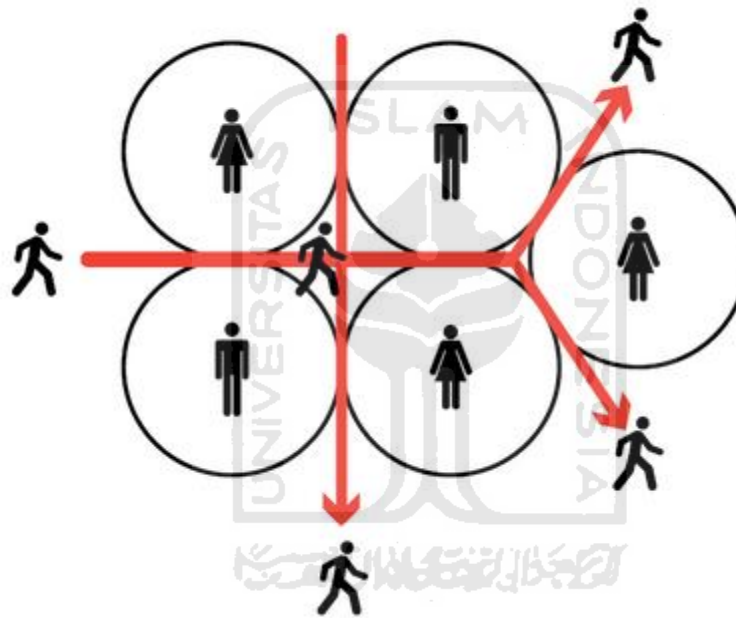


Source : aia.org

The area of a six-foot physical distance radius enables and accounts for human movement and navigation across space. It's still going strong.

### **Physical Distancing and the Building Code**

The circle of an individual's physical distance space is denoted by a six-foot radius in this study, which allows for the complex nature of human activity. The physical distance circle can be used to assess permissible occupancy levels for a specific room based on square footage.



Source : [aia.org](http://aia.org)



## **COLD CHAIN STUDIES**

### **Introduction**

The cold chain technique is a supply chain in which the goal is to maintain a constant temperature for the product throughout the delivery process. Because the right distribution networks can have good cold chain product quality, proper treatment at each of the key distribution sites in the cold chain is an important aspect in maintaining cold chain product quality.

The usage of cold chains demands the installation of a variety of storage and delivery facilities. For the storage process, cold storage and freezing devices are necessary, whereas refrigerated transportation fleets are required during the distribution process (carriers, aircraft and vehicles). Various industrial industries rely heavily on the cold chain market, including the food processing industry, fishing industry, retail network, pharmaceutical industry, and so on.

The cold chain sector sees Indonesia as a prospective market. The user industrial market, which is exhibiting indications of improvement, backs this up. As indicated by their contribution to Indonesia's GDP in 2018, consumer industrial sectors such as livestock, fisheries, processed food, and the chemical, pharmaceutical, and drug industries continue to be important for national growth.

The cattle sector provided 1.5 percent, or Rp231.7 trillion, of Indonesia's overall GDP of Rp4,837.3 trillion during that time period, according to figures from the Central Bureau of Statistics (BPS), while the fisheries sector contributed 2.6 percent, or Rp267.3 trillion. Indonesia's food and beverage industry contributed 6.2 percent to the country's total GDP, The chemical, pharmaceutical, and drug industries contributed for 1.6 percent of the total.

### **Development of Cold Chain Production in Indonesia**

Keeping cold storage facilities in good working order needs a large financial investment. Many businesses do not have their own cold storage facilities, which is understandable. As a result, many of them lease or deal with owners of cold storage facilities.

The amount of cold storage production in Indonesia is difficult to quantify and can only be done based on cold storage capacity.

Various industry sectors are involved in this activity, including cold storage companies, food processing companies, meat importers including slaughterhouses, fishing companies, ice cream companies, fruit importers, distribution networks, and pharmaceutical companies.

Over the next five years, demand for cold storage is predicted to increase, resulting in an inevitable increase in installed capacity. Demand for cold storage will climb by 10% to 20% each year on average over the next few years, according to the patterns observed by major cold storage companies questioned.

According to this prediction, the demand for cold storage space would exceed 462,700 tons in 2019, necessitating an increase in capacity of 92,500 tons over the existing 370,200 tons. Before 2024, the capacity will reach 824,700 tons, requiring an additional 59,600 tons, as stated in the table below:

**Table 4.3: Projection of Potential Demand for Cold Storage in Indonesia, 2019–2024**

Year	Projection of Production Capacity (tons)	Additional Production Capacity (thousand tons)
2019	462,750	92,550
2020	548,359	85,609
2021	631,161	82,802
2022	692,384	61,223
2023	765,084	72,700
2024	824,760	59,677

Notes: Estimated based on the trends experienced by major cold storages being surveyed. Additional Production Capacity denotes gap between the projected capacity and the previous year's capacity.

Source : *eria.org*

### **Transition of Frozen Food Consumption in Indonesia**

Indonesia's food and beverage business, which is predominantly driven by frozen meals, particularly those produced from marine products, is considered as having great potential.

Demand for frozen food is thought to have increased in recent years as a result of changes in people's eating habits, which appear to be smooth, functional, and costeffective while still providing nutritional and health criteria. Indonesia, with a population of over 260 million people, has a sizable frozen food sector, which is being bolstered by expanding public purchasing power.

Frozen food consumption has increased by 6.9% each year on average over the last five years, according to CIC's research. Although frozen food consumption was just 5.0 million tons in 2014, it climbed by 8.6% to 5.5 million tons in 2015. In 2016, there was a return of similar issue, with frozen food consumption rising 7.4% to 5.9 million tons. In 2018, 6.6 million tons of frozen food were consumed worldwide. Additional information on the evolution of frozen food consumption from 2014 to 2018 may be found in the table below:

**Table 4.4: Development of Frozen Food Consumption in Indonesia, 2014–2018 (Ton)**

Year	Production	Import	Export	Consumption	Growth (%)
2014	5,629,902	280,360	828,130	5,082,132	–
2015	5,920,708	229,551	631,013	5,519,246	8.6
2016	6,211,514	314,470	600,794	5,925,191	7.4
2017	6,502,321	389,626	621,604	6,270,342	5.8
2018	6,793,127	406,179	568,774	6,630,531	5.7
<b>Annual Average (%)</b>					<b>6.9</b>

Notes: See footnote for frozen foods referred in this discussion.<sup>18</sup> Domestic consumption was estimated from production + import – export.

Source: Central Bureau of Statistics (2019).

### **Demand for Cold Storage in Indonesia**

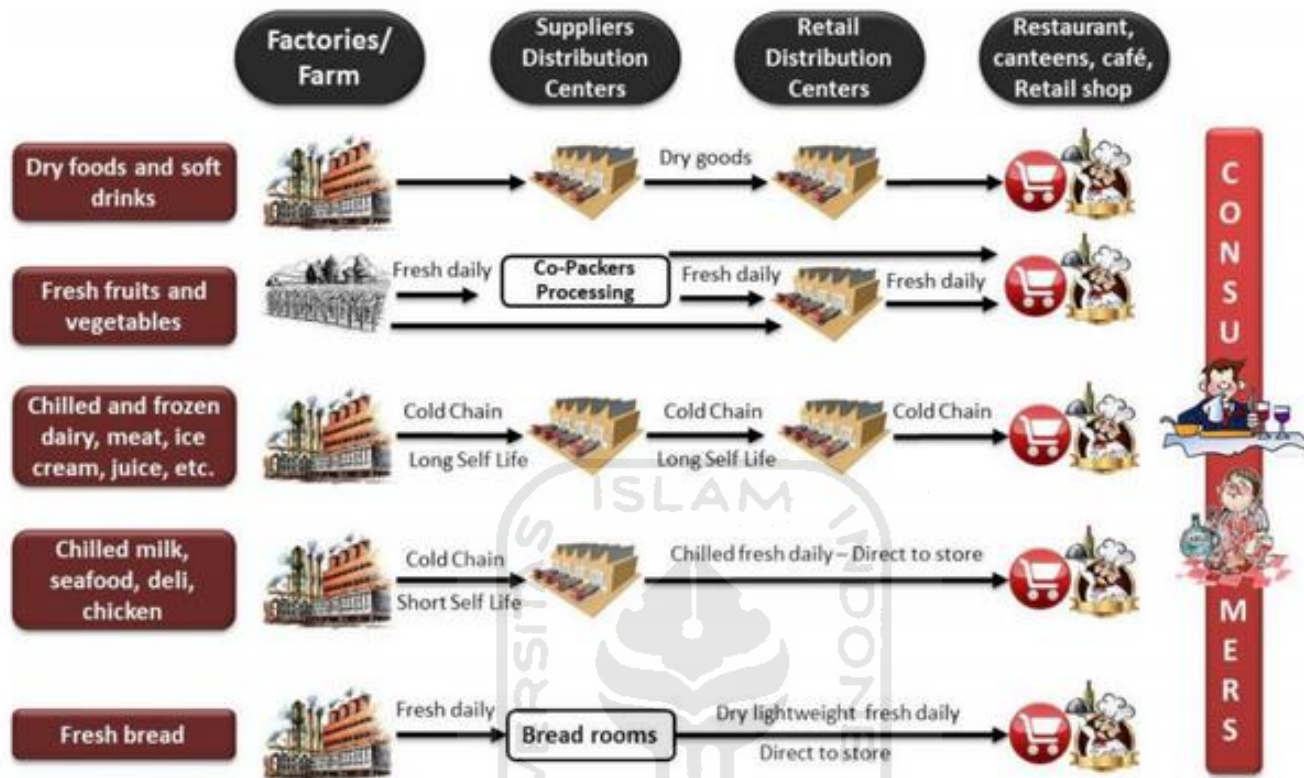
Cold storage is required to maintain the temperature of the product and prevent it from being harmed during distribution. Cold storage is required to maintain the temperature of the product and prevent it from being harmed during distribution.

To acquire the correct cold chain system, especially for frozen items, handling during the initial phase, storage and processing upon arrival, handling during transportation to the destination country, and handling on loading and distribution systems to clients are all stages that must be followed.

Cold storage for foodstuffs includes freezing, storing in cold storage, delivering in refrigerated vehicles, displaying in cold cabinets at grocery stores, and finally, storing in home freezers. Food goods with decent packaging that have gone through the stages of manufacturing plants usually have a long shelf life and can be stored at normal temperatures.

The food processing business manages the commodities supply cycle for all consumers in numerous locations, with separate distribution networks for small and large outlets, as well as special attention paid to each product segment and marketing channel.

Food goods that require cold storage, such as milk and fish, are typically transported by a refrigerated vehicle before entering the shop. The food distribution system is depicted in the diagram below depending on handling characteristics:



Source: Cited from Tobing (2015).

## CREATIVE HUB STUDIES

### Introduction

A Creative Hub is a physical or virtual location that brings together creative people. It serves as a convenor, giving a location and resources for networking, business development, and community engagement in the creative, cultural, and technological sectors. (Creative Hub definition, Creative HubKit, p.4)

The creative hub serves a variety of goals, according to Janine Matheson of Creative Edinburgh and Gillian Easson of Creative Dundee Creative Hubkit:

- To give long-term and short-term support to the idea, the initiative, the organization, and the business that is hosting it, including events, skills training, capacity building, and worldwide chances, through services and/or facilities.
- To make it easier for people in the community to collaborate and network.
- To make contact with R&D centers, institutions, and the creative and non-creative industries.
- Develop active communication tactics to communicate and engage with a larger audience.
- To champion and celebrate an up-and-coming talent who is pushing the boundaries of current practice and taking risks in the pursuit of innovation.

### Creative Hub Models

There are numerous sorts of creative hubs, according to Janine Matheson of Creative Edinburgh and Gillian Easson of Creative Dundee Creative Hubkit:

- **Studio**  
In a co-working space, a small group of people work together to complete a task.
- **Center**  
Large-scale buildings with various amenities like as cafes, bars, cinemas, marketerspace, shops, and exhibition space are used for creative endeavors.
- **Network**  
Individual groups may be familiar with a variety of enterprises, but they nevertheless develop networks or relationships based on specific industries.
- **Cluster**  
Individual groups are familiar with a creative company that operates in a certain geographic area.
- **Online Platform**  
In order to conduct creative business, create a creative center employing online tools such as a website and social media.
- **Alternative**  
Create a creative center focused on introducing new financial sectors and types to the community.

## Creative Hub Features

Creative hubs can be defined and formed into sections according to features given like:



## Creative Industry Studies

The creative industry is one that generates intellectual, original ideas and concepts that are realized through concrete thoughts and actions in order to generate jobs and grow the economy.

Creative Industry, according to the Ministry of Trade, is an industry that is based on the use of individual creativity, skills, and abilities to generate prosperity and employment by producing and empowering these persons' creative force and inventiveness.



Source : [binus.ac.id](http://binus.ac.id)

The creative industry, according to BEKRAF, is divided into 16 sub-sectors: application and game development, architecture, product design, fashion, interior design, visual communication design, performing arts, film, animation, and video, photography, craft, culinary, music, advertising, publishing, fine art, television, and radio.



## SPACE NEED STUDIES

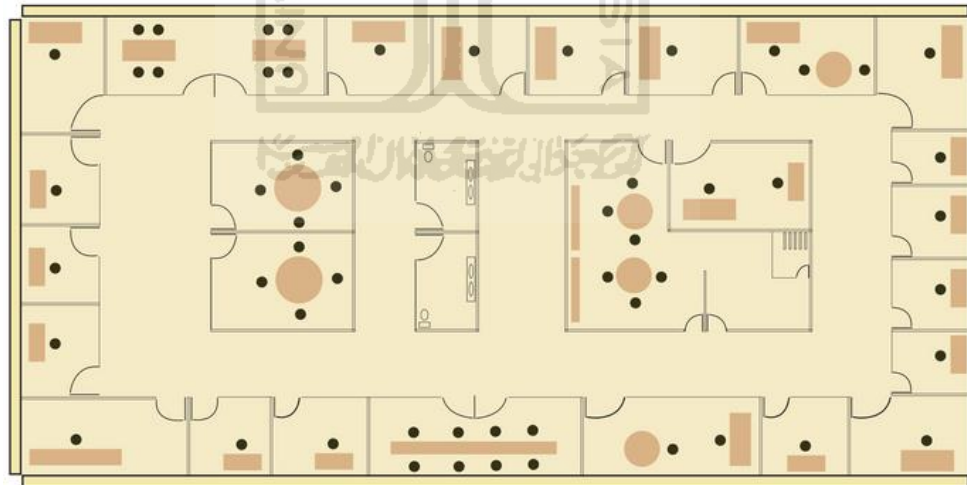
### Introduction

The first step in any space delivery project is to determine the demands of the inhabitants, which is referred to as space programming. Identifying challenges and requests, as well as providing the right amount and type of space, equipment, and furniture, are all part of space programming. If this critical step is neglected, the project team may misinterpret the space requirements, leading to costly change orders and construction cost overruns.

Space planning goes from broad concerns to very particular occupant needs. The first thing to think about is what kind of facility management support tenants will need to fulfill their responsibilities. The space programming process then moves from broad concerns, such as the occupier mission, to finer and finer details, eventually drilling down to everyday work activities.

### Office Space Planning Guide

1. Closed Office Floor Plan  
Traditional, closed floor layouts offer private meeting rooms and frequently highwalled cubicles. The private office rooms are then set up along the outer walls, with windows on both sides.



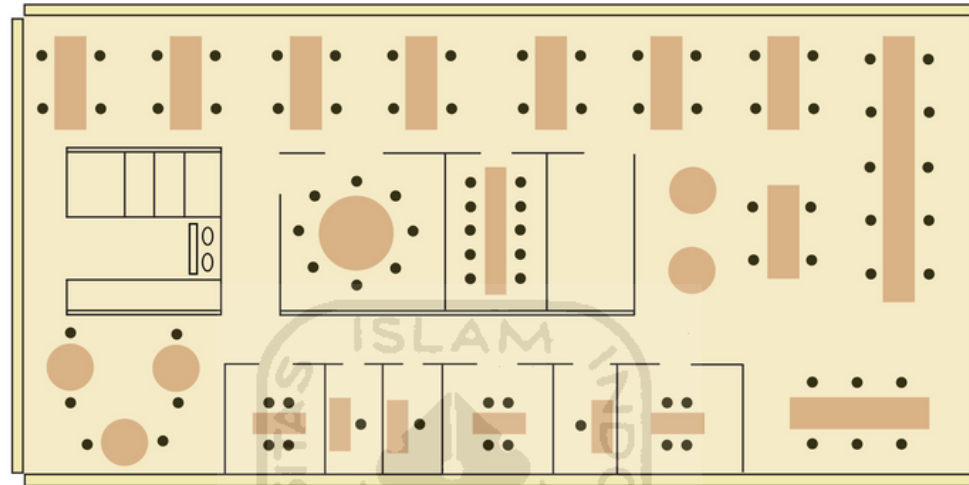
Source : [softwareadvice.com](http://softwareadvice.com)

Increased privacy, reduced noise and other distractions, and improved employee attention are all advantages of a closed office plan.



## 2. Open Office Floor Plan

There are a lot of windows in the floor plans. Bench seating, low-walled cubicles, collaboration areas, and glass-walled conference rooms can all be used to replace hard walls.



Source : [softwareadvice.com](http://softwareadvice.com)

Reduced real estate expenses, easy layout modification, and ideal for staff collaboration are all advantages of an open office plan.

One factor for the open-office trend is the new commercial real estate market. While open office ideas save money on real estate, they don't always deliver the same productivity or retention benefits for all departments or employees, particularly introverts, who account for around half of the population.

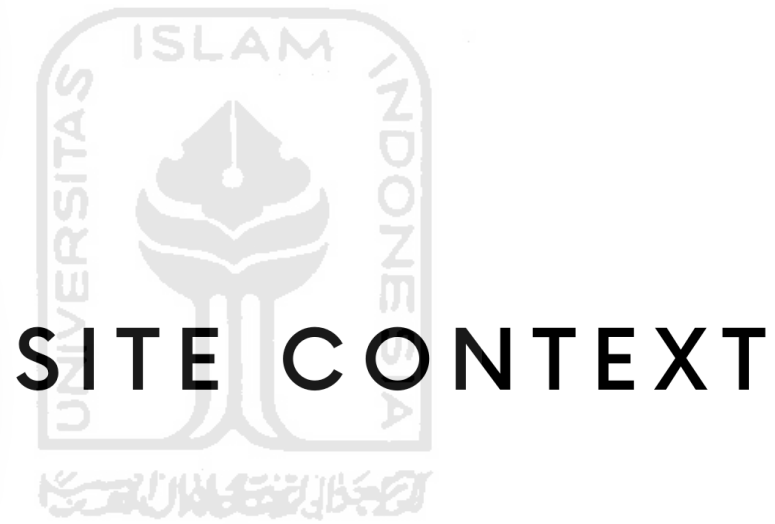
### **Workstation Spaces**

When it comes to designing office space, the following guidelines will help. While compliance with the guidelines is not required, they serve as a guide for making sound management decisions and should be followed unless there are compelling reasons to deviate.

For various job functions, the following is a list of recommended workstation sizes. These workstation sizes would allow for more effective space planning inside building grids while also allowing for potential organizational changes.

Space Type	Functional Assignment	Space Allocation	
		m <sup>2</sup>	ft <sup>2</sup>
Enclosed Type A	Frequent meetings with up to four others and/or requiring confidentiality, security, visual and acoustical privacy. Typical assignment for Deputy Minister or equivalent.	22.5	240
Enclosed Type B	Frequent meetings with up to two others and/or requiring confidentiality, security, visual and acoustical privacy. Typical assignment for Assistant Deputy Minister, Director, senior position in charge of a regional or district office or equivalent.	13.9	150
Enclosed Type C	Frequent meetings with up to two others and/or requiring confidentiality, security, visual and acoustical privacy. Typical assignment for position involved with counseling, human resources management or other sensitive situations requiring ongoing visual and acoustical privacy.	9.3	100
Open Type D	Concentrated multi-source paperwork: compiling information, reading, writing, analyzing, calculating and referencing multiple sources of material; allows for manual and automated drafting functions. Typical assignment for managerial, professional or technical staff.	9.3	100
Open Type E	Multi-task paper intensive work: telephone work, keyboarding, filing, sorting documents, handling mail, editing, operating equipment, scheduling, receiving visitors. Typical assignment for secretary and administrative support staff.	6.5	70
Open Type F	Specific, task-oriented work, focusing on data input into electronic media. Typical assignment for clerical and data-entry staff.	4.5	50

# 3

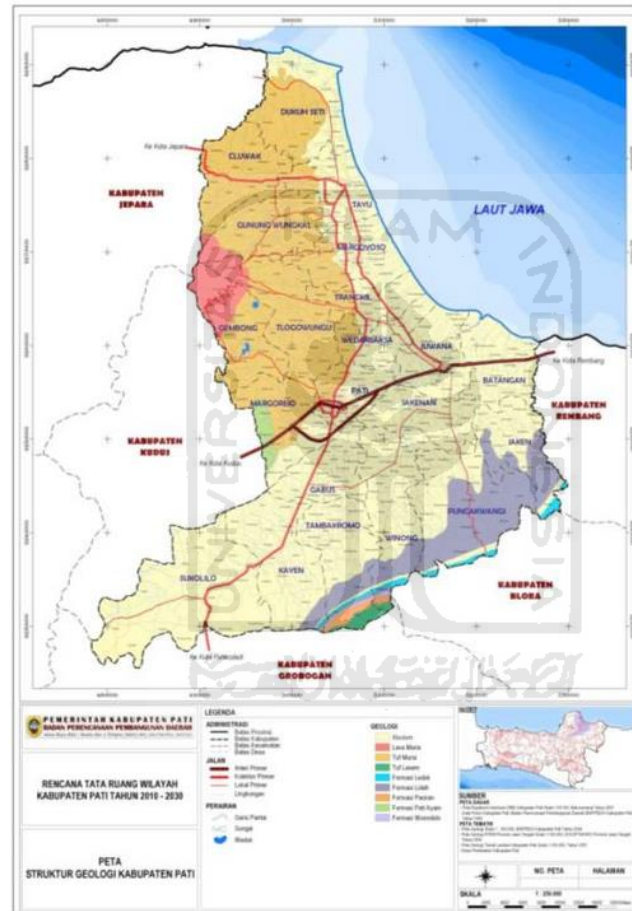


## SITE CONTEXT

## GENERAL DESCRIPTION OF THE PATI AREA DISTRICT

### Geographical Consitions

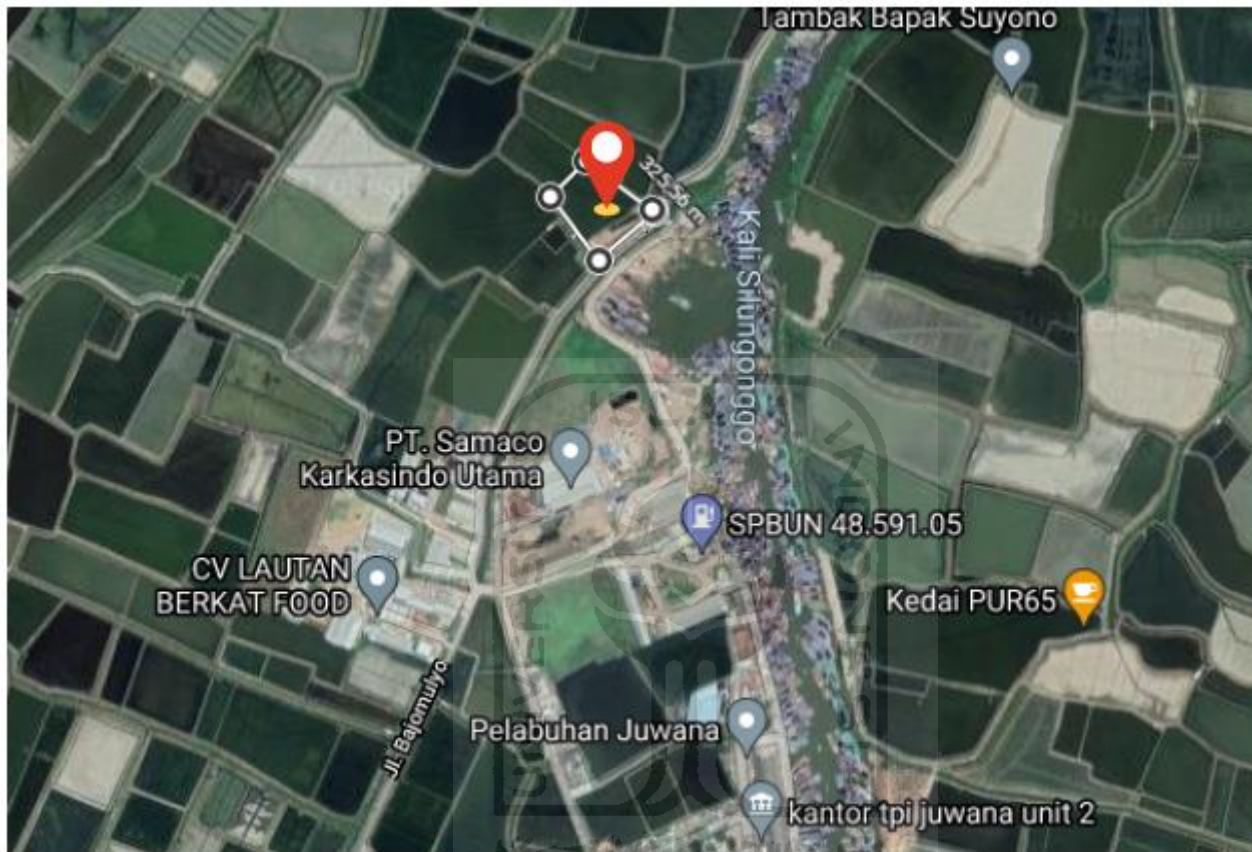
Pati Regency is one of 35 regencies / cities in Central Java Province, and it is strategically located since it is crossed by a national road that connects important cities on Java Island's north shore, including Surabaya, Semarang, and Jakarta. The attached map depicts Pati Regency's direction toward Java Island and major cities.



Source : [ilmurakyat.wordpress.com](http://ilmurakyat.wordpress.com)

Pati Regency has a total area of 150,368 ha, with 59,332 ha of rice fields and 91,036 ha of non-rice fields, and is located at 1100.15' - 1110.15' East Longitude and 60.25' - 70.00' LS. Pati Regency is located to the north of Jepara Regency and the Java Sea, to the west of Kudus Regency and Jepara Regency, and to the south of Grobogan Regency and Regency. Blora, as well as the Rembang Regency and the Java Sea to the east.

## SITE LOCATIONS



Source : google maps



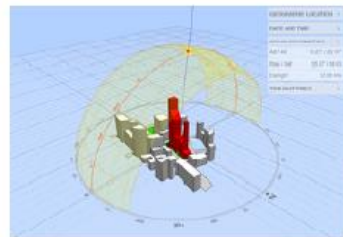
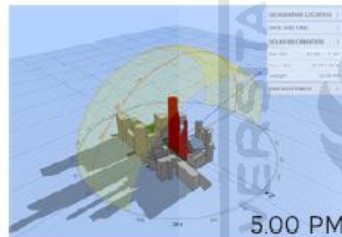
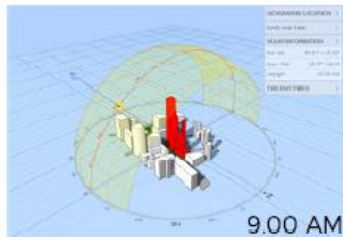
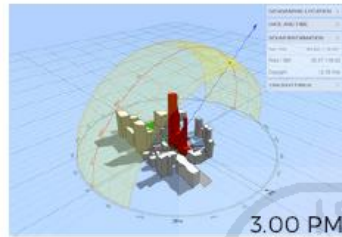
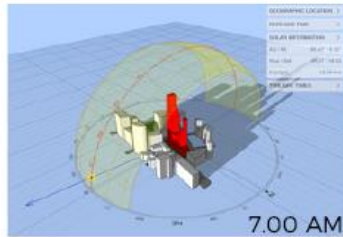
Jl. Ujung No.2, Bendar, Kec. Juwana, Kabupaten Pati, Jawa Tengah 59185

This location is near the Juwana port, which is currently being developed by the pati regency government to become a fishery center. This place is also rapidly developing into the center of the fishing industry in Pati Regency.

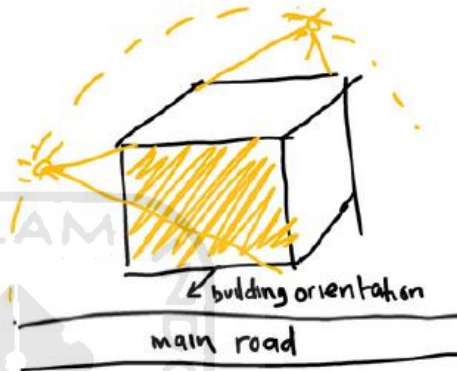
## Location Restrictions



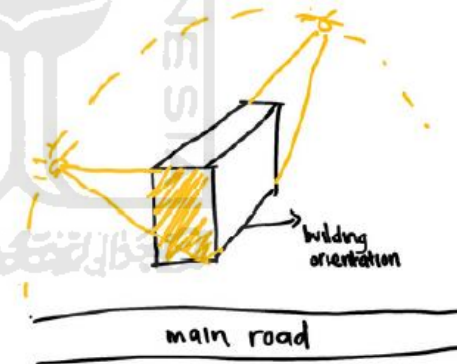
## Sun Path Analysis



The side of the building facing north and west is exposed to direct sunlight, while the east and south sides get indirect sunlight. It would be better if the north and west sides of the building had a smaller surface than the south and east sides.

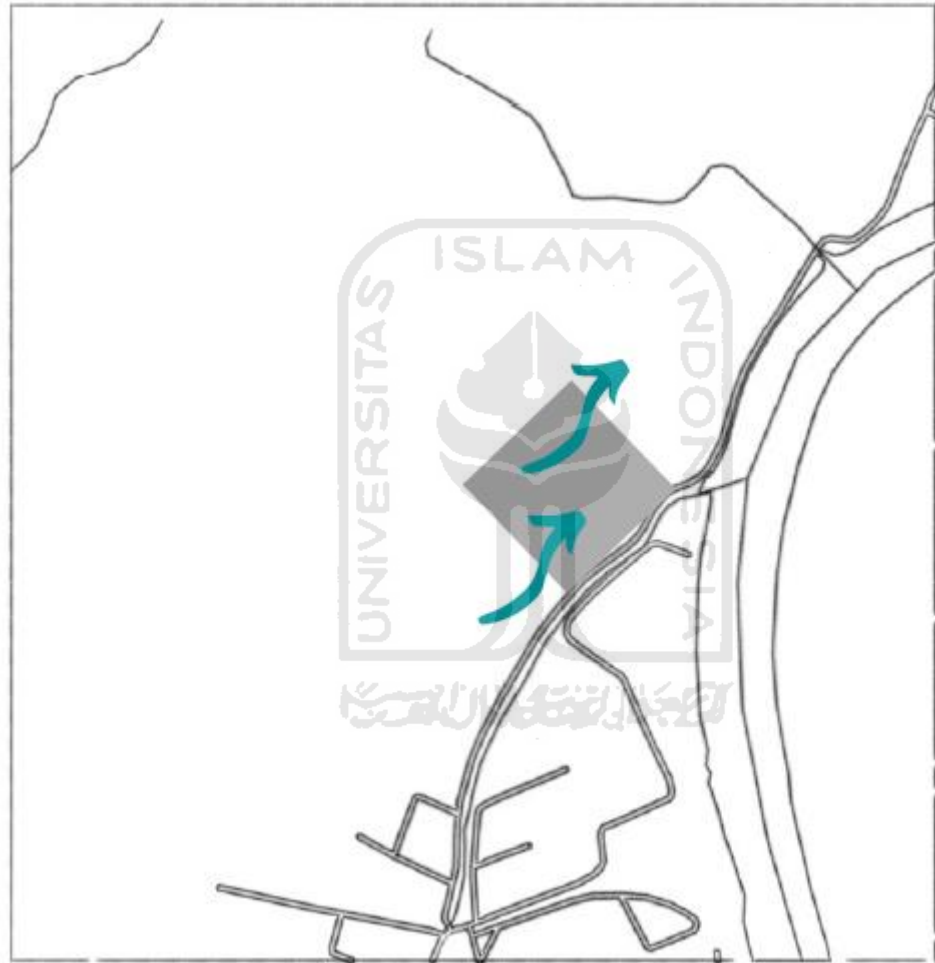


With this orientation, there are too much space that accept direct sunlight. It can trigger high temperature in the building.



Smaller area that accept direct sun light. The building temperature will not increase drastically

## Wind Directions



The wind is moving from the west to the north

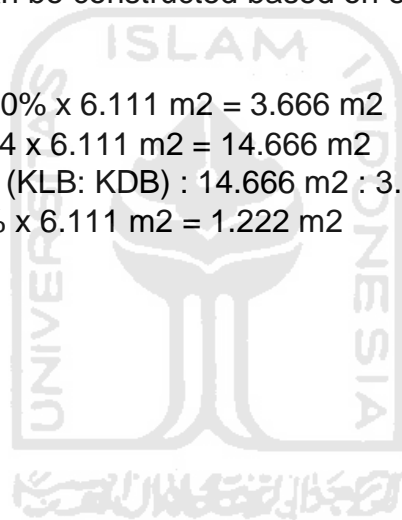


## Site Regulations

- Building Floor Coefficient (KLB) on secondary collector roads (Jl. Bajomulyo) for offices and public facilities : 2,4
- Basic Building Coefficient (KDB) on secondary collector roads (Jl. Bajomulyo) offices and public facilities : 60-70%
- Green Basic Coefficient (KDH) at least 20% of the total land area.
- The basement footprint coefficient is calculated for the trading building services, parking buildings and offices that provide besmen for land expansion with a fixed value equal to the KDB value pay attention to the construction of the building above it.

Calculation of the area of buildings that can be constructed based on existing regulations to the size of the tread 6.111 m<sup>2</sup>.

- Basic Building Coefficient (KDB) :  $60\% \times 6.111 \text{ m}^2 = 3.666 \text{ m}^2$
- Building Floor Coefficient (KLB) :  $2,4 \times 6.111 \text{ m}^2 = 14.666 \text{ m}^2$
- Maximum number of building floors (KLB: KDB) :  $14.666 \text{ m}^2 : 3.666 \text{ m}^2 = 4 \text{ Floor}$
- Green Basic Coefficient (KDH)  $20\% \times 6.111 \text{ m}^2 = 1.222 \text{ m}^2$

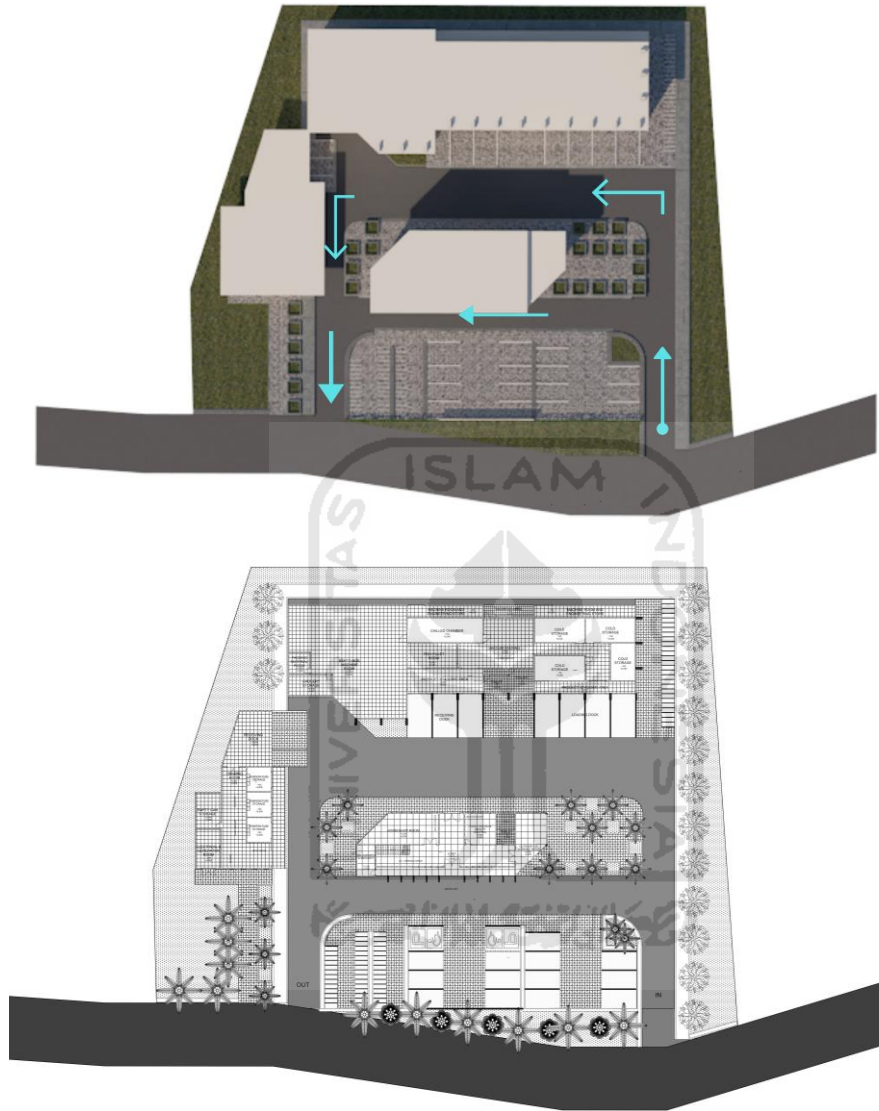


# 4



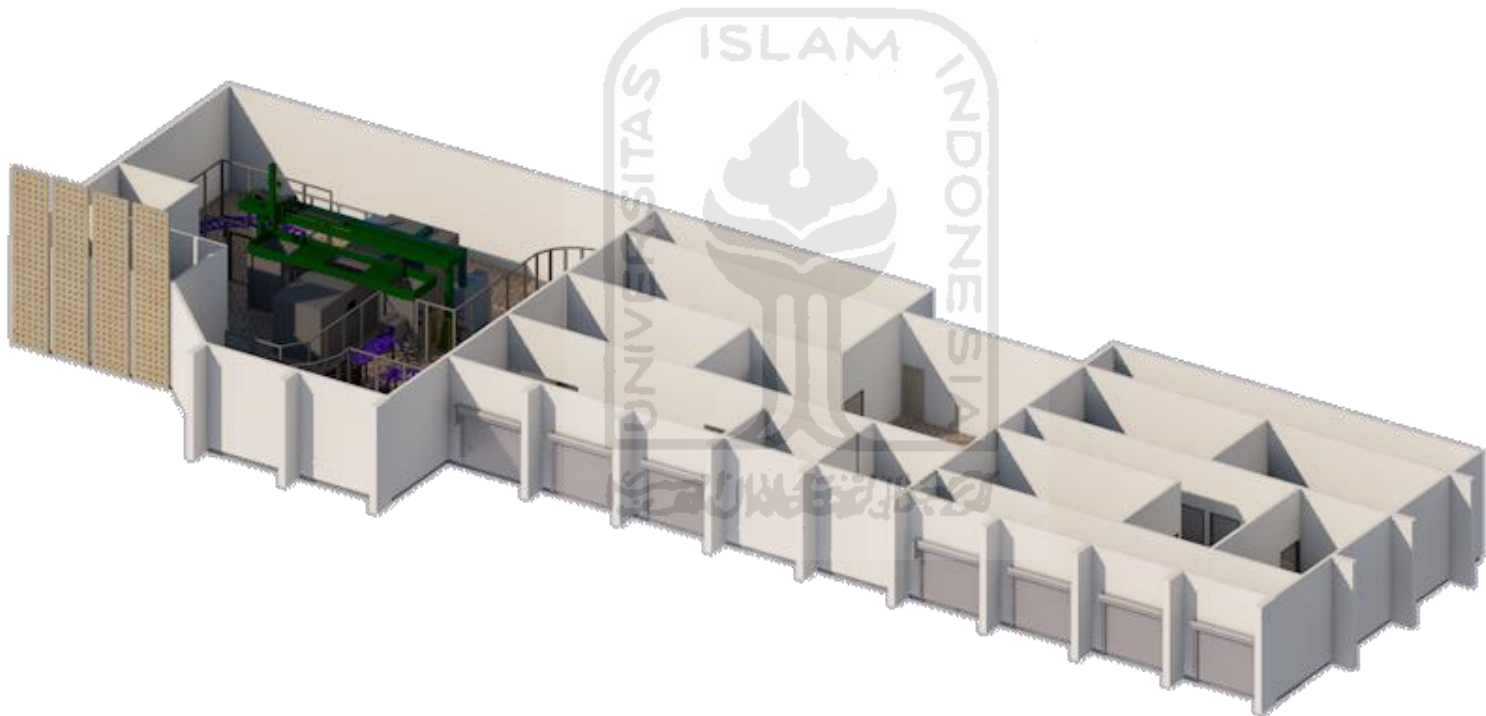
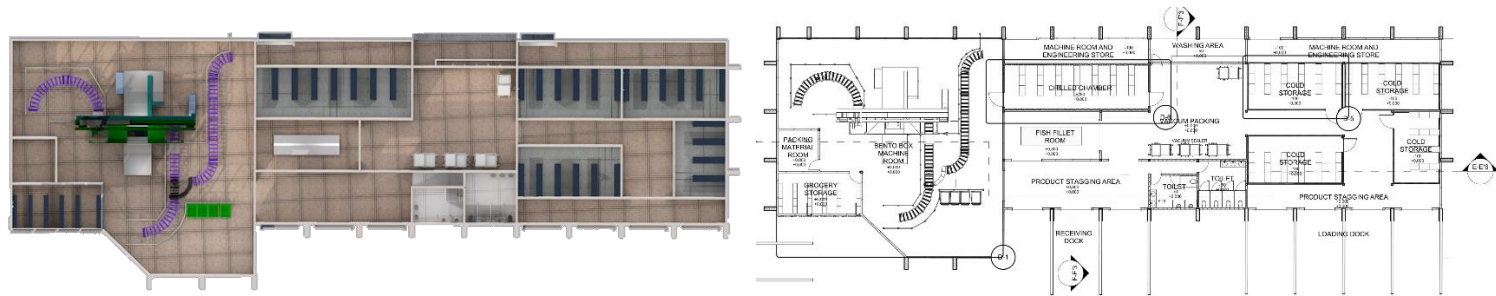
**DESIGN  
RESULTS**

## SITUATION AND SITE PLAN



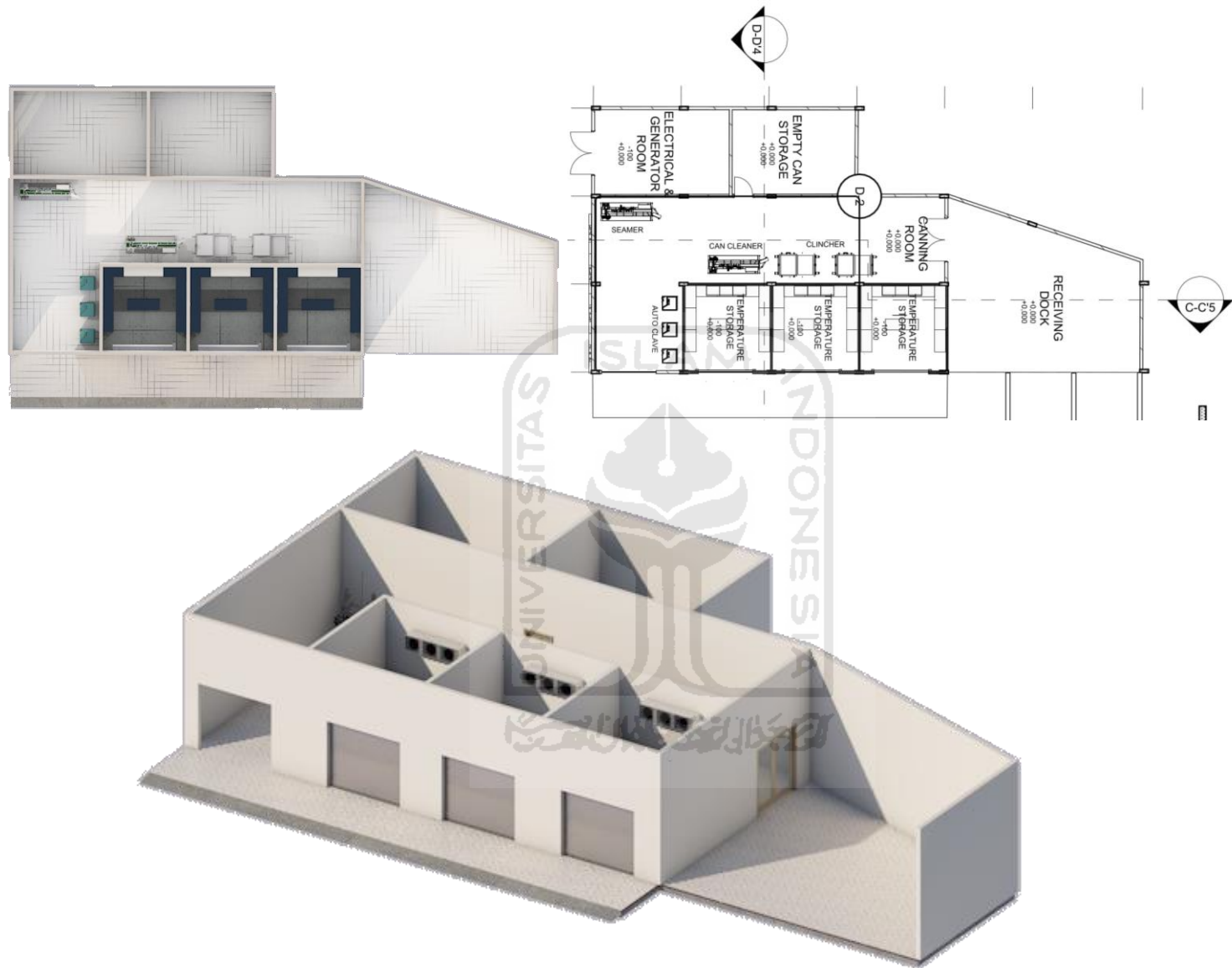
Circulation in this place is designed around the building, so that it can be accessed easily. This can also make it easier for fire engines to get to the location of the fire.

## PRODUCTION SPACE



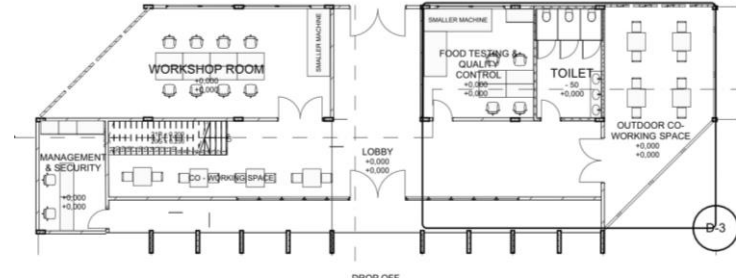
This place is dedicated to the production department. Starting from sorting raw materials, processing, packaging, to storage in freezing temperatures.

## PRODUCTION SPACE



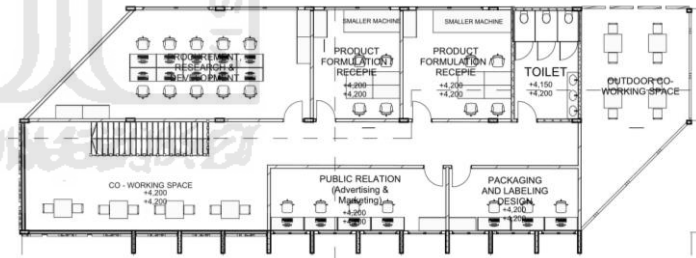
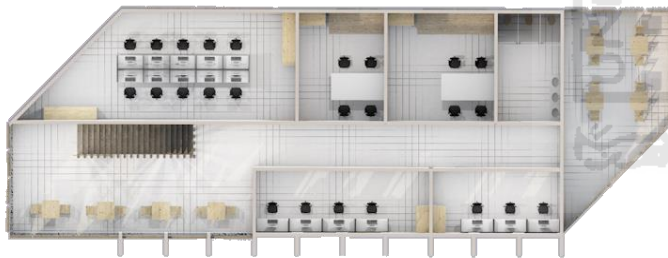
Apart from processing frozen food, this place will also facilitate food canning. This area will be devoted to canning and storage room with a maintained temperature so that canned food can last a long time.

## CREATIVE SPACE



### 1ST FLOOR

Meanwhile, this place is devoted to the development of creative ideas. In the lower area will be a semi-public place, in this place, business people can invite several people to test their new menu.

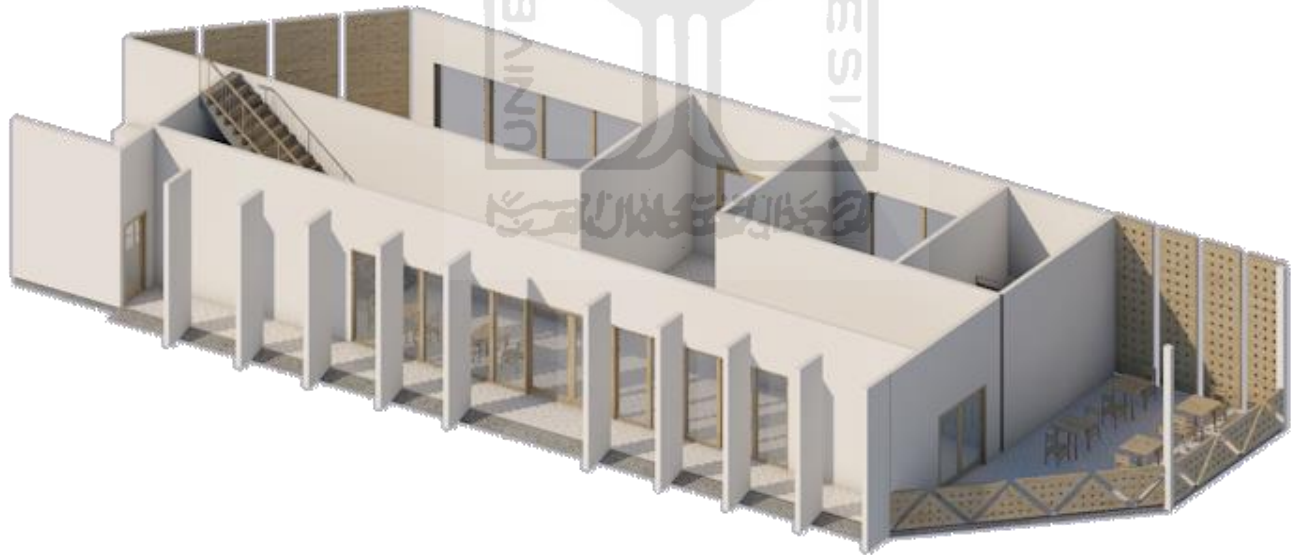


### 2ND FLOOR

On the second floor, this is the place to grow their business. Starting from raw material selection, recipe development, packaging design, and product marketing.

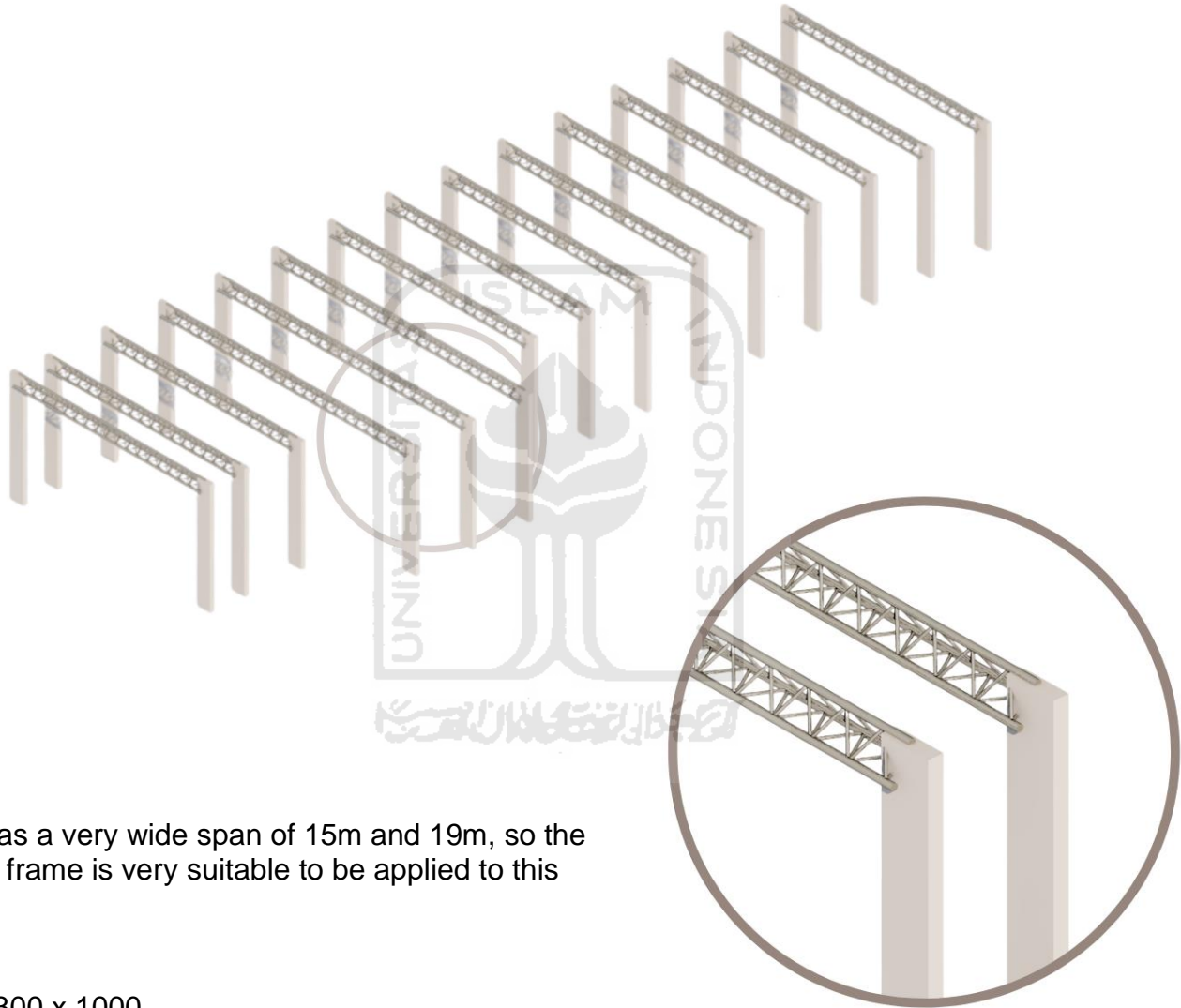


2ND FLOOR



1ST FLOOR

## SPACE FRAME STRUCTURE

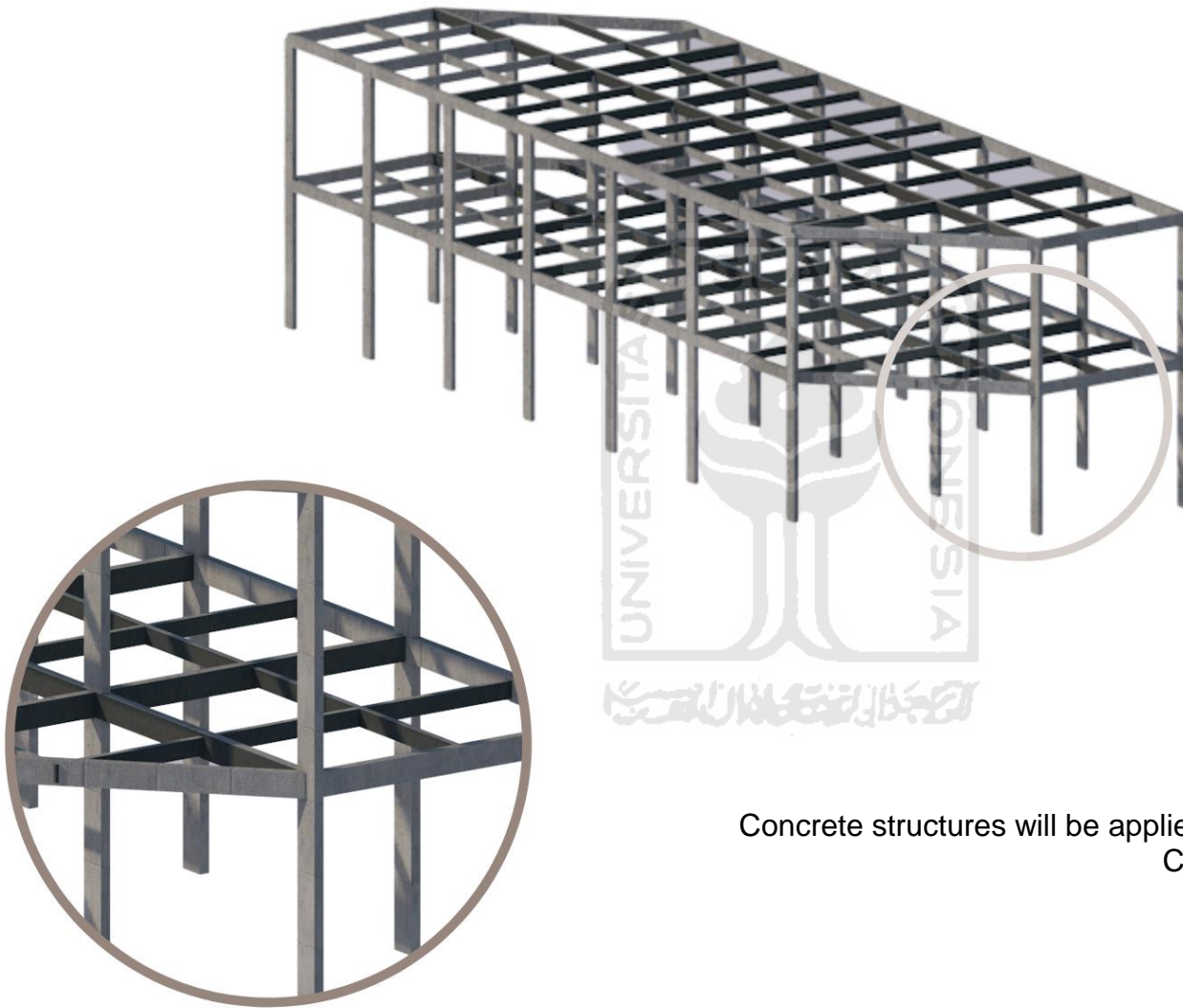


This building has a very wide span of 15m and 19m, so the use of a space frame is very suitable to be applied to this building.

RC COLUMN 300 x 1000  
STEEL SPACE FRAME STRUCTURE

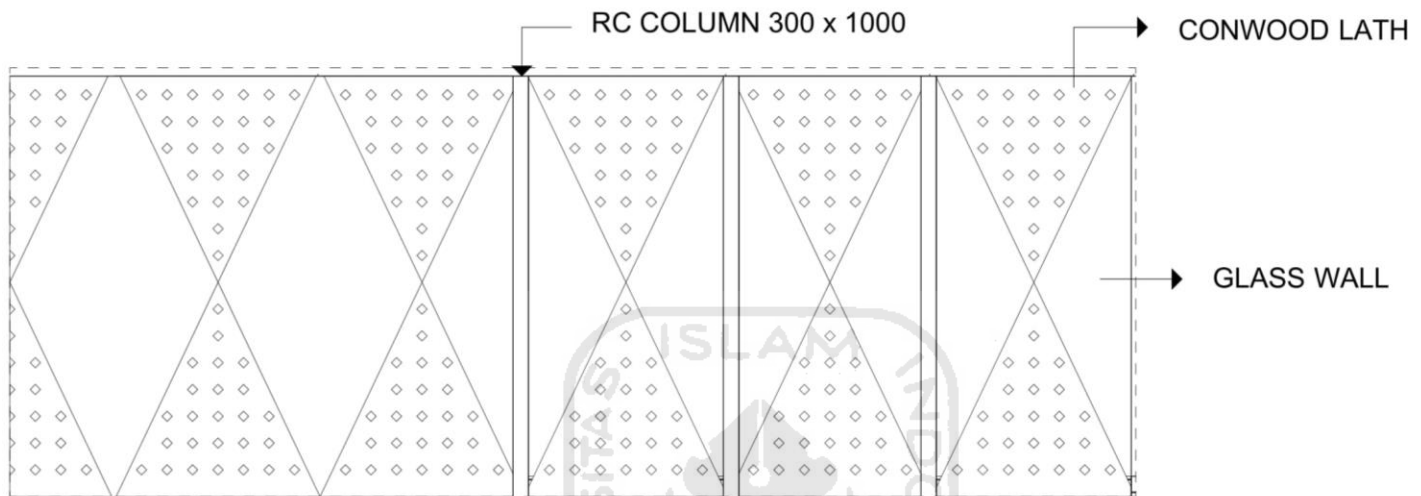


## CONCRETE STRUCTURE

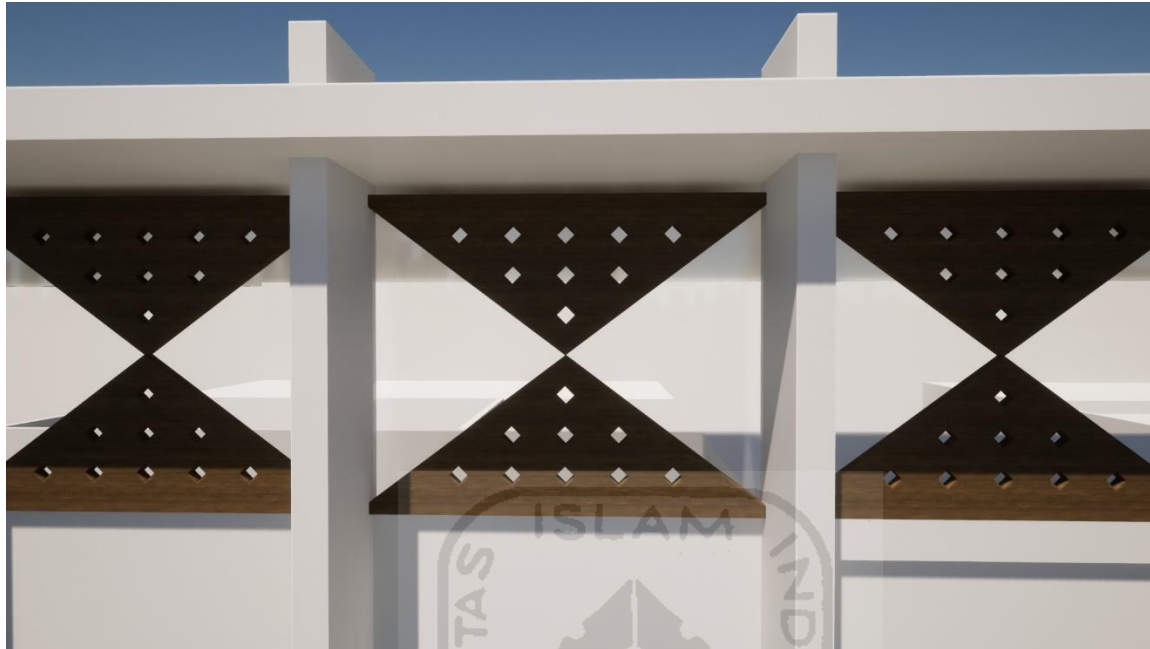


Concrete structures will be applied to this building by:  
Column 150 x 350 cm  
Girder 150 x 200 cm  
Beam 120 x 150 cm

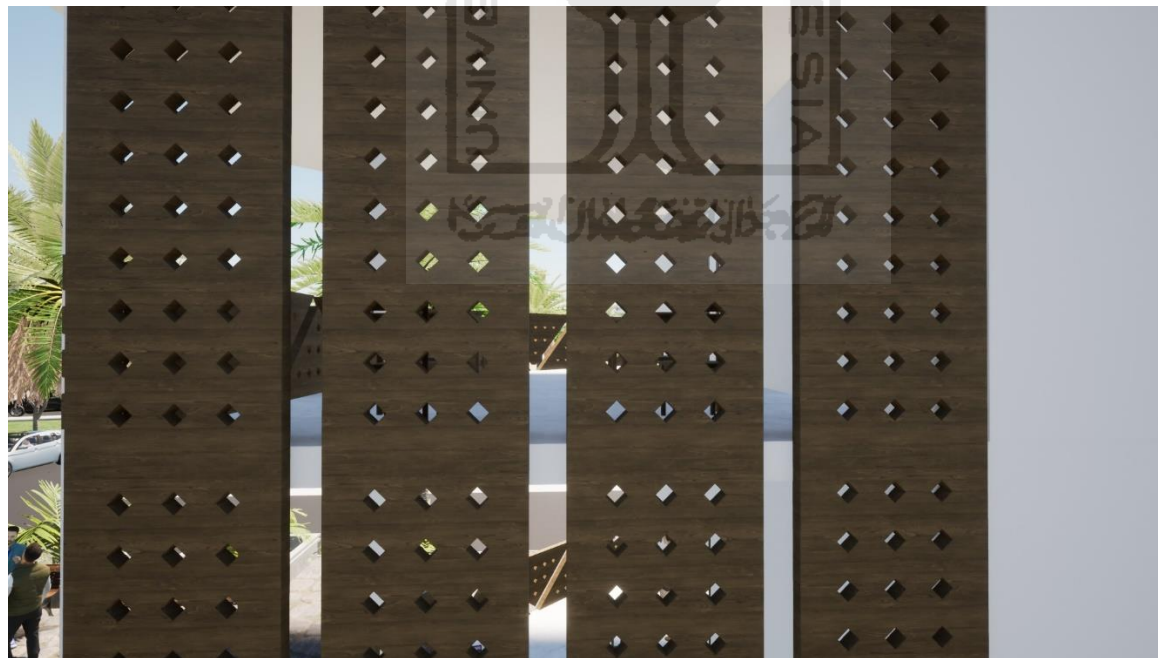
## SECONDARY SKIN FACADE



Secondary skin facade creative space



Secondary skin facade production area



Secondary skin facade creative space

## SPECIAL FEATURES : SHADING



Column and slab as shading



Lobby view; column and slab as shading

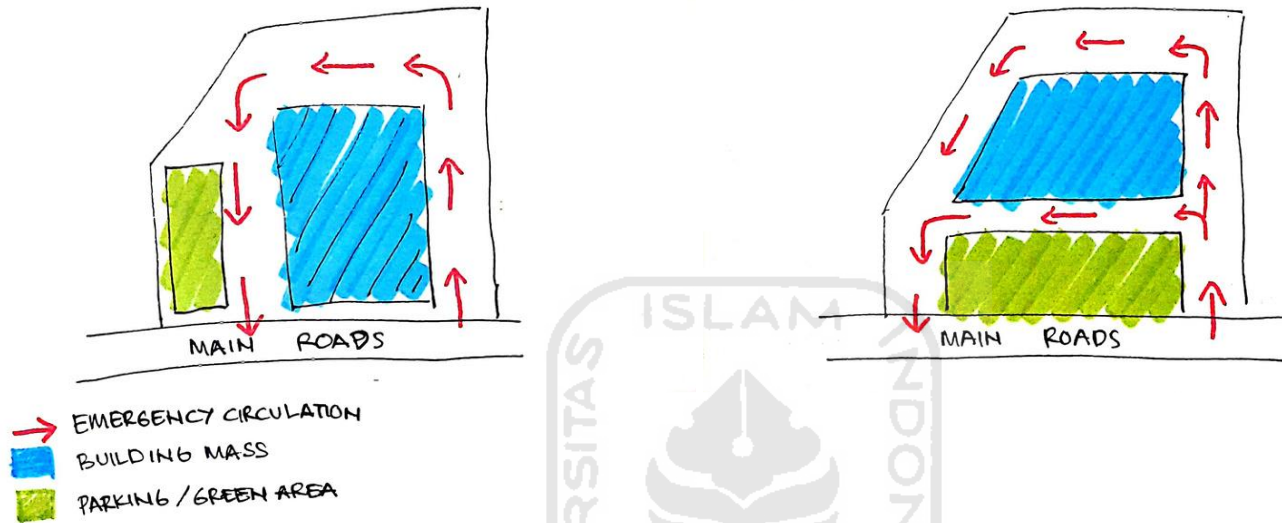
5



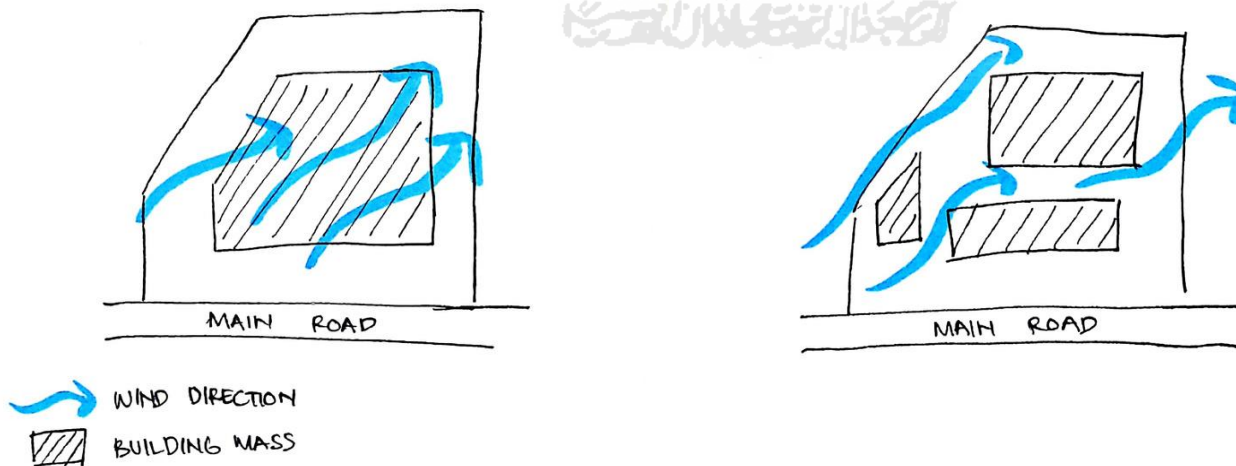
## TRIZ : Another Dimention

Moving into Z dimention by arranging the building mass

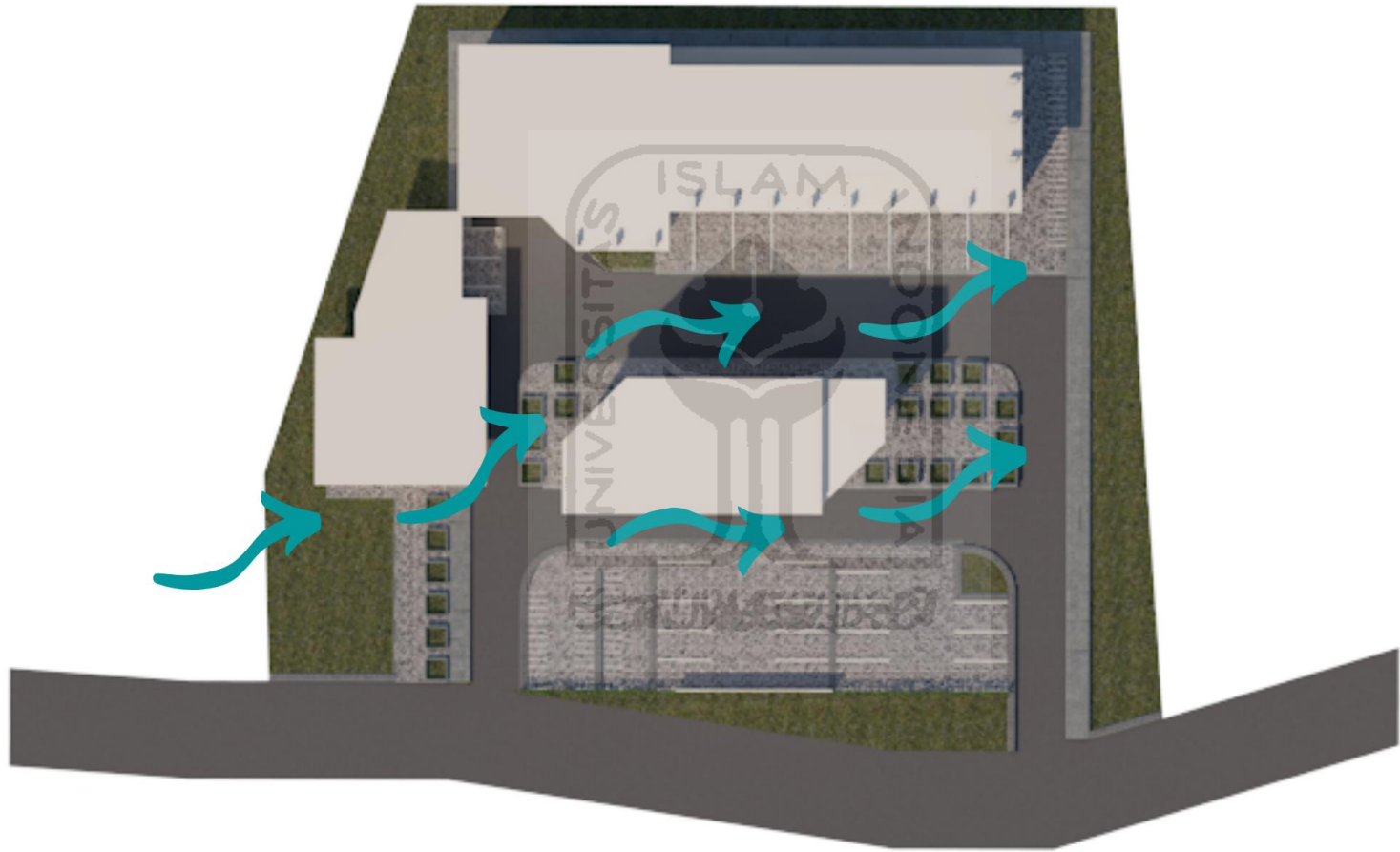
### SITE ANALYSIS



From the circulation analysis that I did, I found that the circulation around the building is beneficial especially during an emergency situation. With this circulation model, a fire truck or other officer's vehicle will easily approach a building that has a problem.



Based on my field studies, the wind in this location blows from west to east in the afternoon, and vice versa in the morning. The wind at this location is quite strong due to the location close to the local port in the area. This can provide goodness in the form of natural ventilation that can be used so that the room in the building is not hot and can get a lot of wind.



Taking the example of the Tooker House precedent mentioned in chapter 1, the placement of the building layout is largely influenced by the direction of the wind blowing at that location. With the application of site analysis that I have done, a layout like the picture above is the best layout so that the wind can blow between the buildings and can provide coolness.

### TRIZ : Nested Doll

Nice function without additional spaces :

Creating space between space, the main reason is because of the privacy.



Creating a room inside the other room to maintain the privacy and closeness.



### TRIZ : Preliminary Actions

Pre-arrange objects such that they can come into action from the most convenient place and without losing time for their delivery.



PROVIDE A PLACE THAT ARE CHANGEABLE. THIS WORKSHOP ROOM ARRANGEMENT CAN BE CHANGE ACCORDING TO THE ACTIVITY THAT WILL HAPPEN.

### TRIZ : Parameter Change

Changing the architectural element to create bigger space in such small area.



APPLYING MORE WINDOW TO CREATE A TRANSPARENT BARRIER TO MAKE THE LOBBY FEEL BIGGER.

### 3.1 Programming

- Provide dispersed, temporary work surfaces for outdoor working/dining to reduce quarantine fatigue.
- Provide outdoor seating to supplement indoor seating.
- Include outdoor space for retail.

#### OUTDOOR CO-WORKING SPACE



#### INDOOR CO-WORKING SPACE



### 3.2 SPACE PLANNING

- Stagger work stations where possible and rotate to face the same direction.
- Provide or retrofit locking casters to limit furniture mobility where mobility could pose an issue for physical distancing.
- Relocate some taxi/ride sharing/drop-off stops to increase physical distancing.



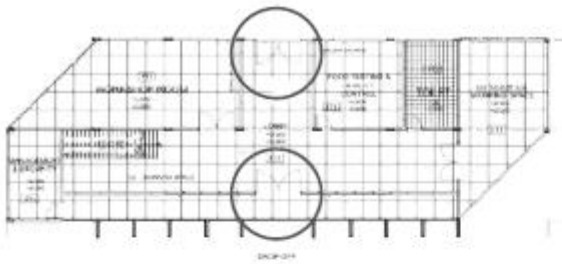
SAME DIRECTIONS WORK STATIONS ON  
PUBLIC RELATION ROOM & PACKAGING AND  
LABELING ROOM.



SAME DIRECTIONS WORK STATIONS ON  
PUBLIC RELATION ROOM & PACKAGING AND  
LABELING ROOM.

### 3.3 Non-Structural Partitions and Openings

- Consider an exit separate from the entrance.
- Create touch less entry capability.
- Let in direct sunlight where possible.



THERE ARE 2 DOORS TO ENTER THE BUILDING.



MAXIMIZE THE USE OF NATURAL LIGHTING AND USE THE COLUMN AND SECONDARY SKIN TO ACT AS THE SHADING.



PROVIDE AUTOMATIC DOOR OPENERS / PROXIMITY SENSORS



### 3.6 Mechanical and Passive Ventilation

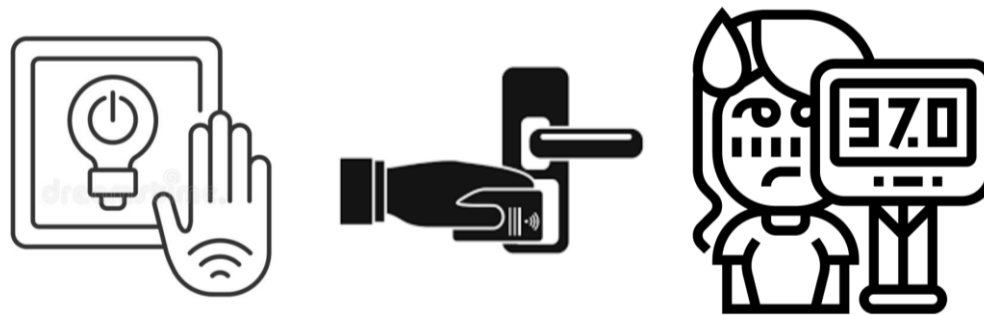
- If feasible, use moveable windows for natural ventilation.
- Ensure that ventilation systems are working properly and that each space has adequate indoor air quality for the present occupancy level.



APPLYING OPERABLE WINDOWS IN EVERY ROOM.

### 3.7 Electrical, Lighting and Communication

- Utilize IoT technology (RFIDs/key fobs) to reduce touch points. (touch-free door locks, touchfree turnstiles, touch-free time cards).
- Replace light switches with motion sensor controls or phone-based application controls.



PROVIDE THE MOTION SENSOR FOR LAMP SWITCH AND USING CARD KEY FOR THE DOOR. ALSO THERMAL SCREEN TO CHECK THE BODY TEMPERATURE.

### 3.9 Finishes and Furnishing

- Utilize temporary, movable partitions to subdivide large working spaces.
- Modify restroom stalls/partitions to make partitions floor to ceiling where fire safety and proper ventilation isn't an issue.



PROVIDE MOVEABLE PARTITION.

### 3.10 Site Work

- Reconfigure parking and/or access lanes to accommodate curbside pickup.
- Provide entry queuing area with ample spacing that also minimizes exposure to inclement weather including wind, sun, and precipitation.
- Ensure the designated building/space ingress and egress pathways support clearly separated directional traffic that also provide ADA accessibility.
- Consider providing outdoor heating and/or shading to support exterior programming.



COLUMN AND SECONDARY SKIN THAT ACTED AS SHADING



# RE-OCCUPANCY ASSESSMENT TOOL V3.0 RESULTS

## 7 Re-occupancy Assessment Tool V3.0

### Building controls

- E Education
- O Office
- F Restaurant
- S Senior living
- R Retail
- H Housing

The assessment tool does not prescribe required interventions but includes controls applicable to many building types and scales of operation. The controls may be applied to non-essential facilities that are to initially reopen with required limitations (short-term) and eventually operate without imposed restrictions (long-term). Not all controls may be applicable to all building types under all situations, similarly additional controls may be necessary. The relevant controls may be further categorized as “essential” or “desirable” in an effort to prioritize.

#### Considerations organized by CDC priority

Essential	Desirable
-----------	-----------

#### 1. First priority: Elimination

Institute social isolation. Wherever possible, occupants should work or perform other activities from home. This should include restructuring responsibilities to minimize the number of occupants that need to be physically present.<sup>vi</sup>

#### 2. Second priority: Substitution

Replace the hazard. There is no available substitution for COVID-19; thus the control measure is not applicable.<sup>vi</sup>

#### 3. Third priority: Architectural and engineering controls

Isolate persons from SARS-CoV-2 exposure. Where appropriate, these controls reduce exposure to hazards without relying on occupant behavior and can be cost-effective to implement.<sup>5</sup>

#### 3.1 Programming

3.1.1 Adapt space to contribute to public health goals.

- E Utilize large interior, traditionally active, spaces (i.e., gymnasium), as extended, passive instructional space and move active programming outside.
- H S O Provide dispersed, temporary work surfaces for outdoor working/dining to reduce quarantine fatigue.
- H S Identify ad hoc space for package storage overflow.
- F Utilize the parking lot as a waiting area to avoid congregating in restaurant waiting areas or wandering throughout the dining room.

Essential	Desirable
N/A	
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

5. Considerations are associated with a wide range of costs. The ROI of each design intervention will vary by building.

- E Education
- O Office
- F Restaurant
- S Senior living
- R Retail
- H Housing

Considerations organized by CDC priority	Essential	Desirable
<span style="color: green;">S</span> Provide an in-room dining area for family visitation to reduce isolation. <sup>xvii</sup>	<input type="checkbox"/>	<input type="checkbox"/>
<span style="color: green;">S</span> Identify a designated space for visitation, preferably with direct access to outdoors.	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2 Provide <b>biophilic amenities</b> that promote mental health and wellbeing. <sup>xviii</sup>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.3 Provide space for outdoor programming. <sup>xix</sup>	<input type="checkbox"/>	<input type="checkbox"/>
<span style="color: red;">E</span> <span style="color: orange;">O</span> <span style="color: blue;">F</span> <span style="color: green;">S</span> Provide outdoor seating to supplement indoor seating.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<span style="color: purple;">R</span> Include outdoor space for retail.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<span style="color: green;">S</span> Designate outdoor area for family visits.	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.2 Space planning</b>		
3.2.1 Reduce density and/or increase spacing of seating.	<input type="checkbox"/>	<input type="checkbox"/>
<span style="color: red;">E</span> <span style="color: orange;">O</span> Stagger work stations where possible and rotate to face the same direction.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<span style="color: red;">E</span> <span style="color: orange;">O</span> Provide or retrofit locking casters to limit furniture mobility where mobility could pose an issue for physical distancing.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<span style="color: red;">E</span> <span style="color: orange;">O</span> <span style="color: blue;">F</span> <span style="color: green;">S</span> Retrofit dining room or break room layout to increase spacing between tables and limit number of seats to allow for adequate spacing apart of people, measurement taken minimum six feet from shoulder outward. <sup>xx, xxix, xxxi</sup>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.2 Reduce amount of equipment to provide more space.	<input type="checkbox"/>	<input type="checkbox"/>
<span style="color: red;">E</span> Remove/relocate corridor lockers to provide a wider path for common travel.	<input type="checkbox"/>	<input type="checkbox"/>
3.2.3 Restrict access to restroom plumbing fixtures to provide minimum six-foot spacing between individuals at fixtures. <sup>6</sup>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.4 Ensure additional touchless trash cans are placed near entrances, doors, and PPE stations.	<input type="checkbox"/>	<input type="checkbox"/>
3.2.5 Consider one-way traffic flow in common spaces, hallways, entry and exit points, while keeping in mind that changes to typical routes and lengthening travel distances can pose new challenges. <sup>xxxiii, xxxiv</sup>	<input type="checkbox"/>	<input type="checkbox"/>

6. Ensure quantity of plumbing fixtures will accommodate maximum number of building users.

- E Education
- O Office
- F Restaurant
- S Senior living
- R Retail
- H Housing

Considerations organized by CDC priority

	Essential	Desirable
3.2.6 Determine ingress/egress to and from restrooms to establish paths that mitigate waiting in proximity of others, and face-to-face convergence between those entering and exiting. Consider dispersing users with signage to direct them to restrooms that are typically underutilized.	<input type="checkbox"/>	<input type="checkbox"/>
3.2.7 Expand interior queuing spaces where throttling circulation is required; using barriers as necessary to ensure physical distancing.	<input type="checkbox"/>	<input type="checkbox"/>
3.2.8 Relocate some taxi/ride sharing/drop-off stops to increase physical distancing.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>3.3 Non-structural partitions and openings</b>		
3.3.1 Consider an exit separate from the entrance. <sup>xxx</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.3.2 This item regarding limiting entrances was deleted in V3.0, and instead integrated into 3.3.1.		
3.3.3 Identify separate entrances for staff and students, visitors, and/or deliveries.	<input type="checkbox"/>	<input type="checkbox"/>
3.3.4 Create touchless entry capability.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Set revolving doors to continual movement.	<input type="checkbox"/>	<input type="checkbox"/>
• Sliding doors: Elbow-to-push plate activated, voice activated, mobile phone activated, proximity device activated.	<input type="checkbox"/>	<input type="checkbox"/>
• Entry door on motion, proximity sensor or bluetooth command.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Replace door assembly with hands-free doors and hardware.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Use alarm-releases on fire doors in the path of travel.	<input type="checkbox"/>	<input type="checkbox"/>
• Provide automatic door openers/proximity sensors.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Eliminate restroom doors where possible when long corridors/vestibule are able to screen views; alternatively reverse restroom doors to swing out, enabling a touch free exit after washing hands.	<input type="checkbox"/>	<input type="checkbox"/>
• Consider temporarily disabling door latches where fire/life safety is not an issue.	<input type="checkbox"/>	<input type="checkbox"/>
3.3.5 Let in direct sunlight where possible. <sup>7 xxxvi xxxvii xxxviii</sup>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.3.6 <span style="color: orange;">O</span> <span style="color: green;">F</span> <span style="color: purple;">R</span> Install drive-thru and/or pick-up service windows. <sup>xxix</sup>	<input type="checkbox"/>	<input type="checkbox"/>

7. Warmer temperatures and exposure to sunlight will reduce the time the virus survives on surfaces and objects.<sup>xxx</sup>

- E Education
- O Office
- F Restaurant
- S Senior living
- R Retail
- H Housing

Considerations organized by CDC priority

Essential Desirable

**3.4 Signage<sup>8</sup>**

3.4.1 Display COVID-19 mitigation signage on the building's exterior to convey actions taken to protect public health. Use large dimension, high contrast characters on a non-glare surface for legibility.

3.4.2 Post hygiene, cleaning, and sanitizing signage.

3.4.3 Implement floor/pavement markings (i.e., paint/tape) to visualize recommended spacing among occupants.<sup>xxx</sup>

3.4.4 Install markings/signage encouraging one-way travel where practical, however minimize the extent of rerouting to keep travel length and reorientation at a minimum.

3.4.5 Map the floor surface to delineate circulation and/or furniture location.

3.4.6 Place conspicuous signage at entrances and throughout the space alerting occupants to the required occupant limits, minimum physical distances, use of PPE, and other risk management policies.<sup>xxxii</sup>

3.4.7 Use communication boards and digital messaging to convey access or pre-shift information. Incorporating a voice activated feature assists those who are visually impaired.

3.4.8 Place signs indicating that toilet lids (if present) should be closed before flushing.<sup>xxxiii</sup>

**3.5 Plumbing and plumbing fixtures**

3.5.1 Consider implementation of water management program for building operations.<sup>xxxiii</sup>

3.5.2 For buildings experiencing extended closure, flush and test potable water systems.<sup>xxxiv</sup>

3.5.3 Replace flush valves and faucets with hands-free devices.

3.5.4 Add touchless handwashing/hygiene stations throughout, and especially in common spaces.

3.5.5 Replace traditional drinking fountains with touchless type such as a bottle filling station.

3.5.6 Install toilet lids.

8. All signage is recommended to be multi-lingual and include large dimension characters on a high contrast, non-glare surface.<sup>xxxv</sup>

**11 Re-occupancy Assessment Tool V3.0**

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9. For additional guidance on HVAC systems, refer to ASHRAE's COVID-19 (Coronavirus) Preparedness Resources.

10. There are multiple side effects of altering or increasing the airflow in a space. Higher airflow rates could increase resuspension from fomites and increase the potential for contamination throughout the building by distributing indoor air more quickly, at higher velocities and volumes, potentially resuspending more ultrafine particles.<sup>ixv</sup>

11. Systems may also need to be rebalanced to ensure the extended down time has not impacted building performance.

12. Increased ventilation rates and increasing fresh air intake can be helpful if the outdoor air quality and thermal conditions are acceptable. Air pollution is a complication; microbes can be found on particulate matters in the air, and can travel with the particulate matters.<sup>ixv</sup>

13. Higher outside air fractions and higher air exchange rates in buildings may help to dilute the indoor contaminants, including viral particles, from air that is breathed within the built environment. Higher outside air fractions may be achieved by further opening outside air damper positions on air-handling units, thus exhausting a higher ratio of indoor air and any airborne viral particles present. Regional climate and air pollution conditions may limit this technique.<sup>ixvi</sup>

14. ASHRAE recommends increasing the level of filtration in the Air Handling Units (AHUs) upon opening the building to the extent that the air handling systems and fans can overcome the additional pressure drop of the new filters and still maintain air flow at acceptable levels.<sup>ixvi, ixvii</sup>

15. Based on studies of SARS-CoV-2 and MERS, the viability of the COVID-19 virus in aerosol form and on surfaces is highest at low relative humidity levels (i.e., 30-40 percent RH). Relative humidity (RH) above 40 percent is detrimental to the survival of many viruses, including CoVs in general.<sup>ixviii</sup>

**Considerations organized by CDC priority**

**Essential**      **Desirable**

**3.6 Mechanical and passive ventilation<sup>9</sup>**

3.6.1 Utilize operable windows for natural ventilation if possible.<sup>10, ixix, xxxvi, xxxvii</sup>

3.6.2 Ensure ventilation systems operate properly and provide acceptable indoor air quality for the current occupancy level for each space.<sup>11, xxxviii</sup>

3.6.3 Monitor relative humidity, temperature and CO<sub>2</sub> levels regularly to identify and resolve issues quickly.

3.6.4 Increase ventilation rates and air changes.<sup>12, xxxix</sup>

3.6.5 Prioritize fresh air intake versus recycled air where possible by adjusting dampers, economizers, and AHUs.<sup>13, xl</sup>

3.6.6 Commission each restroom for negative air pressure.<sup>xli</sup>

3.6.7 Consider a maximum number of occupants per HVAC zone.

3.6.8 Check filters to ensure they are within service life and appropriately installed.<sup>xlii</sup>

3.6.9 Align HVAC filter selection, cleaning schedule and replacement cycles with ASHRAE recommendations.

- Install HEPA or MERV 16 filters at recirculated air ducts.

- Install filters with at least MERV-13 rating for filtering airborne viruses (MERV 14 is preferred).<sup>14, xliii</sup>

- Seal edges of filter to limit bypass.<sup>xliiv</sup>

3.6.10 Clean HVAC intakes daily.<sup>xlv</sup>

3.6.11 Flush the building for two hours before occupancy in the morning and after occupancy in the afternoon/evening.<sup>xlvi</sup>

3.6.12 Monitor and maintain relative humidity levels, preferably to RH 40-60%.<sup>15, xlvii, xlviii</sup>

3.6.13 Disable demand-controlled ventilation (DCV).<sup>xlix, l</sup>

3.6.14 Consider the use of portable room air cleaners with HEPA filters.<sup>li</sup>

3.6.15 Consider temporary bypass of energy recovery systems.

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Considerations organized by CDC priority

Essential Desirable

3.6.16 If room fans are utilized, take steps to minimize air from fans blowing from one person directly at another individual.<sup>16</sup>

3.6.17 Consider installing UV germicidal irradiation (UVGI) in mechanical ventilation paths or in upper-room applications to indirectly treat air through convective air movement.<sup>16</sup>

3.6.18 Consider utilizing ultraviolet C (UVC) during non-occupied hours for sterilization.

3.6.19 For larger buildings, check cooling and water tower condensate for bacterial growth.<sup>17</sup>

3.6.20: Vent toilets separately where possible (e.g., turn exhaust fan on if vented directly outdoors and run fan continuously).<sup>18</sup>

**3.7 Electrical, lighting, and communications**

3.7.1 Utilize IoT technology (RFIDs/key fobs) to reduce touch points.

- Touch-free door locks

O Touch-free turnstiles

O R F S Touch-free time cards

3.7.2 Replace light switches with motion sensor controls or phone-based application controls.<sup>19</sup>

3.7.3 Program elevators to pick up on only one floor and go to only one floor.

3.7.4 Change elevator controls to voice or mobile phone-actuated.

3.7.5 Increase data security protocols and protections.

3.7.6 Improve conferencing and “shareware” software to facilitate optimal computer-based communications.

**3.8 Appliances, equipment, and accessories**

3.8.1 If instituting temperature check as part of symptom screen process, install non-touch temperature detection equipment as required.<sup>14</sup>

3.8.2 Add easy to clean vending machines.

3.8.3 Provide dishwasher to sanitize reusable utensils/cookware.

16. UV light in the region of shorter wavelengths (254-nm UV C [UVC]) is particularly germicidal, and fixtures tuned to this part of the light spectrum are effectively employed in clinical settings to inactivate infectious aerosols and can reduce the ability of some viruses to survive. However, UV germicidal irradiation (UVGI) has potential safety concerns if the room occupants are exposed to high-energy light. For this reason, UVGI is safely installed in mechanical ventilation paths or in upper-room applications to indirectly treat air through convective air movement.<sup>16K</sup>

17. Such conditions may pose a *Legionella* risk. Additionally, air ducts may need to be flushed, filtration media replaced, and water supply piping flushed to minimize the risk of legionella. For additional guidance on Legionella mitigation, refer to ASHRAE Guideline 12-2020, *Managing the Risk of Legionellosis Associated with Building Water Systems*.

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Considerations organized by CDC priority	Essential	Desirable
3.8.4 Provide equipment that supports physical distancing and decreases the spread of pathogens.	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> <li><span style="color: orange;">O</span> Provide an extra monitor at workstations dedicated to video conferencing.</li> <li><span style="color: orange;">O</span> Utilize personal headsets instead of shared desk phones.</li> <li><span style="color: teal;">S</span> Add built-in technology into resident rooms to enable virtual connection to mitigate the effects of isolation.</li> </ul>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.8.5 Retrofit or replace existing kiosks with touchless kiosks.	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.9 Finishes and furnishings</b>		
3.9.1 Install physical barriers such as clear plastic partitions or sneeze guards. <small>(vii)(viii)</small>	<input type="checkbox"/>	<input type="checkbox"/>
<span style="color: red;">E</span> Use cubbies, shelf units, and other classroom furniture as low barriers adjacent to student desks and adjacent to teaching area.	<input type="checkbox"/>	<input type="checkbox"/>
<span style="color: red;">E</span> <span style="color: orange;">O</span> <span style="color: blue;">F</span> <span style="color: teal;">S</span> Dining area separations: install temporary partitions or tall booths.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<span style="color: orange;">O</span> Utilize temporary, movable partitions to subdivide large working spaces.	<input type="checkbox"/>	<input type="checkbox"/>
Include passive talk ports or intercoms to accommodate hearing impairments and improve sound transmission	<input type="checkbox"/>	<input type="checkbox"/>
3.9.2 Replace or modify restroom stalls/partitions to make partitions floor to ceiling where fire safety and proper ventilation is not an issue.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.9.3 Minimize use of high-touch or difficult to clean finishes and equipment (rugs, mobile whiteboards, etc).	<input type="checkbox"/>	<input type="checkbox"/>
3.9.4 Retrofit existing trash cans or install new no-touch trash cans.	<input type="checkbox"/>	<input type="checkbox"/>
3.9.5 Provide touchless hand soap, and clean towels or air dry hands. <small>ix, ix</small>	<input type="checkbox"/>	<input type="checkbox"/>
3.9.6 Provide cleanable, transparent films over surfaces such as elevator buttons.	<input type="checkbox"/>	<input type="checkbox"/>
3.9.7 Prioritize easy to clean materials when selecting replacement furnishings.	<input type="checkbox"/>	<input type="checkbox"/>

- E Education
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18. Multiple paths will require consideration of supplemental surveillance/security provisions to address the public's proper usage, loss-prevention, and possible violent intruders (active-shooter scenario).

19. Policies such as those listed in section 4.1 may also be applicable to other diseases, such as the flu.

20. Policies may include hazard pay, paid sick time, the identification of essential personnel, flexible work schedules for caregivers, revised PTO carryover policy and/or travel policy, etc. Ensure sick leave policies and practices are consistent with public health guidance, follow state and federal workplace laws and policies, and are shared with employees.

21. Strategies might include isolation, enhanced cleaning and sanitization, temporary office closure, contact tracing, etc.

Considerations organized by CDC priority

Essential Desirable

3.9.8 Enhance acoustic treatment so occupants can hear/be heard through masks.



**3.10 Site work**

3.10.1 R Reconfigure parking and/or access lanes to accommodate curbside pickup.<sup>18</sup>



3.10.2 Provide entry queuing area with ample spacing that also minimizes exposure to inclement weather including wind, sun, and precipitation.



3.10.3 This control was combined with 3.10.2 in Version 3.0.

3.10.4 Ensure the designated building/space ingress and egress pathways support clearly separated directional traffic that also provide ADA accessibility.<sup>19</sup>



3.10.5 Consider providing outdoor heating and/or shading to support exterior programming.



3.10.6 S H Identify ad hoc space for farming and/or biophilic plantings to promote mental wellbeing and enhance food security.



**4. Fourth priority: Administrative controls**

Requires action by the person or business and are typically changes in work policy or procedures to reduce or minimize exposure to hazard.

**4.1 Policies<sup>19</sup>**

4.1.1 Develop an emergency communications plan as well as a pandemic and/or outbreak response plan.



4.1.2 Develop escalation procedure to report potential cases of COVID-19 to local health department.



4.1.3 Identify necessary revisions to human resources policies.<sup>20</sup>



4.1.4 Develop organizational policies to guide what happens if a person at the workplace is found to be COVID-19 positive.<sup>21</sup>



4.1.5 Provide up-to-date education and training on COVID-19.



4.1.6 Identify and accommodate occupants in CDC-defined higher health risk categories.



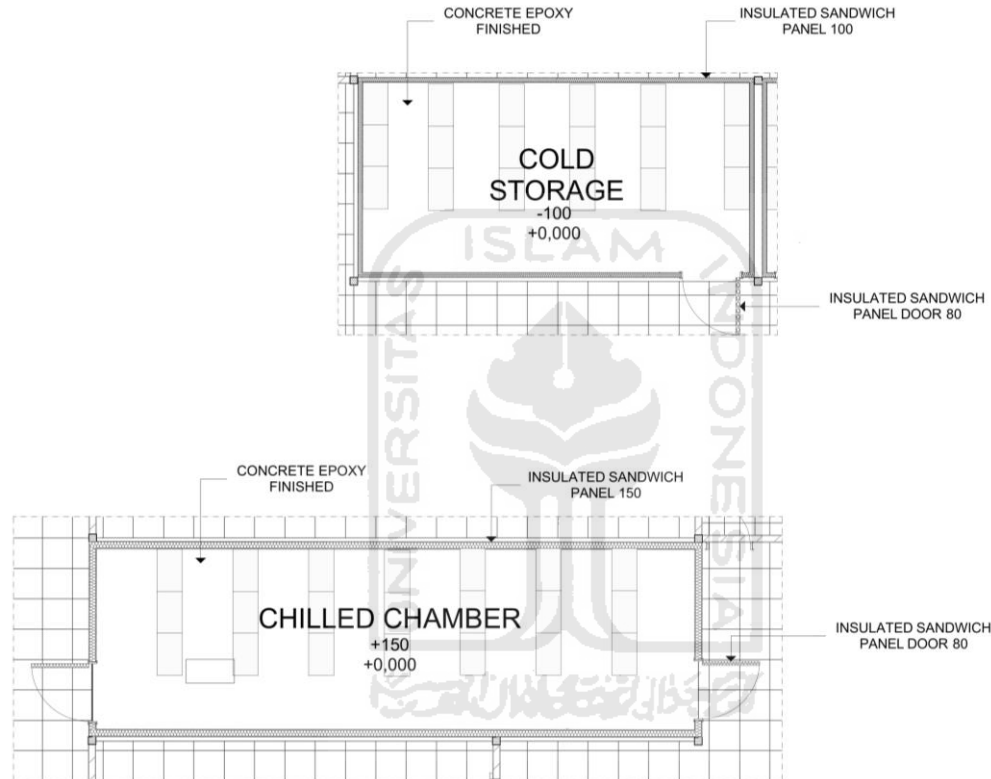
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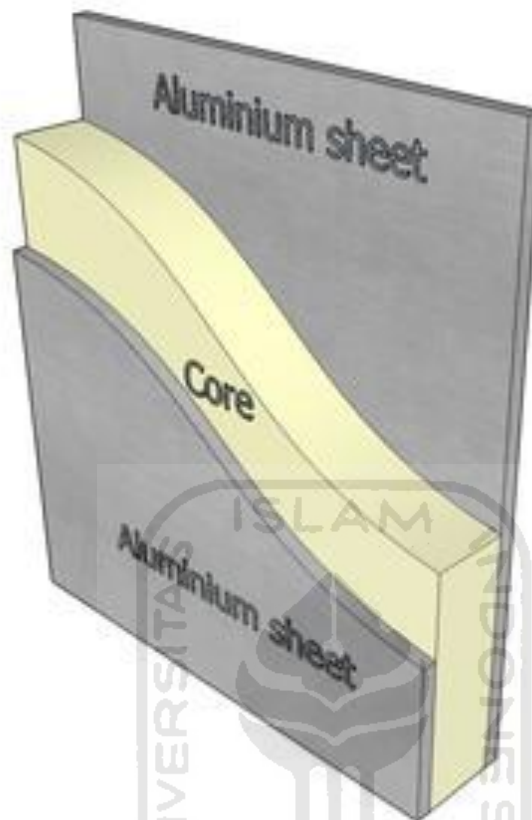
**DESIGN  
REFLECTIONS**

## DETAIL MATERIAL IN THE BUILDING

In this building, especially in factory area, there are some room that needs special attention to the material such as cold storage, chilled chamber, temperature storage, and the toilet. So in the technical drawing, there is special material detail for those room.



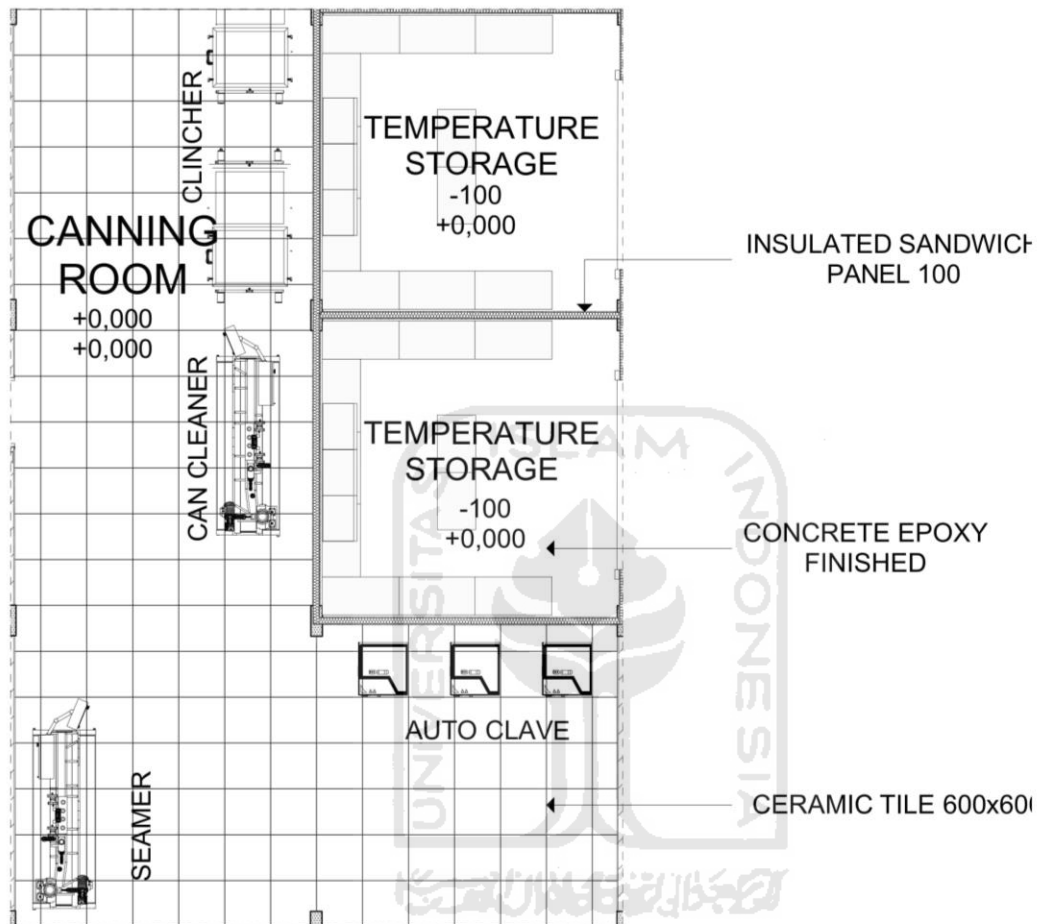
Special materials that can endure high temperatures are used in cold storage and chilled chambers. New concepts have been generated as a result of advancements in the innovation of modern building materials to fulfill the needs of construction work to be more efficient and cost-effective. Sandwich panels are structural materials that can survive hot and cold conditions, and they are one of the latest building materials. This material is made up of two layers: the skin/cover layer is made up of two thin layers that make up the sandwich structure, and the core layer is made up of one layer.



Source : google image

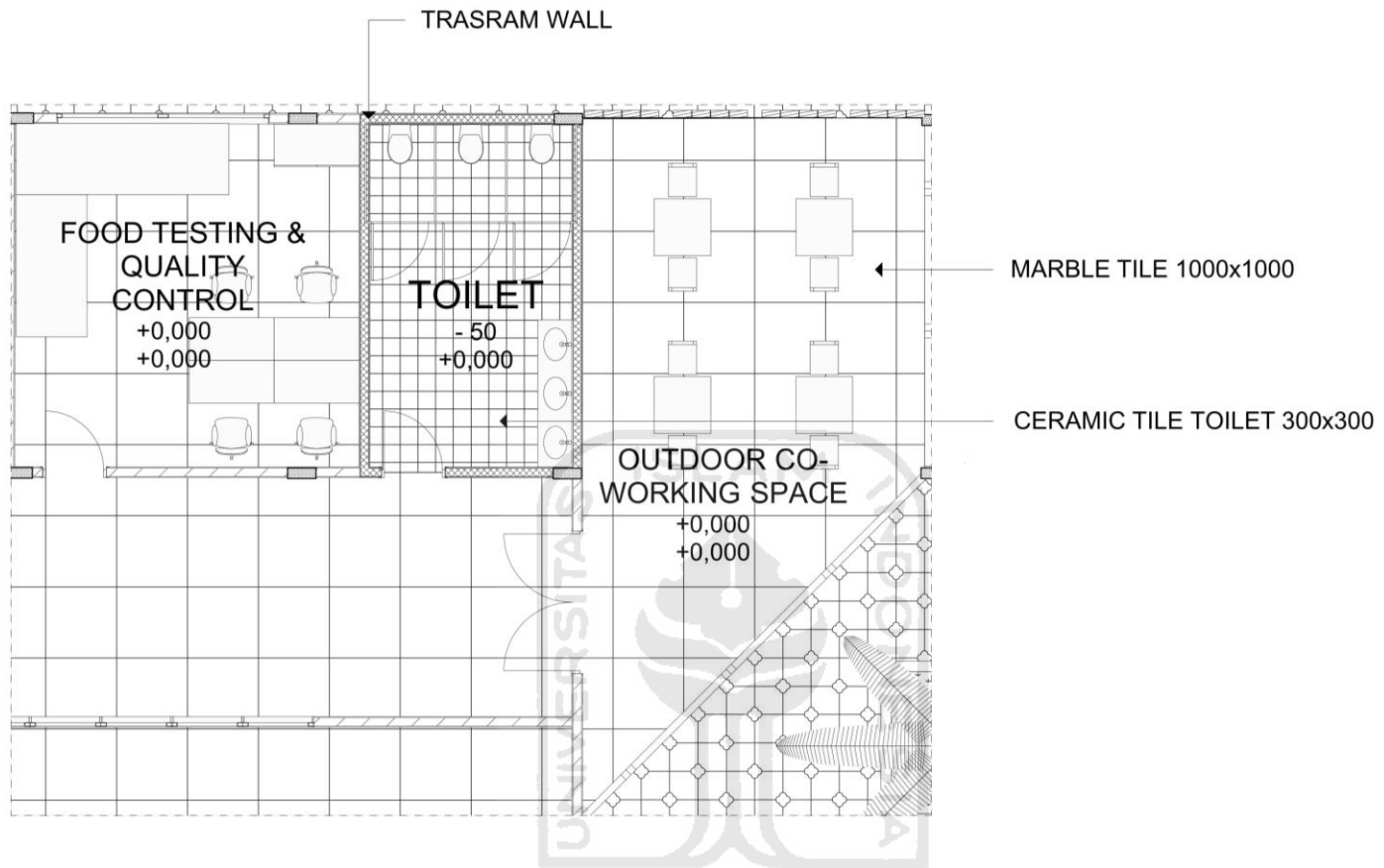
Sandwich panels provide a number of advantages as a building material, including ease of installation and maintenance, energy savings, cost savings, simultaneous installation without finishing, earthquake resilience, lighter materials, and custom manufactured.

Metal or galvanized steel is utilized as the skin layer to protect the surface from corrosion and rust, while Polyurethane is used as the core layer inside the sandwich panel (PU). Rigid and hard foam material with mixed materials or the results of insulating between rubber and plastic to produce a material solution with the advantages of being very friction-resistant, wear-resistant, resistant to some mild chemicals, stable in cold and hot temperatures, and good in energy savings, as well as the ability to prevent condensation. Thickness sizes available in the market in sizes 50, 75, 100, 125, 150 mm.

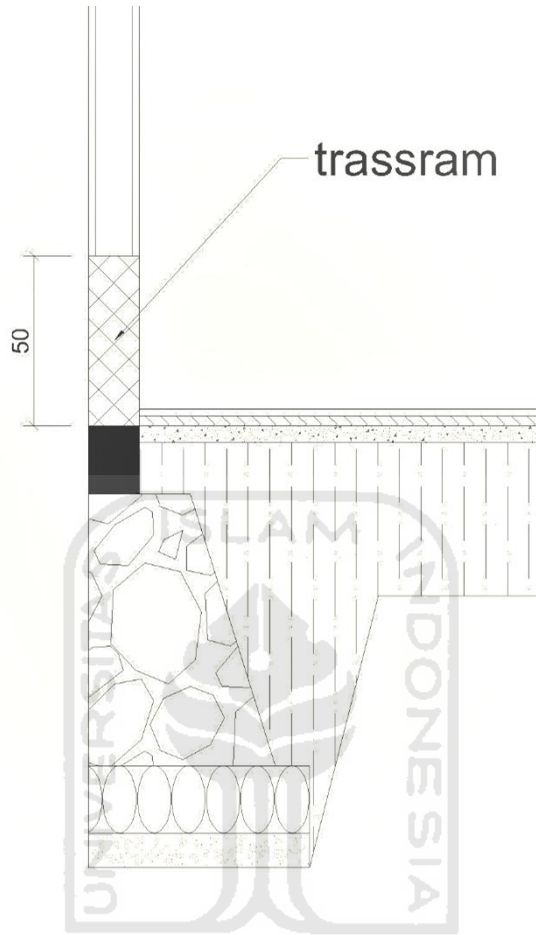


Manufacturing cooling rooms, cold storage, cool rooms, chilling rooms, and freezers with 100mm thick sandwich panels. Typically used to store frozen meat and frozen processed items at temperatures up to -25°C. Meanwhile, 150mm thick sandwich panels are used to make refrigerated rooms, cold storage freezers, semi-contact pallets, and air blast freezers with temperatures as low as -40°C/shift (12 hours), which are used to freeze meat, fish, and processed items.

Then moving to the toilet, the is using trassram wall. Trasram is a cement-based waterproof plaster designed for use on brick walls. Trasram offers excellent adhesive strength, anti-cracking, tensile strength, and water repellency. In wet locations, apply to red bricks, bricks, and aerated light bricks (AAC/ALC).



Trasram is a form of water-resistant brick. The trasram is frequently situated at the bottom, immediately above the sloof, because of its waterproof nature. Trasram is also utilized for wet walls in bathrooms and kitchens. Trasram pairs are in direct contact with the building's foundation (soil), which includes water that can leak through regular masonry and cause damp, moist, and moldy conditions. The room gets uncomfortably damp as a result of the wet walls.



The Trassram is put from 0.20 m below the floor to 0.20 m above the floor for standard walls. Meanwhile, the minimum trassram height for the bathroom Trassram is 1.50 m above the floor, to prevent splashing water from wetting the typical brick wall.

## SPACE ARRANGEMENT

The rooms in this structure appear to serve the same purpose, which is common in innovative architecture. Food tasting and quality control, recipe formulation, public relations, packaging design, and even the research and development area appear to be typical workshop rooms. However, due of the equipment and facilities inside, it is vital to distinguish those spaces.



cooking equipment table

For example, the recipe formulation room above, there will be an extra desk for the cooking equipment and the layout of the table is gather because they will need a lot of discussion in the middle of formulating. Not only about the furniture layout, the reason why the space need to be differentiated is because even they both using computer, but the file need to be separated. For example between public relation and marketing, If the file is mixed, it will be excessively complicated, especially since this is a public space that will be utilized by a large number of people. And so for the public relation space, the work doesn't need that much

discussion. Mainly using the computer to search about the client and stuff. So that's why the layout of the desk is facing the window. Not only it gives nice view while working, but also can increase the entire mood of working by facing the outdoor.



The partition on the table are responding to the re-occupancy assessment tool about the covid spreading. It not only give the privacy to the user, but also can be a barrier due to the pandemic situation.



## CREATIVE SPACE ACTIVITIES

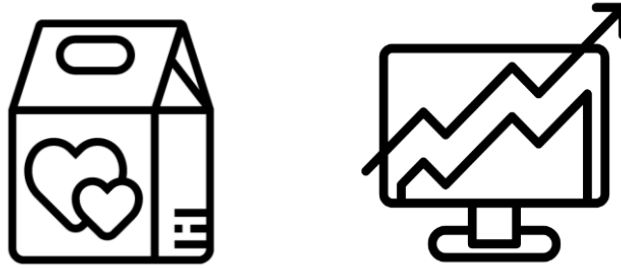
As I mention in chapter 2 about design study of creative hub, the creative hub serves a variety of goals, according to Janine Matheson of Creative Edinburgh and Gillian Easson of Creative Dundee Creative Hubkit:

- To give long-term and short-term support to the idea, the initiative, the organization, and the business that is hosting it, including events, skills training, capacity building, and worldwide chances, through services and/or facilities.
- To make it easier for people in the community to collaborate and network.
- To make contact with R&D centers, institutions, and the creative and non-creative industries.
- Develop active communication tactics to communicate and engage with a larger audience.
- To champion and celebrate an up-and-coming talent who is pushing the boundaries of current practice and taking risks in the pursuit of innovation.

So, this place is more like a creative space rather than a workshop space only, as for the creative hub models according to Janine Matheson of Creative Edinburgh and Gillian Easson, it is an alternative creative hub where it create a creative center focused on introducing new financial sectors and types to the community. This creative hubs can be defined and formed into sections according to features given like:

Structure	: Profit / privacy
Sector	: Specific sector / technology & social enterprises
Hub Offer	:
	- Hot desking
	- Studio room
	- Training, workshop, event
	- Equipment, experience, resources, networking, incubation, business support, monitoring, and retail opportunity financing are all available.

The main activities in this creative space are Packaging and Digital Marketing. Creative packaging entails unique designs and solutions that not only help products stand out from the crowd, boosting their growth and success, but also provide more sustainable and cost-effective solutions throughout the package's lifespan, from the warehouse to the assembly line to store shelves and customers' hands. With creative and ecological designs, packaging can have a beneficial impact on a product's and business's marketing campaign, as well as save shipping and storage expenses. Continue reading to learn more about effective marketing using creative packages, as well as creative sustainable packages that contribute to a greener future.



As a Marketing Strategy : The packaging of a product can have a significant impact on its marketing strategy, as it delivers a statement about its style, purpose, and values. A packaging design must attract the customer's eye in a matter of seconds at the point of sale, providing them a cause to pick up the package and make the buy. Through striking colors, appealing designs, and convenient aspects, creative packaging techniques help things stand out in a crowd of similar objects. Simplicity, portability, and storage are also significant factors to consider.



Source : [jejapiknik.com](http://jejapiknik.com)

Customized logos and vibrant colors may be found on the exterior of inventive wine shipping boxes, as well as convenient handles and innovative cushioning techniques to keep the bottles secure during shipment. Retail display boxes can be packaged and constructed into imaginative kits that reflect the seasons, holidays, or special offers. Closures that keep products safe throughout shipping and give tamper evidence while allowing customers to quickly access the product after purchase are also included in creative packaging.

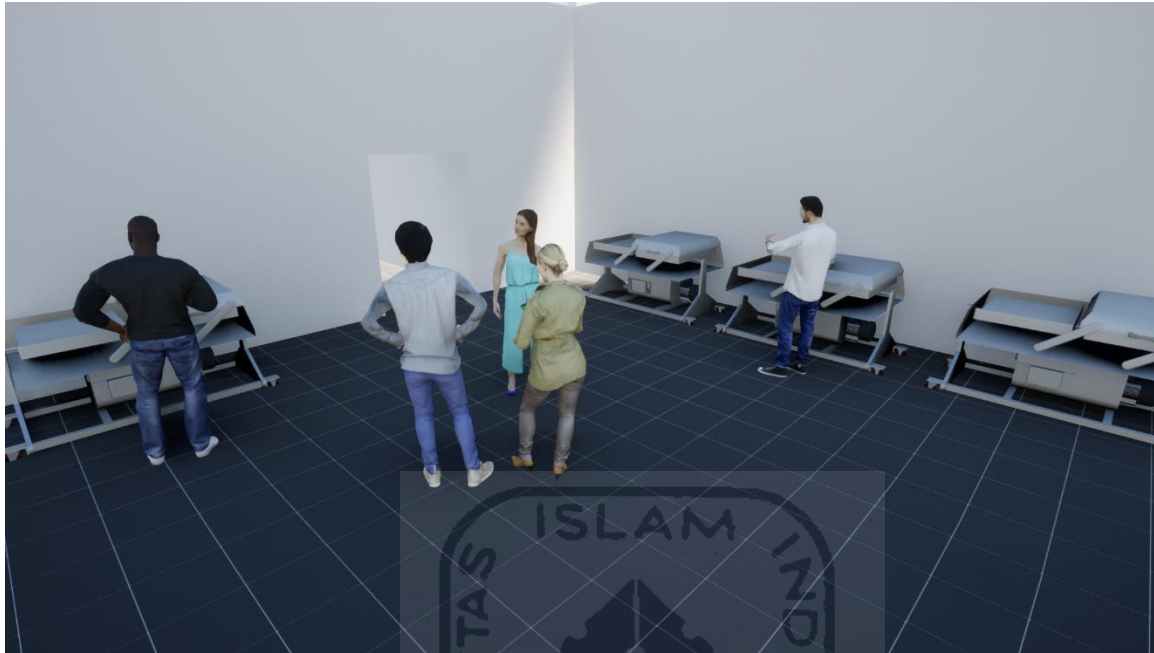
## SPACE NEEDS, QUALITY CONTROL, AND TRIZ: PNEUMATIC AND HYDRAULIC

The Juwana Creative Hub area building will accommodate the analysis of space requirements, activities, and the amount of space utilized to calculate the required space requirements, as well as the size, which is then adjusted to the size of the building the area of the site on the site.

The quantity of space required is mostly dictated by the size of the machine to be employed, as this area will be partially occupied by packaging machines.



The space for this ready-to-eat meal packaging is an example. Because the machine in question is quite large, it takes a lot of room. Other engine rooms, such as vacuum and canning machinery, are similar.



Vacuum Machine Room



Canning Machine Room

For the transportation in the building mainly will use hand lift / hand pallet. Hand Pallet, also known as Hand Jack or Hand Pallet Truck, is a tool used to transfer items on wooden or plastic pallets with varying lifting power and weight capacities in order to make the operator's job easier and save time when transporting one item from one location to another.



Hand Pallet uses a hydraulic mechanism to raise and transport items. Depending on the type and specifications of each Hand Pallet, we can handle big loads ranging from hundreds of kilograms to one ton. As a result of their simple working manner and more portable design, hand pallets are commonly employed in warehouses, industries, supermarkets, shops, and office buildings. This simple equipment also fulfil the TRIZ: Pneumatic and Hydraulic, replacing the pneumatic tube system that aren't used often in the building so its better to be replaced.

Based on the study on CV. Toha Sentosa, the product quality control will be on every step of the packaging process.



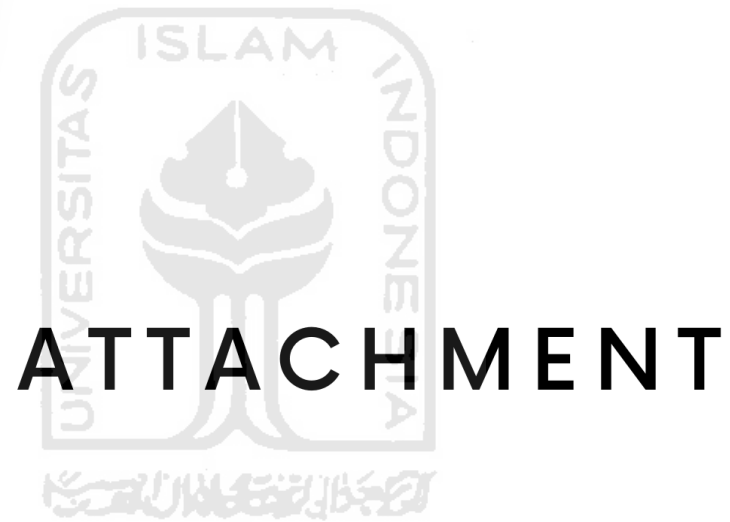
Ready Meal and Vacuum Machine Building



Canning Machine Building

● Quality Control Process

7





# DESIGN OF JUWANA CREATIVE HUB

Designing Food Creative Space Using Re-Occupancy Assessment Approach V3.0 In Juwana

## PREMISE DESIGN

Juwana Creative Hub is a place for people who want to start a business in the frozen and canned food sector. Equipped with adequate facilities such as cold storage, public kitchen, storage room, packaging room, canning room, marketing room, and space for developing creativity such as recipe development, food testing, packaging, and marketing. This place will be a center for the development of creativity in frozen food processing and a gathering place for creative people to showcase their ideas and develop them into a product that will then be marketed. By considering the Re-assessment approach, this place is designed to be used even in times of a pandemic which requires us to keep our distance from each other.

## BACKGROUND



DURING THE COVID-19 PANDEMIC, UNEMPLOYMENT IN PATI RAISED 19,6 PERCENT

## WHY CREATIVE SPACES?



### Jobless

Many people lost their jobs because of the layoffs of employees during the pandemic.



### Producer of Fishery Products

Juwana area has the advantage of being the largest fish producer in Pati Regency.



### Creative Ideas

With the existence of creative ideas, the potential can be developed into business opportunities for the unemployed.



### Creative Hub

That is why a place with adequate facilities is needed to develop these creative ideas.

## WHAT KIND OF CREATIVE SPACES?



### Packaging

- What kind of packaging that are suitable for the following product?
- How is the packaging can change the way of marketing?



### Digital Marketing

- How to increase the number of product sales using digital marketing?
- How to use the digital platform to help the product?



DEPARTMENT OF  
ARCHITECTURE

SALMA YOANI MUSFIRATUN  
17512094

Supervisor:  
Assist. Prof. Dr. Ir. Arif Wismadi, M. Sc.

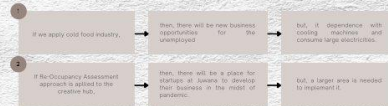
Jury:  
Dr. Ing. Ilya Fajjar Maharka, IA,  
Ir. Tony Kunto Wibisono, M. Sc., IA,

Project Name  
JUWANA CREATIVE HUB  
Designing Food Creative Space using Re-Occupancy Assessment Approach V3.0

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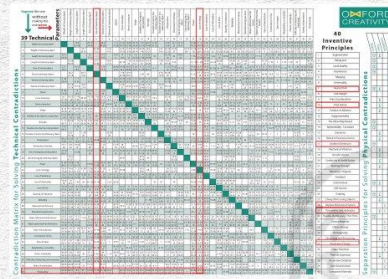


## PROBLEM FORMULATIONS



## TRIZ METHODS

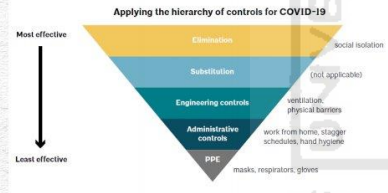
Feature to Improve: Productivity  
Feature to Preserve: Area of Stationary



Inventive Principles (Contradiction 1):  
1. Preliminary Action  
2. Technical System  
3. Local Quality  
4. Asymmetry  
5. Separation in Space  
6. Separation in Time  
7. Multi-Functionality  
8. Weight Compensation  
9. Prior Action  
10. Self-Service  
11. Self-Cleaning  
12. Copying  
13. Inversion  
14. Spherulization  
15. Dynamicity  
16. Partial or Excessive Action  
17. Transition to a Superstate  
18. Mechanical Oscillation  
19. Periodicity  
20. Aperiodicity  
21. Continuity of Useful Action  
22. Hand  
23. Feedback  
24. Intermediary  
25. Self-Organization  
26. Transformation of Properties  
27. Self-Adjustment  
28. Replacement of Parts  
29. Self-Assembly  
30. Self-Protection  
31. Self-Adjustment  
32. Self-Adjustment  
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46. Self-Adjustment

## DESIGN STUDIES : Re-Occupancy Assessment V3.0

The assessment tool does not prescribe required interventions but includes controls applicable to every building type and scales of operation. The controls may be applied to non-essential facilities that are to industry owners with their capabilities (short-term and eventually operate without imposed restrictions (long-term). Not all controls may be applicable to all building types under all situations.



## BUILDING CONTROL

### 3.1 Programming

- Provide deposit, temporary work permits for outdoor working areas to reduce outdoor office.
- Provide outdoor seating to supplement indoor seating.
- Provide outdoor space for staff.

### 3.2 Space Planning

- Stagger work stations where possible and rotate to face air space direction.
- Provide or retrofit locking cabinets to seal furniture cavity when needed to reduce air flow for physical distancing.
- Provide some flexible shelving/height adjust to increase physical distancing.

### 3.3 Non-Structural Partitions and Openings

- Consider air seal between floor and ceiling.
- Consider touchless entry capability.
- Air in and out paths where possible.

### 3.6 Mechanical and Passive Ventilation

- Utilize operable windows for natural ventilation if possible.
- Ensure ventilation systems operate properly and provide appropriate air quality for the current occupancy level for each space.

### 3.7 Electrical, Lighting, and Communications

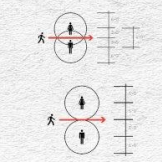
- Utilize IoT technology for occupancy based to reduce floor energy. (Reduce floor loads, lower floor temperature, lower floor area ratio).
- Reduce light pollution with motion sensor controls or photo based application controls.

### 3.9 Finishes and Furnishings

- Utilize temporary, movable partitions to subdivide large-volume spaces. Use partitions to face partitions top to ceiling since the safety and proper ventilation air is less.

### 3.10 Site Work

- Reconfigure parking and/or access lanes to accommodate outdoor office.
- Provide entry queuing area with ample fencing that also can be reconfigured to accommodate outdoor seating and work from home.
- Increase the segregated building/traffic ingress and egress facilities located directly adjacent to the entrance that also provide ADA accessibility.
- Consider providing outdoor seating and/or shading to support outdoor programming.



## ANALYSIS OF USER ACTIVITIES AND SPACE NEEDS

Activities	Users	Facilities	Character	Space Needs
• cooking • packing • storing	• UMKM actors	• Production Facilities	• semi public • slightly crowded • cozy • accessible	• public kitchen • parking space • wash room
• meeting • negotiating • buy and sell • exhibition	• UMKM actors	• Marketing Facilities	• semi public • comfort • calm • accessible	• co-working space • gift shop • exhibition room
• eat/drink • leisure • monitoring • sanitation • storing goods	• management • officer • building management	• Supporting Facilities	• private • cozy • accessible • hidden	• canteen • management office • MEE room • storage room

## SITE LOCATIONS



This location is near the Juwana port, which is currently being developed by the pati regency government to become a fishery center. This place is also rapidly developing into the center of the fishing industry in Pati Regency.

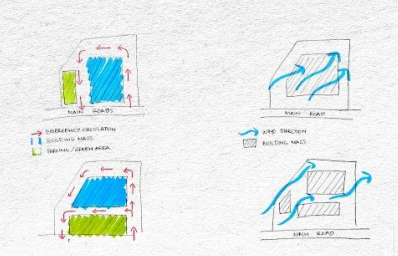
## SITE REGULATIONS

- Building Floor Coefficient (KLB) on secondary collector roads (I. Bajorauyo) for offices and public facilities : 2,4
- Basic Building Coefficient (KBB) on secondary collector roads (I. Bajorauyo) offices and public facilities : 60-70%
- Green Basic Coefficient (KDB) at least 20% of the total land area
- The basement footprint coefficient is calculated for the trading building services, parking lot and/or office that provide basement for land expansion with a fixed value equal to the KDB value pay attention to the construction of the building above it.

Calculation of the area of building that can be constructed based on existing regulations to the size of the plot is 4.111 m<sup>2</sup>.

- Basic Building Coefficient (KBB): 60% x 6.111 m<sup>2</sup> = 3.666 m<sup>2</sup>
- Building Floor Coefficient (KLB): 2.4 x 6.111 m<sup>2</sup> = 14.666 m<sup>2</sup>
- Maximum number of building floors (KLB KDB): 14.666 m<sup>2</sup> - 3.666 m<sup>2</sup> = 4 Floor
- Green Basic Coefficient (KDB) 20% x 6.111 m<sup>2</sup> = 1.222 m<sup>2</sup>

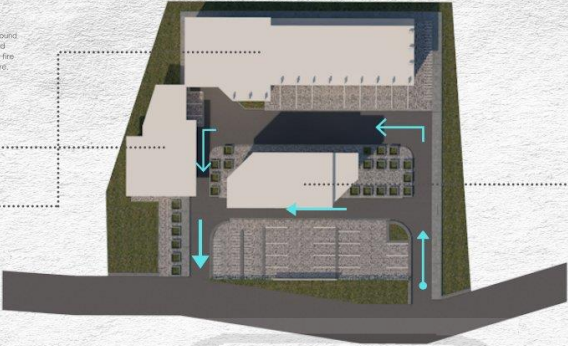
## ZONING ANALYSIS



## DESIGN RESULTS


**SITUATION**

Circulation in this place is designed around the building, so that it can be accessed easily. This can also make it easier for fire engines to get to the location of the fire.



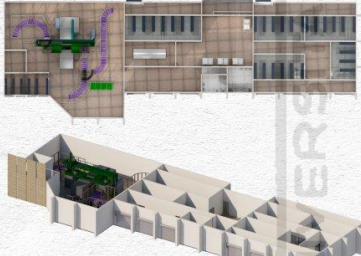
**CREATIVE SPACE AREA**

Meanwhile, this place is devoted to the development of creative ideas. In the lower area will be a semi-public place, in this place, business people can invite several people to test their new menu.




**PRODUCTION READY MEAL AND VACUUM AREA**

This place is dedicated to the production department. Starting from sorting raw materials, processing, packaging, to storage in freezing temperatures.



**PRODUCTION CANNING AREA**

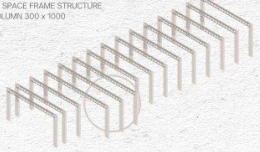

Apart from processing frozen food, this place will also facilitate food canning. This area will be devoted to canning and storage room with a maintained temperature so that canned food can last a long time.



**STRUCTURE SYSTEM**



This building has a very wide span of 15m and 19m, so the use of a space frame is very suitable to be applied to the building.


STEEL SPACE FRAME STRUCTURE  
RC COLUMN 300 x 1000

Concrete structures will be applied to this building by:

Column 150 x 350 cm  
Girder 150 x 200 cm  
Beam 100 x 150 cm



DEPARTMENT of  
**ARCHITECTURE**

SALMA YOANI MUSPIRATUN  
17512094

Supervisor:  
Asist. Prof. Dr. Ir. Arif Wisnadi, M. Sc.

Jury:  
Dr. Ing. Ilya Fajar Mahanka, IAI,  
Ir. Tony Kunto Wibisono, M. Sc., IAI.

Project Name:  
ELWANA CREATIVE HUB  
Designing Food Creative Space using Re-Occupancy Assessment Approach V3.0

**3**

## DESIGN PROFF

### TRIZ: ANOTHER DIMENSION

Moving into 2 Dimensions by arranging the building mass.



### TRIZ: NESTED DOLL

Nest function without additional spaces : Creating space between space, the main reason is because of the privacy.



### 3.1 PROGRAMMING

- Provide dispersed, temporary work surfaces for outdoor working/dining to reduce quarantine fatigue.
- Provide outdoor seating to supplement indoor seating.
- Include outdoor space for retail.

#### OUTDOOR CO-WORKING SPACE



#### INDOOR CO-WORKING SPACE



### TRIZ : PRELIMINARY ACTION

- Pre-arrange objects such that they can come into action from the most convenient place and without losing time for their delivery.



PROVIDE A PLACE THAT ARE CHANGEABLE. THIS WORKSHOP ROOM ARRANGEMENT CAN BE CHANGE ACCORDING TO THE ACTIVITY THAT WILL HAPPEN.

### 3.2 SPACE PLANNING

- Stagger work stations where possible and rotate to face the same direction.
- Provide or retrofit locking casters to limit furniture mobility where mobility could pose an issue for physical distancing.
- Relocate some taxi/ride sharing/drop-off stops to increase physical distancing.



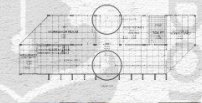
SAME DIRECTIONS WORK STATIONS ON PUBLIC RELATION ROOM & PACKAGING AND LABELING ROOM.



SAME DIRECTIONS WORK STATIONS ON PUBLIC RELATION ROOM & PACKAGING AND LABELING ROOM.

### 3.3 NON-STRUCTURAL PARTITIONS AND OPENINGS

- Consider an exit separate from the entrance.
- Create touchless entry capability.
- Let as direct sunlight where possible.



THERE ARE 2 DOORS TO ENTER THE BUILDING.



MAXIMIZE THE USE OF NATURAL LIGHTING AND USE THE COLUMN AND SECONDARY SIGN TO ACT AS THE SHADING.



PROVIDE AUTOMATIC DOOR OPENERS / PROXIMITY SENSORS.

### 3.6 MECHANICAL AND PASSIVE VENTILATION

- Utilize operable windows for natural ventilation if possible.
- Ensure ventilation systems operate properly and provide acceptable indoor air quality for the current occupancy level for each space.



APPLYING OPERABLE WINDOWS IN EVERY ROOM.

### TRIZ : PARAMETER CHANGE

- Changing the architectural element to create bigger space in such small area



APPLYING MORE WINDOW TO CREATE A TRANSPARENT BARRIER TO MAKE THE LOBBY FEEL BIGGER.



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## DESIGN PROFF

### 3.7 ELECTRICAL, LIGHTING, AND COMMUNICATION

- Utilize IoT technology (RFIDs/key fobs) to reduce touch points, touch-free door locks, touch-free turnstiles, touch-free time cards.
- Replace light switches with motion sensor controls or phone based application controls.



### 3.9 FINISHES AND FURNISHING

- Utilize temporary, movable partitions to subdivide large working spaces.
- Modify restroom stalls/partitions to make partitions floor to ceiling where fire safety and proper ventilation isn't an issue.



PROVIDE MOVEABLE PARTITION.

### 3.10 SITE WORK

- Reconfigure parking and/or access lanes to accommodate curbside pickup.
- Provide entry queuing area with ample spacing that also minimizes exposure to inclement weather including wind, sun, and precipitation.
- Ensure the designated building/space ingress and egress pathways support clearly separated directional traffic that also provide ADA accessibility.
- Consider providing outdoor heating and/or shading to support exterior programming.



DROP OFF AREA



COLUMN AND SECONDARY SKIN THAT ACTED AS SHADING.

## 3D RENDERING



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**ARCHITECTURE**

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17512094

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Direktorat Perpustakaan Universitas Islam Indonesia  
Gedung Moh. Hatta  
Jl. Kaliurang Km 14,5 Yogyakarta 55584  
T. (0274) 898444 ext.2301  
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**SURAT KETERANGAN HASIL CEK PLAGIASI**

Nomor: 1611821710/Perpus./10/Dir.Perpus/VI/2021

*Bismillaahirrahmaanirrahiim*

*Assalamualaikum Wr. Wb.*

Dengan ini, menerangkan Bahwa:

Nama : SALMA YOANI MUSFIRATUN  
Nomor Mahasiswa : 17512094  
Pembimbing :  
Fakultas / Prodi : Teknik Sipil Dan Perencanaan/ Arsitektur  
Judul Karya Ilmiah : JUWANA CREATIVE HUB Designing Food Creative Space Using Re-Occupancy Assesment Approach V3.0

Karya ilmiah yang bersangkutan di atas telah melalui proses cek plagiasi menggunakan **Turnitin** dengan hasil kemiripan (*similarity*) sebesar **16 (Enam Belas) %**.

Demikian Surat Keterangan ini dibuat untuk dapat dipergunakan sebagaimana mestinya.

*Wassalamualaikum Wr. Wb.*

Yogyakarta, 25 Juni 2021

Direktur



Joko S. Prianto, SIP., M.Hum

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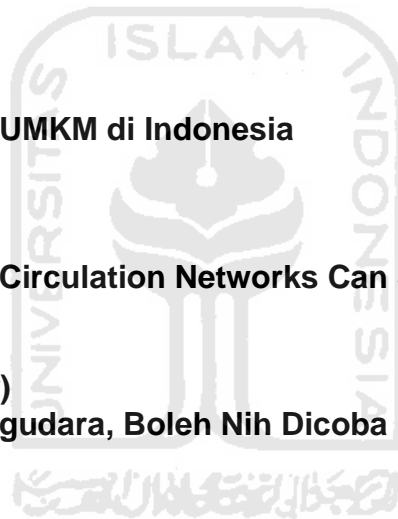
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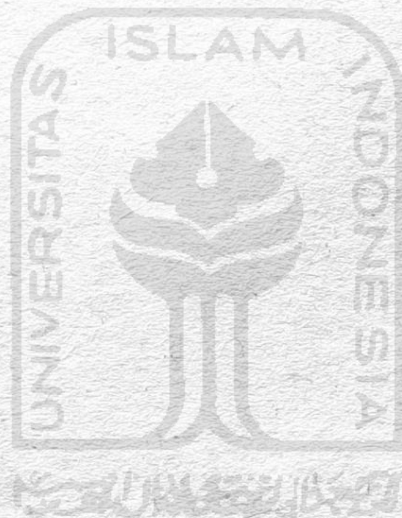
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