

Safety Induction Design on Campus (Case Study: Faculty of Engineering)

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Abstract:- The Faculty of Engineering, X University has several buildings viz the Faculty of Engineering Building (Dean Building), Lecture A Building (Letter U Building), Lecture B Building (BR Building), and Hall Building. In starting a job or activity, the community and guests (visitors) must be able to know the initial steps in occupational health and safety (OH&S). The first step in occupational health and safety is to design a safety induction in starting an activity/job. The aim of this study was to determine designing the safety induction and knowing the safety induction based on the layout. This study was obtained through direct observation and interviews. The results of this study obtained three proposed SOPs (Standard Operating Procedure), that is SOPs when entering the building, SOPs for dealing with disasters, and SOPs for safety induction. The results of the analysis also obtained the proposed evacuation layout in the Faculty of Engineering Building (Dean Building), Lecture A Building (Letter U Building), Lecture B Building (BR Building), and the Hall Building.

Keywords:- occupational health and safety; safety induction; SOPs; layout.

I. INTRODUCTION

The Faculty of Engineering is one of the faculties at X University. Geographically, the location of the engineering faculty is quite strategic and close to industrial areas. So that the engineering faculty often gets visits from similar institutions and industries. Visits from similar institutions are often arranged by visiting practicum laboratories and other facilities in engineering faculty buildings. The mission of the engineering faculty, of which is to improve the governance of the engineering faculty. To support this mission, one which is required is occupational health and safety (OH&S) promotion.

As in [1] and [2], the positive impact of promoting OH&S standards at the acknowledgment organizational level by the government, employers and workers. It effects on reduction of occupational hazards and accidents, increase only risk management and compliance with legal obligations, but also on productivity, leading to more effective use of resources and increased ability to deliver consistent service and products and at the same time improve financial performance.

For improving safety, the promotion of occupational health and safety (OH&S) is used by many parties, both local, national and even international. Promotion OH&S can be implemented in the workplace in many ways. For example, in the fields of constructions [3]–[7], aviation [8], waste management unit [9], [10], small and medium enterprise (SMEs) [11], [12], oil and gas industry [13], the

steel industry [14], and education [15]. The motivation of promotion of OH&S is to increase employee awareness about the importance of OH&S for himself, the workforce, companies and the community around the company. One form of promotion of OH&S, among others, is safety induction.

Safety induction is part of occupational health and safety (OH&S). Safety induction is a way to communicate to the public that occupational safety and health hazards occur during work or visits by the community or new guests so that they can consciously take control of work against the risks encountered [4], [5]. Not only was it someone who obtained information regarding occupational safety induction has the potential to understand the hazards that occur in the work environments [8]. Information issues through induction include information about the site, working methods, proper use of facilities, equipment, welfare facilities, and emergency procedures.

Safety induction at university has not been much discussed yet, so to the best of the author's knowledge, still many opportunities to discuss it. Fath's discusses safety induction at universities with the aim of knowing the effect of safety induction on increasing knowledge and safe attitudes towards one of the research buildings. Meanwhile, this research designs safety induction scilicet engineering faculty, because it has not provided information or guidance on occupational safety and health (OH&S). Safety induction is beneficial for informing or directing occupational safety and health to the community and guests (visitors) to maintain personal safety and health when carrying out activities at the Faculty of Engineering. The main contribution is the state through the making of SOPs (Standard Operating Procedures) and evacuation route layouts. It is helping the community and visitors to take control actions against the hazards encountered. Also useful for ensuring occupational safety and health at the Faculty of Engineering, X University.

II. RESEARCH METHODS

The steps in this research base on [8] are as follows:

A. Data Collection

Data collection methods perform as follows:

a) Observation

Direct observations at the research site, viz faculty of engineering. Monitoring was made on factors that influence the design of safety induction, i.e data on potentially hazardous rooms, data on rooms potentially affected by natural disasters, data on the number of stairs to go up and down, emergency facilities, and gathering points.

- b) Interview
Interviews are a way of obtaining data through communication with other parties who are considered experts. This time, interviews were conducted with newly selected occupational health and safety coordinators at the engineering faculty.
- c) Literature review
This technique is carried out to obtain information and obtain material through books and scientific works related to the research topic

B. Analysis Method

The analytical method used in this study is a qualitative approach. This approach simplifies the data obtained and focuses on the main points, and looks for patterns and flows in the design of safety induction. Then at the final stage, look for conclusions from existing data and perform data processing by designing safety induction.

III. RESULT AND DISCUSSION

Data processing is in the form of submission for SOPs (Standard Operating Procedure) and Evacuation Path Layout. This study obtained three proposed SOPs (Standard Operating Procedure), that is SOPs when entering the building, SOPs for dealing with disasters, and SOPs for safety induction.

A. SOPs when entering the building

The SOPs (Standard Operating Procedure) explain the SOP for entering the building. The SOPs for getting into the faculty of engineering:

- Must maintain good manners in dress and behaviour.
- It is forbidden to bring sharp weapons into the building.
- It is forbidden to fight, consume liquor, drugs, and illegal drugs
- It is prohibited to damage the building and its facilities, doodle, spit and litter.
- No smoking inside the building. Mandatory to maintain cleanliness in the dean's building environment.

B. SOP (Standard Operating Procedure) Facing Disaster

These SOPs explain procedures for dealing with disasters while at the building site. The SOPs for dealing with disasters based on the pocketbook "Response Tangguh Responding to Disasters" written by the National Disaster Management Agency (BNPB) are as follows:

- a) When there is a flood
 - Avoid walking near waterways to avoid being swept away by the current.
 - Turn off the electricity in the building or contact PLN to turn off the electricity in the affected area.
 - Evacuate to safe areas or flood posts as early as possible when standing water is still possible to pass.
 - Immediately secure valuables to higher ground.

- b) When an Earthquake Occurs
 - Do not cause panic or be a victim of panic, follow all instructions from the officer or security guard.
 - Take cover under a table, if the earthquake subsides, get out in order to find a clear place, don't stand near buildings, poles and trees.
 - Do not use the elevator during an earthquake. If trapped in an elevator, contact the building staff or security using the interphone if available.
- c) When a Tsunami Occurs
 - Immediately run to a high and safe place, while telling other friends.
 - Put safety first and leave unnecessary or hindering items.
- d) In the event of a fire
 - Use the nearest extinguisher or water hose, if the fire is still under control, but do not take the risk.
 - If the fire cannot be extinguished, close all doors and leave the building via the emergency stairs.
 - Take the emergency stairs instead of using the elevator.
 - If the clothes catch fire, stop for a moment and lie down, cover your face and roll around slowly to turn it off (do not run because it will start the fire with oxygen).

C. SOP (Standard Operating Procedure) Safety Induction
SOP (Standard Operating Procedure) Safety Induction in one of the buildings, namely the hall building.

STANDARD OPERASIONAL PROCEDURE (SOPs)
Hall Building Faculty of Engineering, X University
I. OBJECTIVE This Standard Operating Procedure (SOP) was prepared as a reference for the use of the hall building at the Faculty of Engineering, X University, along with the facilities and infrastructure.
II. SCOPE This Standard Operating Procedure (SOPs) covers the procedure for the use of the building, the use of facilities and their maintenance and the way to borrow building facilities. This SOP applies to the entire academic community of the Faculty of Engineering, X University and everyone who uses the hall building facilities at the faculty of engineering, X University.
III. Standard Operating Procedures (SOP) for Building Use <ol style="list-style-type: none"> 1. Building users must comply with all applicable regulations in every building at the Sultan Ageng Tirtayasa Faculty of Engineering. 2. Building users may not use the building without the permission and knowledge of the department in charge of borrowing the building. 3. Users of the hall building are not allowed to take and use the equipment or facilities without the permission of the building staff. 4. Building users are not allowed to bring equipment into the building without the permission and

<p>knowledge of the part in charge of borrowing the building.</p> <p>5. Building users must tidy up the tools or facilities that have been used previously.</p> <p>6. Building users should always keep clean and don't litter.</p>
<p>IV. Standard Operating Procedures (SOP) for Borrowing Equipment and Facilities</p> <p>A. Procedure for Borrowing Equipment and Facilities</p> <ol style="list-style-type: none"> 1. Tools and facilities loaned are by those in the letter of borrowing tools and facilities. 2. The duration of borrowing tools and facilities is adjusted with the loan letter. 3. The building loan officer serves the borrowing of tools and facilities on weekdays. 4. If the borrowed tools or facilities are damaged, the borrower is obliged to replace or repair the borrowed tools and facilities.

Table 1: SOPs (Standard Operating Procedure) Safety Induction

a) Layout of the Evacuation Path of the Faculty of Engineering (Dean Building)

The layout of the evacuation route is an illustration or direction to direct to a safer place in the event of a disaster or emergency that could endanger safety. It has been validated by the person in charge of the OH&S Faculty of Engineering, X University. The following is the layout of the evacuation route in the dean's building:

- *Layout of the Engineering Faculty Building Evacuation Path (Dean Building)*

The layout of the evacuation route for the Faculty of Engineering Building (Dean Building) on the 1st floor has been validated by the person in charge of OH&S at the Faculty of Engineering X University.

- *Layout of the Evacuation Path of the Faculty of Engineering (Dean Building) Floor*

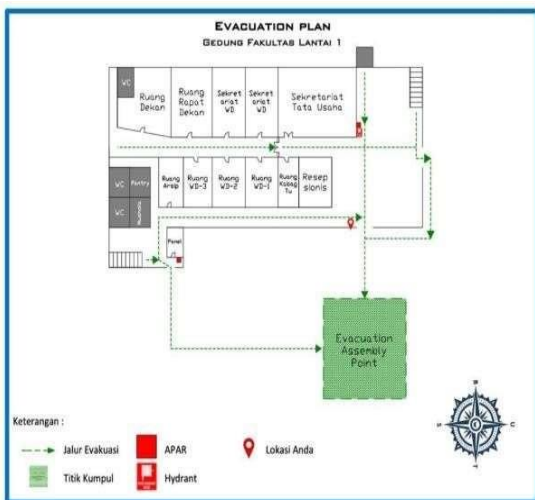


Fig. 1: 1st Floor Engineering Faculty Building Layout

The 1st floor of the Faculty of Engineering building has 12 rooms and has three facilities in the form of women's and men's toilets, one elevator, one pantry room, and a prayer room. In the event of an emergency on the 1st floor of the engineering faculty building, it has two stairs consisting of one stair to go up and a stair to go down. This building also has light fire extinguishing facilities in the form of APAR & Box Hydrant, APAR is used in the event of a fire or minor fire in the building. Furthermore, in the event of a disaster or emergency that could endanger safety, follow the instructions of the evacuation director to be directed to a gathering point or a safe area.

- *Faculty Building Evacuation Path Layout Engineering (Dean Building) 2nd Floor.*

The layout of the evacuation route of the Faculty of Engineering Building (Dean Building) on the 2nd floor has been validated by coordinator of OH&S at the Faculty of Engineering, X University.

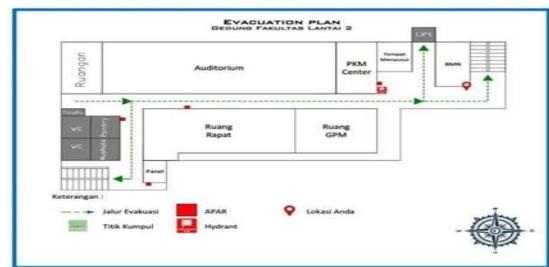


Fig. 2: 2nd Floor Engineering Faculty Building Layout

The 2nd floor of the Faculty of Engineering building has eight rooms and has two facilities in the form of women's and men's toilets, one elevator, a pantry room, and a prayer room. In the event of an emergency on this floor, there are two stairs consisting of 1 stair to go up and a stair to go down. This building also has light fire extinguishing facilities in the form of APAR & Box Hydrant. APAR is used in the event of a fire or minor fire in the building. Furthermore, in the event of a disaster or emergency that could endanger safety, follow the instructions of the evacuation director to be directed to a gathering point or a safe area.

- *Layout of the Evacuation Path of the Faculty of Engineering (Dean Building) Floor 3*

The layout of the evacuation route on the 3rd floor has been approved by of OH&S coordinator of the Faculty of Engineering, X University.

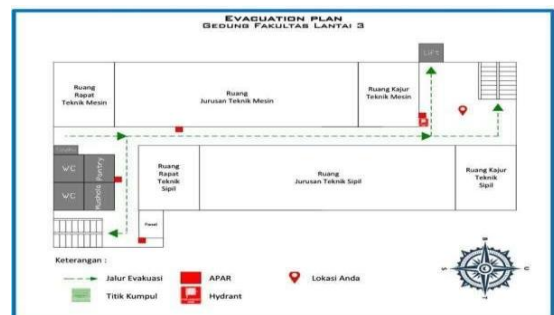


Fig. 3: 3rd Floor Engineering Faculty Building Layout

The 3rd floor of the Faculty of Engineering building has seven rooms and has two toilets (one for men, the other for women), one elevator, a pantry room, an ablution place and the prayer room. In the event of an emergency on the 3rd floor of the engineering faculty building, it has two stairs consisting of 1 stair to go up and one stair to go down. This building also has light fire extinguishing facilities in the form of APAR & Box Hydrant if there is a fire or minor fire in the building. Furthermore, in the event of a disaster or emergency that could endanger safety, follow the instructions of the evacuation director to be organized to a gathering point or a safe area.

- Layout of the Evacuation Path of the Faculty of Engineering (Dean Building)

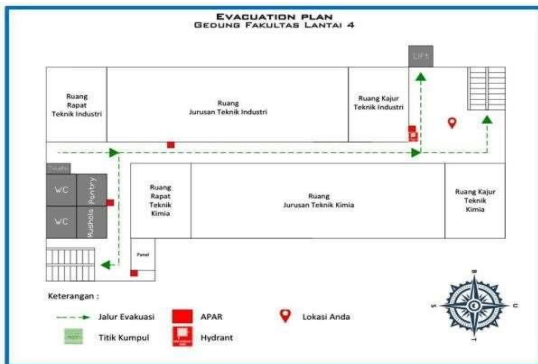


Fig. 4: 4th Floor Engineering Faculty Building Layout

The 4th floor of the Faculty of Engineering building has seven rooms and has two facilities toilets, an elevator, a pantry room, and the prayer room. In an emergency, the building has two stairs that can be taken for self-defence. There are light fire extinguishing facilities in the form of APAR & Box Hydrant, which can be used in the event of a fire or minor fire in the building. In a disaster or emergency that can endanger safety, follow the instructions of the evacuation director to go to a gathering point or a safe area.

- Layout of the Evacuation Path of the 5th Floor Engineering Faculty Building
The layout of the evacuation route Dean Building on the 5th floor has been authorized by the OH&S coordination.

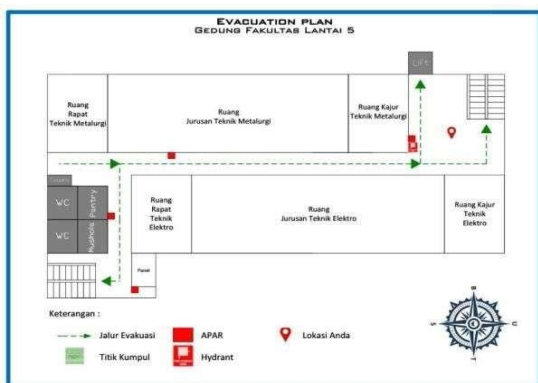


Fig. 5: 5th Floor Engineering Faculty Building Layout

The 5th floor of the Faculty of Engineering building has seven rooms and has two facilities in the form of women's and men's toilets, an elevator, a pantry room, and one prayer room. It has two stairs like other buildings. This building also has light fire extinguishing facilities vis APAR & Box Hydrant. APAR is used in the event of a fire or minor fire in the building. In case of disasters, follow the instructions to be directed to a gathering point or a safe area.

- Layout of Evacuation Paths for Lecture A (Building Letter U)
- Layout of Evacuation Paths for Lecture A Building (Letter U Building) 1st Floor
The layout of the evacuation route for the Lecture A Building (Building Letter U) on the 1st floor has been legalized by coordination of OH&S.

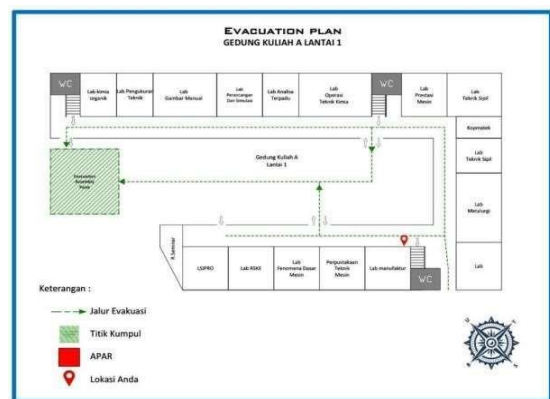


Fig. 6: Lecture Building Layout A-1st floor

Lecture Building A on the 1st floor has 18 rooms and has three facilities in the form of women's and men's toilets. The building has three stairs consisting of a stair to go up and two stairs to go on. Almost every room in this building has light fire extinguishing facilities in the form of APAR. Furthermore, in the event of a disaster or emergency that could endanger safety, follow the instructions of the evacuation director.

- Lecture A Building Evacuation Path Layout (Letter U Building) 2nd Floor
The OH&S coordination recognises the layout of the evacuation route on this building.

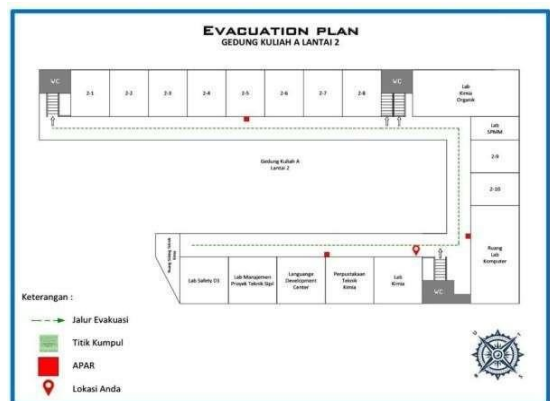


Fig. 7: Lecture Building Layout A-2nd floor

Lecture Building A on the 2nd floor has 18 rooms and has three facilities toilets. Same with the Lecture A Building on the 1st floor, the 2nd floor has three stairs consisting of 1 stair to go up and two stairs to go down. This building also has light fire extinguishing facilities in the form of APAR located on the outer walls of rooms 2-5, 2-9, and LDC. APAR is used in the event of a fire or minor fire in the building. Furthermore, in the event of a disaster or emergency that could endanger safety, follow the instructions of the evacuation director to be directed to a gathering point or a safe area.

- Layout of Evacuation Paths for Lecture A Building (Letter U Building) 3rd Floor
The layout of the evacuation route for the Lecture A Building (Building Letter U) on the 3rd floor has been proved by the person in charge of OH&S at the Faculty of Engineering.

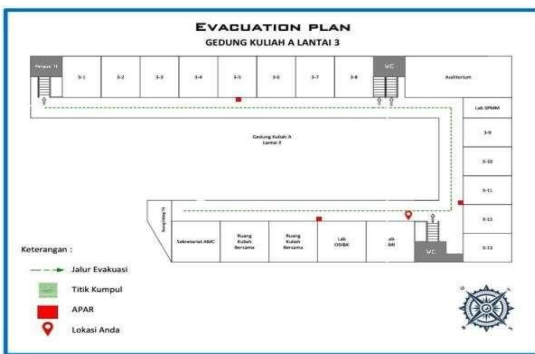


Fig. 8: Lecture Building Layout A-3rd floor

Lecture Building A on the 3rd floor has 21 rooms and has three facilities in the form of women's and men's toilets. If there is an emergency on the 3rd floor of lecture building A, it has three stairs to go down. This building also has light fire extinguishing facilities in the form of APAR located on outdoor walls 3-5, 3-11, and the OSI&K Laboratory.

- Lecture B Building Evacuation Path Layout (BR Building)
 - Lecture B Building Evacuation Path Layout (BR Building) 1st Floor
Evacuation route layout is a description or directions to direct to a safer place in the event of a disaster or emergency that could endanger safety. The following is the layout of the evacuation route on the 1st floor of the B lecture building.

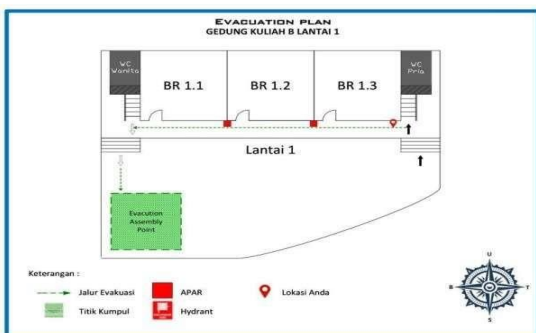


Fig. 9: Lecture Building Layout B-1st floor

Lecture Building B on the 1st floor has three rooms consisting of BR 1.1, BR 1.2, and BR 1.3 rooms. It has two toilets, women's toilets on the left and men's on the right. The building has two stairs consisting of 1 ladder to go up and a ladder to go down. This building also has a light fire extinguishing facility in the form of an APAR which is located on the outdoor ring fence of BR 1.1 and BR 1.2. APAR is used in the event of a fire or minor fire in the building. The instructions will lead to a gathering point or a safe area when a disaster happens.

- Lecture B Building Evacuation Path Layout (BR Building) 2nd Floor
The evacuation route layout for the Lecture B Building (BR Building) on the 1st floor has been validated by the person in charge of the OH&S.

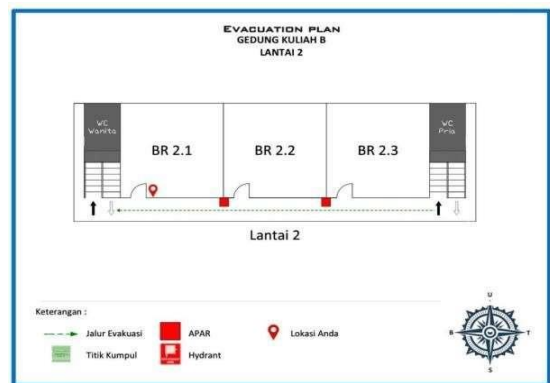


Fig. 10: Lecture Building Layout B-2nd floor

Lecture Building B on the 2nd floor has three rooms viz BR 1.1, BR 1.2, and BR 1.3. It has two toilets, women's on the left and men's on the right. The 2nd floor has two stairs consisting of one ladder to go up and a ladder to go down. This building also has a light fire extinguishing, namely APAR. The APAR is located on the wall of BR 1.1 and BR 1.2. Furthermore, in the endanger safety, follow the instructions of the evacuation director to be directed to a gathering point or a safe area.

- Lecture B Building Evacuation Path Layout (BR Building) 3rd Floor
The layout of the evacuation route for the Lecture B Building (BR Building) on the 3rd Floor has been validated by the person in charge of OH&S.

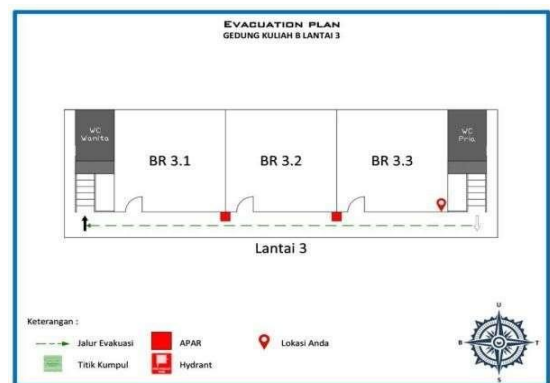


Fig. 11: Lecture Building Layout B-3rd floor

Lecture Building B on the 3rd floor has three rooms consisting of BR 3.1, BR 3.2, and BR 3.3. It has two toilets, women's toilets on the left and men's on the right. If there is an emergency in the building, it has two stairs to down. This building also has an APAR which is located on the wall of BR 3.1. APAR is used in the event of a fire or minor fire in the building. Furthermore, in the event of a disaster or emergency that could endanger safety, follow the instructions of the evacuation director to be directed to a gathering point or a safe area.

- Hall Building Evacuation Path Layout

The layout of the evacuation route is a guide for directing to a safer place in the event of a disaster. The layout of the evacuation route for the Hall Building has been validated by the OH&S coordinator of the Faculty of Engineering. The following is the layout of the evacuation route in the hall building.

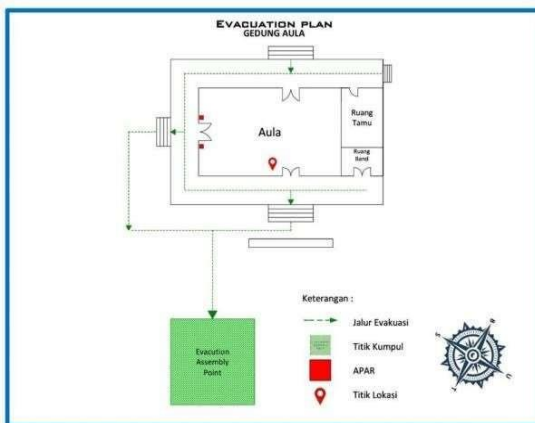


Fig. 12: Hall Building layout

The Hall building has three rooms consisting of a hall, living room, and band room. The hall building has three doors consisting of 1 to enter and two to exit, while the living room and band room have 1 door to enter and exit. This building also has APAR. It is used in the event of a fire or minor fire in the building. Furthermore, follow the instructions of the evacuation director to be directed to a gathering point or a safe area if any disaster happens.

IV. CONCLUSION

The proposed SOPs in this study are SOPs when entering the building, SOPs for dealing with disasters, and SOPs for safety induction. SOPs entering the building inform the procedures for dressing and behaving while in the building area. Meanwhile, SOPs for disasters notify the steps in dealing with disasters while in the building area. Furthermore, SOPs safety induction provides information or direction to the community and guests (visitors) regarding the steps for using the building, building facilities, and tools in the building.

The layout of the evacuation route in the building provides direction to the community or guests (visitors) at the Faculty of Engineering to get to the assembly point when there is a potential disaster that can endanger safety or health in activities.

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