



اَوْنُوْرَسِيْتِي تِي كُنُوْ لُو كِي مَارَا
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**ECS 358
CIVIL ENGINEERING DESIGN PROJECT**

**REINFORCED CONCRETE BUILDING
DESIGN PROJECT
&
PROJECT BASED LEARNING (CASE STUDY)**

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It is my pleasure to remind the fine people in MARA University of Technology for their sincere guidance that been received by me to uphold the project as well as the skill in the subject that been taken which is Civil Engineering Design Project (ECS358).

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In residential buildings, firefighting equipment or devices are important. An alarm system must be built according to project specifications. The fire can be detected by a smoke detector, a heat detector or manually by a person via the manual button, then the alarm system is activated. As the first stage of the alarm system, the smoke detector and manual call point will transmit an emergency signal to the control room. The control room will confirm the emergency by dispatching personnel to the affected areas. They will evacuate people from the affected area by activating an alarm in phase 2 after the emergency is identified. There is also an effective system when using a sprinkler fire suppression system. This can help reduce fires when watering areas that meet UBBL requirements.

According to project, the building consists of a two-storey townhouse. This means that firefighters use the stairs in the event of a fire. This is very important as it can help firefighters move from the ground floor to the fire level in the shortest possible time. The width of the existing floor complies with the provisions of the seventh asterisk of this statute. In addition, the staircase must be of such a width that it can support the greatest load on all floors of access to the staircase, calculated according to the provisions of the seventh annex of these regulations. The required step width must correspond to the free width between the walls, but the railing can exceed this width by up to 75 mm. The required width of the staircase must be maintained along its entire length, including the landing. The fire extinguisher should also be provided in accordance with relevant codes of conduct and should be placed in prominent places or exit routes to be visible from all directions and a similar fire extinguisher in a building should have the same mode of operation.

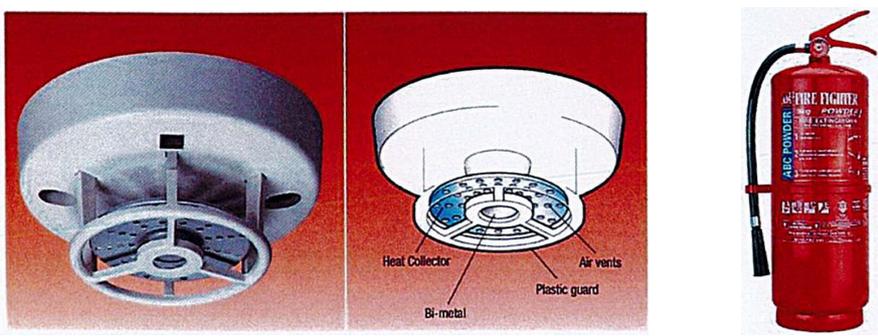


Figure 1 show heat detector and portable fire extinguisher

From the designated works that have been done, all the design that been calculated by manual are the critical elements that show if all the elements are pass, other also will follow the designated design. This is because if the calculation is not pass, the student needs to redesign the construction elements because the student will be the engineer that will conduct the construction site to create a building that have safety aspect so that the building is safe for user to stay and used. With the detailing that been design also will help in constructing the building to make the contractor easy to understand on how the reinforcement and shear link that required for the specified construction element. For PROKON calculation, several element of the construction work cannot be compared to the manual due to difference of method, calculation and formula that even not come close to the unit that been calculated in manual. The PROKON data also show no error for the input as the value is not turn red in color. It is true that the PROKON is the software that can be use by the student to check either the manual design is no having problems or not, but for some circumstance, the value that been calculated by the PROKON cannot be compared with manual calculation. This is because the student did not expose to the method and formula that been used by the software and student cannot determine either the manual design is achieved the required specification or not. Also, the computation of the calculation code did not be studied in the programme code which is EC110 that make it difficult and hard for the student to take other option on how the software been programmed.

For the taking off and Bill of Quantities, the student can know on ho much the cost of material to construct the building by applying the Civil Engineering Quantities and Estimation (ECM366) knowledge towards this project. With this, the student has the experience in estimating experience even though not by getting it by internship course. The student also can know the latest rate of material of the construction material so that they can planned of the construction budget to avoid any over-budget of the project.