DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

QUALITY CONTROL OF SEKOLAH AGAMA KEBANGSAAN JOHOR (SAKJ) PROJECT

Prepared by:

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DEPARTMENT OF BUILDING

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

UNIVERSITI TEKNOLOGI MARA (PERAK)

DECEMBER 2019

It is recommended that the report of this practical training provided

By

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2017206676

Entitled

QUALITY CONTROL OF SAKJ PROJECT

Accepted in partial fulfilment of requirement has for obtaining Diploma in Building

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STUDENT'S DECLARATION

I hereby declare that this report is my own work except for extract and summaries for which the original references stated herein prepared during a practical training session that I underwent at KPRJ BUILDERS SDN BHD for duration of 20 weeks starting from 5 August 2019 and ended on 20 December 2019. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfilment of the requirements for obtaining the Diploma in Building.

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ACKNOWLEDGEMENT

Alhamdulillah, praise to Allah, The Most Gracious and The Most Merciful for a great chance for learning and professional development I had with KPRJ Builders Sdn Bhd. Therefore, I consider myself as a very lucky individual as I was provided with an opportunity to be part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who led me though this internship period.

Bearing in mind previous I am using this opportunity to express my deepest appreciation to all those who provided me the possibility to complete this report. A special gratitude I give to En. Mohd Ayub, Senior Site Supervisor of KPRJ Builders who is my supervisor in spite of being extraordinarily busy with his duties, took time to hear, guide and keep me on the correct path and allowing me to carry out my project at their esteemed organization and extending during the training.

It is my radiant sentiment to place on record my regards, deepest sense of gratitude to En. Norazizi, Construction Manager and En. Kamesan, Senior Site Supervisor for their mentoring and precious guidance which were extremely valuable for my study both theoretically and practically. At last but not least, I am thankful to my family and friends for their generous attitude and have been always encouraging me through the practical training.

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I perceive as this opportunity.

ABSTRACT

Defects and failures are common phenomena in construction industry. Negative impacts may arise towards cost, duration and resources of projects. Furthermore, if this situation is left untreated, it will lead to more serious problems in the future upcoming construction project in Malaysia. This report focuses on the contribution factors of building defects that significantly needed attention either still under construction or completed. There are a lot of defects to the school especially in terms of workmanship and material. The study is conducted to identify the types of building defect occur in school building in Pasir Gudang district. Data was collected through interview reviews and document reviews. The inspection of building defects was carried out by a site supervisor and a technician. The result shows that the poor workmanship, poor material usage and not according to specifications, lack of supervision, not follow the method statement given, surrounding temperature and environment and manpower allocation. The solutions to overcome the defects are revise back the method statement, ensure good workmanship, hire a competent worker, ensure good quality of material before usage and give proper training. It is significant to improve the effectiveness of managing appraisal process of failures and defects in the future.

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CHAPTER 1.0
INTRODUCTION

Malaysia is currently in the intermediary phase of development and industrialization whereby many construction projects are being developed including public buildings which is educational buildings and government buildings. However, various types of defects can be found inside or outside buildings. (Ahmad, 2004)

Defect is the nonconformity of a component with a standard or specified characteristic. Defect is used sometimes a synonym for "failure", but the preferred meaning is to indicate only a deviation from some (perceived) standard that may, but will not necessarily, result in failure (Hall, 1988). A building or construction defect is a defect or deficiency in the design, construction or materials on construction project. According to the BS 3811 (Maintenance, 1964) defined defects as deterioration of building features and services to unsatisfactory quality levels of the requirements of users. Many types of research conducted and found that defects can be attributed to various factors. According to (Ramli, 2006), defects in the building are the problem faced by most of the building regardless of building construction techniques or age but it depends on the causes and the factors causing the occurrence of the defects.

Defects can be classified as major defect or minor defect. Major defect is considered as those which cause the building to become unsafe, unsuitable for living in and not suitable to be used for the purposes for which building was designed. On the other hand, minor defects is considered as those originate from poor workmanship or deficient materials used in the construction of the building but do not cause the building to become unsafe, unsuitable for living in and not suitable to be used for the purposes for which building was designed.

In fact, all new buildings have problems in defects like surface cracks, leakage occur in new buildings was due to poor workmanship of the labor, lack of skilled supervision, limited time and etc. This study will identify the types of defects and factors contribute to the building defects in order to create safe building.

1.1 Objectives

The objectives of carrying out this study are as follows:

1. To identify and analyse the types of building defects occur in school.

2. To identify the causes of the building defects.

1.2 Background and Scope of study

Figure 1.1: Location of case study (Source: Google Maps)

This study was carried out on the selected area at Pasir Gudang state which are SAKJ Taman Nusa Damai, SAKJ Taman Bukit Mutiara 16 and SAKJ Taman Scientex were selected as the main scope of the study to obtain information about quality control. The study was limited to the selected building due to limited time in covering several other buildings with same defective symptoms. This study focuses on the systems of quality control of school project, QAQC and QLASSIC. Besides that, the quantity of labor and the defect liability period (DLP) are not within the interest of this study.

1.3 Research method

The research of case study on quality control of school building has been carried out by using several methods in gaining more information.

i. Observation.

Observation on what plan and techniques can be used during inspection have been carried out for an hour everyday each school for four months. Pictures were taken by iPhone 8Plus camera and notes were written on A3 paper which is detail construction drawing for easier reference and evidences.

ii. Interviews.

Interview sessions were conducted at the site office attended by site supervisor, sub-contractor and labors and led by supervisor of the client representative. All the discussions were recorded on a note book.

iii. Document reviews.

The defect checklist was proposed by sub-contractor and have approved by En. Ayub, Senior Site Supervisor of KPRJ representative to recheck the fix for building defects.

CHAPTER 2.0
COMPANY BACKGROUND

2.1 Company Information

KPRJ Builders Sdn Bhd (formerly known as Julung Cipta Sdn Bhd) is a wholly owned subsidiary of Kumpulan Prasarana Rakyat Johor Sdn. Bhd. (KPRJ) whereas KPRJ is accompany wholly owned by the state of Johor. On 26th March 2004, KPRJ Builders has been made the wholly own subsidiary of KPRJ and appointed new board of directors with a new management team. KPRJ Builders is actively involved with the current development within Nusajaya and Iskandar Development Region.Some of KPRJ Builder's main clients are Nusajaya Development Sdn. Bhd., Iskandar Bhd, YPJ Holdings Sdn Bhd, Island & Peninsular Group, IDR Assets Sdn Bhd and Johore State Government.

2.2 Organization Structure

In the beginning, KPRJ Builders was set up for maintaining and building new mosques in several district of the Johor State for KPRJ. A total 32 other mosques had been successfully completed in several districts of Johor under this programmed. On 26th March 2004, KPRJ Builders has been made the wholly own subsidiary of KPRJ and increased the paid-up capital for KPRJ Builders to RM1, 500,000.00 as of the year before, 28th May 1997, the paid-up capital was RM600, 000.00. With the new term on board KPRJ Builders has been awarded construction of 95 nos. abandoned projects Sekolah Agama Kerajaan Johor (SAKJ) with contract sum of RM168 million and expected to be completed in 2017.

2.3 Company Profile

Vision

"To deliver maximum returns to the State of Johor and to continuously benefit the Rakyat"

Mission

KPRJ Builders contributes to the nation-building through:

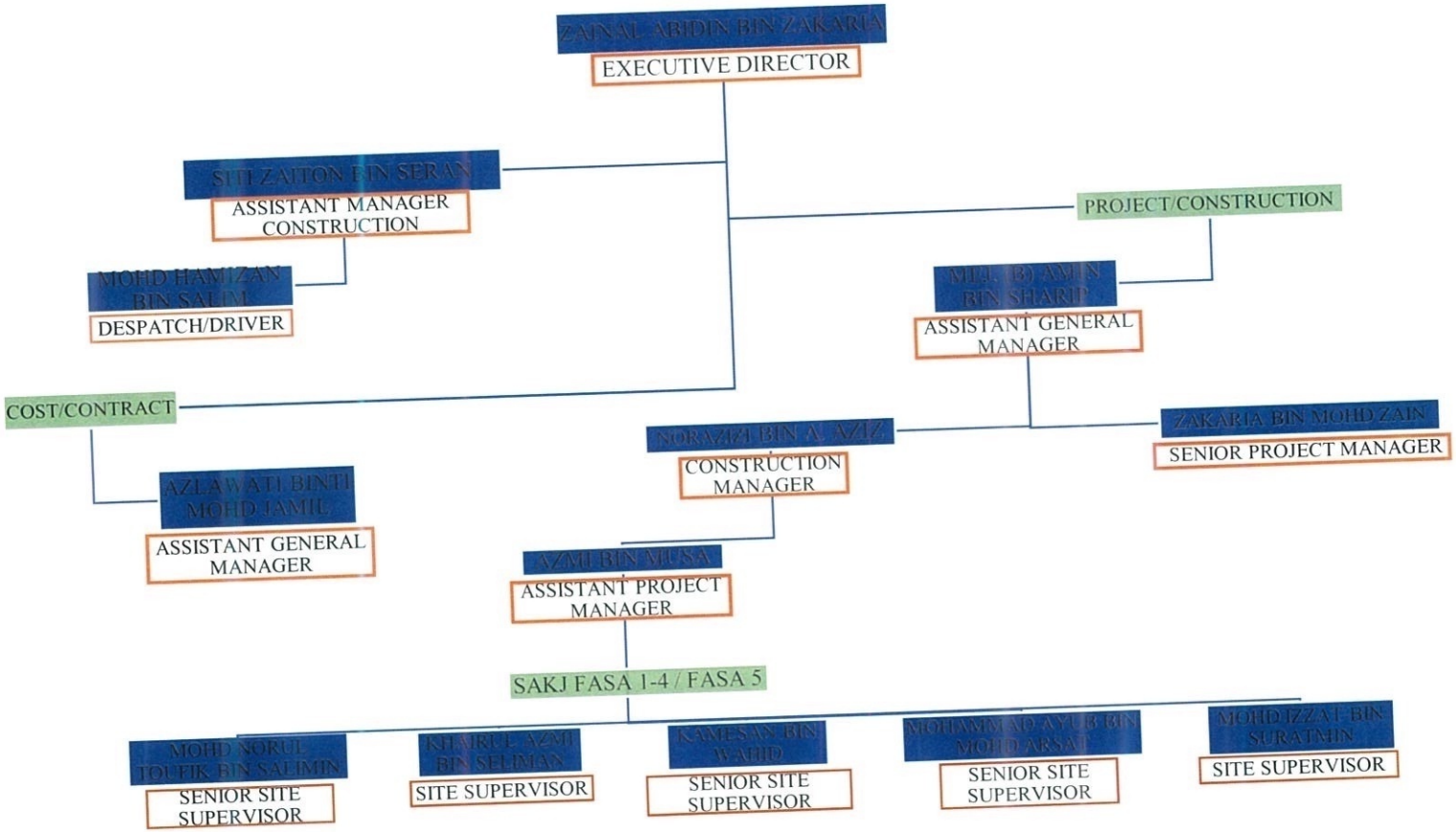
- To accomplish innovative and high-quality projects in order to maximize returns.
- To conduct various CSR programs that bring added value to the community.
- To develop human capital high potential and value.

Objective

- Integrity
- Teamwork
- Commitment
- Leadership
- Innovation
- Quality

2.4 Organization Chart

Figure 2.2.0: Organization chart of KPRJ Builders staff (Source: KPRJ Builders Sdn Bhd)



2.5 List of Projects

2.5.1 List of completed projects

NO.	PROJECTS	CONTRACT VALUE (RM)	DATE OF COMMENCEMENT	DATE OF COMPLETION
1.	STATE SECRETARY COMPLEX FOR JOHOR STATE NEW ADMINISTRATIVE CENTRE, BANDAR NUSAJAYA, JOHOR.	89,514,968.53	26 Dec 2005	2 Feb 2009
2.	CADANGAN PEMBANGUNAN 752 UNIT PANGSAPURI MAMPU MILIK 5 TINGKAT BESERTA KEMUDAHAN AWAM DI ATAS SEBAHAGIAN LOT 39889, DI KAMPUNG SETANGGI, JALAN TEBRAU, JOHOR BAHRU.	48,500,000.00	1 March 2005	30 Oct 2009
3.	PACKAGE ASSOCIATED INFRASTRUCTURE WORKS FOR THE DEVELOPMENT OF RAFFLES AMERICAN SCHOOLS (RAS) IN ISKANDAR MALAYSIA, JOHOR FOR EDUCITY ISKANDAR MALAYSIA SDN. BHD.	6,900,000.00	9 April 2015	8 Jan 2016

Table 1.2.5: List of completed projects (Source: Company Profile of KPRJ Builders Sdn Bhd)

2.5.2 List of on-going projects

NO.	PROJECTS	CONTRACT VALUE (RM)	DATE OF COMMENCEMENT	DATE OF COMPLETION
1.	CADANGAN PEMBINAAN SEBUAH STADIUM BERSERTA KEMUDAHAN BERKAITAN DI ATAS LOT PTD 181003 (TANAH KERAJAAN) MUKIM TEBRAU, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM – PAKEJ 1 KERJA TANAH.	14,082,039.45	26 Oct 2016	24 Apr 2017
2.	CADANGAN MEREKABENTUK, MEMBINA DAN MENYIAPKAN SEKOLAH AGAMA KERAJAAN NEGERI JOHOR (SAKJ), DI ATAS SEBAHAGIAN LOT 77603 (PTD 84033), JALAN TUALANG 1, BANDAR PUTRA, 81000 KULAI, JOHOR DARUL TAKZIM, UNTUK TETUAN JABATAN AGAMA ISLAM NEGERI JOHOR.	8,750,000.00	12 Oct 2016	11 Oct 2018
3.	CADANGAN PEMBANGUNAN DI ATAS LOT 160866 (PTD 181003) (TANAH KERAJAAN), MUKIM TEBRAU, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM – PAKEJ 2 PILING WORKS, BUILDING WORKS, INFRASTRUCTURE WORKS AND ALL ASSCOCIATED WORKS.	130,292,468.22	5 July 2017	4 Jan 2019

Table 2.2.5: List of on-going projects (Source: Company Profile of KPRJ Builders Sdn Bhd)

CHAPTER 3.0
CASE STUDY

The case study was conducted in selected school project KPRJ Builders Sdn Bhd as the contractor appointed by Majlis Agama Islam Negeri Johor (MAINJ) as client to manage SAKJ construction project. Average of contract price is RM 3 million to RM 5 million. This project has 2 phases which are 'FASA 4 – Cadangan Membaikpulih dan Menaiktaraf Kerja Pengambilalihan Projek SAKJ' and 'FASA 5 – Cadangan Merekebentuk, Membina dan Menyiapkan Kerja Pengambilalihan Projek SAKJ'.

Figure 3.3.0: Location of SAKJ Taman Bukit Mutiara 16 (Source: Google Maps)

The case study was conducted at Sekolah Agama Kerajaan Johor (SAKJ) Taman Bukit Mutiara 16, Taman Bukit Mutiara, 81100 Johor Bahru, Johor Darul Ta'zim. Teamcoat Metalcare and Development Sdn Bhd was appointed as sub-contractor to manage this site project. Site starting date was 7 December 2017 until now still in progress. 80% of physical building almost completed except external works which were ancillary building and roadwork.

Figure 4.3.0: Location of SMK Taman Nusa Damai (Source: Google Maps)

The second location was carried out at Sekolah Agama Taman Nusa Damai, Jalan Damai Utama, Taman Nusa Damai, 81700 Pasir Gudang, Johor Darul Ta'zim. SPJB Builders Sdn Bhd was appointed as sub-contractor and ARH Jurukur Bahan as Project Management Consultant (PMC). Site starting date was 4 September 2017 until now still in progress. 98% of total project almost completed except water and electricity supply management for CCC recommendation process.

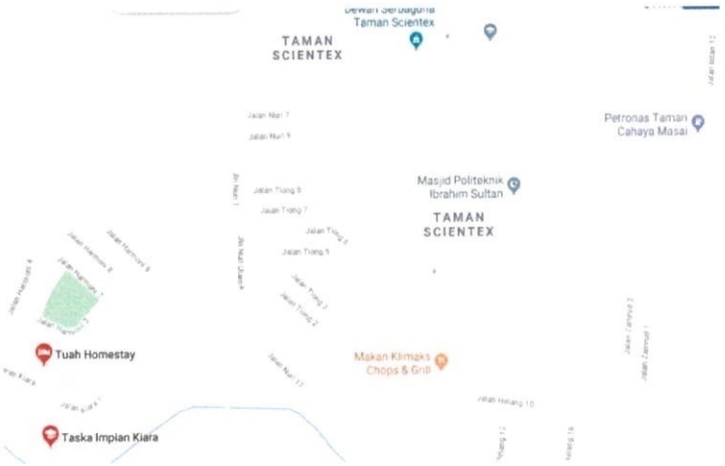


Figure 3.0.5: Location of SAKJ Taman Scientex (Source: Google Maps)

This site project is in Fasa 4 where the project is an additional building according to growing number of students in the area. The third location was carried out at Sekolah Agama Taman Scientex, Jalan Pelanduk, 81700 Pasir Gudang, Johor Darul Ta'zim. Terajuemas Enterprise was appointed as sub-contractor in this project. The contract price is RM 2,098,800.00 and site possession was 7 December 2017 until now still in progress. 99% of whole project except survey pending of sewerage.

3.1 Types of defect

In general, there have several building defects which usually occur to building parts such as roofs, walls, floors, ceilings, toilets, doors and windows. There are various types of building defect can be found in the building such as:

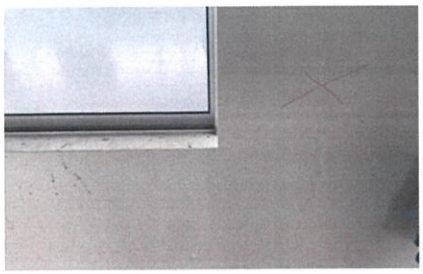
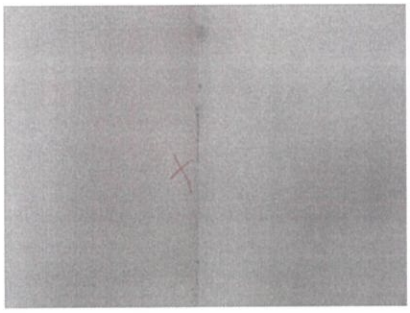
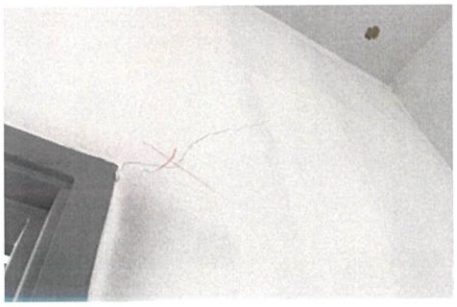
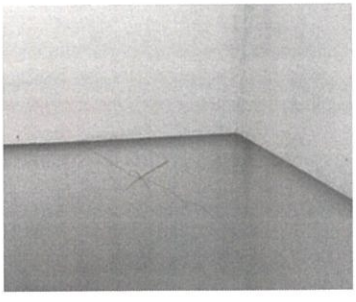
3.1.1 Cracking on walls/ Leaning walls

Apart from distributing loads from roofs and floors to foundations, external walls may be harmful to a building if they are structurally unsound. There were many structural and non-structural cracks found. Cracks in walls either vertical or diagonal, are common symptoms of structural instability. Crack defect have classified of visible damage to walls. Refer (Table 3).

Category of damage	Degree of damage	Description of typical damage	Approximate crack width (mm)
0	Negligible	Hairline crack of less than about 0.1mm widths are classed as negligible. No action required.	Up to 0.1
1	Very slight	Fine cracks which can be easily treated during normal decoration. Damage generally restricted to internal wall finishes; crack rarely visible in external brickworks.	Up to 1
2	Slight	Cracks easily filled. Recurrent crack can be masked by suitable linings. Cracks on not necessarily visible externally, some external reappointing may be required to ensure weather tightness. Doors and windows may be slight and require easing and adjusting.	Up to 5
3	Moderate	Crack which required some opening up and can be patched by a mason. Repointing of external brickwork to be replaced. Doors and windows sticking. Service pipes may fracture. Weather tightness often impaired.	5 to 15 (or several of 3mm)
4	Severe	Extensive damage which required breaking out and replacing sections of walls, especially over doors and windows. Windows and doors frame distorted, floor sloping noticeably. Wall leaning or bulging noticeable, some loss of bearing in beams. Service pipes disrupted.	15 to 25 but depends on number of cracks
5	Very severe	Structural damage which requires a major repair job involving partial or complete rebuilding. Beams lose bearing, wall lean badly and require shoring. Windows broken with distortion. Danger of instability.	Usually greater than 25 but depends on the number of cracks.

Table 3.3.1: List of typical damage in cracks

There are types of cracking in the case study area:

No.	Types and descriptions	Items
1.	Major cracks on sides of window frame and wall	 *Figure 6.3.1: Cracking on the side of window frame*
2.	Major crack on the edges of wall	 *Figure 7.3.1: Hairline crack on edges of wall*
3.	Cracking at the corner of door frame	 *Figure 8.3.1: Hairline crack on the corner of door frame*
4.	Shear crack are inclined at 45° of crack with the horizontal	 *Figure 9.3.1: Shear cracks of beams*

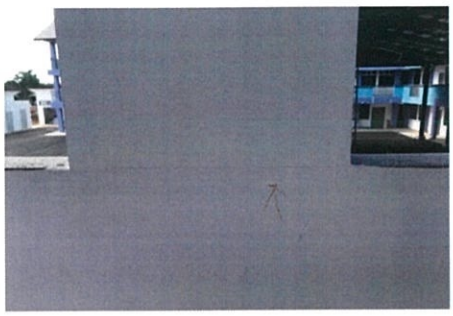
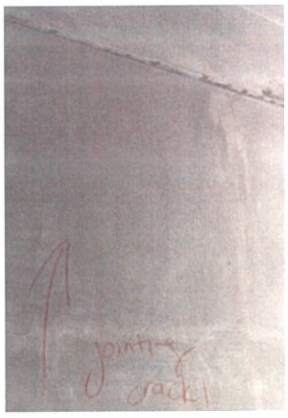
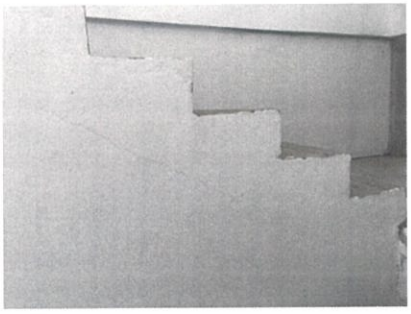
5.	Cracking along column and end of coping.	 *Figure 10.3.1: Hairline cracks along column*
6.	Jointing cracks in concrete beam.	 *Figure 11.3.1: Jointing cracks*
7.	A hairline crack on concrete floor in classroom.	 *Figure 12.3.1: Cracks on concrete*
8.	Major crack seen on stairs wall.	 *Figure 13.3.1: Cracking on stairs wall*

Table 4.3.1: Types of cracking defects

3.1.2 Painting defect

Peeling usually occurs on building facades, mainly on plastered wall, columns and other areas which are exposed to excessive rain and great dampness.

Figure 14.3.1: Peeling paint.

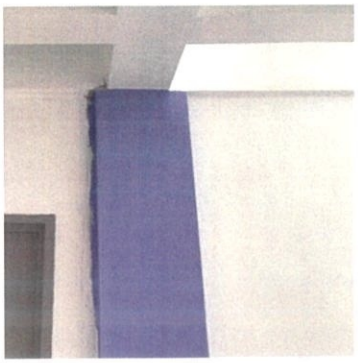


Figure 15.3.1: Excessive paint to the sides of wall.

Figure 16.3.1: Improper painting on door panels.

Figure 17.3.1: Stains on walls

3.1.3 Dampness

Dampness is generally defined as unwanted and excessive water or moisture. The existing of dampness in building is one of the serious matter that had been taken care of. It can cause damage in brickwork by saturating, decaying and breaking up of mortar joints, rotting in the timber structures, defecting by the corrosion of iron and steel materials and also destroying the equipment in building. If the level of dampness is low, the value of the building can be highly affected. Water penetration occurs commonly through walls exposed to prevailing wet wind or rain. Refer (pg. 15)

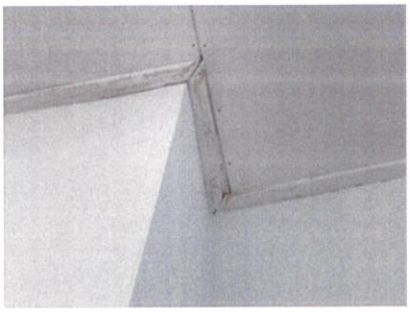


Figure 18.3.1: Dampness on ceiling.

Figure 19.3.1: Dampness on plaster brickworks.

Figure 20.3.1: Dampness on wall.

3.1.4 Timber decay

It can be classified into two categories, non-biological and biological deteriorations. Non-biological deterioration consists of physical decay, excessive moisture content, dimensional instability and chemical deterioration. These defects are mainly caused by the timber in service being subjected to environmental exposure. The most common and destructive timber biological deterioration is those due to dry rot, wet rot as well insect attraction.

Figure 21.3.1: Timber panel of roofing structure decay

3.1.5 Fungus attack

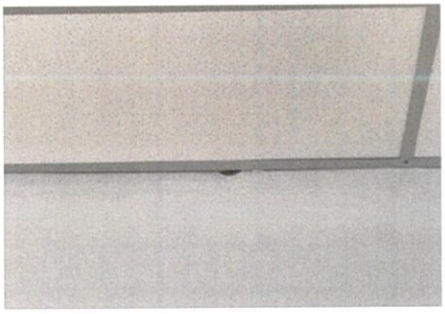
The terms fungi and mold are often used interchangeably, but mold is usually a type of fungi. It seems likely to grow and become bigger threat only when there is water damage, high humidity or dampness either can be found indoor or outdoor exposure.

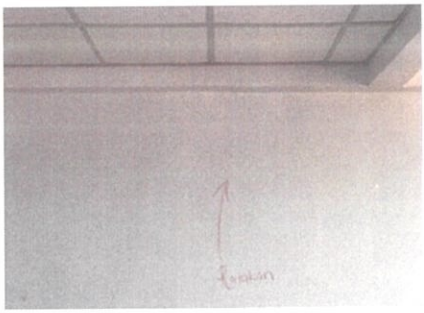
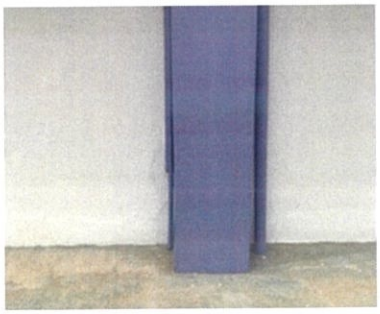
Figure 22.3.1: Mould on concrete

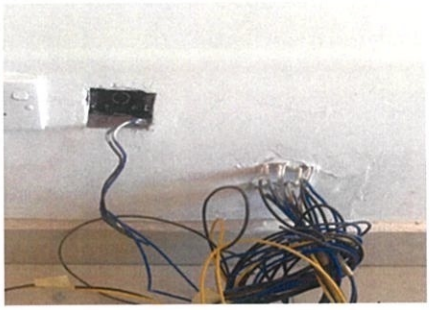
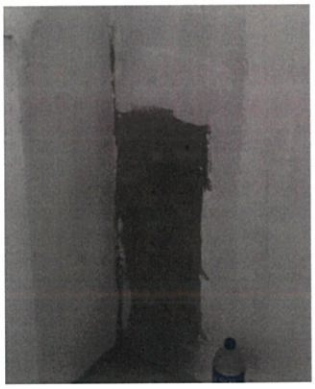
Figure 23.3.1: Mould on column footing

3.1.6 Defective plastering

There are different types of defects on plastering works:

No.	Types	Items
1.	Wet plastering can be seen around the piping in toilet.	 *Figure 24.3.1: Wet plastering*
2.	The alignment of wall were not in straight line.	 *Figure 25.3.1: Non verticality on wall*
3.	Small hole can be seen between the fixed ceiling and beam	 *Figure 26.3.1: Lack of plastering*

4.	A few small hole or mark seen on the wall.	 *Figure 27.3.1: Improper plaster surfaces*
5.	The beam was not in straight line and uneven form.	 *Figure 28.3.1: Wavy beam*
6.	Rough surfaces and smooth surfaces in a column.	 *Figure 29.3.1: Improper plaster on column*
7.	The column are not in a straight line and wavy at the bottom of column.	 *Figure 30.3.1: Non alignment of column*

8.	Drywall plaster on concrete platform of SPAII tank.	 *Figure 31.3.1: Peeling plaster*
9.	The hole of wiring covered with improper plaster	 *Figure 32.3.1: Popping plaster on wall*
10.	The hole are left uncovered with plaster.	 *Figure 33.3.1: Improper plaster surfaces*

.Table 5.3.1: Types of defective plastering

3.1.7 Crazing

Crazing also called as pattern cracking and map cracking, is the formation of closely spaced shallow cracks in an uneven manner.

Figure 34.3.1: Crazing on concrete floor

3.1.8 Delamination

In this case, top surface of concrete gets separated from underlying concrete. Hardening of top layer of concrete before hardening of underlying concrete will lead to delamination.

Figure 35.3.1: Delamination of concrete

3.1.9 Dusting

Dusting, also called as chalking is the formation of fine and loose powdered concrete on the hardened concrete by disintegration.

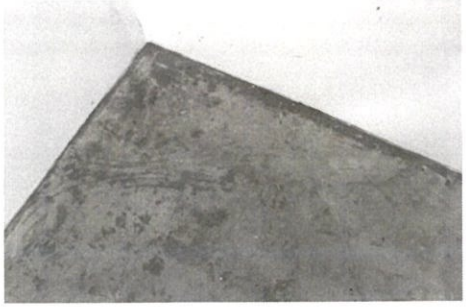


Figure 36.3.1: Dusting of concrete

3.1.10 Uneven tiles lining

The tiles alignment between wall and other wall was not in a straight line.

Figure 37.3.1: Improper arrangement of tiles skirting

3.1.11 Roof defect

Besides being one of the main structures in a building, roof acted as a weather shield, giving protection to users or occupants from rain and sun.

Figure 38.3.1: Poor arrangement of roof tiles

3.1.12 Defective plaster rendering

Commonly occurred at the external walls, column beams or floors.

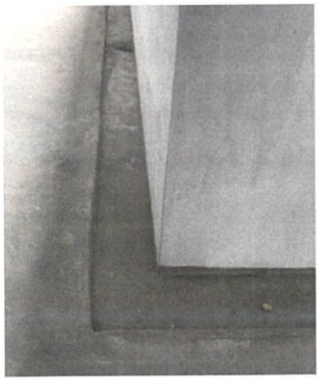


Figure 39.3.1: Non alignment of scupper drain

3.1.13 Excessive cement

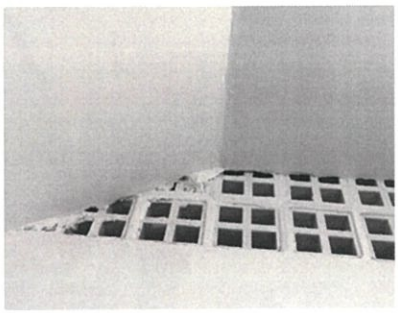


Figure 40.3.1: Cement residue on hollow block

Figure 41.3.1: Excessive cement in scupper drain

3.1.14 Improper installation

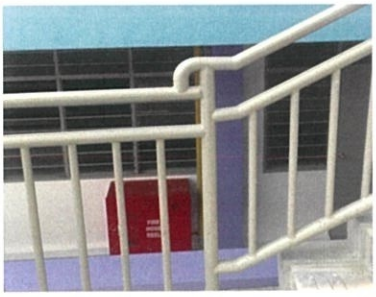


Figure 42.3.1: Improper fabricate ceiling

Figure 43.3.1: Exposed pipe on floor

Figure 44.3.1: Improper installation of pipes in toilet

Figure 45.3.1: Wrong design of trash grill

Figure 46.3.1: Improper installation of ironmongeries

Figure 47.3.1: Window rods bend

Figure 48.3.1: Non-alignment of tap pipe and sink

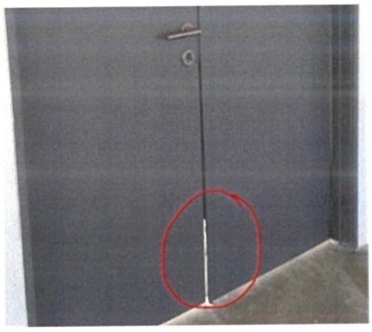


Figure 49.3.1: Broken door

3.1.15 Hollow tiles

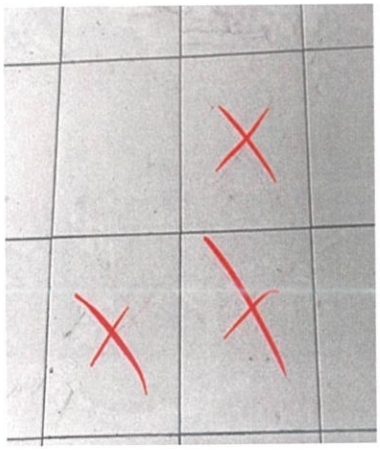


Figure 50.3.1: Hollow tiles in canteen

3.1.16 Gap and Detachment

i. Gap between floor tiles and column

Figure 51.3.1: Gap between piping and column

ii. False ceiling – Gap between ceiling and wall

Figure 52.3.1: Gap between fixed ceiling and wall

3.2 Causes of defect

There are many causes that lead to defects in the new buildings. Some of the defects are caused by natural consequences that developed over the period of time such as aging and typical use. However, many premature skills and care as assigned on the building. The study by Building Research Establishment (BRE) in U.K concludes that over 90 percent of building defects caused by the promptly diagnosable faults in design or construction which could be foreseen beforehand and prevented.

Generally the causes of defects are stated as the following:

3.2.1 Construction deficiencies

According to (Tal. E. Love, 2004), the main factor that affects the quality goes on to the design which is documentation that is unclear and missing, poor coordination for the design and poor workmanship.

3.2.1.1 Poor workmanship

Malaysia Construction Industry, poor workmanship problem in site always has been a highlight is the media especially through newspaper and the result of poor workmanship and low quality of materials being used which has been identified as major causes of defects occur in construction projects when developing new buildings. (Abdul Razak, 2010)

In fact, the contractor plays an important role in construction site when constructing buildings. This is because they need to supervise all the works from piling works until completion of the projects. If no proper supervision be one, the workers simply construct the structure without the notice from the site staffs. Therefore, it is vital to always supervise the workers work when piling works takes place or infrastructure works and many more.

Other than that, lack of experience and competency from the labors also a factor that cause poor workmanship occurred. According to Kasun and Janaka, the productivity cannot be achieved by speed and hard work without adopting a better work practices. Moreover, the main issue that the stakeholders from the construction industry worry about the lack of skilled workers.

Besides that, lack of communication and language as barrier will cause poor workmanship in construction site. This is because of different language used by the local labors between the foreign labors. In addition, according to survey that has been done by (Janaka, 2002) , it shows that more than 40 percent of the respondent that working in the construction industry complained about lack of communication between each other. As a result, a barrier in the communication and language when working leaded to poor workmanship.

3.2.1.2 Material deficiencies

The failures and defects that occur in building were due to material construction whereas the behavior of the structure had determined by the construction materials. The effects of using low grade of materials slowly take effect like a cancer in a concrete. Sometimes, the irresponsible parties as subcontractor had an intention lower down the quality of the materials so that the contractor can minimize the cost for materials. This will eventually downgraded the quality of materials and cause defects occur in new buildings faster.

3.2.2 Design deficiencies

Generally, defects occurred is new buildings is due to the failure that cause by design professionals. This is because the architects have failed to produce an accurate and a complete set of drawing and also for the construction documents. In addition, a design defect also known as latent defect (Aziz, 2015). Other than that, the details of the drawing that are not defined by the designers will eventually cause a problem to the contractor which are solving the problems by their own and normally the problems are found out after the works has completed.

3.2.2.1 Faulty design

Error in the design is often to be seen in order to save the initial construction costs. Besides that, faulty design that occur in building will eventually lead to deficiencies of the structure after completed the construction. Errors in design will give negatives impact to the occupants but also because the building safety will not guaranteed. Normally, the common design fault in construction such as, poor detailing implementation, poor selection of materials and products and flawed structural calculation and loading problems. All the design error will eventually affect the structure and cannot support the load properly and then collapse in the future.

3.2.2.2 Not following to the specification.

A good project has its own procedures to be followed to prevent any unwanted errors be happened during construction work. Mostly, the designer will provide the specifications to the contractor to follow but some of the contractor chose to apply their knowledge and experience in work instead following the designer's specification.

3.2.2.3 Inability to interpret drawing

This issue normally happens in construction site. The background of each supervisor is different. Most of the time, the contractor unable to instruct the workers through drawing because of poor technical background. This will eventually cause faulty design to be happened and rework have done for it.

3.2.3 Limited time

The client and contractors emphasize on time and speed of completing the project. Contractors had speed the time by complete the project before the dateline. Therefore, it caused the construction projects executed in a rushed manner. In a consequence, the quality of workmanship to be a serious matter by client or the user.

3.2.4 Climatic condition.

According to (J. Paul Dai, 2009)it stated that extreme weather was one of the factors that affecting construction labor productivity and workmanship. Extremely hot condition will not only affect the workmanship but also cause lines to the wall that facing the sunlight under high temperature. The rain season also extended all the external works to be done.

CHAPTER 4.0
CONCLUSION

The main objective of this case study is to identify the types of defects and to minimize the defects as the solutions of defects in school building. Occurrence of defects in construction will leads to stand and progress reputation in market, client oriented construction of buildings need to be constructed to improve the quality and service to the end users. The most important reason is poor workmanship, not following the instructions which was given in the specifications also responsible for the occurrence of defects. Inspection of work is important for a building at a particular intervals of time throughout the life of building. This report focuses on defects occurs in construction projects before completion of works on site. The reason for the defects are common causes which are poor workmanship, faulty design, lower quality of materials, lack of supervision, wrong construction methods, lack of inspection after construction. .

References

Abdul Razak, B. I. (2010). An investigation of the status of the Malaysian construction industry. *Benchmarking: An International Journal*, pp. 294-308.

Ahmad, A. (2004). *Understanding Common Building Defect.* The Dilapidation Survey Report , Universiti Sains Malaysia, Penang.

Aziz, A. L. (2015). *Building MAintenance Processes and Practices.* Malaysia.

Hall, D. (1988). *Building Defect Inspection and Report.*

J. Paul Dai, M. &. (2009). Construction craft workers' perception of the factors affecting their productivity. *Journal of Construction Engineering and Management.*

Janaka, N. H. (2002). Illustrative benchmarking rework and rework costs in Swedish construction industry. *Journal of Management in Engineering* , pp. 76-83.

Maintenance. (1964). *Code of British Standards (BS 3811:1964).*

Ramli. (2006). *Prisip dan Praktis Pengurusam Penyelenggaran Bangunan.* Batu Cave.: Pustaka Ilmi.

Tal. E. Love, I. P. (2004). A rework reduction model for construction projects. *IEEE Transaction on Engineering Management*, pp. 51(4): 426-440.

The Building Defects of Construction Essay. (2018, November). Retrieved from U.K Essays: https://www.ukessays.com/essays/construction/the-building-defects-of-construction-construction-essay.php?vref=1