



**DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)**

**A CASE STUDY OF BUILDING DEFECTS AT BANK NEGARA
MALAYSIA (LOWER GROUND 1)**

Prepared by:

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(PERAK)

DECEMBER 2018

It is recommended that the report of this practical training provided

By

NUR SYAMIRA BINTI ZAMRI

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entitled

**A CASE STUDY OF BUILDING DEFECTS AT BANK NEGARA MALAYSIA
(LOWER GROUND 1)**

accepted in partial fulfillment of requirement has for obtaining Diploma in Building.

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DECEMBER 2018

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 SGS (M) Sdn Bhd for duration of 14 weeks starting from 3 September 2018 and ended on 7 December 2018. It is submitted as one of the prerequisite requirements of DBG307 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

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Last but not least, my special thanks to my beloved parents for their sacrifices over the years.

Thank you so much.

ABSTRACT

Building defect is defined as failing or shortcoming in the function, performances, statutory or user requirements of a building and might indicate itself within the structure, services or other facilities. Building defect can be occurred either in new building or old building. Our inspection work is carried out at Bank Negara Malaysia, Sasana Kijang. The purpose of building condition survey had been done to this building is to investigate and ensure that this building is in a good condition and materials used for each elements are complying with UBBL. There is certain factor that is mainly caused due to non-compliance with Building Code and UBBL standards. In addition, the objective of this report is to identify the types of defect in the building. There are two types of defect which is major defect and minor defect. Major defect is considered as one that is likely to create failure on the building while minor defect is the difference from the standards but one that is not likely to affect the usability of an object. Plus, to determine the suitable recommendation to fix the defects. From the inspection, we carried out the work by using visual inspection with some suitable tools and equipment. In conclusion, as a building inspector, a basic knowledge of building inspection work is needed.

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4.1 Conclusion

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CHAPTER 1.0

INTRODUCTION

1.1 Introduction

A defect is a building flaw or design mistake that reduces the value of the building and will cause a dangerous condition. A construction defect can occur due to many factors such as poor workmanship or the use of materials. Some common defects caused by agents such as atmospheric pollution, poor workmanship or the use of materials and climatic conditions are more frequent.

Defective building construction not only contributes to the final cost of the product but also to the cost of maintenance. For example, activities such as compaction not done to specifications leading to ground subsidence and eventual early deterioration of foundations. This may lead to the complete failure of a structure.

Defects resulting to an inaccurate construction can be avoided by ensuring that proper inspection mechanisms are in place. The understanding of building defects and their causes is essential for better performance of any building.

1.2 Objective

This report is developed based on a few objectives. The objectives are as follow:

- i. To identify the types of defect in the building.
- ii. To determine the suitable remedies to fix the defects.

1.3 Scope of Study

This study was carried out at Bank Negara Malaysia Museum and Art Gallery, Sasana Kijang, 2, Jalan Dato Onn, Kuala Lumpur, 50480 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur. This study focuses only on the types of defect in the Lower Ground 1 basement and determine the suitable remedies to fix the defects at Lower Ground 1 basement. The inspection was conducted to investigate and ensure that this building is in a good condition and materials used for each elements are complying with Uniform Building by Law. The building inspection works only took two months to complete every floor including the basement and rooftop.

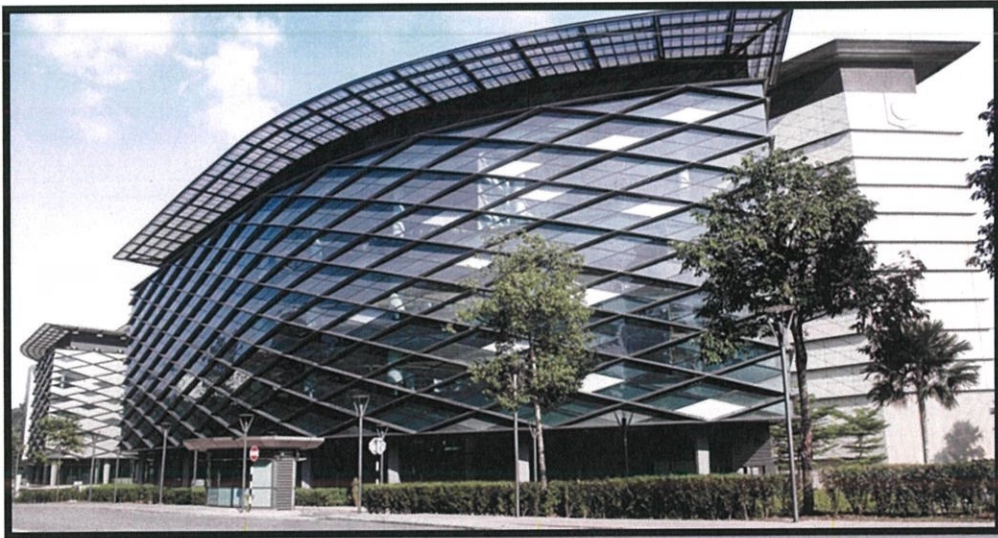


Figure 1.1: Bank Negara Malaysia, Sasana Kijang

Source: Bank Negara Malaysia

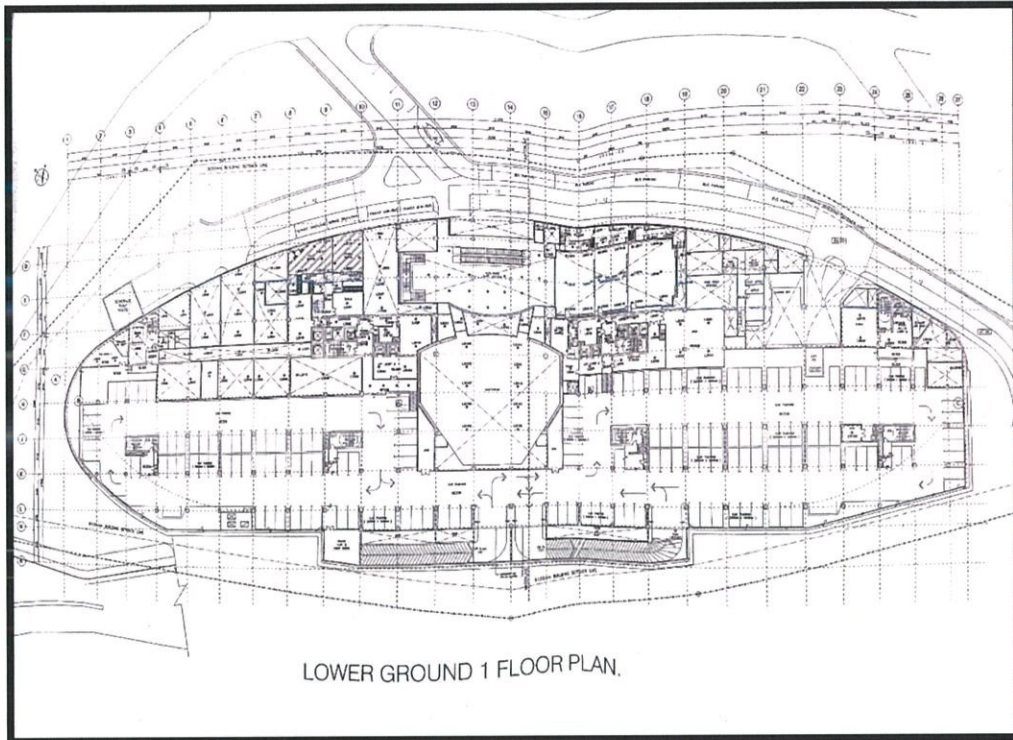


Figure 1.2: Lower Ground 1 Floor Plan of Bank Negara Malaysia

Source: Pn. Siti Nurul Syazwani, Building Inspector

1.4 Method of Study

The research of case study about building inspection has been carried out by using all of these methods.

I. Interview

Interview was conducted to get more information about this project. Interview with someone such as building inspector, who have more experience in this field and involved for this project. It helps a lot in completing my report.

II. Observation

This observation method is done during practical training directly by site visit. The information was collected based on what happen at the site guided by site supervisor. The technology as camera, cell phone and taking short notes was used to record any important information such as the defects in the building and equipment that is used while doing inspection.

III. Document Analysis

Document analysis that has been obtained were photos, drawing plan of this building, company profile. A lot of photo from site activities and project document that has been able from the supervisor of the company with permission.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction

SGS was found in 1878. The SGS Group based in Geneva, Switzerland is the world's leading inspection, verification, testing and certification company. Truly worldwide and benefiting from a unique international network. With an electronically connected network of 251 affiliated companies with over 845 offices, 338 laboratories and 75,000 full-time employees in over 140 countries, the SGS Group is able to provide its international clientele with a comprehensive range of services.

SGS has no manufacturing, trading or financial interests which could compromise its independence. Its guarantee of independence, its reputation for professionalism, integrity and impartiality, as well as its remarkable international network, place the SGS Group in a unique position.

SGS Services are extremely varied, ranging from traditional inspection and control services offered in relation to the production, fabrication, construction and shipment of goods or the performance of machinery and equipment, through the more specialized controls and tests carried out on potential safety or environmental hazards, to the related but distinct disciplines of appraisal and loss adjusting.

2.2 Company Profile

The Industrial Services Division of SGS offers a wide range of services in both the industrial and construction sectors. Clients range from contractors, consultants, manufacturers and insurance companies to private householders who requires independent technical advice.

The division has at its disposal in Malaysia more than 120 inspectors, engineers and surveyors experienced in a wide range of disciplines and is able to draw on the extensive resources of the SGS Group worldwide whenever required. A multi-disciplinary approach is encouraged as much as possible through regular attendance at in-house and external training courses.

Personnel are supported by a wide range of sophisticated test equipment, laboratories and corrosion management and material testing facilities nationwide. The division operates a quality management system independently certified in accordance with ISO 9001. The company holds a Petronas operating license and is authorized by the DOSH to conduct Statutory Inspections in Malaysia and throughout the world.

2.3 Organization Chart

2.3.1 Industrial (IND)

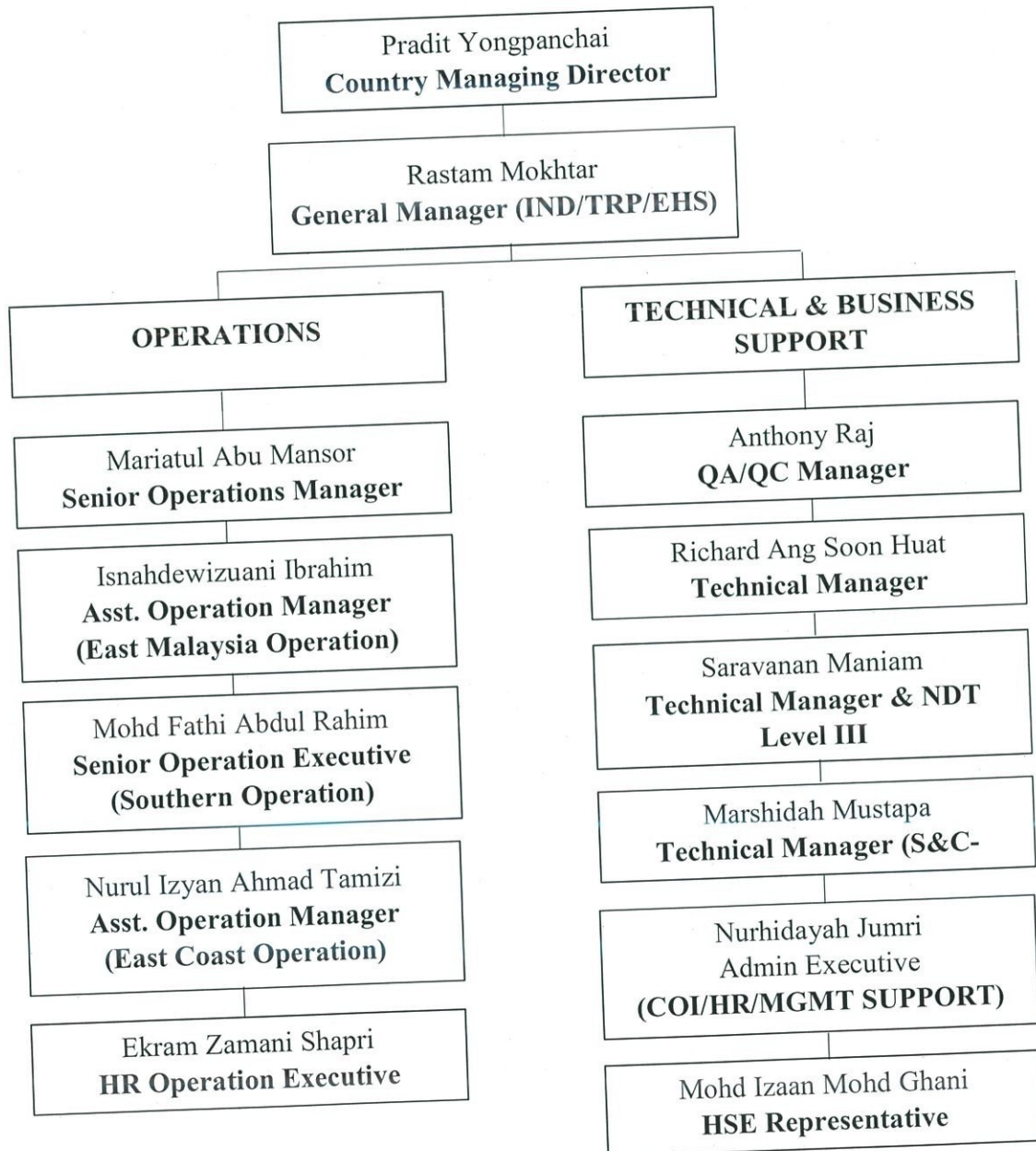


Figure 2.1: Company Organization Industrial (IND)

2.3.2 Industrial (IND) – Central Operation

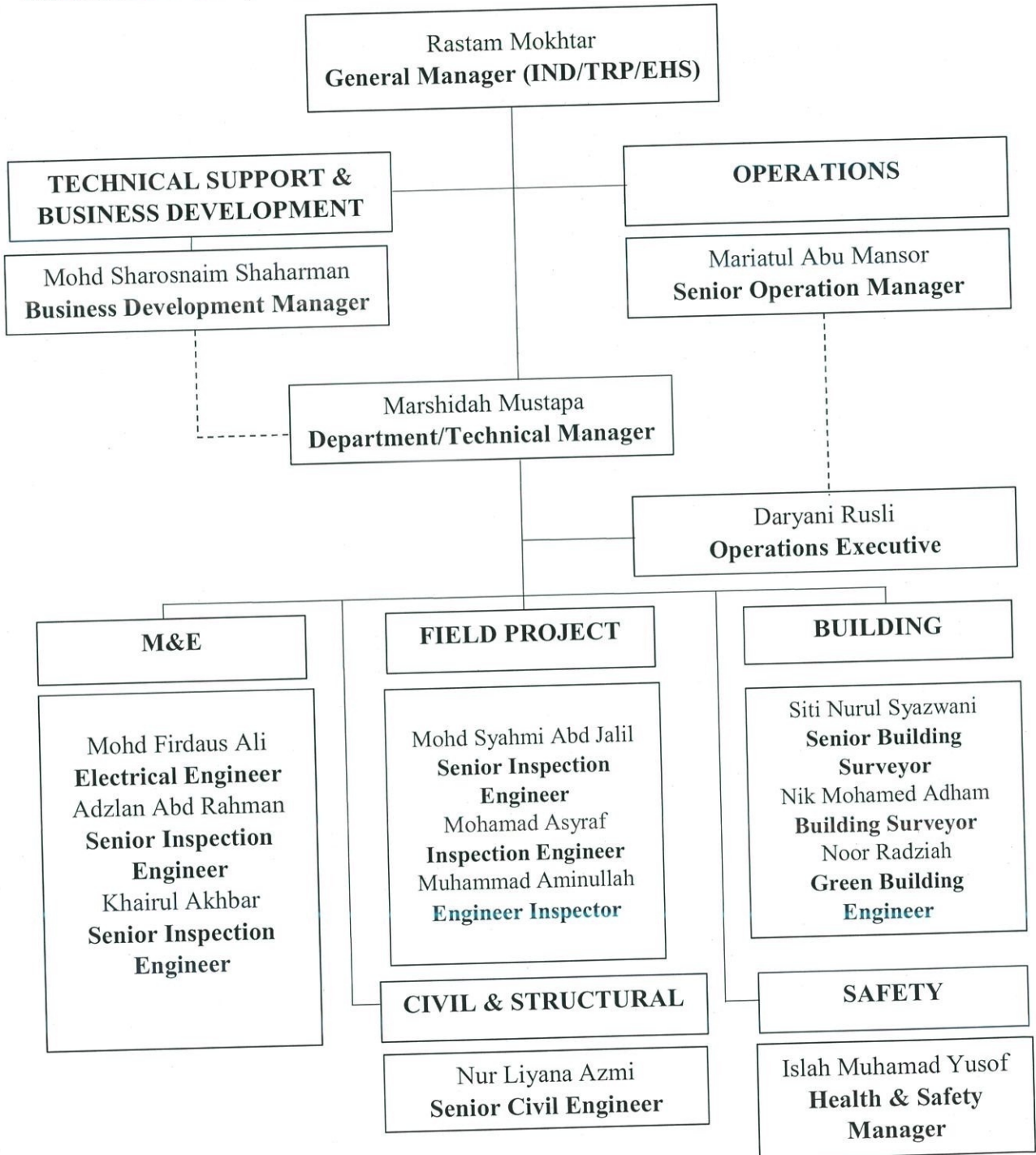


Figure 2.2: Company Organization Industrial (IND) - Central Operation

2.4 List of Project

2.4.1 Completed Projects

Table 2.1: List of past experience project of SGS (M) Sdn Bhd

No	Client	Project	Year	Country	Service Performed
1	Bank Negara Malaysia	Building Audit Consultancy Services at Tunas Kijang, Kuala Lumpur	2016	Malaysia	Building Audit
2	AGA Group	Mackintosh at Seksyen 7, Shah Alam	2016	Malaysia	Mackintosh Probe
3	Jcorp Consultant	Soil Investigation Works at Tanjung Langsat Terminal, Pasir Gudang, Johor.	2016	Malaysia	Soil Investigation
4	Petronas Penapisan Melaka	DT & NDT on concrete structure	2017	Malaysia	Concrete testing
5	HR Builder Enterprise Sdn Bhd	Moisture Meter and Hollowness Test at Taman Desa Cemerlang, Johor Bahru	2017	Malaysia	Moisture Meter and Hollowness Test

2.4.2 Project in Progress

Table 2.2: List of on-going project of SGS (M) Sdn Bhd

No	Client	Project	Year	Country	Service Performed
1	Tetra pak (M) Sdn Bhd	Safety consultant and safety implementation	2015-2018	Malaysia	Safety Design and Construction Safety
2	HSBC (M) Sdn Bhd	Thermography scanning and Electrical Inspection at all HSBC Branch	2017-2018	Malaysia	Thermography scanning & Electrical Inspection
3	MRCB George Kent Sdn Bhd	Light rail Transit 3	2018	Malaysia	Safety Assessment Reviewer (SAR)
4	Thialoc (Malaysia) Sdn Bhd	QAQC Inspections	2018	Malaysia	QAQC Inspections service
5	Dyna Segmen Sdn Bhd	DT & NDT on concrete structure at Terminal Airport Kertih	2018	Malaysia	Concrete testing

CHAPTER 3.0

A CASE STUDY OF BUILDING DEFECTS AT BANK NEGARA MALAYSIA

3.1 Introduction of Project

SGS (M) Sdn Bhd execute a building inspection project at Bank Negara Malaysia Museum and Art Gallery. It is located at Jalan Dato Onn, Kuala Lumpur, 50480 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur. This building consists of six floors and five floors of basements. The whole building was inspected and it only took almost two months to complete the inspection. It started from September 2018 until November 2018.

The activities carried out at the Bank Negara Malaysia is to investigate and ensure that this building is in a good condition and materials used for each elements are complying with Uniform Building by Law.

My focus on this case study is to identify the types of defects in the building and to determine the suitable recommendation to fix the defects. This project is completed during the duration of my practical.

3.2 Building Defects

Building defects is an inadequacy or an insufficiency intends to be needing, ailing in some quality important for fulfillment. Likewise, it characterizes building defects as a disappointment of building or any segment to be raised in a sensibly workmanlike way. A building or development imperfection is a deformity or lack in the outline, development, or materials on a development extend.

Building defects emerge through improper or poor plan, detail or development and in addition to lacking consideration given to building support. As we all know, there are no buildings that is free from deformities. A building inspection on quality procedures will lower the quantity of imperfections in the building and the results will uncover any deformity in the building.

Category of Building Defects

The defect can be divided into two categories:

a) Structural defect

Structural defect is a basic imperfection that implies any deformity in component of a building that is owing to blemished plan, inadequate or low workmanship or lacking material and any blend of these. These imperfections can be caused by shameful soil investigation, improper site determination, and the utilization of deficient materials. Additional deformities in a building can happen after some time because of crumbling, wear and tear, over-burdening, and poor support. They should be repaired to keep up the building's structure and to keep any further disappointments.

b) Non-structural defect

A non-basic deformity in a building represent as an imperfection in a non-basic component of the working subsequently of imperfect building work. A non-auxiliary deformity incorporates imperfection in block work, moistness in old structures, and imperfections in mortar works.

3.2.1 Types of Defect

1) Peeling Paint

Peeling paint significantly lowers the attractiveness of a building. It can turn a beautiful building into a rotting structure. If the peeling happens inside the building, it can cause health issues for the occupants. It is because the falling paint chips can be harmful if they land in the occupant’s eyes, and breathing in paint dust can irritate your lungs.

Table 3.1: Peeling paint on the wall

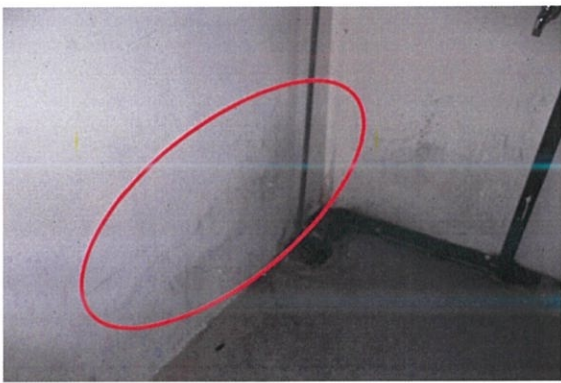
 <p>Figure 3.1 Peeling paint at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0529			
	Element:	Wall plaster			
	Location:	LG1-West-AHU-Near Female Surau			
	Description of Defect:	Sign of peel off paint on the wall.			
	Category:	A	B	C	D
				✓	

Table 3.2: Peeling paint on the wall

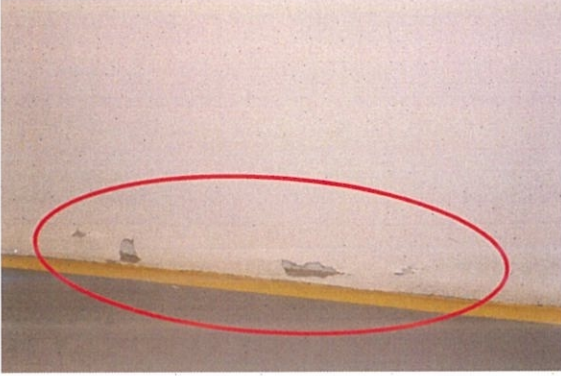

 <p>Figure 3.2 Peeling paint at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0617			
	Element:	Wall plaster			
	Location:	LG1-East-Exhaust Air Shaft			
	Description of Defect:	Sign of peel off paint on the wall.			
	Category:	A	B	C	D
				✓	

Table 3.3: Peeling paint on the wall

 <p>Figure 3.3 Peeling paint at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0640			
	Element:	Wall plaster			
	Location:	LG1-East-Near Gelung Hos			
	Description of Defect:	Sign of peel off paint on the wall.			
	Category:	A	B	C	D
				✓	

2) Cracking on Walls

Most building cracks over time. Some of the cracks are considered serious and some are not. It can be caused by a slight settlement of foundations, mortar shrinkage or slight roof movement. For the serious cracks, it may be caused by foundation displacement water penetration or excessive roof movement. In this case, the common reason for the cracks on the wall occur are settlement, thermal expansion, moisture penetration and roof movement.

Table 3.4: Diagonal crack on the wall


 <p>Figure 3.4: Diagonal crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0510			
	Element:	Wall plaster			
	Location:	LG1-Lift Lobby			
	Description of Defect:	Diagonal crack on the wall.			
	Category:	A	B	C	D
				✓	

Table 3.5: Vertical crack on the wall

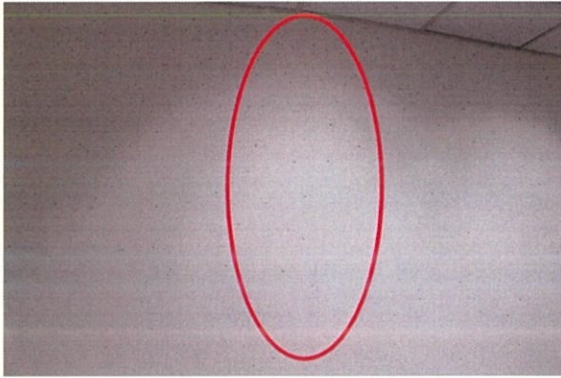
 <p>Figure 3.5: Vertical crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0519			
	Element:	Wall plaster			
	Location:	LG1-West-Corridor			
	Description of Defect:	Vertical crack on the wall.			
	Category:	A	B	C	D
				✓	

Table 3.6: Random crack on the wall

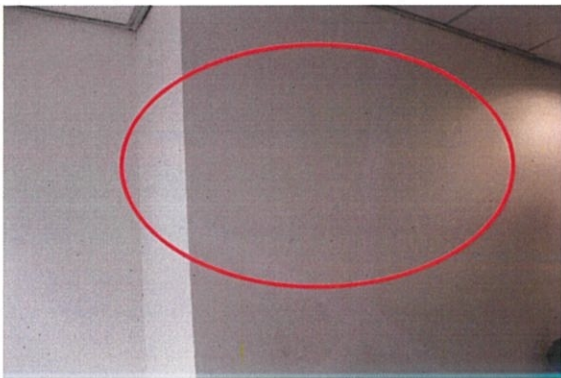
 <p>Figure 3.6: Random crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0521			
	Element:	Wall plaster			
	Location:	LG1-West-Corridor			
	Description of Defect:	Random crack on the wall.			
	Category:	A	B	C	D
				✓	

Table 3.7: Gap Jointing on door frame


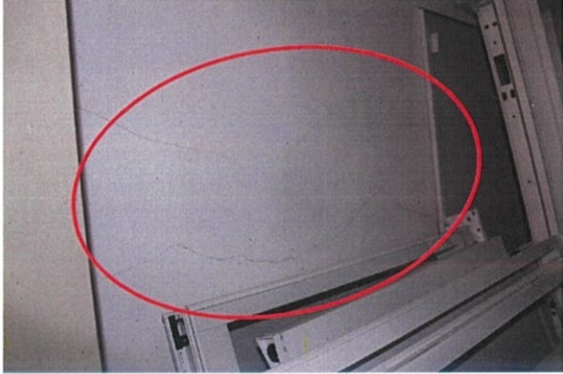
 <p>Figure 3.7: Gap jointing at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0545			
	Element:	Door frame			
	Location:	LG1- West- Staircase 7			
	Description of Defect:	Sign of gap jointing between door frame and wall.			
Category:	A	B	C	D	
					✓

Table 3.8: Horizontal crack on the wall

 <p>Figure 3.8: Horizontal crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0556			
	Element:	Wall plaster			
	Location:	LG1- West- CL16- Lot 17			
	Description of Defect:	Horizontal crack on the wall.			
Category:	A	B	C	D	
					✓

3) Dampness

Dampness can be a genuine matter, especially to structures situated close to water sources. It breaks down building structures as well as harms to decorations. The reason is water entering a working through various courses. With the presence of gravity, water may infiltrate through vessels or splits between mortar joints, and blocks or squares before working up trap dampness behind hard renders. Water may likewise drive additionally up the divider to rise at a more elevated amount. Clamminess additionally happens in dividers because of different components, for example, spilling canals or down funnels, faulty channels, burst pipes and buildup because of lacking ventilation.

Table 3.9: Water mark on the ceiling

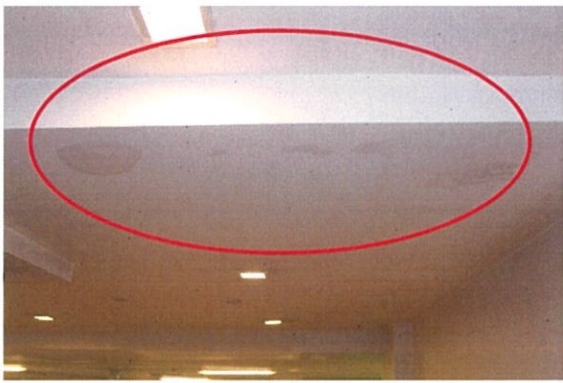
 <p>Figure 3.9: Water mark at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0511			
	Element:	Ceiling			
	Location:	LG1- Lift Lobby			
	Description of Defect:	Sign of water mark. Suspected due to leakage from above ceiling/ pipe leaks.			
Category:	A	B	C	D	
			√		

Table 3.10: Water mark on the ceiling


 <p>Figure 3.10: Water mark at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0512			
	Element:	Ceiling			
	Location:	LG1- West- CL26- Lot 62			
	Description of Defect:	Sign of water mark. Suspected due to leakage from above ceiling/ pipe leaks.			
Category:	A	B	C	D	
			√		

Table 3.11: Dampness and stalactite on the ceiling

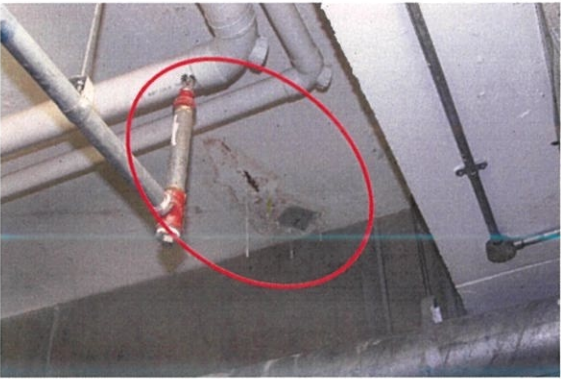
 <p>Figure 3.11: Dampness and stalactite at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0538			
	Element:	Ceiling			
	Location:	LG1-West- AHU Room (foyer)			
	Description of Defect:	Sign of dampness and stalactite.			
Category:	A	B	C	D	
			√		

Table 3.12: Water mark on the ceiling



 <p>Figure 3.12: Water mark at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0543			
	Element:	Ceiling			
	Location:	LG1- West- CL24- Lot 35			
	Description of Defect:	Sign of water mark. Suspected due to leakage from above ceiling/ pipe leaks.			
	Category:	A	B	C	D
			√		

Table 3.13: Dampness on the wall

 <p>Figure 3.13: Dampness at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0551			
	Element:	Wall plaster			
	Location:	LG1- West- Water Tank and Pump Room			
	Description of Defect:	Sign of dampness on the wall.			
	Category:	A	B	C	D
			√		

3.3 Recommendation for Defects

Table 3.14: Random crack on the wall


 <p>Figure 3.14: Random crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0553
	Element:	Wall plaster
	Location:	LG1- West- CL15- Lot 14
	Description of Defect:	Random crack on the wall.
	Recommendation:	Repair the affected areas with cement based grout. For application of cementitious grout generally some form of routing and surface preparation, such as removal of loose debris are needed. Repair the affected surface with suitable coating.

Table 3.15: Dampness on the wall

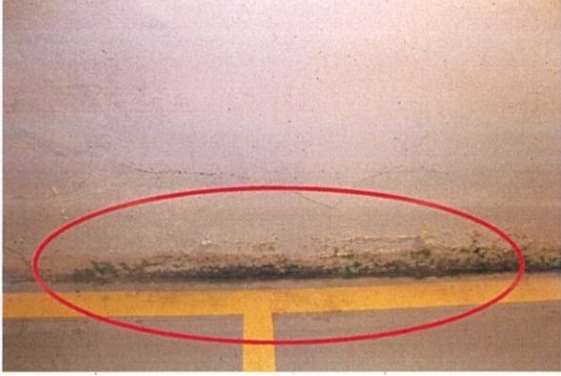
 <p>Figure 3.15: Dampness at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0554
	Element:	Wall plaster
	Location:	LG1- West- CL15- Lot 14
	Description of Defect:	Sign of dampness on the wall.
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean defective area. Refurbish the affected areas with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

Table 3.16: Damage of ceiling


 <p>Figure 3.16: Damage of ceiling at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0555
	Element:	Ceiling
	Location:	LG1- West- CL16- Lot 17
	Description of Defect:	Damage of ceiling.
	Recommendation:	Rectify and install with the new ceiling at the affected area.

Table 3.17: Horizontal crack on the wall

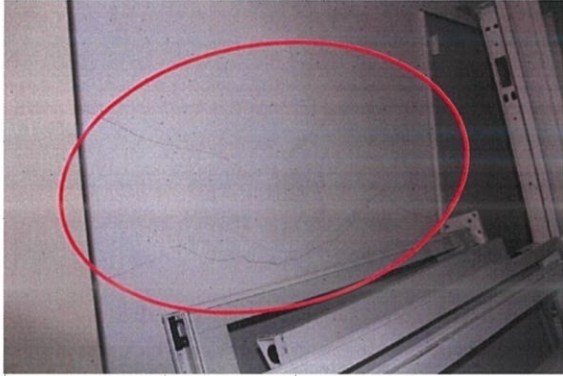
 <p>Figure 3.17: Horizontal crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0556
	Element:	Wall plaster
	Location:	LG1- West- CL16- Lot 17
	Description of Defect:	Horizontal crack on the wall.
	Recommendation:	Repair the affected areas with cement based grout. For application of cementitious grout generally some form of routing and surface preparation, such as removal of loose debris are needed. Repair the affected surface with suitable coating.

Table 3.18: Random crack on the wall

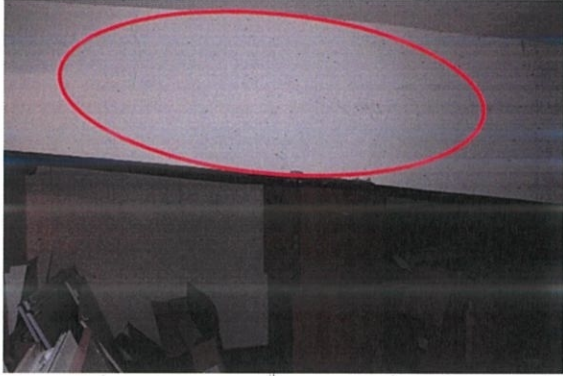
 <p>Figure 3.18: Random crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0557
	Element:	Wall plaster
	Location:	LG1- West- CL16
	Description of Defect:	Random crack on the wall.
	Recommendation:	Repair the affected areas with cement based grout. For application of cementitious grout generally some form of routing and surface preparation, such as removal of loose debris are needed. Repair the affected surface with suitable coating.

Table 3.19: Random crack on the wall

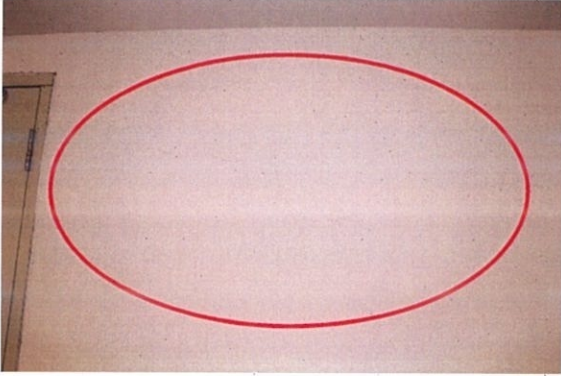
 <p>Figure 3.19: Random crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0558
	Element:	Wall plaster
	Location:	LG1- West- CL16
	Description of Defect:	Random crack on the wall.
	Recommendation:	Repair the affected areas with cement based grout. For application of cementitious grout generally some form of routing and surface preparation, such as removal of loose debris are needed. Repair the affected surface with suitable coating.

Table 3.20: Horizontal crack on the wall

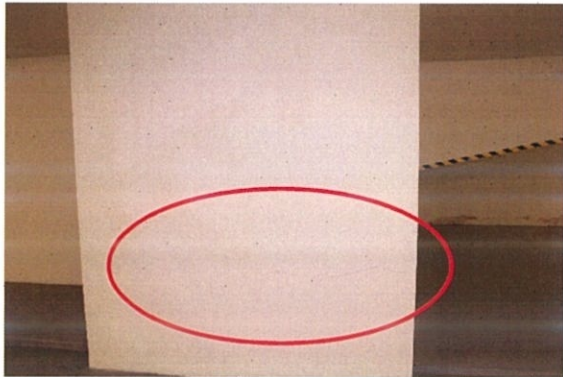
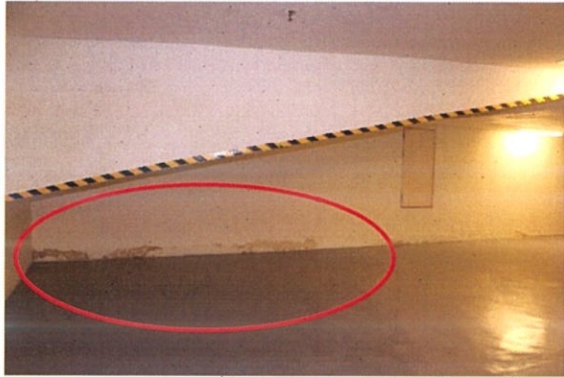
 <p>Figure 3.20: Horizontal crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0559
	Element:	Wall plaster
	Location:	LG1- West- CL 16
	Description of Defect:	Horizontal crack on the wall.
	Recommendation:	Repair the affected areas with cement based grout. For application of cementitious grout generally some form of routing and surface preparation, such as removal of loose debris are needed. Repair the affected surface with suitable coating.

Table 3.21: Dampness on the wall

 <p>Figure 3.21: Dampness on wall at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0560
	Element:	Wall plaster
	Location:	LG1- West- CL16
	Description of Defect:	Sign of dampness on the wall.
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean defective area. Refurbish the affected areas with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

3.22: Sign of gap jointing on the wall


 <p>Figure 3.22: Sign of gap jointing at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0561
	Element:	Wall plaster
	Location:	LG1- West- CL16
	Description of Defect:	Sign of gap jointing between wall and beam.
	Recommendation:	Repair and close the joint or gap with crack filler, joint sealant or similar product.

Table 3.23: Random crack on the wall

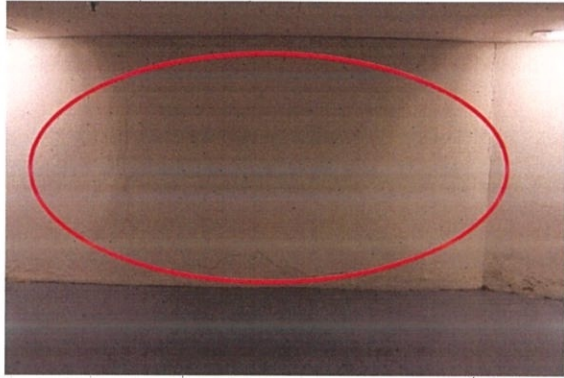
 <p>Figure 3.23: Random crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0562
	Element:	Wall plaster
	Location:	LG1- West- CL16
	Description of Defect:	Random crack on the wall.
	Recommendation:	Repair the affected areas with cement based grout. For application of cementitious grout generally some form of routing and surface preparation, such as removal of loose debris are needed. Repair the affected surface with suitable coating.

Table 3.24: Dampness on the wall


 <p>Figure 3.24: Dampness on wall at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0563
	Element:	Wall plaster
	Location:	LG1- West- CL16
	Description of Defect:	Sign of dampness on the wall.
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean defective area. Refurbish the affected areas with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

Table 3.25: Water mark on the wall

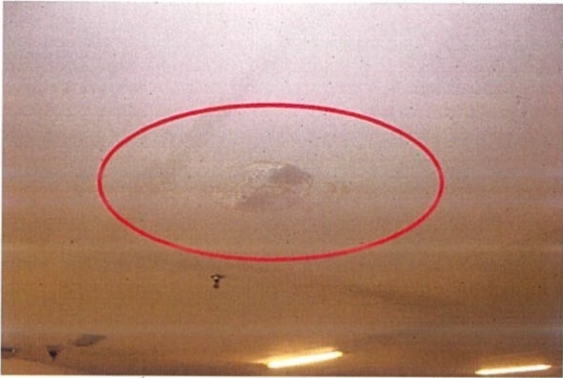
 <p>Figure 3.25: Water mark at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0564
	Element:	Ceiling plaster
	Location:	LG1- West- Lot 18
	Description of Defect:	Sign of water mark. Suspected due to leakage from above ceiling/ pipe leaks.
	Recommendation:	Perform detail investigation and rectify the leakages problems before repair and refurbish affected area. Rectify and install with the new ceiling at the affected area.

Table 3.26: Random crack on the wall

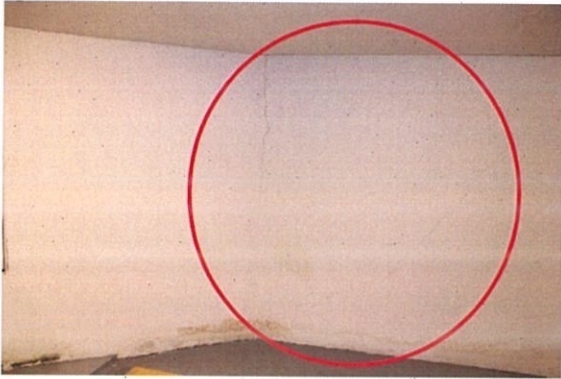
 <p>Figure 3.26: Random crack at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0565
	Element:	Wall plaster
	Location:	LG1- West- Lot 18
	Description of Defect:	Random crack on the wall.
	Recommendation:	Repair the affected areas with cement based grout. For application of cementitious grout generally some form of routing and surface preparation, such as removal of loose debris are needed. Repair the affected surface with suitable coating.

Table 3.27: Dampness on the wall

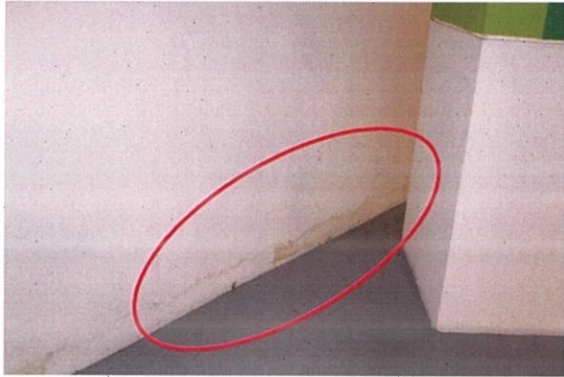
 <p>Figure 3.27: Dampness on the wall at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0566
	Element:	Wall plaster
	Location:	LG1- West- Lot 18
	Description of Defect:	Sign of dampness on the wall.
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean defective area. Refurbish the affected areas with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

Table 3.28: Unevenness of paint on the ceiling


 <p>Figure 3.28: Unevenness of paint at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0567
	Element:	Ceiling plaster
	Location:	LG1- West- Lot 18
	Description of Defect:	Unevenness of paint on the ceiling.
	Recommendation:	Refurbish the affected area with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

Table3.29: Dampness on the wall

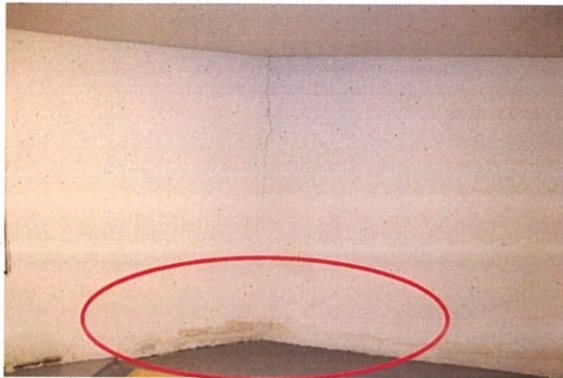
 <p>Figure 3.29: Dampness on the wall at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0568
	Element:	Wall plaster
	Location:	LG1- West- CL17- Lot 52
	Description of Defect:	Sign of dampness on the wall.
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean defective area. Refurbish the affected areas with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

Table 3.30: Dampness on the wall


 <p>Figure 3.30: Dampness on the wall at LG1</p> <p>Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0569
	Element:	Wall plaster
	Location:	LG1- West- CL34- Lot 53
	Description of Defect:	Sign of dampness on the wall.
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean defective area. Refurbish the affected areas with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

Table 3.31: Damage of ceiling


 <p>Figure 3.31: Damage of ceiling at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0570
	Element:	Ceiling
	Location:	LG1- West- Telco and ICT Room
	Description of Defect:	Damage of ceiling.
	Recommendation:	Rectify and install with the new ceiling at the affected area.

Table 3.32: Blistering of paint on the wall


 <p>Figure 3.32: Blistering of paint at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0571
	Element:	Wall plaster
	Location:	LG1- West- Telco and ICT Room
	Description of Defect:	Sign of blistering paint on the wall.
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean defective area. Refurbish the affected areas with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

Table 3.33: Dampness on the ceiling


 <p>Figure 3.33: Dampness on ceiling at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0572
	Element:	Concrete slab (ceiling)
	Location:	LG1- West- Telco and ICT Room
	Description of Defect:	Sign of dampness on the concrete slab (ceiling).
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean the defective area. Refurbish the affected area with protective seal coat.

Table 3.34: Sign of gap jointing on door frame


 <p>Figure 3.34: Sign of gap jointing at LG1</p> <p>Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0573
	Element:	Door frame
	Location:	LG1- West- Staircase 8
	Description of Defect:	Sign of gap jointing between door frame and wall.
	Recommendation:	Repair and close the joint or gap with crack filler, joint sealant or similar product.

Table 3.35: Water mark on the ceiling


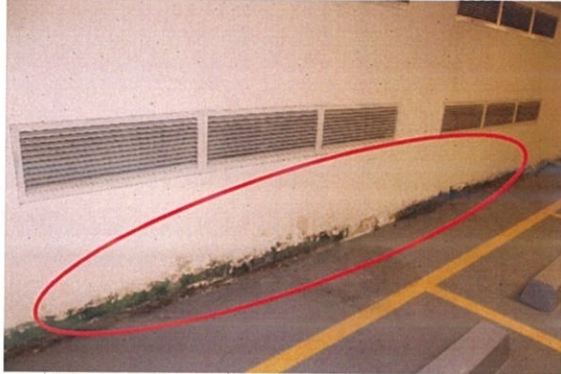
 <p>Figure 3.35: Water mark at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0574
	Element:	Ceiling
	Location:	LG1- West- CL34- Lot 55
	Description of Defect:	Sign of water mark. Suspected due to leakage from above ceiling/ pipe leaks.
	Recommendation:	Perform detail investigation and rectify the leakages problems before repair and refurbish affected area. Rectify and install with the new ceiling at the affected area.

Table 3.36: Dampness on the wall

 <p>Figure 3.36: Dampness on the wall at LG1 Source: SGS (M) Sdn Bhd</p>	Defect No:	CSA-0575
	Element:	Wall plaster
	Location:	LG1- West- CL34- Lot 55
	Description of Defect:	Sign of dampness on the wall.
	Recommendation:	Perform detail investigation and rectify the dampness problems before repair and refurbish affected area. Scrap and clean defective area. Refurbish the affected areas with cement based paint or textured wall coating. Repaint the affected area by using appropriate paint system.

CHAPTER 4.0

CONCLUSION

4.1 Conclusion

After the building inspection had been done at Bank Negara Malaysia Museum and Art Gallery, the building condition is still safe for the occupants to stay. However, there are still some minor defects occurred in the building that need to be repair so that it will not change to major defects.

Based on the investigation, the factors contribute to the defects is poor workmanship which includes poor management, lack experience, competency of labours, language barrier to communication, poor weather condition and more. In order to overcome the issue, there are a few remedies that has been done to correct the defects in the building such as performing a detail investigation and rectify the problems, installing new materials at the affected areas, repair or close the joint with crack filler or joint sealant and many more. Besides that, there are different ways to overcome the issue which is strict supervision, training and education, proper communication among parties involved, proper construction and manpower management.

As a conclusion, the whole structures are subjected to the different types of deformities. It is huge to evaluate each defects in all aspects of building and discover every individual deformity. At that point, cure them effectively.

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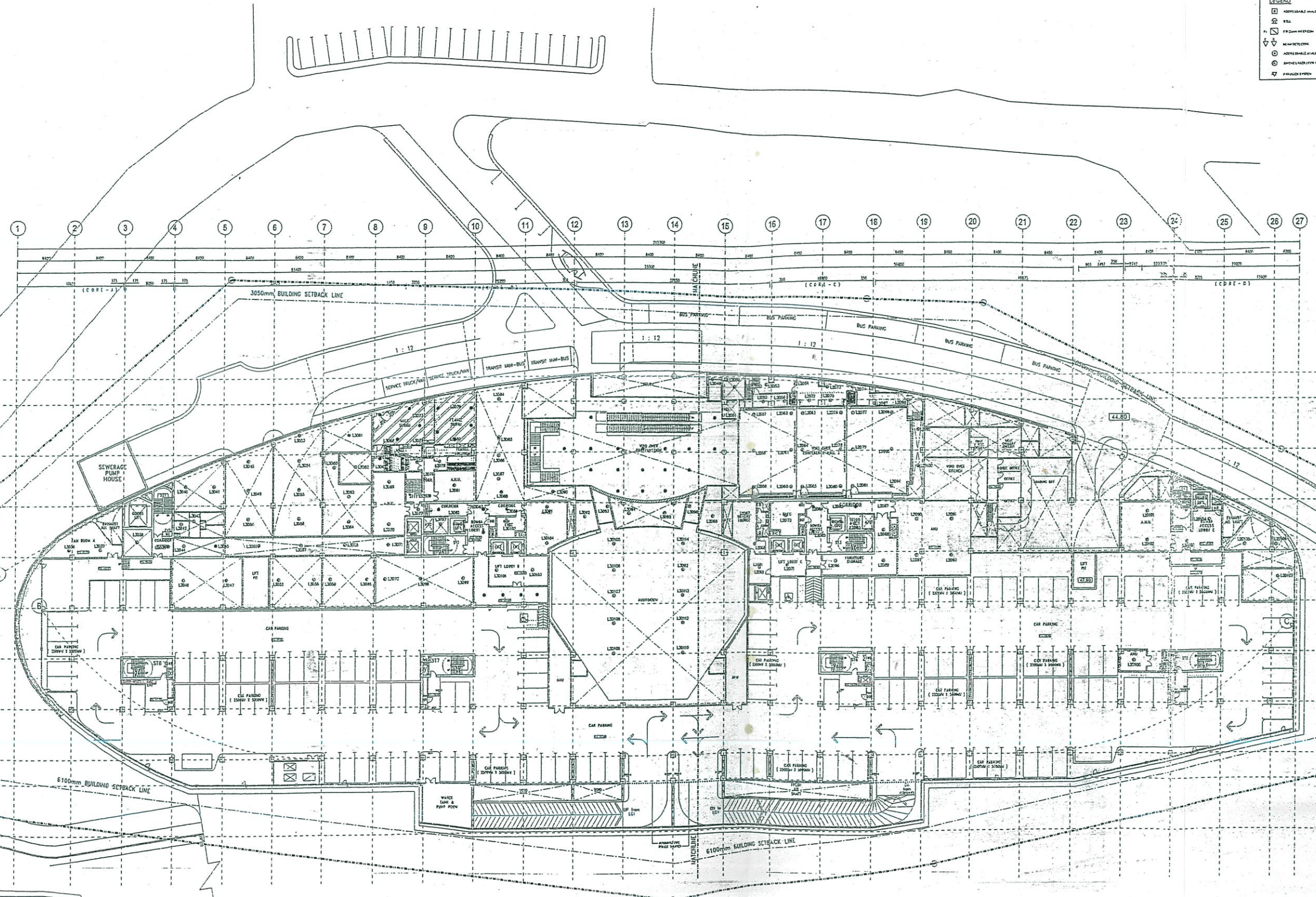
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- How to Identify Defects. (2016). Available from: <http://www.building.govt.nz>
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APPENDIX

LEGEND

- ADJUSTABLE WALL/PIPE BEHIND
- WALL
- ▭ FIRE ALARM SYSTEM
- ▽ FIRE ALARM SYSTEM
- ADJUSTABLE WALL/PIPE BEHIND
- ADJUSTABLE WALL/PIPE BEHIND
- ▽ FIRE ALARM SYSTEM



LOWER GROUND 1 FLOOR PLAN.

Client:
BANK NEGARA MALAYSIA
 JALAN BANGSA
 62500 KUALA LUMPUR
 TEL: 60-3-2111 2011

Land Owner:
PUSURUJAYA TANAH PERSEKUTUAN

Project Manager:
WYTH CONSULTANT SDN BHD
 11, JALAN PANGLOSS, 11000 KUALA LUMPUR
 TEL: 60-3-2111 1111

Architect:
MRSASIA ASSOCIATES SDN BHD
 11, JALAN PANGLOSS, 11000 KUALA LUMPUR
 TEL: 60-3-2111 1111

Structural Engineer:
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 11, JALAN PANGLOSS, 11000 KUALA LUMPUR
 TEL: 60-3-2111 1111

MEP Engineer:
PERUNDING HASMIM & REZA SDN BHD
 11, JALAN PANGLOSS, 11000 KUALA LUMPUR
 TEL: 60-3-2111 1111

Quantity Surveyor:
KPK
 11, JALAN PANGLOSS, 11000 KUALA LUMPUR
 TEL: 60-3-2111 1111

Management Contractor:
PUTRA PERCANA CONSTRUCTION Sdn. Bhd.
 11, JALAN PANGLOSS, 11000 KUALA LUMPUR
 TEL: 60-3-2111 1111

Sub Contractor:
MARK JAYA ENGINEERING SDN. BHD.
 11, JALAN PANGLOSS, 11000 KUALA LUMPUR
 TEL: 60-3-2111 1111

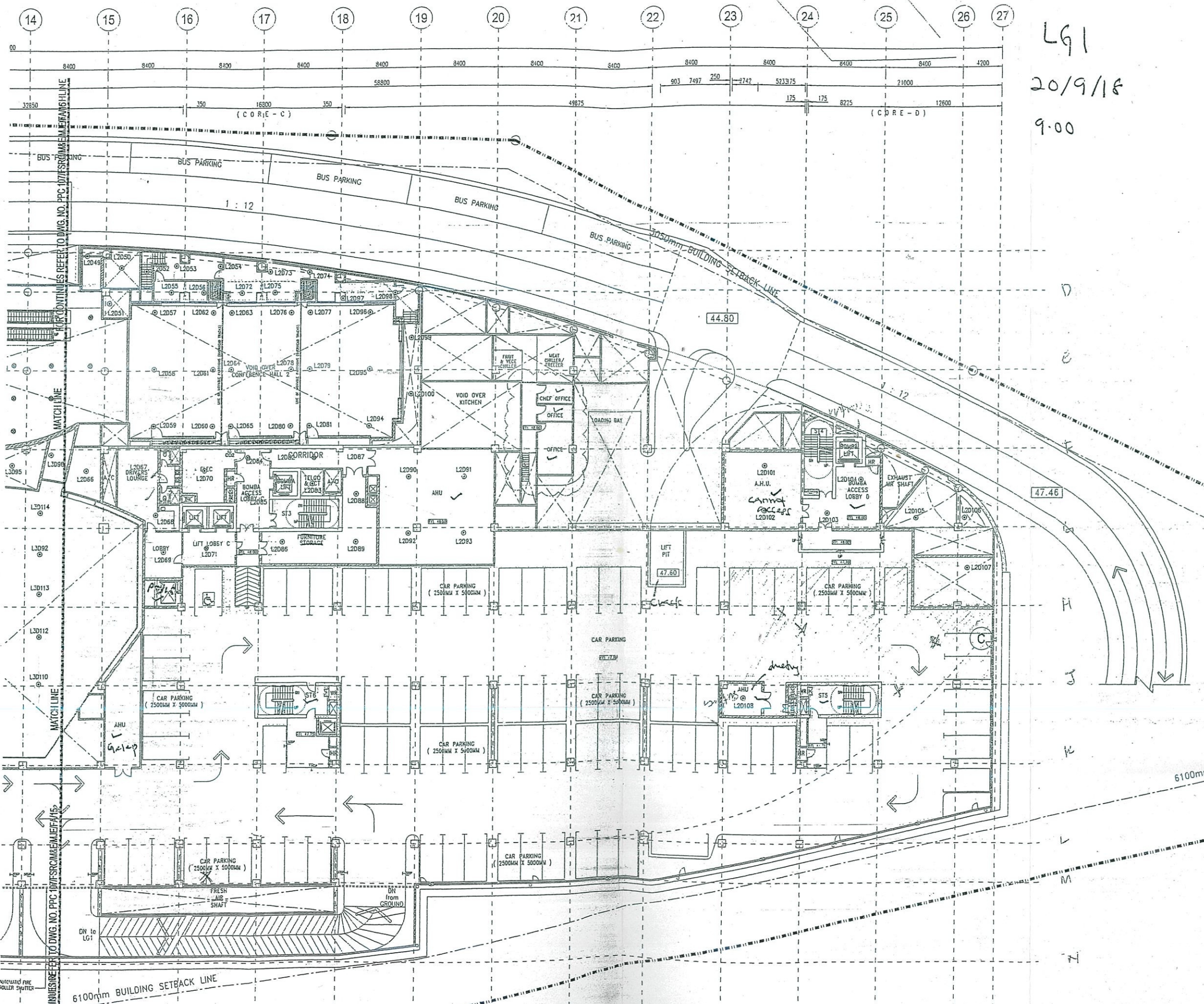
Project: THE EXECUTION AND COMPLETION OF THE REMAINING AND REMEDIAL WORK OF THE MAIN BUILDING AND EXTERNAL WORKS TO "CADANGAN MEMBINA SATU BLOK BANGUNAN PEJABAT DAN INSTITUSI 6 TINGKAT DENGAN 5 PARAS BESAM TEMPAT LETAK KERETA DI ATAS LOT 42, JALAN DATO ONN, KUALA LUMPUR" (SASANA KJANG)



Drawing Title: FIRE PROTECTION INSTALLATION
 FIRE ALARM SYSTEM
 LOWER GROUND 1 FLOOR PLAN.

Drawn by: HAHWA
Scale: 1:1250
Checked by: TENG/THWA
Approved by: KAMARUL
Date: MAY 2011

AS BUILT DRAWING



LG1
20/9/18
9.00

PART OF LG 1 FLOOR (EAST) PLAN

Client:
BANK NEGARA MALAYSIA
Jalan Duta
50480 Kuala Lumpur
Tel: 60-3-201 2001 Fax: 60-3-201 2000

Land Owner:
PESURUHJAYA TANAH PERSEKUTUAN

Project Manager:
WYV CONSULTAN SDN BHD
Lot 11, 10th Floor, 10th Mile
Jalan Puncak Jalil, Kuala Lumpur
Tel: 60-3-2113 0311 Fax: 60-3-2113 0311

Architect:
HMS WASTON ASSOCIATES SDN BHD
Wisma Puncak Jalil Bldg
Jalan Puncak Jalil, 50080 Kuala Lumpur
Tel: 60-3-2113 0311 Fax: 60-3-2113 0311

MEP Engineer:
T & T CONSULTAN SDN BHD
Lot 11, 10th Floor, 10th Mile
Jalan Puncak Jalil, Kuala Lumpur
Tel: 60-3-2113 0311 Fax: 60-3-2113 0311

M&E Engineer:
PERINDING HASHIM & NEH SDN BHD
Amenjana Mawana Sur Estate (151817-01)
Persiaran, Block C, Puncak Jalil
No. 2, Jalan Puncak Jalil, 50080 Kuala Lumpur
Tel: 60-3-2113 0311 Fax: 60-3-2113 0311

Quantity Surveyor:
KPK QUANTITY SURVEYORS (SIAM) SDN BHD
10-4 & 10-7, Block B, 10th Mile, Puncak Jalil
Jalan Puncak Jalil, 50080 Kuala Lumpur
Tel: 60-3-2113 0311 Fax: 60-3-2113 0311

Management Contractor:
PUTRA PERDANA CONSTRUCTION Sdn. Bhd.
(A Subsidiary of PUTRAJAYA PERDANA BERHAD)
2nd & 3rd Floor
No. 8, Jalan P16, Precinct 16,
62500 Putrajaya, Malaysia
Tel: (65) 6080 8088
Fax: (65) 6080 8088
Email: info@putra.com

Sub Contractor:
MARK JAYA ENGINEERING SDN. BHD.
Room 10, 10th Floor
77000 Putrajaya, Malaysia
Tel: (65) 6080 8088
Fax: (65) 6080 8088
Email: info@markjaya.com

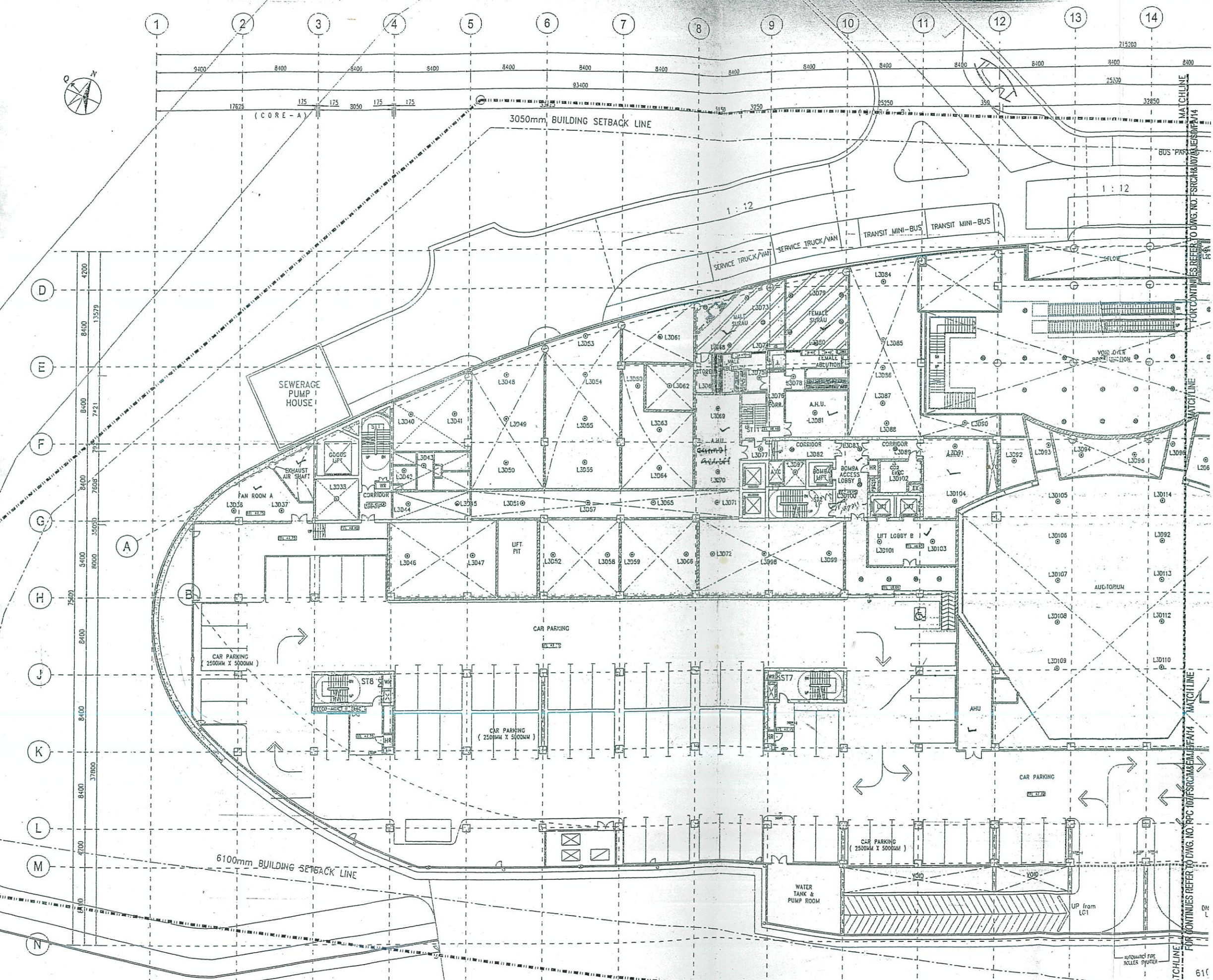
Project Description:
THE EXECUTION AND COMPLETION OF THE REMAINING AND REMEDIAL WORK OF THE MAIN BUILDING AND EXTERNAL WORKS TO "CADANGAN MEMBINA SATU BLOK BANGUNAN PEJABAT DAN INSTITUSI 6 TINGKAT DENGAN 6 PARAS BESMEN TEMPAT LETAK KERETA DI ATAS LOT 43, JALAN DATO ONN, KUALA LUMPUR" (SASANA KUANG)

Key Plan:

Drawing Title:
FIRE PROTECTION INSTALLATION
FIRE ALARM SYSTEM
PART OF LG 1 FLOOR (EAST) PLAN

Drawn By: HERNAN **Scale:** 1:100
Checked By: TONI/THVA **Approved By:** KAMARUL

Date: MAY 2011



PART OF LG 1 FLOOR (WEST) PLAN

LG1
19/9/18
9.00 am

Client: **BANK NEGARA MALAYSIA**
 Land Owner: **PESURUHAYA TANAH PERSEKUTUAN**
 Project Manager: **WYD CONSULTANT SDN BHD**
 Architect: **HAS & WASTU ASSOCIATES SDN BHD**
 CAD Engineer: **T.T. ENGINEERING SDN BHD**
 MEP Engineer: **PERUNDING HASHIM & NEGI SDN BHD**
 Quantity Surveyor: **KQC QUANTITY SURVEYING (PENANG) SDN BHD**
 Mechanical Contractor: **PURITA PERKONSTRUKSI Sdn Bhd**
 Sub Contractor: **MARK JAYA ENGINEERING SDN. BHD.**

PROJECT: THE EXECUTION AND COMPLETION OF THE REMAINING AND REMEDIAL WORK OF THE MAIN BUILDING AND EXTERNAL WORKS TO "CADANGAN MEMBINA SATU BLOK BANGUNAN PEJABAT DAN INSTITUSI 6 TINGKAT DENGAN 5 PARAS BESMEN TEMPAT LETAK KERETA DI ATAS LOT 43, JALAN DATO ONN, KUALA LUMPUR" (SASANA KIJANG)

Scale: 1:150
 Date: MAY 2018
 Drawn By: HSD/AM
 Checked By: TSH/DNA
 Approved By: KAM/APJ

AS BUILT DRAWING