



UNIVERSITI TEKNOLOGI MARA

DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

**INSTALLATION OF STARKEN AUTOCLAVED AERATED
CONCRETE (AAC) BLOCK WALL**

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UNIVERSITI TEKNOLOGI MARA
(PERAK)**

DECEMBER 2018

It is recommended that the report of this practical training provided

By

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Entitled

**INSTALLATION OF STARKEN AUTOCLAVED AERATED CONCRETE
(AAC) BLOCK WALL**

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

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SEPTEMBER 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 practical training session that I underwent at RME Sdn.Bhd. for duration of 14 weeks starting 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 fulfilment of the requirements for obtaining the Diploma in Building.

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ABSTRACT

Installation Starken Autoclaved Aerated Concrete (AAC) Block Wall. AAC block product are made using slurry mix containing cement, sand, lime and aerating agent. The slurry is poured and moulded to form lightweight blocks, panels and lintels upon which are cured in autoclave. Objective of this study is to identify the tools and material and to determine the method statement or the process of block wall construction from the beginning. The method of this study are observation the type of basic wall components, accessories and basic installation tools, interview the workers to find out their view and opinions on how to make the bricklaying and references to find information to make the wall. To illustrate the most importance factor in this study is ensure the setting up and levelling for the first block, make sure before laying the block put the Damp Proof Course (DPC) at the ground level. AAC block it proven to provide better insulation to thermal comfort and sound transmitted. It is design with excellent grade and able to withstand impact loads from rough usage.

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CHAPTER 1.0

1.1 INTRODUCTION

This project is all about the Starken Autoclaved Aerated Concrete (AAC) block wall. The Starken AAC Sdn. Bhd. was founded by Datuk Chiau Beng Teik in 1974. Starken AAC Sdn. Bhd. was incorporated in 2011 by Chin Hin Group Berhad. It is professionally managed by a team of personnel who have more than 13 years of experience in AAC industry. Overview AAC block product are made using slurry mix containing cement, sand, lime and aerating agent. The slurry is poured and moulded to form lightweight blocks, panels and lintels upon which are cured in autoclaved. The high-pressure steam-curing mechanism in the autoclave facilitates the curing process the moulded lightweight concrete, producing physically and chemically stable products that weight about 1/5 of normal concrete. AAC product contain millions of tiny non-connecting air pocket yielding superior thermal insulation property. AAC product are typically installed to form wall, floors and roofs. There are many types of product in AAC such as, standard block, jumbo block, interlocking block, wall panel, floor panel and lintel. Another material are thin bed adhesive, render and skim coat. The advantages of AAC make the wall building safer, more comfortable, more energy-efficient and more durable. Besides, AAC block products has many competitor such as, clay brick, concrete brick and concrete block but Starken team with strong building industry experience is capable of delivering standard to customised job scopes which are consulting, design, computing, development, drawing, construction training, engineering subcontractor and acceptance co-ordination.

1.2 OBJECTIVES

- i. To identify the types of machineries, equipment and materials used during block works in construction.
- ii. To analyse the method statement of installation of Starken AAC Block Wall at hotel located at Jalan Panji Alam.

1.3 SCOPE OF STUDY

Based on case study, the hotel is still under renovation and it located in Jalan Panji Alam, Kuala Terengganu, Terengganu. The purpose to build this hotel is to provide travellers with shelter, food, refreshment and similar services and goods, offering on a commercial basis things that are customarily furnished within households but unavailable to people on a journey away from home. With completion of this renovation project it can bring advantages to travel and tourism Terengganu.

Observation for this project has been done around the whole area of Panji Alam. Besides that, any problem occurred during the installation of block has been investigated and the solution were identified for each matter. The study shown on the installation of block as infill wall (non-load bearing) at Panji Alam by using Starken AAC block wall.

The project started on 1 July 2018 and estimated to complete and operational on 31 December 2018 and this project has been sub to Epika Enterprise Sdn. Bhd. to handle the project but under the supervision of RME Sdn. Bhd. as a client. The proposed of this project valued approximately RM 3 million. The construction of hotel is highly depending on the client's needs, desired concept and plan. The proposed is located about 10km from Bandar Kuala Terengganu.

1.4 METHOD OF STUDY

There are a few method are used for data collection in this case study. Those methods are purposed to obtain information and identify all problem and facts for my case study.

i.) Observation Method

Made the observation to identify the type of basic wall components, accessories and basic installation tools that used and the way that must be made to run the process of make the wall.

ii.) Interview Method

The next method is interviewing the workers to find out their views and opinions on how to make the bricklayer (Aerated light-weight concrete) (AAC Block) not based on theory. Not only interviewed the workers, supervisor and also engineer at site been interview.

iii.) Reference

Apart from that, because to hard to find a information and the method to make the wall, so a reference with surfing the internet and read a few plans for additional information are the best way.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

RME SDN BHD was incorporated on the 8th August, 1980 and was registered in the same year as a wholly owned Bumiputera Company. It's Head Office is located at 29-A, First Floor, Wisma Awang Chik, Jalan Sultan Mahmud, 20400 Kuala Terengganu, Terengganu Darul Iman.

RME SDN BHD is a civil engineering and building contractor backed by a team of whole Bumiputera professionals with the experience and resources, registered with Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB) as Grade G7 contractor and recognized as a Kontraktor Bumiputera by Pusat Khidmat Kontraktor (PKK) of Kementerian Kerja Raya Malaysia. RME SDN BHD is also a member of Guild of Bumiputera Contractor.

With the version to forge ahead and uphold a philosophy to provide comprehensive and diversified range of service to meet various standard, RME SDN BHD has also registered with PETRONAS, TENAGA NASIONAL BERHAD, SURUHANJAYA PERKHIDMATAN AIR NEGARA (SPAN), PUTRJAYA HOLDING and MIDF PROPERTY BERHAD. Since its existence, RME SDN BHD has been operating successfully and has undertaken and completed a wide range of works such as :

1. Jungle clearing and land preparation.
2. Building Works which include steel, structural and architectural for building type such as library, office, flats, houses, sport complex, mosque, residential hostel, warehouse etc.
3. Civil Engineering works which include highway and road construction, earthwork, drainage system and sewerage system etc.
4. Water reticulation system.
5. M&E services.

RME SDN BHD has executed more than 641 million worth of work and are prepared to undertake and fulfil the construction works within the time frame stipulated competently to prove that we seriously and actively involved in activities which contribute toward achieving the company primary mission.

“TO PARTICIPATE AND CONTRIBUTE IN WHATEVER WAYS TO OUR CAPABILITIES TOWARD DEVELOPING OUR GREAT NATION-MALAYSIA”

RME SDN BHD along the process to further enhancing the company capabilities, not only strengthening its managerial skills and technological expertise, but also continuing to develop and implement growth strategies and strive for even greater level of efficiency, services and quality.

2.1.1 Company Logo



Figure 2.1 : Company Logo

2.1.2 Company Location

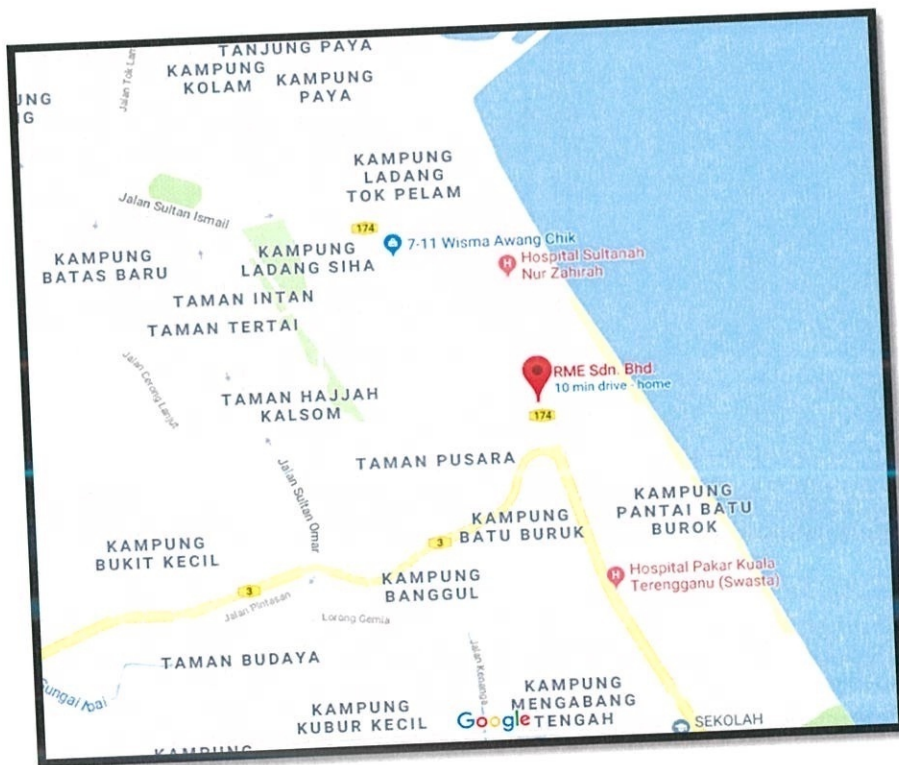


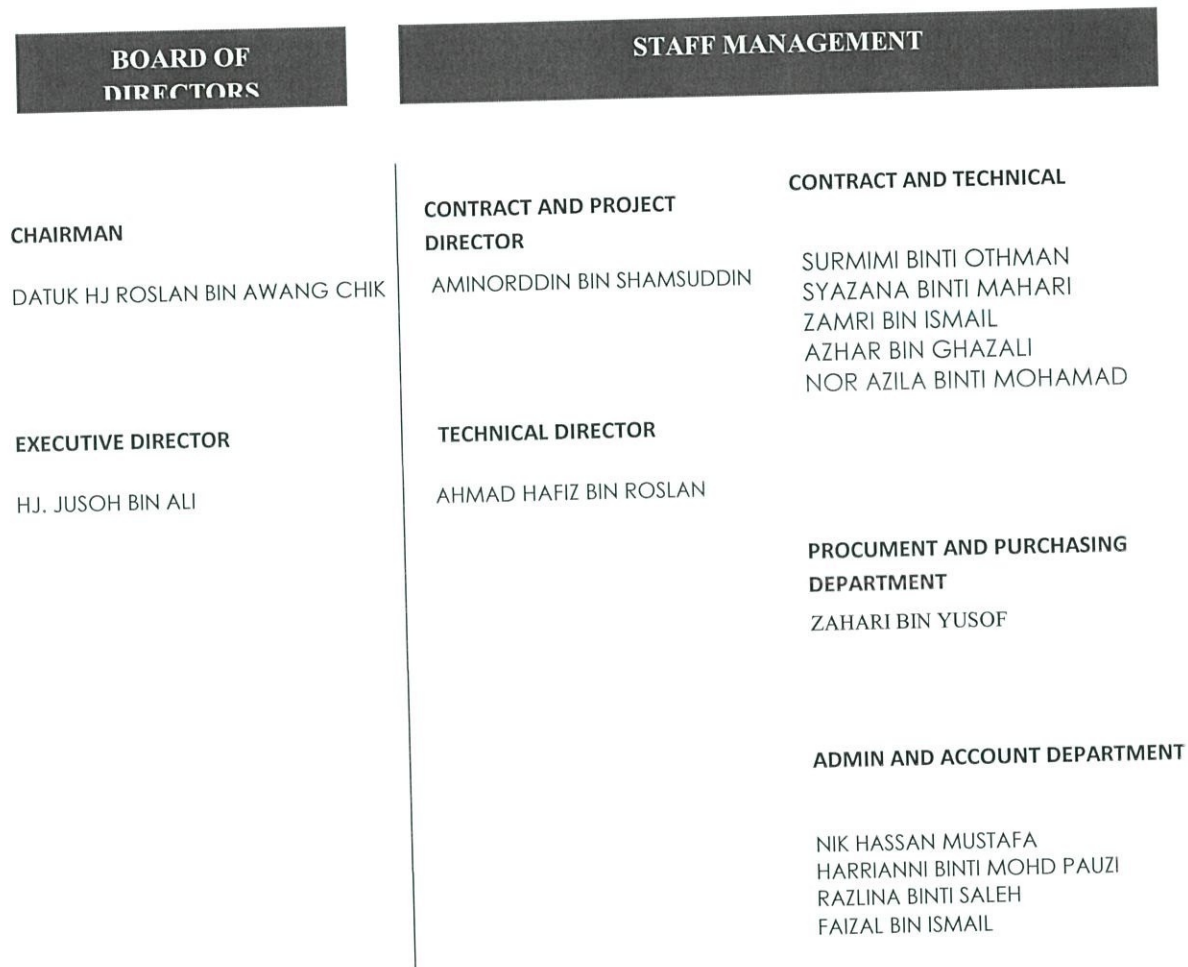
Figure 2.2 : Location Map

2.2 Company Background Profile

Table 2.1 : Company Background Profile

COMPANY NAME	RME SDN BHD
REGISTERED NO.	61311-U
ADDRESS	29 A, First Floor, Jalan Sultan Mahmud 20400 Kuala Terengganu, Terengganu, Malaysia
PHONE NO. FAX NO. EMAIL	rme.sdnbhd@gmail.com
DATE OF INCORPERATION REGISTRAION	8th August 1980 <ul style="list-style-type: none"> • Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB) – Grade G7 • Pusat Khidmat Kontraktor – (Bumiputera Status) • Petronas-SC2 • Tenaga Nasional Berhad (TNB) • Suruhanjaya Perkhidmatan Air Negara (SPAN) • MIDF Property Berhad • Kontraktor Berwibawa (KOWIBAWA) • Intertek International Certificate (Malaysia) Sdn. Bhd.
CHAIRMAN	<ul style="list-style-type: none"> • Datuk Haji Roslan Bin Awang Chik (MBA, University of Southern California)
BOARD OF DIRECTORS	<ul style="list-style-type: none"> • Tuan Haji Jusoh Bin Ali – Executive Director • Aminorddin Bin Shamsuddin – Contract & Project Director • Ahmad Hafiz Bin Roslan – Technical Director
BANK	<ul style="list-style-type: none"> • CIMB Bank Berhad Business Centre - Terengganu / Kelantan Acc No. : • Affin Bank Berhad Kuala Terengganu Branch Acc No. : • RHB Bank Berhad Kuala Terengganu Branch Acc No. : • EON Bank Berhad Kuala Terengganu Branch Acc No. :

2.3 Company Organization Chart



2.3.1 Company Personnel

Table 2.2 : Company Personal

MANAGEMENT STAFF	NO
Chairman	1
Executive Director	1
Contract and Project Director	1
Technical Director	1
Quantity Surveyor	1
Assistant Quantity Surveyor	0
Project Manager	0
Assistant Project Manager	0
Site Engineer	1
Safety And Health/Traffic Management Officer	0
Environmental Officer	0
Site Supervisor	1
Purchasing Officer	1
Admin and Account Executive	2
Total	11

Operation Stall	NO.
Clerk	2
General Staff	1
Crane Operator	1
Backhoe / Case Operator	1
Driver	1
Total	6

2.3.2 Construction Plants and Equipment

Table 2.3 : Construction Plants and Equipment

ITEM	DESCRIPTIONS	QUANTITY
A	<u>MOBILE CRANE</u>	2 nos
1.	Tadano TL-200m	
B	<u>EXCAVATOR</u>	1 no
1.	EX200	
C	<u>BACKHOE</u>	2 nos
1.	Case-Super L	3 nos
2.	Case-Super K	
D	<u>LORRY / VAN</u>	4 nos
1.	Hino-Lorry 6W	3 nos
2.	Toyota/Daihatsu-Van 1 Ton	
E	<u>SHOVEL</u>	1 no
1.	Caterpillar-CAT950	
F	<u>ROLLER</u>	1 no
1.	Bomag BW-212	1 no
2.	Potable Roller-1 Tonne	
G	<u>CONCRETE MIXER</u>	10 nos
1.	Lister-7T	5 nos
2.	Lister-14T	
H	<u>AIR COMPRESSOR& GENERATOR</u>	1 no
1.	Genset 2.2KVA	1 no
2.	Compressor-175CFM	
I	<u>OTHERS</u>	2,000 sets
1.	Scaffold	10 nos
2.	Water Pump	12 nos
3.	Vibrator Poker c/w Engine	5 nos
4.	Hand Compactor	1 set
5.	Bar Cutting & Bending Machine	2 nos
6.	Water Jet	

2.4 List of Project

2.4.1 Completed Project

Table 2.4 : List of Completed Project

ITEM	PROJECT / LOCATION	CONTRACT VALUE (RM)	CLIENT / OWNER	CONTRACT PERIOD
1.	Membina & Menyiapkan Kerja-Kerja Terbengkalai, Perumahan TNB Di Atas Lot 1886, 2330 & P.T 746K, Mukim Batu Buruk, Kuala Terengganu.	3,780,780.00	TNB (DETRA BINA SDN BHD)	14/05/1991 - 21/10/1992
2.	Cadangan Membina Dan Menyiapkan Sebuah Masjid Dan Kerja-Kerja Yang Berkaitan Di Kolej Agama Sultan Zainal Abidin, Mukim Batu Rakit, Kuala Terengganu.	10,167,888.82	Jabatan Kerja Raya (JKR)	20/05/1990 - 16/08/1993
3.	Cadangan 2 Blok Rumah Pangsa Jenis IVB, 5 Blok Rumah Berkembar Jenis 1C Dan 18 Blok Rumah Berkembar Jenis III Di Kompleks Perumahan Paka, Terengganu.	8,891,673.18	DETRA BINA SDN BHD	05/08/1991 - 27/09/1993
4.	Cadangan Membina Dan Menyiapkan Bangunan Baru Malayan Banking Berhad Di Atas Lot 4147, Jalan Sultan Ismail, Kuala Terengganu, Terengganu.	2,468,892.36	MALAYAN BANKING BERHAD (MAYBANK)	15/06/1992 - 31/12/1993
5.	Earthwork For The Proposed Teachers Training College At Besut, Terengganu.	7,748,098.05	Jabatan Kerja Raya (JKR)	27/12/1992 - 25/05/1994
6.	Cadangan Jalan Kembar Dari Bulatan Jubli Perak Ke Jambatan Kuala Ibai, Kuala Terengganu.	10,982,877.00	Jabatan Kerja Raya (JKR)	19/08/1992 - 11/01/1995
7.	Projek Khas Penyelenggaraan Bangunan-Bangunan Sekolah Di Daerah Kuala Terengganu.	5,000,000.00	Jabatan Kerja Raya (JKR)	15/08/1994 - 14/08/1995

ITEM	PROJECT / LOCATION	CONTRACT VALUE (RM)	CLIENT / OWNER	CONTRACT PERIOD
8.	EPMI Housing And Office Expansion Project At Rantau Petronas, Kemaman, Terengganu.	43,707,107.00	EPMI	20/03/1994 -31/08/1996
9.	Cadangan 5 Tingkat Ibu Pejabat Bank Bumiputra Terengganu Mengandungi 1 Tingkat Besemen Separuh Dan 17 Ruang Letak Kereta Di Atas Lot 3083, Jalan Paya Bunga, Kuala Terengganu.	5,543,693.78	BBMB Properties	06/12/1994 -28/01/1997
10.	Cadangan Membina Dan Menyiapkan Bangunan Guna Sama Persekutuan, Raub, Pahang.	12,750,000.00	Jabatan Kerja Raya (JKR)	18/01/1995 -22/07/1997
11.	Membina Dan Menyiapkan Kemudahan Rejimen Dan Bateri Peluru Berpandu Starburst Rejimen Ke 32 Artileri (Rejimen Misail Di Kem Terendak, Melaka).	11,017,881.55	Jabatan Kerja Raya (JKR)	08/11/1995 -30/09/1997
12.	Proposed Construction Of 1 Unit Warehouse With 2 Storey Office On Lot 90, Semambu Industrial Estate, Kuantan For Weld Court Realty Sdn Bhd And Construction Of 2 Units Warehouse And Office On Lot 22 And 25, LTAT Light Industrial Estate, Kuantan For Weld Court Realty Sdn Bhd.	6,449,260.00	Boustead Sdn Bhd	17/11/1997 -13/07/1999
13.	Jalan-Jalan Dari Simpang Guai Ke Paloh Hinai – Jalan Kg. Terapai Ke Kg. Peijing (CH2050 Ke CH10500).	14,399,048.50	Kementerian P'angunan Luar Bandar	15/08/1996 -31/03/2000
14.	Proposed Construction Of A New Terminal Building And Parking Apron At Sultan Ismail Petra Airport, Kota Bharu, Kelantan (Phase 1) - Site Clearance, Demolition And Pilling Works Over The Main Terminal Building And Cub Area As Well As The Construction Of The New Meteorological Station And Other Related Items.	6,500,000.00	Malaysia Airport Berhad	18/11/1999 -23/03/2000

ITEM	PROJECT / LOCATION	CONTRACT VALUE (RM)	CLIENT / OWNER	CONTRACT PERIOD
15.	Cadangan Pembinaan Klinik Kesihatan Jenis 3, Kuarters 16g, 8F, 1D Dan 1C Di Kg. Rahmat, Mukim Chalok, Setiu, Terengganu.	8,461,354.29	Kementerian Kesihatan	05/04/1999 -31/07/2001
16.	Menaiktaraf Laluan 3, Jalan Kuala Terengganu - Kuantan, Km 75 - 86, Dungun, Terengganu.	21,765,000.00	Jabatan Kerja Raya (JKR)	17/05/1999 -30/09/2001
17.	Cadangan Pembinaan Kampus Politeknik Terengganu, Dungun, Terengganu.	39,560,962.90	Kementerian Pendidikan Malaysia / KKBT	21/08/1998 -31/03/2002
18.	Cadangan Pembinaan Bangunan Pencawang Elektrik Dan Pusat Kawalan Wilayah Di Atas Sebahagian Lot P.T 335, Seksyen 41, Kg. Periok / Kg. Limau.	41,553,596.93	Sdn Bhd Tenaga Nasional Berhad (TNB)	11/08/1997 -27/05/2002
19.	Proposed Female Residential College 6 For International Islamic University Malaysia, Gombak Campus, Selangor.	19,687,051.75	Universiti Islam Antarabangsa	01/09/2000 -06/06/2002
20.	Cadangan Merekabentuk, Membina dan Menyiapkan Sekolah Menengah Kebangsaan (Agama) Batu Rakit, Kuala Terengganu.	34,200,000.00	Kementerian Pendidikan Malaysia	29/12/2000 -12/01/2003
21.	1 Blok Bangunan Sekolah, Makmal Dan Dewan Perhimpunan Tambahan Di SMK. Tengku Ibrahim, Setiu, Terengganu.	7,792,284.00	Kementerian Pendidikan Malaysia	03/03/2002 -30/04/2003
22.	Proposed Male Residential College 1&2 For International Islamic Universiti Malaysia, Gombak Campus, Selangor.	61,000,000.00	Universiti Islam Antarabangsa Malaysia (UIAM)	01/09/2000 -15/09/2003

ITEM	PROJECT / LOCATION	CONTRACT VALUE (RM)	CLIENT / OWNER	CONTRACT PERIOD
23.	Cadangan Membina Dan Menyiapkan Sebuah Bangunan Perpustakaan Dan Pusat Teknologi Maklumat 3 Tingkat Di Atas Lot P.T 8818K, Lot 13183 Dan Lot P.T 6971, Kolej Universiti Sains Dan Teknologi Malaysia, Terengganu.	20,399,956.54	Kolej Universiti Sains Dan Teknologi Malaysia (KUSTEM)	10/02/2003 -10/08/2004
24.	Cadangan Membina Dan Menyiapkan Pembangunan Kolej 2 Kampus Perubatan Universiti Islam Antarabangsa Malaysia, Kuantan, Pahang.	23,289,000.00	Universiti Islam Antarabangsa Malaysia (UIAM)	14/01/2003 -30/06/2006
25.	The Replacement Of Underground Tank Works At Petronas Services Station 54, Kijal, Kemaman, Terengganu.	270,000.00	Petronas Dagangan Berhad	15/06/2004 -15/08/2004
26.	The Engineering Procurement, Construction And Commissioning Of Petronas Services Station On Lot P.T 14907, Mukim Mentakab, Temerloh, Pahang.	1,498,500.00	Petronas Dagangan Berhad	14/12/2004 -13/09/2005
27.	The Proposed Upgradig Works At Petronas Services Station Lot 2424, Batu Mengkabang, Guchil Kuala Krai, Kelantan.	515,000.00	Petronas Dagangan Berhad	29/06/2005 -23/08/2005
28.	The engineering, Procurement, Construction And Commissioning Of Petronas Service Station At Lot 114, Bandar AMBS, Durian Mas, Dungun, Terengganu.	1,797,797.00	Petronas Dagangan Berhad	08/02/2006 -27/10/2006
29.	Menyiapkan Pembinaan Sebuah Bangunan Pusat Pentadbiran 6 Tingkat Beserta Besemen Dan Sebuah Bangunan Utiliti Di Kolej Universiti Islam Malaysia, Bandar Baru Nilai, Negeri Sembilan.	20,787,787.00	Kolej Universiti Islam Malaysia (KUIM)	15/07/2005 -22/04/2007

ITEM	PROJECT / LOCATION	CONTRACT VALUE (RM)	CLIENT / OWNER	CONTRACT PERIOD
30.	Membina Dan Menyiapkan Projek Bekalan Air Luar Bandar Secara Konsep Bersepadu Negeri Terengganu Tahun 2007.	11,997,000.00	Kementerian Kemajuan Luar Bandar & Wilayah	03/09/2007 -31/12/2008
31.	Universiti Islam Antarabangsa Malaysia Kampus Gombak, Selangor Darul Ehsan – Menyiapkan Kerja-Kerja Tertinggal Di Kolej Kediaman Perempuan 7	23,418,810.80	Universiti Islam Antarabangsa Malaysia (Kampus Gombak), Selangor Darul Ehsan	12/11/2008 - 13/10/2009
32.	Menender Semula Projek Naik Taraf Jalan Dari Bulatan Sultan Mansor Ke Kuala Berang Pakej 3a : Dari Binjai Rendah Ke Wakaf Tapai (KM 20- KM 26).	45,952,264.40	Jabatan Kerja Raya Terengganu (JKR)	01/11/2010- 27/09/2015
33.	The Engineering, Procurement, Construction and Commissioning (EPCC) of PSS at Lot PT 9546 - 9556 HSM 5820 - HSM 5830 and Part of Lot PT 9557 - PT9560 HSM 5831 - HSM 5834, Mukim Kuala Berang, Hulu Terengganu, Terengganu (PDB/RBD/14/2012/0383)	3,580,000.00	PETRONAS Dagangan Berhad	21/05/2012- 27/02/2013
34.	The Proposed Upgradig Works At Petronas Services Station Lot 2424, Batu Mengkabang, Guchil Kuala Krai, Kelantan.	515,000.00	Petronas Dagangan Berhad	29/06/2005 -23/08/2005
35.	Cadangan Pembinaan Yang Terdiri Dari 1 Blok Pangsapuri Kos Sederhana 16 Tingkat (178 Unit) Yang Mengandungi 2 Unit Kediaman Orang Kurang Upaya, 1 Unit Dewan Orang Ramai, 1 Unit Pejabat Pengurusan, 1 Unit Surau, 1 Unit Tadika, 1 Unit Kedai, 1 Unit Dobi, 1 Unit Pencawang Elektrik Dan 1 Unit Bilik Isihan Surat Di Atas Lot P.T 47401, Jalan Nova U5/71A, Subang Bestari, Seksyen U5, 40150 Shah Alam, Selangor.	21,300,000.00	Worldwide Holdings Berhad	23/04/2012 - 29/12/2014

ITEM	PROJECT / LOCATION	CONTRACT VALUE (RM)	CLIENT / OWNER	CONTRACT PERIOD
36.	Cadangan Membina Satu Blok Kedai Pejabat (17 Unit) Strata Setinggi 4 – 5 Tingkat Yang Mengandungi; i) Tempat Letak Kereta & Motorsikal Berkunci Dan Berbumbung Serta Rumah Sampah, ii) S.T.P Dan TNB Sub-station Di Atas Lot Pt 2501 (Pt2398) H.S.(D) 10135, Jalan Panji Alam, Mukim Batu Buruk, Kuala Terengganu, Terengganu.	26,783,000.00	Lembaga Tabung Amanah Warisan Negeri Terengganu (LTAWNT) / RME SDN BHD	01/11/2014 - 30/04/2017



Figure 2.3 : Perpustakaan Kebangsaan, Kuala Lumpur



Figure 2.4 : Masjid Kusza, Kuala Terengganu



Figure 2.5: Kolej Kampus Prebuatan UIAM



Figure 2.6 : USIM



Figure 2.7: Projek Naik Taraf Jalan



Figure 2.8: Pangsapuri 16 tingkat, Shah Alam

2.4.2 Current Project



Figure 2.9: Hotel Bajet at Panji Curve

The current project of RME Sdn Bhd is a proposal to renovate office buildings to the Budget Hotel at Panji Curve. The project commence in late June 2018 and it will end in 31 December 2018.

2.5 List of Registration Certificate

Table 2.5 : List of Registration Certificate

ITEM	PENDAFTARAN	REGISTRATION NO. / SERIES NO.	VALIDITY / PERIOD
1.	Construction Industry Development Board (CIDB)	1960227-TR000454 / 239330 A	26/03/2017 – 15/03/2019
2.	Sijil Perolehan Kerja Kerajaan (SPKK) (CIDB)	A171105	28/03/2017– 15/03/2019
3.	Pusat Khidmat Kontraktor (PKK)- Bumiputra Status	TB 212554	27/04/2017 – 15/03/2019
4.	Petroliam Nasional Berhad (PETRONAS)	RHQ-61311-U	30/09/2015 – 29/09/2018
5.	Suruhanjaya Perkhidmatan Air Negara (SPAN)	73293	06/04/2017 – 05/04/2018
6.	Kontraktor Berwibawa (KOWIBAWA)	167	SINCE 27/12/1994
7.	Intertek International Certificate (Malaysia) Sdn. Bhd.	Q812188	15/05/2015 – 14/05/2018

CHAPTER 3.0

CASE STUDY

3.1 Introduction of case study

Introduction of Project

As stated in scope of study, the site that I have been chosen was at Jalan Panji Alam, Kuala Terengganu, Terengganu. Project of Renovation Building into the Hotel located nearby Bandar Kuala Terengganu, Terengganu. The project was started at 1 July 2018 and it will end on 31 December 2018. This project has been sub Epika Enterprise Sdn. Bhd. and construct of Hotel Bajet. This on-going project was named as “Cadangan Ubah Guna Bangunan Kedai Pejabat Kepada Hotel Bajet Di Atas Lot 60197(P.N 11806), Plot 1 (Tingkat Bawah –Tingkat 4) & Plot 2(Tingkat 1-4), Dataran Panji, Jalan Panji Alam, Mukim Batu Buruk, Kuala Terengganu, Terengganu Darul Iman” which was builded up on the strategic area.



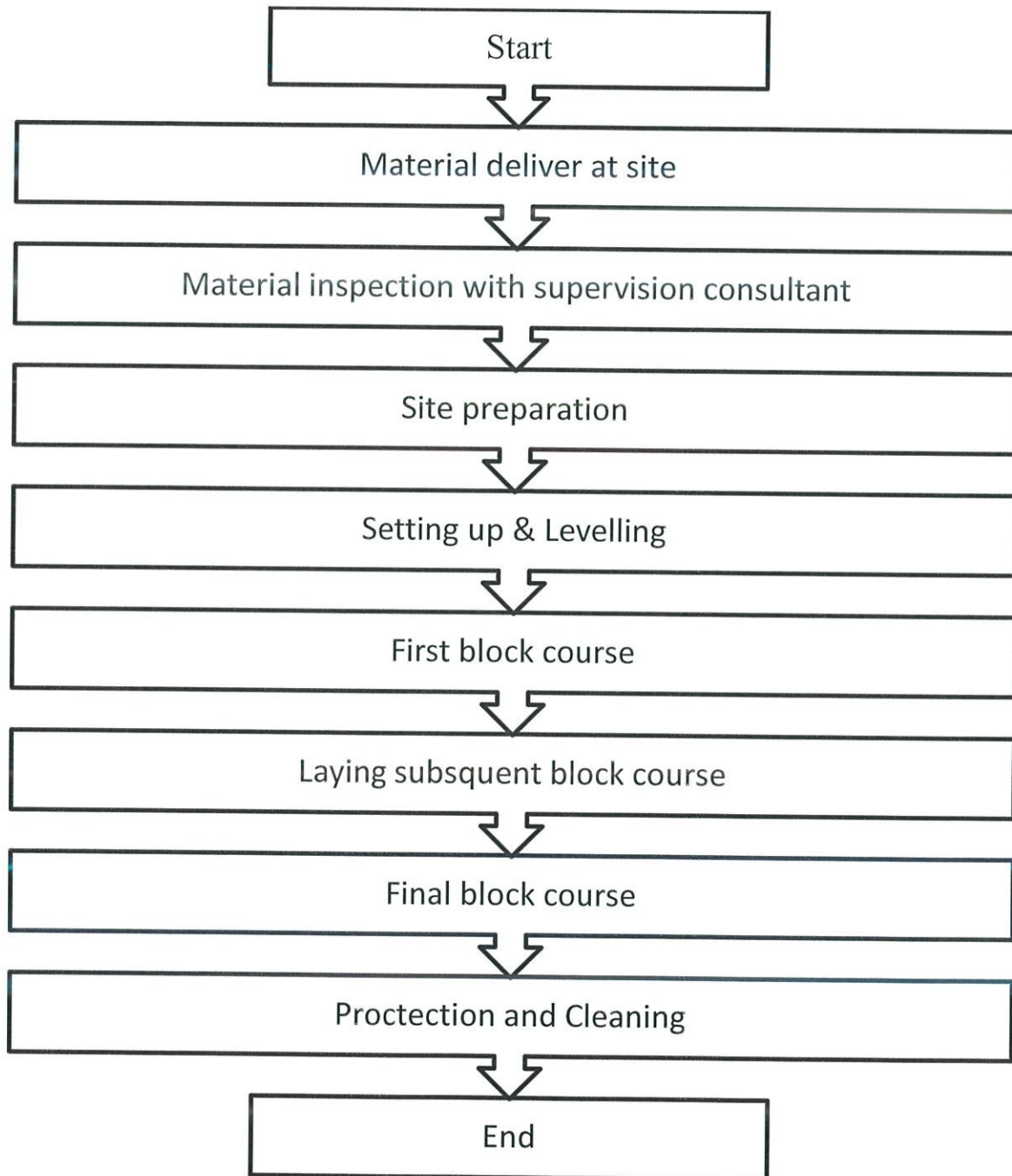
Photo 3.1 : Front View of Hotel Bajet

Table 3.1 : Project Summary

Title of Project	Cadangan Ubah Guna Bangunan Kedai Pejabat Kepada Hotel Bajet Di Atas Lot 60197(P.N 11806), Plot 1 (Tingkat Bawah – Tingkat 4) & Plot 2(Tingkat 1-4), Dataran Panji, Jalan Panji Alam, Mukim Batu Buruk, Kuala Terengganu, Terengganu Darul Iman
Client	RME SDN.BHD.
Contractor	Epika Enterprise Sdn.Bhd.
Project Start	1 July 2018
Project End	31 December 2018
No. Insurance	TPC-60000718-TI

3.2 Installation of Starken AAC Block Wall




To study the installation process of Starken AAC Block wall in construction.



3.1.1 Material

Table 3.2 : List of Material




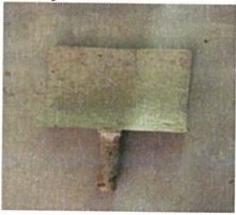
Schedule of material for activities as follow:



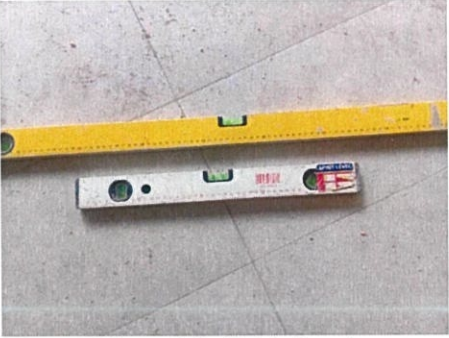

No.	Material	Description	Quantity
a.	Starken AAC Block (200x600x100mm)  Photo 3.2 : Starken AAC Block	Autoclaved aerated concrete (AAC) is a lightweight, precast building product. It is an ideal material for internal and external walls, firewalls, acoustic walls and floors.	As required
b.	Thin Bed Adhesive  Figure 3.1 : AAC Adhesive	Starken AAC Thin Bed Adhesive is a high-quality cementitious adhesive specially formulated and recommended for bonding Starken AAC product such as blocks, panels and lintels.	As required
c.	ST 2 tie  Photo 3.3 : ST2 Tie	ST2 Tie fied or join to column or stiffener and bedded into adhesive at block horizontal joint. It allowing the two parts to act as a homogeneous unit.	As required




3.1.2 Plant and Equipment

Table 3.3 : List plant and Equipment

List of plant, machineries, equipment and tool for execution of activities.

No	Plant, machineries and equipment	Description	Quantity
a.	<p>Notched trowel (100mm)</p>  <p>Figure 3.2 : Notched Trowel</p>	<p>A steel tool used in the construction industry for spreading, scooping, combining and finishing adhesives and mortars during wall, ceiling or floor installations.</p>	As required
b.	<p>Tungsten Carbide Tipped Saw</p>  <p>Photo 3.4 : Tipped Saw</p>	<p>The saw blade's teeth are tipped with small pieces of sharp tungsten carbide block. This saw is used to cut the block to achieve stretcher bond pattern.</p>	As required
c.	<p>Hand drill</p>  <p>Figure 3.3 : Hand Drill</p>	<p>A hand drill is a fastening tool used to secure screws or bolts.</p>	1 nos
d.	<p>Standard Masonry Trowel</p>  <p>Photo 3.5 : Masonry Trowel</p>	<p>The masonry trowel is a hand used in brickwork or stonework for levelling, spreading and shaping mortar and concrete.</p>	As required

e.	<p>Rubber Mallet</p>  <p>Photo 3.6 : Rubber Mallet</p>	<p>This rubber mallet is used in block work by knock the block to get the stationary position of the block.</p>	<p>As required</p>
f.	<p>Mixing Container</p>  <p>Photo 3.7 : Mixing Container</p>	<p>A container used to mix the adhesive together with another material or substances.</p>	<p>As required</p>
g.	<p>Spirit Level</p>  <p>Photo 3.8 : Spirit Level</p>	<p>This tool is used to level the block to make sure the block is in straight position.</p>	<p>As required</p>
h.	<p>Stirrer machine</p>  <p>Figure 3.5 : Stirrer Machine</p>	<p>A machine that homogeneously combine cement, AAC adhesive and water to form adhesive block.</p>	<p>1 nos</p>

i.	<p>Wheelbarrow</p>  <p>Photo 3.9 : Wheelbarrow</p>	<p>The wheelbarrow used to carry many thing in one time. For example it used to carry Starken block from one place to another place.</p>	<p>As required</p>
j.	<p>Mobile Crane</p>  <p>Photo 3.10 : Mobile Crane</p>	<p>This crane is to lift the block of starken AAC off from the heavy truck and to lift onto the rooftop of the building.</p>	<p>1 nos</p>
k.	<p>Multiline Laser</p>  <p>Photo 3.11 : Multiline Laser</p>	<p>A laser line level is a tool combining a spirit level and plumb bob with a laser to display an horizontal or vertical illuminated line on a surface the laser line level is laid against.</p>	<p>1 nos</p>

3.1.3 Manpower

Persons directly involved with site activities stated in this method statement are as follow:

Table 3.4 : List of Manpower

No.	Description	Roles & Responsibilities	No of person
a.	Project Manager	Responsible for project technical, plan drawings and construction activities.	1 person
b.	Construction Manager	Monitoring overall construction activities, safety & environmental issues.	1 person
c.	Site Engineer / Supervisor	Coordinating, planning and supervising site activities.	1 person
d.	Specialist Installer	Carry out installation work.	1 team (5 workers)

3.2 Construction Procedure of Block Wall

3.2.1 Material of delivery handling and Storage of material.

- a) Deliver material to site, with labels and marking clearly identify material name and contractor/fabricator according to the sequence of installation.
- b) Protect the materials and equipment during handling and installation to prevent damages.
- c) Store materials in suitable area that provided by site supervisor.
- d) All delivered material will be inspected by Epika Enterprise representative.
- e) Lifting material to the rooftop of building with crane machine make easy working environment at the site.

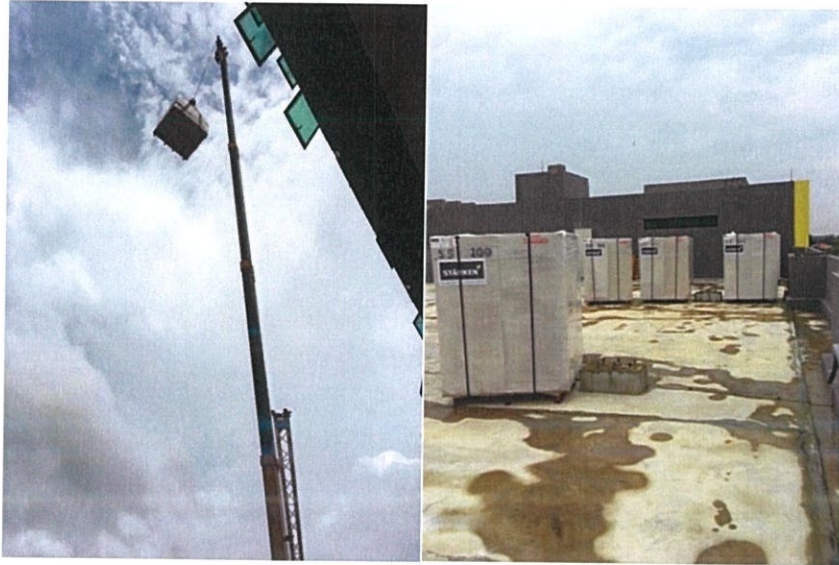


PHOTO 3.12 : Material arrived at site

3.2.2 Site Preparation

- a) Carry out required site preparation such as installation of scaffolding, platform for material and etc.
- b) The site engineer must apply final cleaning and surface preparation to ensure the installation work is working in good condition.
- c) The following are to be removed from the structure:
 - i. All timber formwork, construction debris, concrete droppings, etc.
 - ii. All loose debris, including mud, etc.
 - iii. All paints, solvents, oils, etc.



PHOTO 3.13 : Site Clearence

3.2.3 Installation of Starken AAC Block Wall

a) First step Setting up & Levelling

- i. Mark and measure the area installation of block wall with auto laser line level. This step is kindly do by the workers and being supervise by site supervisor.

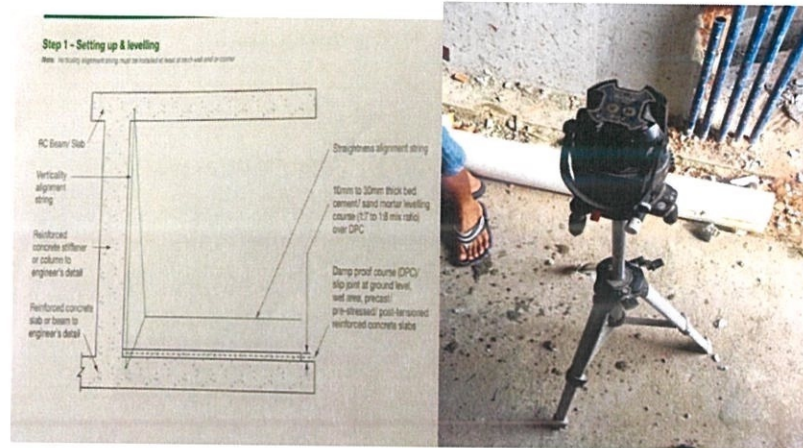


PHOTO 3.14 : Marking Laser

- ii. Then, vertical and horizontal alignment string must be installed at least at each wall end or corner.

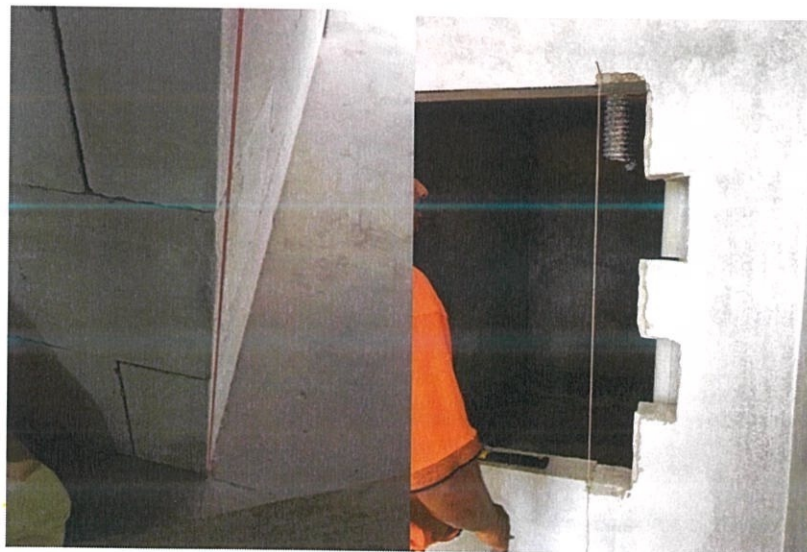


PHOTO 3.15 : Alignment String at Site

b) Second step is First block course

- i. First block must set 10mm to 30mm away from edge of column or stiffener.

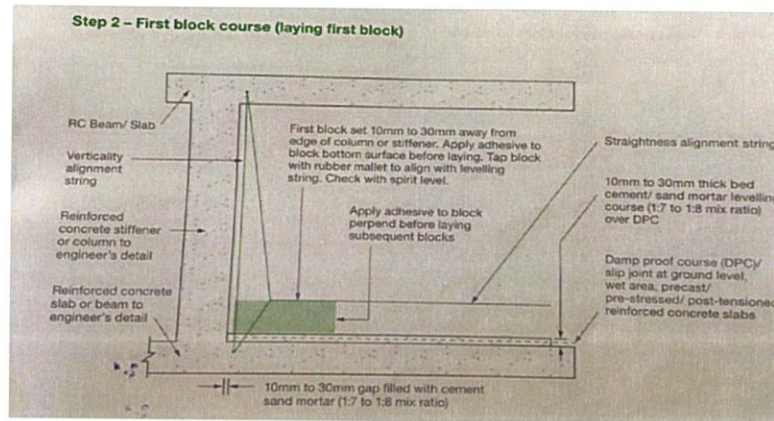


PHOTO 3.16 : Installation Manual Picture

- ii. Apply adhesive to block bottom surface before laying.



PHOTO 3.17 : Laying adhesive

- iii. Tap block with rubber mallet to align with levelling string.



PHOTO 3.18 : Tap with rubber mallet

- iv. Check with spirit level.

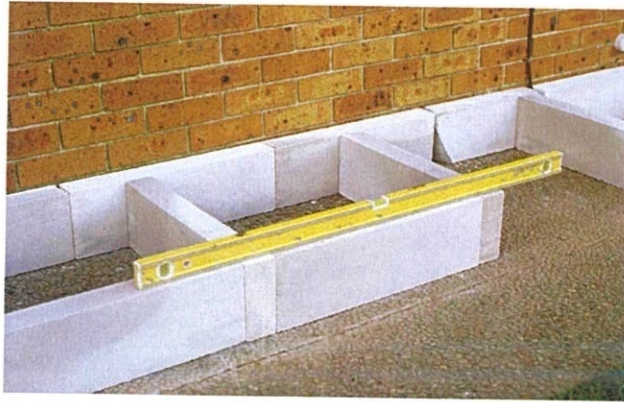


PHOTO 3.19 : Spirit Level

- c) Third step Laying subsequent block courses
 - i. Install ST2 Tie fied to column or stiffener & bedded into adhesive at block horizontal joint.



PHOTO 3.20 : ST 2 Tie

- ii. Cut block to 300mm length to achieve stretcher bond laying pattern (100mm min. block overlap).



PHOTO 3.21 : Cut the block with saw

- iii. Apply adhesive to top of course blocks and all perpend of adjacent blocks before placing the next blocks in position.



PHOTO 3.22 : Apply adhesive on block

- iv. Make sure the horizontal alignment moved upward as each block course progresses.



PHOTO 3.23 : Alignment string move upward

- v. And also make sure mortar levelling course has achieve sufficient strength before laying the subsequent block course.
- vi. At this stage, scaffolding is required.

d) Last step Final block courses

- i. When finishing block is install we must mind the gap between 20mm to 50mm min. from slab or RC beam to fill with lean mortar having cement mortar to sand ratio of 1:7 to 1:8.
- ii. ST2 Tie also fied to RC beam or slab spaced at 1200mm centres horizontally.

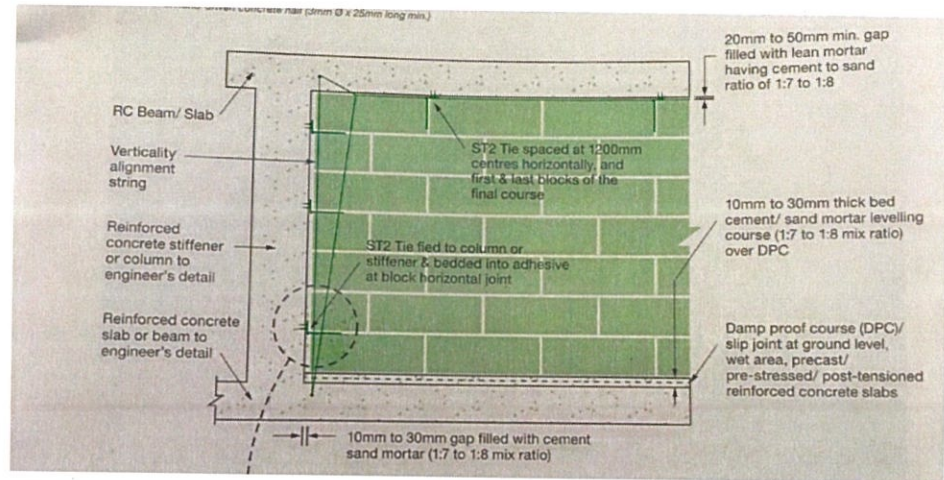


PHOTO 3.24 : Installation manual

- iii. At this stage, scaffolding is also required.



PHOTO 3.25 : Install block at the slab

- e) The procedure from (a) to (d) will be repeated until all the block wall in the building installed.
- f) To protect the block wall, plaster the block wall is carry out and cleaning for block wall until final acceptant from site supervisor.



PHOTO 3.26 : Plastering work

4.0 CONCLUSION

CONCLUSION

4.1 Conclusion

In conclusion, wall is a structure that defines an area, carries a load, provides shelter or security. The purposes of the wall in building are to support roofs, floors and ceilings to enclosed a space as part of the building envelope along with a roof to give building form and to provide shelter and security. In addition the wall can give house various type of utilities such as electrical wiring and plumbing. By using autoclaved aerated concrete (AAC) block has many opportunities to reduce at least 30% of environment waste, decreases 50% of greenhouse radiation and over 60% integrated energy on the surface of brick. A process bricklaying required good workability using AAC can be easily sawn, cut, curved nailed or drilled using ordinary hand tools. AAC block it design become lightweight to marking it easily handled and thermal comfort with excellent thermal insulation properties result in improved comfort level. Although expensive but it durable because history of usage dated more than 50 years protecting building envelopes and durable even under extreme weather condition.

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Web Site :

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2. Starken block (2015). Available (14/11/2018) from: <http://www.starken.com.my/>
3. AAC Block: Benefit of AAC Block (2013). Available (15/11/2018) from: <http://www.ecogreenproducts.in/benefits.php>

Manual :

1. Installation Manual: Starken AAC Block Wall – Infill Wall (Non-Load Bearing)

APPENDICES

APPENDICES A
CONSTRUCTION PLAN

