

Annex 1 HIA Approval

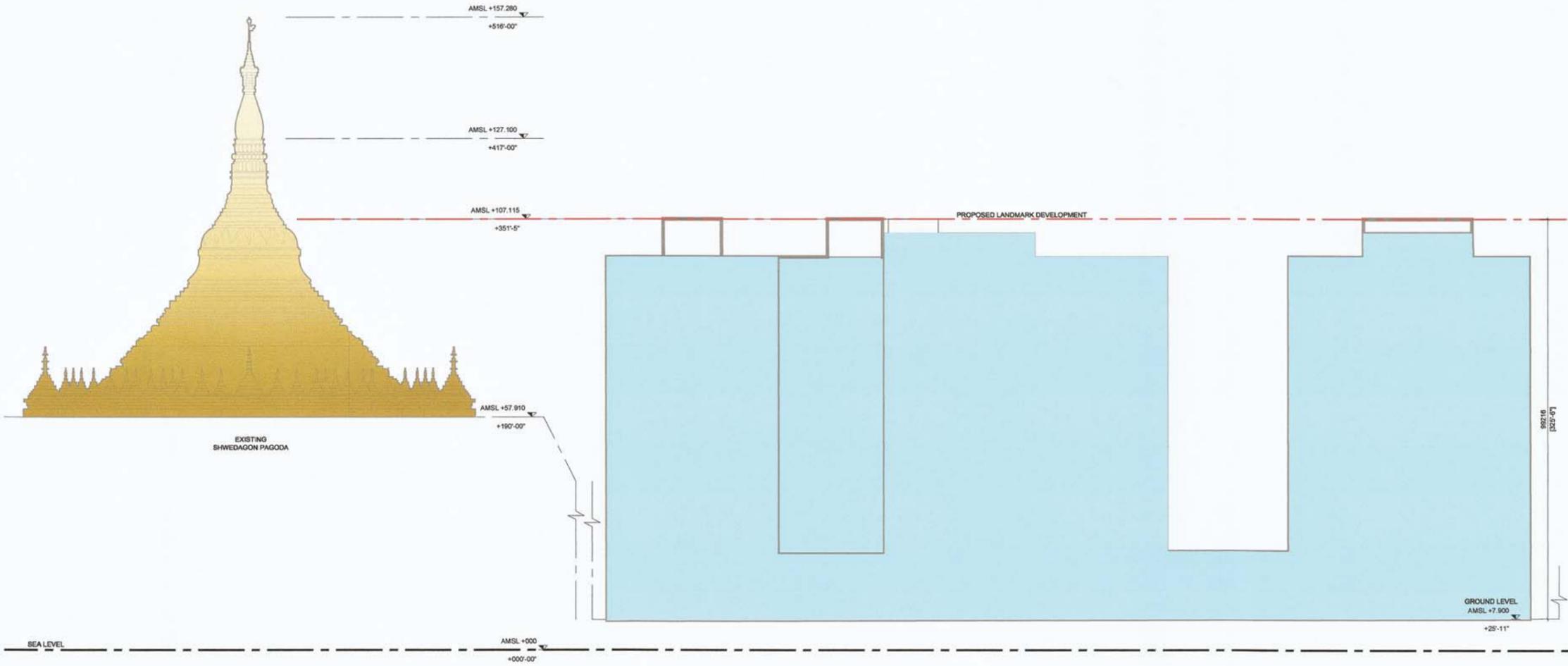
ရန်ကုန်တိုင်းဒေသကြီးအစိုးရအဖွဲ့
 (၉.၁၀.၂၀၁၄)ရက်နေ့
 အစည်းအဝေးအမှတ်စဉ် (၃၇/၂၀၁၄)ဖြင့်
 အဖွဲ့အစည်း
 "မူ" အရ ခွင့်ပြုထားပြီးဖြစ်ပါသည်။



အင်ဂျင်နီယာဌာန (အဆောက်အအုံ)
 အထပ်ပြင် အဆောက်အအုံ ဆောက်လုပ်မှုဆိုင်ရာ
 စံချိန်စံညွှန်းများ စစ်ဆေးရေးနှင့် ကြီးကြပ်ရေးအဖွဲ့

(Signature)

အတွင်းရေးမှူး
 အထပ်ပြင်အဆောက်အအုံ ဆောက်လုပ်မှုဆိုင်ရာ
 စံချိန်စံညွှန်းများ စစ်ဆေးရေးနှင့် ကြီးကြပ်ရေးအဖွဲ့
 ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မယ်
 ဝန်ကြီးဌာန
 စီမံခန့်ခွဲရေးဦးစီးဌာန



ပြန်ဟောင်းရထား
 ပို့ဆောင်ရေးနှင့် ဆက်သွယ်ရေး ဝန်ကြီးဌာန
 ဆောက်လုပ်မည့် ကုမ္ပဏီ
 MEEYAHTA DEVELOPMENT LIMITED (MDL)

PROJECT	၀။ Basement (၁) ထပ် + (၂၆) ထပ် Residential (၁) လုံး ၀။ Basement (၁) ထပ် + (၂၆) ထပ် Hotel (၁) လုံး ၀။ Basement (၁) ထပ် + (၂၂) ထပ် Office (၂) လုံး ၀။ Basement Tank (၄) ထပ် ဗိုလ်ချုပ်အောင်ဆန်းလမ်းနှင့် ဆူးလေဘုရားလမ်းထောင့် ၊ ဝန်းဘတ်တန်းမြို့နယ် ၊
BLOCK NO.	၂၉D
LOT NO.	၁+၄၈နှင့်၄၉
TOWNSHIP	ဝန်းဘတ်တန်းမြို့နယ်
SUBJECT	HIGHT COMPARISON
SCALE	SHEET NO. A-11
DATE	

LS

PROFESSIONAL ENGINEER
 CIVIL
 CHIT SWE NYUNT
 CONSTRUCTION
 Valid up to Dec 2023
 MYANMAR

(Signature)

L.C

Sr.LA

(Signature)

WIN TIN
 SENIOR LICENSED ARCHITECT SLA-026

OWNER

(Signature)

U Tun Tun
 Director
 Meeyahtha Development Limited

အဆိုပြု စီမံကိန်းနှင့် ဓလ္လတိတုံ အမြင်နှိုင်းယှဉ်ပြပုံ

NTS




အတွင်းရေးမှူး
 အထပ်ပြင်အဆောက်အအုံ ဆောက်လုပ်မှုဆိုင်ရာ
 စံနှစ်ကျမ်းစာရေးဆွဲရေးနှင့်ကြီးကြပ်ရေးအဖွဲ့
 ရန်ကင်းမြို့နယ်အုပ်ချုပ်ရေးဦးစီးဌာန
 ဖိစစ်အတည်ပြုပြီး




LANDMARK- YANGON


U Tun Tun
 Chairman
 Meevahta International Hotel Limited.

အဆိုပြု စီမံကိန်းနှင့် ရွှေတိဂုံ အကွာအဝေးပြမြေပုံ


ZAW MIN MYINT B.E(CIVIL)
 Senior Licensed Engineer (335)
 Yangon City Development Committee
 (74) Thatanayeiktha St. Middle Shwe Block
 Bahan Township Ph 09-515-4547

DATE: 02-June-2014

Annex 2 Master Lease Documentation



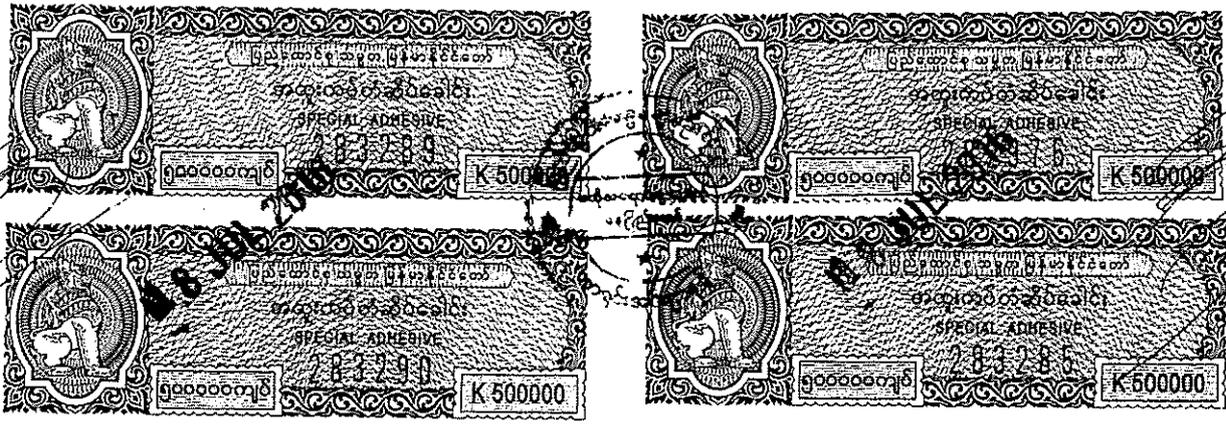
2016 Master Land Lease No. 1 (International Hotel Project)

Pursuant to the Build, Operate and Transfer Contract, the Lease Agreement, and the Construction Agreement, all dated 14th August 1993; the Land Lease Agreement dated 18th May 1995; the Supplementary Build, Operate and Transfer Contract, the Supplementary Lease Agreement and the Supplementary Construction Agreement, all dated 9th January 1997; and the Framework Agreement dated 31st December 2015 (collectively "The Agreements"), this agreement ("2016 Master Land Lease No. 1") is made in Nay Pyi Taw on 23rd July 2016 between:

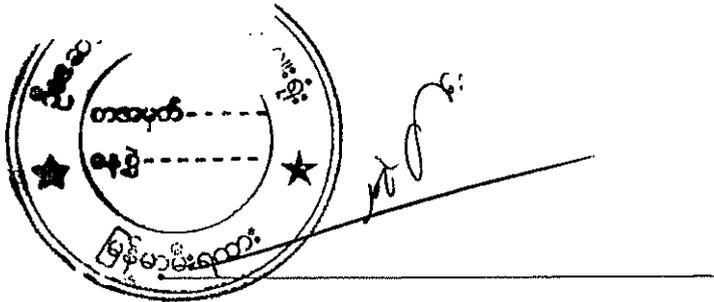
Myanma Railways of Ministry of Transport and Communications, the Republic of the Union of Myanmar ("the Lessor" or "MR" which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this 2016 Master Land Lease No. 1 by U Thurein Win, Managing Director, of the one part; and

Meeyahta International Hotel Limited, a limited company incorporated under the laws of the Republic of the Union Myanmar, having an address of FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon, ("the Lessee" or "MIHL" which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this 2016 Master Land Lease No. 1 by U Theim Wai @ Mr Serge Pun, of the other part.

(each a "Party" and together the "Parties").



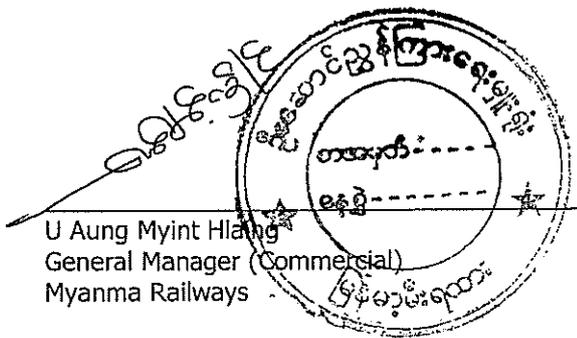
IN WITNESS whereof the Lessor and the Lessee have hereto executed this 2016 Master Land Lease No. 1 on the day the month and the year first above mentioned.



Signed by **U Thurein Win**
 For and on behalf of **Myanmar Railways of
 Ministry of Transport and Communications**

Date: 23rd July 2016

In the presence of:



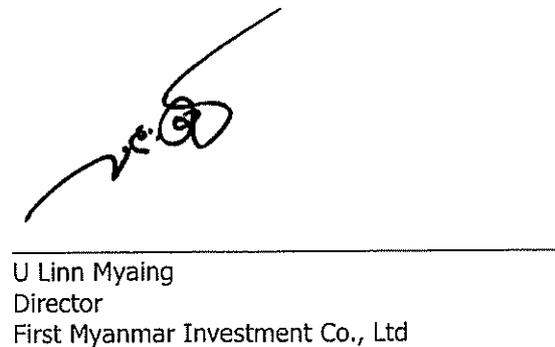
 U Aung Myint Hlaing
 General Manager (Commercial)
 Myanmar Railways



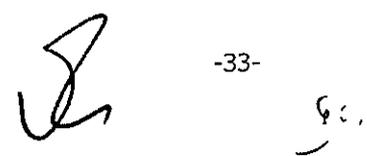
Signed by **U Theim Wai @ Mr. Serge Pun**
 For and on behalf of **Meeyahta International
 Hotel Limited**

Date: 23rd July 2016

In the presence of:



 U Linn Myaing
 Director
 First Myanmar Investment Co., Ltd





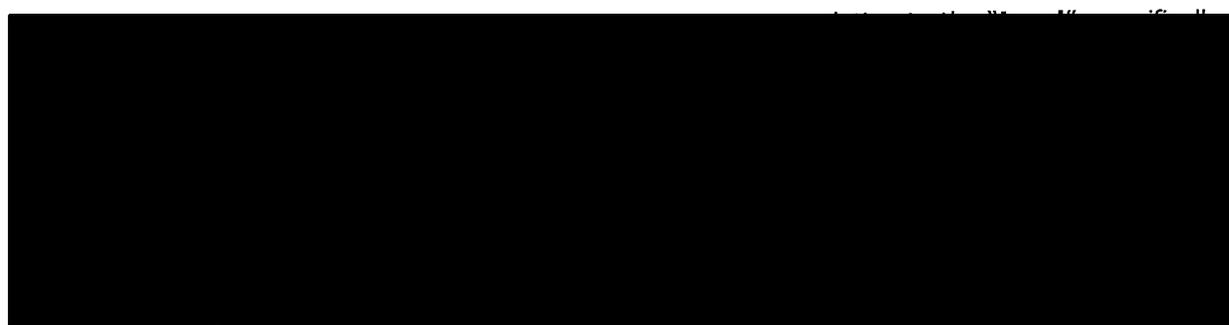
2016 Build Operate and Transfer Contract No. 1 (International Hotel Project)

Pursuant to the Build, Operate and Transfer Contract, the Lease Agreement, and the Construction Agreement, all dated 14th August 1993; the Land Lease Agreement dated 18th May 1995; the Supplementary Build, Operate and Transfer Contract, the Supplementary Lease Agreement and the Supplementary Construction Agreement, all dated 9th January 1997; and the Framework Agreement dated 31st December 2015 (collectively "**The Agreements**"), this 2016 Build Operate and Transfer Contract No. 1 ("**2016 BOT Contract No. 1**") is made in Nay Pyi Taw on 23rd July 2016 between:

Myanma Railways of Ministry of Transport and Communications, the Republic of the Union of Myanmar ("**the Lessor**" or "**MR**" which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this 2016 BOT Contract No. 1 by U Thurein Win, Managing Director, of the one part; and

Meeyahta International Hotel Limited, a limited company incorporated under the laws of the Republic of the Union Myanmar, having an address of FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon, ("**the Lessee**" or "**MIHL**" which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this 2016 BOT Contract No. 1 by U Theim Wai @ Mr Serge Pun, of the other part.

(each a "**Party**" and together the "**Parties**").



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

THE LEASE AND THE LEASE TERM

1. (a) The Land comprises a total land area of 39,177 square metres which will be subdivided into the International Hotel Project Land totalling 13,488 square metres and the Landmark Project Land totalling 25,689 square metres. In accordance with the Foreign Investment Law 2012 (and any subsequent enabling legislation) the Lease will be for a period of an initial 50 (fifty) years, commencing on 1 January 1998, and any further period extended under the Foreign Investment Law 2012 ("**Lease Term**").
- (b) In consideration of the "**Annual Rent**" MR has agreed to Lease the International Hotel Project Land to MIHL but specifically excluding all mines, mineral products, coal, petroleum, and other natural resources as well as buried treasure occurring in, under or within the said land.
- (c) The particulars of the Projects; The Rental Land Use Premium; The Annual Rent; Additional Payments and Guarantees; and Penalties for Delay are all detailed in Clauses 1,2,3,4 and 5 of the 2016 Master Land Lease No.1 executed of even date. The International Hotel Project shall be completed within 42 months commencing from 6 months after the signing of this 2016 BOT Contract No. 1 and the 2016 Master Land Lease No.1 or the incorporation of the International Hotel JV, whichever is later, for all the construction permits from the relevant authorities in respect of the Projects to be applied for and obtained (provided that any delay in construction for the Projects attributable to a Force Majeure event and any delay in obtaining the construction permits not attributable to the fault of MIHL shall be allowed a corresponding extension of the completion date).
- (d) This 2016 BOT Contract No. 1 and the 2016 Master Land Lease No.1 shall be read together to reflect the obligations of the Parties in relation to the leasing and development of the International Hotel Project Land on a BOT basis. The Parties also have a bundle of relevant Ancillary Documents agreed and dated of even date



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("Common Bundle of Ancillary Documents" or "CBAD") which shall form an integral part of this 2016 BOT Contract No. 1 and the 2016 Master Land Lease No. 1. However in the event of any conflict, the terms of this 2016 BOT Contract No.1 and the 2016 Master Land Lease No. 1 shall prevail over the terms and conditions of the Ancillary Documents.

- (e) The Parties hereby confirm and agree that the terms of the 2016 Master Land Lease No. 1 and this 2016 BOT Contract No. 1 shall substitute The Agreements.

THE BUILD, OPERATE AND TRANSFER PROVISIONS

- 2 (a) MR authorises the completion and operation of the International Hotel Project as a Build, Operate and Transfer "**BOT**" project.
- (b) The Parties acknowledge that the sub-division of the Land into the International Hotel Project Land and the Landmark Project Land is for the sole purpose of enabling each of the lands to be separately developed. In that regard, the Parties agree that MIHL shall assign and/or transfer all of its rights and obligations relating to the International Hotel Project to the International Hotel JV to be incorporated in Myanmar with the approval of the MIC. In addition, MIHL agrees that no demolition works shall commence on the International Hotel Project Land until the International Hotel JV is incorporated.
- (c) MIHL shall, with the support of MR, submit an application to the MIC for approval to incorporate the International Hotel JV which effective interest will be held by HSH - 70%, YSI - 24% and FMI - 6% no later than 3 months after the Signing Date. The Parties shall execute any other documents necessary to give effect to the assignment and transfer of MIHL's rights and obligations to the International Hotel JV. MIHL shall procure that upon completion of the assignment and/or transfer of such rights and obligations, the International Hotel JV shall observe and perform the provisions and obligations applicable to MIHL under this 2016 BOT Contract No. 1 including the responsibility of developing and completing the International Hotel Project and for its operation during the Lease Term and in return MIHL acknowledges that the International Hotel JV shall be entitled to any and all the rights and benefits of this 2016 BOT Contract No. 1.
- (d) MIHL shall bear any applicable stamp duty payable on the signing of this 2016 BOT Contract No. 1.

MIHL'S COVENANTS

3. MIHL covenants with Lessor as follows:-
- (a) To make any payments due under the 2016 Master Land Lease No. 1 on the due date and in the manner appointed for payment thereof and also to pay fees or charges collectable by the relevant Government Authorities with respect to any services supplied;



- (b) Without prejudice to Clause 6, save as has been expressly permitted by MR under this 2016 BOT Contract No. 1, MIHL shall only be entitled to sub-lease, mortgage, assign or transfer the whole or a significant part of the leasehold interest in the International Hotel Project Land hereby created with the prior written consent of the Lessor which consent shall not be unreasonably withheld or delayed;
- (c) To utilise the International Hotel Project Land for the purpose of constructing and subsequently operating the business of the International Hotel Project;
- (d) To ensure that all activities and operations carried out on the International Hotel Project Land including the construction and related facilities, are in conformity with the Laws of Myanmar;
- (e) To be responsible, to the extent possible and reasonably practicable, for the preservation of the environment at and around the area of the International Hotel Project Land site, MIHL shall exert its best efforts to ensure the control of pollution of air, water and land and other degradation;
- (f) To take necessary measures in order to fulfil environmental protection as prescribed by the laws of Myanmar such as installation of the waste water treatment plant and other treatment procedures to keep the International Hotel Project site environmentally friendly;
- (g) To restrict, to the extent possible and reasonably practicable, any kind of destruction and action which may cause annoyance to the local community or impact adversely upon cultural and religious activities which are of importance to the local community or which unreasonably affect the local cultural environment;
- (h) Where possible, to the extent reasonably practicable, to ensure the use of Myanmar staff in the International Hotel Project, and provide on-the-job training to such staff so as to improve their efficiency in the various disciplines;
- (i) Where possible to ensure the International Hotel Project installs international communication systems, as permitted by the Ministry of Communications and Information Technology;
- (j) MR shall have the right to appoint and pay for a recognised auditor to inspect and audit the books of accounts of the International Hotel Project within 60 (sixty) days after the day of completion of the annual financial statements and upon reasonable prior written notice; and
- (k) MIHL shall have the right to sub-contract any material part of the construction of the International Hotel Project provided that it shall be responsible towards MR for such construction works and MIHL shall have the full right to operate and manage



(including any such expansion, repair, rebuilding or renovation required) the International Hotel Project thereof.

MR'S COVENANTS

4. MR covenants with MIHL as follows:-

- (a) MR covenants, represents and warrants that it has the legal and beneficial ownership rights to the International Hotel Project Land, is authorised to lease the International Hotel Project Land to MIHL in accordance with the terms of this 2016 BOT Contract No. 1;
- (b) MR covenants with the Lessee that each of MIHL and its respective authorised personnel shall have peaceful and quiet possession, use, enjoyment and access to the International Hotel Project Land during the Lease Term and the construction period without any interruption or disturbance by MR;
- (c) MIHL ensuring all payments are made under this 2016 BOT Contract No. 1 and all covenants hereinbefore contained are performed, MR hereby covenants with MIHL that MIHL and any person lawfully occupying the International Hotel Project Land shall peacefully and quietly hold the International Hotel Project Land during the Lease Term without any interruption or disturbance of whatsoever nature by the Lessor or any person lawfully claiming to represent MR. In the event of there being interruption or disturbance from any Government Authorities under this Clause 4 (c), MR shall use all efforts to assist MIHL and to stop or prevent such occurrence in any way prejudicing the International Hotel Project;
- (d) To obtain the approval and consent from the relevant Government Authorities to implement this 2016 BOT Contract No. 1;
- (e) To assist MIHL and any relevant investor involved or invested in the International Hotel Project to apply for the tax exemptions, privileges and reliefs which are available under any prevailing Union of Myanmar Foreign Investment Law and related rules, regulations and notifications;
- (f) To assist Lessee and any relevant investor involved or invested in the International Hotel Project in any issues to secure from the relevant Government Authorities of Myanmar all approvals, licenses, and permits which are necessary for MIHL's or any third party investors' performance under this 2016 BOT Contract No. 1 (including, but not limited to, any building or construction permits and/or licences, registrations, import licences for materials, machinery, equipment for the International Hotel Project thereof);
- (g) MIHL shall be entitled to remit the profit arising from the operation of the International Hotel Project annually or at any time of the financial year after completely paying the commercial tax, income tax, profit tax, to the Government Authorities concerned and having obtained prior clearance of the respective Ministries



and the Central Bank of Myanmar. However, payment of the Annual Rent and any other payments due hereunder must be made to the MR before the net profit remittance. The net profit remittances shall not be subject to any tax duties and charges by any Myanmar Authority unless otherwise required under the prevailing laws; and

- (h) Mineral resources, treasures, gems and natural resources discovered unexpectedly from, in or under the International Hotel Project Land during the term of this 2016 BOT Contract No. 1 shall be property of the MR, and the MR shall be at liberty to excavate the aforesaid at any time and in that regard MR shall indemnify, defend and hold MIHL harmless from and against any and all claims, demands, actions, losses, damages, assessments, charges, liabilities, costs and expenses (including without limitation interest, penalties, and legal fees and disbursements) which may at any time be suffered or incurred by, or be assessed against, any and all of them, directly or indirectly, on account of or in connection with such excavation to be undertaken by MR.

DEFAULT BY LESSEE

- 5. It is hereby mutually agreed that if MIHL shall in any substantial respect fail to perform or observe the terms and conditions of this 2016 BOT Contract No. 1 and fails to rectify such non-performance or not-observance in compliance with the notices from the Lessor of such default in accordance with Clause 7 (b), MR shall, subject always to Clause 6 (c), be at liberty to re-enter upon and take possession of the International Hotel Project Land covered by this 2016 BOT Contract No. 1 and the Lease Term shall thereupon cease.

[Redacted]

- 6.

[Redacted]

IN WITNESS whereof MR and MIHL have hereto have executed this 2016 BOT Contract No. 1 on the day the month and the year first above mentioned.



Signed by **U Thurein Win**
For and on behalf of by **Myanma Railways of
Ministry of Transport and Communications**



Signed by **U Theim Wai @ Mr. Serge Pun**
For and on behalf of **Meeyahta
International Hotel Limited**

Date: 23rd July 2016

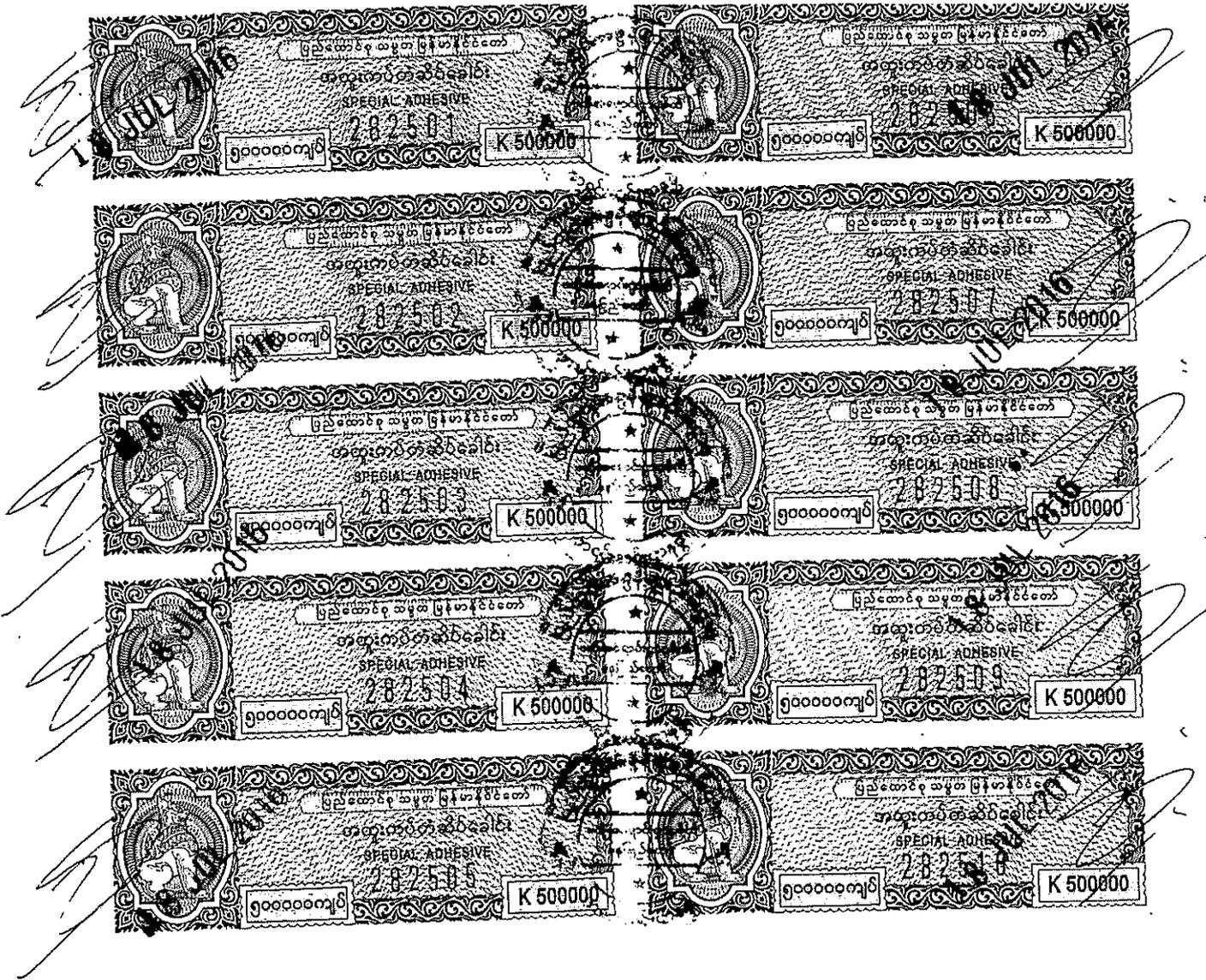
Date: 23rd July 2016

In the presence of:

In the presence of:

U Aung Myint Hlaing
General Manager (Commercial)
Myanma Railways

U Linn Myaing
Director
First Myanmar Investment Co., Ltd



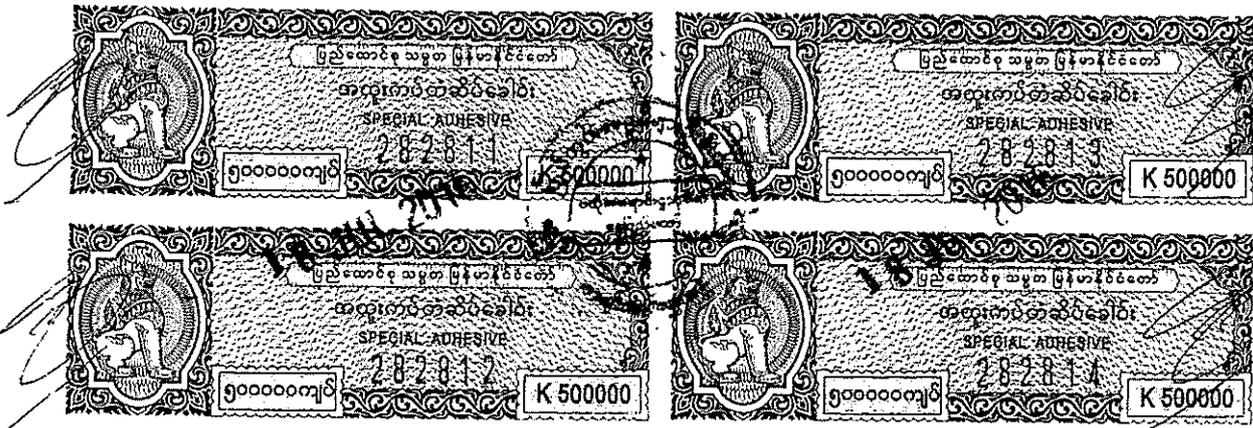
2016 Master Land Lease No. 2 (Landmark Project)

Pursuant to the Build, Operate and Transfer Contract, the Lease Agreement, and the Construction Agreement, all dated 14th August 1993; the Land Lease Agreement dated 18th May 1995; the Supplementary Build, Operate and Transfer Contract, the Supplementary Lease Agreement and the Supplementary Construction Agreement, all dated 9th January 1997; and the Framework Agreement dated 31st December 2015 (collectively "**The Agreements**"), this agreement ("**2016 Master Land Lease No. 2**") is made in Nay Pyi Taw on 23rd July 2016 between:

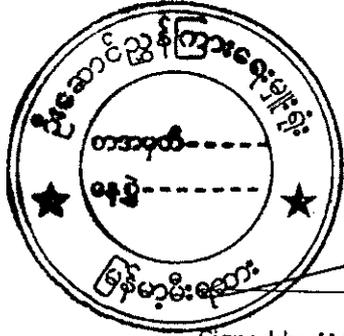
Myanma Railways of Ministry of Transport and Communications, the Republic of the Union of Myanmar ("**the Lessor**" or "**MR**" which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this 2016 Master Land Lease No. 2 by U Thurein Win, Managing Director, of the one part; and

Meeyahta International Hotel Limited, a limited company incorporated under the laws of the Republic of the Union Myanmar, having an address of FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon, ("**the Lessee**" or "**MIHL**" which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this 2016 Master Land Lease No. 2 by U Theim Wai @ Mr Serge Pun, of the other part.

(each a "**Party**" and together the "**Parties**").



IN WITNESS whereof the Lessor and the Lessee have hereto executed this 2016 Master Land Lease No. 2 on the day the month and the year first above mentioned.



Handwritten signature of U Thurein Win

Signed by **U Thurein Win**
For and on behalf of by **Myanma Railways of Ministry of Transport and Communications**

Handwritten signature of U Theim Wai @ Mr. Serge Pun



Signed by **U Theim Wai @ Mr. Serge Pun**
For and on behalf of **Meeyahta International Hotel Limited**

Date: 23rd July 2016

Date: 23rd July 2016

In the presence of:

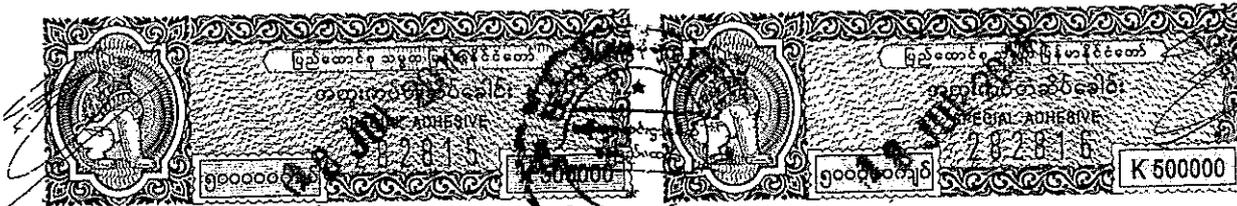
In the presence of:

Handwritten signature of U Aung Myint Hlaing

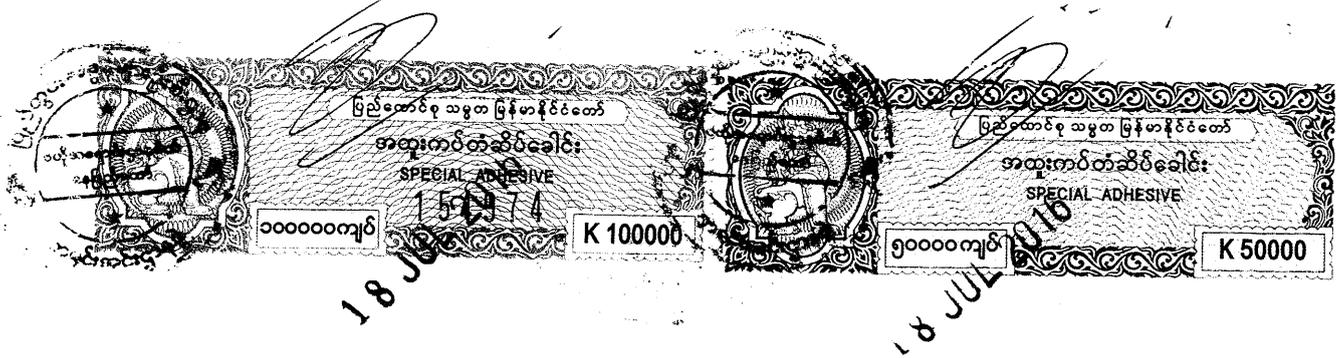
U Aung Myint Hlaing
General Manager (Commercial)
Myanma Railways

Handwritten signature of U Linn Myaing

U Linn Myaing
Director
First Myanmar Investment Co., Ltd



Handwritten mark



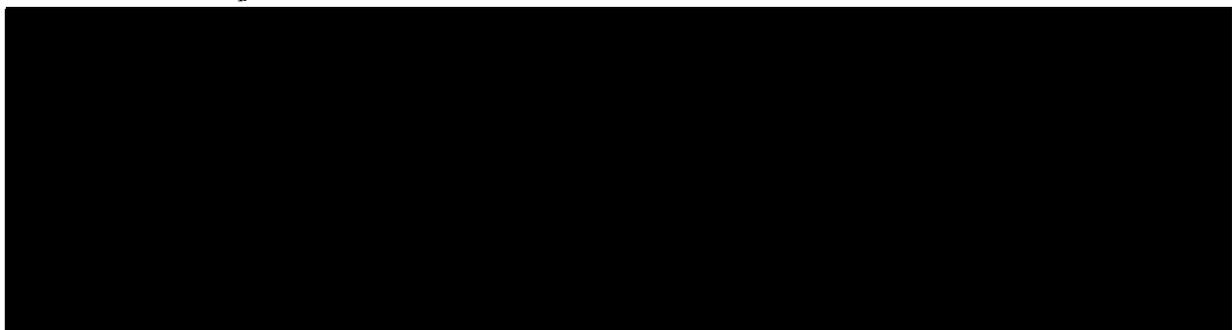
2016 Build Operate and Transfer Contract No. 2 (Landmark Project)

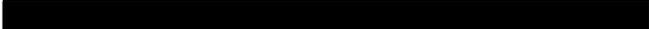
Pursuant to the Build, Operate and Transfer Contract, the Lease Agreement, and the Construction Agreement, all dated 14th August 1993; the Land Lease Agreement dated 18th May 1995; the Supplementary Build, Operate and Transfer Contract, the Supplementary Lease Agreement and the Supplementary Construction Agreement, all dated 9th January 1997; and the Framework Agreement dated 31st December 2015 (collectively "**The Agreements**"), this 2016 Build Operate and Transfer Contract No. 2 ("**2016 BOT Contract No. 2**") is made in Nay Pyi Taw on 23rd July 2016 between:

Myanma Railways of Ministry of Transport and Communications, the Republic of the Union of Myanmar ("**the Lessor**" or "**MR**" which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this 2016 BOT Contract No. 2 by U Thurein Win, Managing Director, of the one part; and

Meeyahta International Hotel Limited, a limited company incorporated under the laws of the Republic of the Union Myanmar, having an address of FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon, ("**the Lessee**" or "**MIHL**" which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this 2016 BOT Contract No. 2 by U Theim Wai @ Mr Serge Pun, of the other part.

(each a "**Party**" and together the "**Parties**").





THE LEASE AND THE LEASE TERM

1. (a) The Land comprises a total land area of 39,177 square metres which will be sub-divided into the International Hotel Project Land totalling 13,488 square metres and the Landmark Project Land totalling 25,689 square metres. In accordance with the Foreign Investment Law 2012 (and any subsequent enabling legislation) the Lease will be for a period of an initial 50 (fifty) years, commencing on 1 January 1998, and any further period extended under the Foreign Investment Law 2012 ("**Lease Term**").
- (b) In consideration of the "**Annual Rent**" MR has agreed to Lease the Landmark Project Land to MIHL but specifically excluding all mines, mineral products, coal, petroleum, and other natural resources as well as buried treasure occurring in, under or within the said land.
- (c) The particulars of the Projects; The Rental Land Use Premium; The Annual Rent; Additional Payments and Guarantees; and Penalties for Delay are all detailed in Clauses 1,2,3,4 and 5 of the 2016 Master Land Lease No. 2 executed of even date. The Landmark Project shall be completed within 48 months commencing from 6 months after the signing of this 2016 BOT Contract No. 2 and the 2016 Master Land Lease No.2 or the incorporation of the Landmark JV, whichever is later, for all the construction permits from the relevant authorities in respect of the Projects to be applied for and obtained (provided that any delay in construction for the Projects attributable to a Force Majeure event and any delay in obtaining the construction permits not attributable to the fault of MIHL shall be allowed a corresponding extension of the completion date).

- (d) This 2016 BOT Contract No. 2 and the 2016 Master Land Lease No. 2 shall be read together to reflect the obligations of the Parties in relation to the leasing and development of the Landmark Project Land on a BOT basis. The Parties also have a bundle of relevant Ancillary Documents agreed and dated of even date ("**Common Bundle of Ancillary Documents**" or "**CBAD**") which shall form an integral part of this 2016 BOT Contract No. 2 and the 2016 Master Land Lease No. 2. However in the event of any conflict, the terms of this 2016 BOT Contract No. 2 and the 2016 Master Land Lease No. 2 shall prevail over the terms and conditions of the Ancillary Documents.
- (e) The Parties hereby confirm and agree that the terms of the 2016 Master Land Lease No. 2 and this 2016 BOT Contract No. 2 shall substitute The Agreements.

THE BUILD, OPERATE AND TRANSFER PROVISIONS

2. (a) MR authorises the completion and operation of the Landmark Project as a Build, Operate and Transfer "**BOT**" project.
- (b) The Parties acknowledge that the sub-division of the Land into the International Hotel Project Land and the Landmark Project Land is for the sole purpose of enabling each of the lands to be separately developed. In that regard, the Parties agree that MIHL shall assign and/or transfer all of its rights and obligations relating to the Landmark Project to the Landmark JV to be incorporated in Myanmar with the approval of the MIC. In addition, MIHL agrees that no demolition works shall commence on the Landmark Project Land until the Landmark JV is incorporated.
- (c) MIHL shall, with the support of MR, submit an application to the MIC for approval to incorporate the Landmark JV which effective interest will be held by YSI –48%, FMI – 12%, MC & MEC – 30% collectively, IFC – 5% and ADB – 5% no later than 3 months after the Signing Date. The Parties shall execute any other documents necessary to give effect to the assignment and transfer of MIHL's rights and obligations to the Landmark JV. MIHL shall procure that upon completion of the assignment and/or transfer of such rights and obligations, the Landmark JV shall observe and perform the provisions and obligations applicable to MIHL under this 2016 BOT Contract No. 2 including the responsibility of developing and completing the Landmark Project and for its operation during the Lease Term and in return MIHL acknowledges that the Landmark JV shall be entitled to any and all the rights and benefits of this 2016 BOT Contract No. 2.
- (d) MIHL shall bear any applicable stamp duty payable on the signing of this 2016 BOT Contract No. 2.

MIHL'S COVENANTS

3. MIHL covenants with Lessor as follows:-

- (a) To make any payments due under the 2016 Master Land Lease No. 2 on the due date and in the manner appointed for payment thereof and also to pay fees or charges collectable by the relevant Government Authorities with respect to any services supplied;
- (b) Without prejudice to Clause 6, save as has been expressly permitted by MR under this 2016 BOT Contract No. 2, MIHL shall only be entitled to sub-lease, mortgage, assign or transfer the whole or a significant part of the leasehold interest in the Landmark Project Land hereby created with the prior written consent of the Lessor which consent shall not be unreasonably withheld or delayed;
- (c) To utilise the Landmark Project Land for the purpose of constructing and subsequently operating the business of the Landmark Project;
- (d) To ensure that all activities and operations carried out on the Landmark Project Land including the construction and related facilities, are in conformity with the Laws of Myanmar;
- (e) To be responsible, to the extent possible and reasonably practicable, for the preservation of the environment at and around the area of the Landmark Project Land site, MIHL shall exert its best efforts to ensure the control of pollution of air, water and land and other degradation;
- (f) To take necessary measures in order to fulfil environmental protection as prescribed by the laws of Myanmar such as installation of the waste water treatment plant and other treatment procedures to keep the Landmark Project site environmentally friendly;
- (g) To restrict, to the extent possible and reasonably practicable, any kind of destruction and action which may cause annoyance to the local community or impact adversely upon cultural and religious activities which are of importance to the local community or which unreasonably affect the local cultural environment;
- (h) Where possible, to the extent reasonably practicable, to ensure the use of Myanmar staff in the Landmark Project, and provide on-the-job training to such staff so as to improve their efficiency in the various disciplines;



- (i) Where possible to ensure the Landmark Project installs international communication systems, as permitted by the Ministry of Communications and Information Technology;
- (j) MR shall have the right to appoint and pay for a recognised auditor to inspect and audit the books of accounts of the Landmark Project within 60 (sixty) days after the day of completion of the annual financial statements and upon reasonable prior written notice; and
- (k) MIHL shall have the right to sub-contract any material part of the construction of the Landmark Project provided that it shall be responsible towards MR for such construction works and MIHL have the full right to operate and manage (including any such expansion, repair, rebuilding or renovation required) the Landmark Project thereof.

MR'S COVENANTS

4. MR covenants with MIHL as follows:-

- (a) MR covenants, represents and warrants that it has the legal and beneficial ownership rights to the Landmark Project Land, is authorised to lease the Landmark Project Land to MIHL in accordance with the terms of this 2016 BOT Contract No. 2;
- (b) MR covenants with the Lessee that each of MIHL and its respective authorised personnel shall have peaceful and quiet possession, use, enjoyment and access to the Landmark Project Land during the Lease Term and the construction period without any interruption or disturbance by MR;
- (c) MIHL ensuring all payments are made under this 2016 BOT Contract No. 2 and all covenants hereinbefore contained are performed, MR hereby covenants with MIHL that MIHL and any person lawfully occupying the Landmark Project Land shall peacefully and quietly hold the Landmark Project Land during the Lease Term without any interruption or disturbance of whatsoever nature by the Lessor or any person lawfully claiming to represent MR. In the event of there being interruption or disturbance from any Government Authorities under this Clause 4 (c), MR shall use all efforts to assist MIHL and to stop or prevent such occurrence in any way prejudicing the Landmark Project;
- (d) To obtain the approval and consent from the relevant Government Authorities to implement this 2016 BOT Contract No. 2;
- (e) To assist MIHL and any relevant investor involved or invested in the Landmark Project to apply for the tax exemptions, privileges and reliefs which are available under any

prevailing Union of Myanmar Foreign Investment Law and related rules, regulations and notifications;

- (f) To assist Lessee and any relevant investor involved or invested in the Landmark Project in any issues to secure from the relevant Government Authorities of Myanmar all approvals, licenses, and permits which are necessary for MIHL's or any third party investors' performance under this 2016 BOT Contract No. 2 (including, but not limited to, any building or construction permits and/or licences, registrations, import licences for materials, machinery, equipment for the Landmark Project thereof);
- (g) MIHL shall be entitled to remit the profit arising from the operation of the Landmark Project annually or at any time of the financial year after completely paying the commercial tax, income tax, profit tax, to the Government Authorities concerned and having obtained prior clearance of the respective Ministries and the Central Bank of Myanmar. However, payment of the Annual Rent and any other payments due hereunder must be made to the MR before the net profit remittance. The net profit remittances shall not be subject to any tax duties and charges by any Myanmar Authority unless otherwise required under the prevailing laws; and
- (h) Mineral resources, treasures, gems and natural resources discovered unexpectedly from, in or under the Landmark Project Land during the term of this 2016 BOT Contract No. 2 shall be property of the MR, and the MR shall be at liberty to excavate the aforesaid at any time and in that regard MR shall indemnify, defend and hold MIHL harmless from and against any and all claims, demands, actions, losses, damages, assessments, charges, liabilities, costs and expenses (including without limitation interest, penalties, and legal fees and disbursements) which may at any time be suffered or incurred by, or be assessed against, any and all of them, directly or indirectly, on account of or in connection with such excavation to be undertaken by MR.

DEFAULT BY LESSEE

- 5. It is hereby mutually agreed that if MIHL shall in any substantial respect fail to perform or observe the terms and conditions of this 2016 BOT Contract No. 2 and fails to rectify such non-performance or not-observance in compliance with the notices from the Lessor of such default in accordance with Clause 7 (b), MR shall, subject always to Clause 6 (c), be at liberty to re-enter upon and take possession of the Landmark Project Land covered by this 2016 BOT Contract No. 2 and the Lease Term shall thereupon cease.

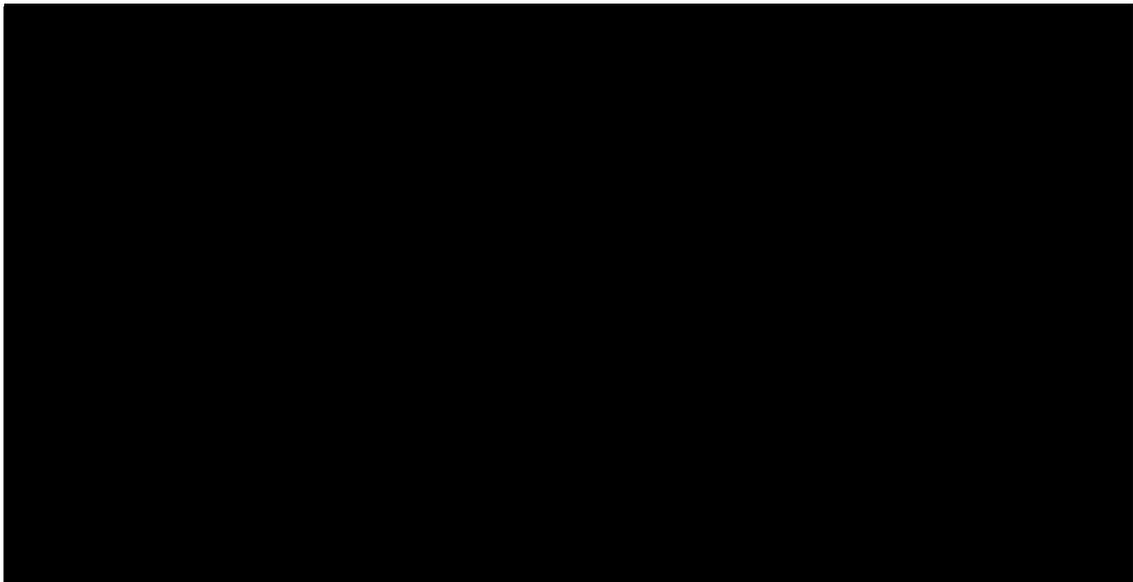
OPERATION OF THE PROJECT

- 6.



- (a) Upon the completion of the whole or part of the construction of the Landmark Project, which allows for occupation, MIHL shall have the right to lease, transfer, assign or dispose (subject to the relevant Laws of Myanmar) any such property or space or unit thereof in part to any Myanmar or Foreign, person or entity, in Myanmar Kyat or foreign currency.
- (b) In relation to the transfer, sub-lease, mortgage, encumbrance or assignment of any property or space or unit thereof in the Landmark Project, MR acknowledges that MIHL must have flexibility in order to operate the Landmark Project, and hereby grants MIHL authority to transfer, sub-lease, mortgage, encumber or assign any such category of property or space or unit thereof in the Landmark Project to Myanmar or foreign, persons or entities, during the Lease Term subject to the relevant Laws of Myanmar (including the right of use over such property or space or unit or any other rights as may be provided for under the prevailing laws).
- (c) MR agrees that so long as the relevant portion of the Annual Rent and any other payments due to MR under this 2016 BOT Contract No. 2, in respect of any property or space or unit thereof in the Landmark Project is paid to MR the occupants of such property or space or unit thereof in the Landmark Project including any transferees, tenants, occupants, mortgagees or assignees shall peacefully occupy, hold, enjoy and retain all their respective rights in connection with the property or space or unit thereof without any interruption whatsoever from MR. MR confirms it will recognise the validity of such sub-lease arrangements and shall recognise the rights of and deal directly with such transferees, tenants, occupants, mortgagees or assignees during the Lease Term as if they are MIHL including executing an agreement to give effect to all the rights of such transferee, tenants, occupants, mortgagee or assignee subject to the relevant Laws of Myanmar.

7.



IN WITNESS whereof MR and MIHL have hereto have executed this 2016 BOT Contract No. 2 on the day the month and the year first above mentioned.



Handwritten signature of U Thurein Win

Signed by **U Thurein Win**
For and on behalf of by **Myanma Railways of
Ministry of Transport and Communications**

Handwritten signature of U Theim Wai @ Mr. Serge Pun



Signed by **U Theim Wai @ Mr. Serge Pun**
For and on behalf of **Meeyahta International
Hotel Limited**

Date: 23rd July 2016

Date: 23rd July 2016

In the presence of:

In the presence of:

Handwritten signature of U Aung Myint Hlaing

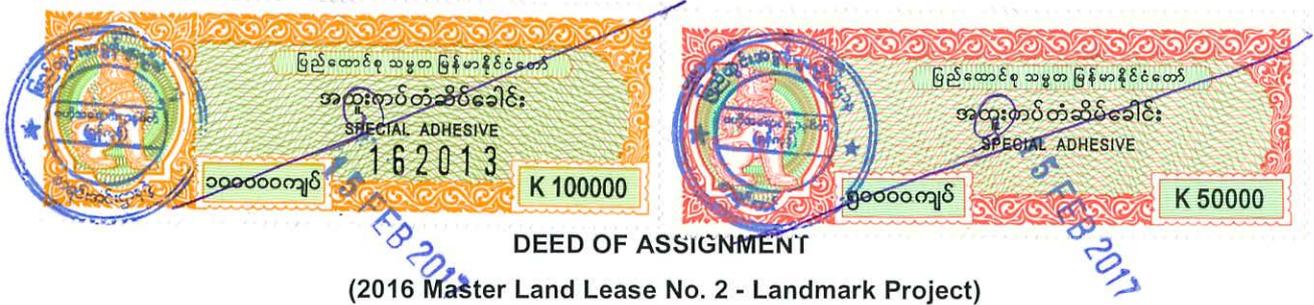
U Aung Myint Hlaing
General Manager (Commercial)
Myanma Railways

Handwritten signature of U Linn Myaing

U Linn Myaing
Director
First Myanmar Investment Co., Ltd

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This Deed of Assignment of all legal rights and liabilities of Meeyahta International Hotel Limited (“**Deed**”) in respect of the 2016 Master Land Lease No. 2 (Landmark Project) (“**Lease Agreement**”) is made in Yangon, the Republic of the Union of Myanmar on 16 February 2017 (“**Signing Date**”) between:

Meeyahta International Hotel Limited, a limited company incorporated under the laws of the Republic of the Union of Myanmar, having an address of FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon, which effective interest is held by Yoma Strategic Investments Ltd. (“**YSIL**”) – 80% and First Myanmar Investment Co. Limited (“**FMI**”) – 20%, (“**Assignor**” which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this Deed by U Theim Wai @ Mr Serge Pun;

Myanma Railways of the Ministry of Transport and Communications of the Republic of the Union of Myanmar, an agency organised and existing under the laws of the Republic of the Union of Myanmar which is situated at Myanma Railways Head Office, Nay Pyi Taw (“**MR**” which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning), represented for the purpose of this Deed by U Thurein Win, Managing Director; and

Meeyahta Development Limited, a limited company incorporated under the laws of the Republic of the Union of Myanmar, having an address of FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon, which effective interest will be held by YSIL – 48%, FMI – 12%, Mitsubishi Corporation & Mitsubishi Estate Co. Ltd – 30%, International Finance Corporation – 5% and Asian Development Bank – 5%, (the “**Assignee**” which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this Deed by U Theim Wai @ Mr Serge Pun,

(each a “**Party**” and together the “**Parties**”)

WHEREAS MR and the Assignor have executed the Lease Agreement on 23 July 2016 in respect of the construction, development and operation of the Landmark Project on the Landmark Project Land;

WHEREAS an application has been submitted to the Myanmar Investment Commission (“**MIC**”) on 6 October 2016 for the incorporation of the Assignee to undertake the Landmark Project and pursuant to the MIC Permit granted on 10 February 2017, the Assignee was duly incorporated on 16 February 2017;

WHEREAS pursuant to Clause 1 (b) and (c) of the Lease Agreement, both MR and the Assignor agree that the Assignor shall assign all of its rights and obligations relating to the Landmark Project to the Assignee where upon completion of the assignment of such rights and obligations, the Assignee shall observe and perform the provisions and obligations applicable to the Assignor under the Lease Agreement including the responsibility of developing and completing the Landmark Project and for its operation during the Lease Term and in return the Assignor acknowledges that the Assignee shall be entitled to any and all the rights and benefits of the Lease Agreement.

NOW, THEREFORE, the Parties have agreed as follows:

DEFINITIONS

In this Deed, capitalised terms used in this Deed and not otherwise defined shall have the meaning given to them in the Lease Agreement, unless the context otherwise requires.

1 ASSIGNMENT

- 1.1 The Assignor hereby assigns to the Assignee, all of the Assignor's rights, titles, interests, obligations and liabilities in, to and under the Lease Agreement, regarding the construction, development and operation of the Landmark Project on the Landmark Project Land. The Assignee hereby accepts such assignment and assumes all of the rights, titles, interests, obligations and liabilities of the Assignor in, to and under the Lease Agreement.
- 1.2 MR hereby agrees to the assignment of all of the Assignor's rights, titles, interests, obligations and liabilities in, to and under the Lease Agreement to the Assignee and releases and discharges the Assignor from all of its rights, titles, interests, obligations and liabilities under the Lease Agreement.
- 1.3 MR acknowledges to the Assignee that it has duly observed and performed and will continue to duly observe and perform all its obligations under the Lease Agreement.
- 1.4 Except as expressly mentioned in this Deed, the terms and conditions of the Lease Agreement are hereby confirmed and shall remain unchanged and be in full force and effect.
- 1.5 This Deed shall form an integral part of the Lease Agreement.

2 EFFECTIVE DATE

This Deed shall take effect upon the Signing Date.

3 NOTICES

The provisions of Clause 15 of the Lease Agreement shall apply to notices or other communications required under this Deed. The Assignee's address for service is:

Meeyahta Development Limited

Address: FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon.

Fax No.: 01246882

Phone No.: 01240363

4 GOVERNING LAW AND DISPUTES

- 4.1 This Deed shall be governed by, read and construed in all respects in accordance with the laws, rules and regulations of the Republic of the Union of Myanmar.

- 4.2 If any dispute, controversy, or claim should arise between the Parties regarding the interpretation or implementation of this Deed or any other agreement or document executed in connection with this Deed, the Parties shall first settle such dispute through negotiation to reach an amicable agreement between MR, the Assignor and the Assignee.
- 4.3 In the event such dispute cannot be settled amicably, it shall be referred to and settled by arbitration. The arbitration proceedings shall in all respects conform to the Myanmar Arbitration Law or any subsisting statutory modification thereof. The arbitration shall be conducted in the English language and held in Yangon, the Republic of the Union of Myanmar. Arbitration fees shall be borne by the losing Party or Parties. The arbitral tribunal shall consist of three (3) arbitrators.

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EXECUTION PAGE

This Deed has been executed as a deed and delivered on the date stated at the beginning of this Deed.

For and on behalf of the)
Myanma Railways)
of the Ministry of Transport and Communications)

U Thurein Win, Managing Director

သူရိန်ဝင်း
ဦးဆောင်ညွှန်ကြားရေးမှူး
မြန်မာမီးရထား

For and on behalf of)
Meeyahta International Hotel Limited)

U Theim Wai @ Mr Serge Pun
Managing Director

U Tun Tun
Director

For and on behalf of)
Meeyahta Development Limited)

U Theim Wai @ Mr Serge Pun
Managing Director

Chi Yam Cyrus Pun
Director

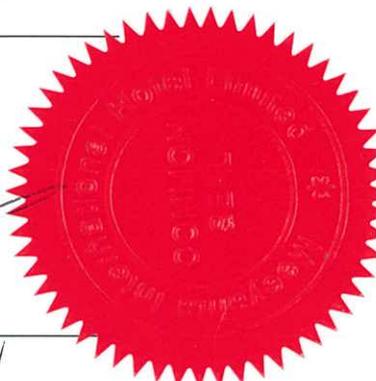
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DEED OF ASSIGNMENT

(2016 Build Operate and Transfer Contract No. 2 Landmark Project)

This Deed of Assignment of all legal rights and liabilities of Meeyahta International Hotel Limited (“**Deed**”) in respect of the 2016 Build Operate and Transfer Contract No. 2 (Landmark Project) (“**BOT Contract**”) is made in Yangon, the Republic of the Union of Myanmar on 16 February 2017 (“**Signing Date**”) between:

Meeyahta International Hotel Limited, a limited company incorporated under the laws of the Republic of the Union of Myanmar, having an address of FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon, which effective interest is held by Yoma Strategic Investments Ltd. (“**YSIL**”) – 80% and First Myanmar Investment Co. Limited (“**FMI**”) – 20%, (“**Assignor**” which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this Deed by U Theim Wai @ Mr Serge Pun;

Myanma Railways of the Ministry of Transport and Communications of the Republic of the Union of Myanmar, an agency organised and existing under the laws of the Republic of the Union of Myanmar which is situated at Myanma Railways Head Office, Nay Pyi Taw (“**MR**” which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning), represented for the purpose of this Deed by U Thurein Win, Managing Director; and

Meeyahta Development Limited, a limited company incorporated under the laws of the Republic of the Union of Myanmar, having an address of FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon, which effective interest will be held by YSIL – 48%, FMI – 12%, Mitsubishi Corporation & Mitsubishi Estate Co. Ltd – 30%, International Finance Corporation – 5% and Asian Development Bank – 5%, (the “**Assignee**” which expression shall be taken to mean and include its successors and permitted assigns except where the context requires another and different meaning); represented for the purpose of this Deed by U Theim Wai @ Mr Serge Pun,

(each a “**Party**” and together the “**Parties**”)

WHEREAS MR and the Assignor have executed the BOT Contract on 23 July 2016 in respect of the construction, development and operation of the Landmark Project on the Landmark Project Land;

WHEREAS an application has been submitted to the Myanmar Investment Commission (“**MIC**”) on 6 October 2016 for the incorporation of the Assignee to undertake the Landmark Project and pursuant to the MIC Permit granted on 10 February 2017, the Assignee was duly incorporated on 16 February 2017;

WHEREAS pursuant to Clause 2 (b) and (c) of the BOT Contract, both MR and the Assignor agree that the Assignor shall assign all of its rights and obligations relating to the Landmark Project to the Assignee where upon completion of the assignment of such rights and obligations, the Assignee shall observe and perform the provisions and obligations applicable to the Assignor under the BOT Contract including the responsibility of developing and completing the Landmark Project and for its operation during the Lease Term and in return the Assignor acknowledges that the Assignee shall be entitled to any and all the rights and benefits of the BOT Contract.

NOW, THEREFORE, the Parties have agreed as follows:

DEFINITIONS

In this Deed, capitalised terms used in this Deed and not otherwise defined shall have the meaning given to them in the BOT Contract, unless the context otherwise requires.

1 ASSIGNMENT

- 1.1 The Assignor hereby assigns to the Assignee, all of the Assignor's rights, titles, interests, obligations and liabilities in, to and under the BOT Contract, regarding the construction, development and operation of the Landmark Project on the Landmark Project Land. The Assignee hereby accepts such assignment and assumes all of the rights, titles, interests, obligations and liabilities of the Assignor in, to and under the BOT Contract.
- 1.2 MR hereby agrees to the assignment of all of the Assignor's rights, titles, interests, obligations and liabilities in, to and under the BOT Contract to the Assignee and releases and discharges the Assignor from all of its rights, titles, interests, obligations and liabilities under the BOT Contract.
- 1.3 MR acknowledges to the Assignee that it has duly observed and performed and will continue to duly observe and perform all its obligations under the BOT Contract.
- 1.4 Except as expressly mentioned in this Deed, the terms and conditions of the BOT Contract are hereby confirmed and shall remain unchanged and be in full force and effect.
- 1.5 This Deed shall form an integral part of the BOT Contract.

2 EFFECTIVE DATE

This Deed shall take effect upon the Signing Date.

3 NOTICES

The provisions of Clause 15 of the BOT Contract shall apply to notices or other communications required under this Deed. The Assignee's address for service is:

Meeyahta Development Limited

Address : FMI Centre Level 10 and 11 Bogyoke Aung San Road, Pabedan Township, Yangon.

Fax No.: 01246882

Phone No.: 01240363

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- 4.3 In the event such dispute cannot be settled amicably, it shall be referred to and settled by arbitration. The arbitration proceedings shall in all respects conform to the Myanmar Arbitration Law or any subsisting statutory modification thereof. The arbitration shall be conducted in the English language and held in Yangon, the Republic of the Union of Myanmar. Arbitration fees shall be borne by the losing Party or Parties. The arbitral tribunal shall consist of three (3) arbitrators.

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EXECUTION PAGE

This Deed has been executed as a deed and delivered on the date stated at the beginning of this Deed.

For and on behalf of the
Myanma Railways
of the Ministry of Transport and Communications)

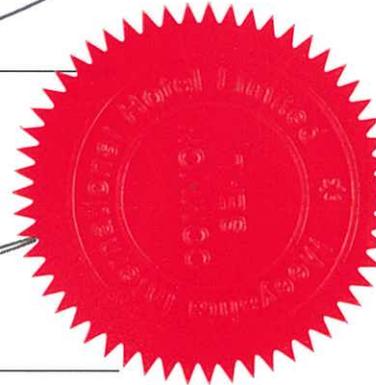
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U Thurein Win, Managing Director

သုရိန်ဝင်း
ဦးဆောင်ညွှန်ကြားရေးမှူး
ပြန်ဟာပီးရတာ

For and on behalf of
Meeyahta International Hotel Limited)

[Handwritten signature]



U Theim Wai @ Mr Serge Pun
Managing Director

U Tun Tun
Director

[Handwritten signature]

For and on behalf of
Meeyahta Development Limited)

[Handwritten signature]



U Theim Wai @ Mr Serge Pun
Managing Director

Chi Yam Cyrus Pun
Director

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Annex 3 Soil Disposal Permit



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
 ရန်ကုန်တိုင်းဒေသကြီးအစိုးရ
 ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ
 အင်ဂျင်နီယာဌာန(လမ်းနှင့်တံတား)

စာအမှတ် ၂၇၁၅ / ၂၄၆၂ / စည်ပင်-ယာ(လမ်း)
 ရက်စွဲ ၊ ၂၀၁၈ ခုနှစ်၊ ဇွန်လ ၅ ရက်

သို့

BYMA MYANMAR Limited
 4th Floor(KFC Building)
 375, Bogyoke Aung San Road
 ပန်းဘဲတန်းမြို့နယ်

အကြောင်းအရာ ။ မြေကြီးသယ်ယာဉ်များဖြတ်သန်းခွင့်ပြုခြင်း

ရည်ညွှန်းချက်။ (၁) အင်ဂျင်နီယာဌာနအဆောက်အအုံ၏ ၇-၆-၂၀၁၇ ရက်စွဲပါစာအမှတ်၊ ၁၅၃၅/လတတ/စည်ပင်-ယာ/အုံ(ပုံစံ)

(၂) BYMA MYANMAR Limited ၏ ၅-၆-၂၀၁၈ ရက်စွဲပါတင်ပြစာ

၁။ BYMA MYANMAR Limited မှ ရည်ညွှန်းချက်ပါစာ(၁)အရ ပန်းဘဲတန်းမြို့နယ်၊ ဗိုလ်ချုပ်အောင်ဆန်းလမ်းရှိ မီးရထားရုံးချုပ်ဟောင်းတွင် ဆောင်ရွက်လျက်ရှိသော (Land Mark Project)မှ ထွက်ရှိလာသည့် စွန့်ပစ်မြေကြီးများအား နောက်ဆက်တွဲဖော်ပြပါ မြေသယ်ယာဉ်(၄၂)စီးဖြင့် ဗိုလ်ချုပ်အောင်ဆန်းလမ်း-ဆူးလေဘုရားလမ်း-အနော်ရထာလမ်း-ရွှေဘုံသာလမ်း-ကမ်းနားလမ်း-ဘုရင့်နောင်လမ်း-ပါရမီလမ်း-မင်းဓမ္မလမ်း-တော်ဝင်လမ်း-ပြည်လမ်း-ဥက္ကလာလမ်းမှစတင်၍ လေကြောင်းရန်ကာကွယ်ရေးတပ်ရင်း၊ အမှတ်(၃၀၁၇)သို့ သယ်ယူခွင့်ပြုပါရန် ရည်ညွှန်းပါစာ(၂)ဖြင့် လျှောက်ထားလာခြင်းအား ခွင့်ပြုကြောင်း ပြန်ကြားပါသည်-

Contact Person - ဦးမောင်စိုး (ဖုန်း - ၀၉ ၂၅၄၆၆၇၇၉) Land Mark Site
 ဦးအောင်မျိုးနိုင် (ဖုန်း - ၀၉ ၄၄၄၇၄၆၇၆၄) လမ်းကြောင်း
 ဦးလှရွှေ (ဖုန်း - ၀၉ ၄၅၁၂၅၀၂၇၂) လေကြောင်းရန်

၂။ အထက်ပါအတိုင်း မြေကြီးသယ်ယူရာတွင် ၂၀၁၈-ခုနှစ်၊ ဇွန်လ ၅ ရက်နေ့မှ ၁၁ ရက်နေ့ထိ နေ့စဉ်ည ၂၁:၀၀ နာရီအချိန်မှ နောက်တစ်နေ့နံနက် ၀၅:၀၀ နာရီအချိန်အထိသာ အပိုဒ်(၁)ပါ သတ်မှတ်လမ်းကြောင်းအတိုင်း အသုံးပြုရန်ဖြစ်ပါသည်။ အသုံးပြုရာ၌ ခွင့်ပြုထားသောယာဉ်မှအပ အခြားယာဉ်သုံးစွဲခြင်း မပြုရန်နှင့် စနစ်တကျလုံခြုံစွာ ဖုံးအုပ်ကာရံ၍ သယ်ယူပေးရမည်ဖြစ်ပြီး၊ မြေကြီးသယ်ယာဉ် ကားများ၏ အလွယ်တကူ မြင်တွေ့နိုင်သောနေရာ၌ (၂ ပေ x ၁ ပေ)အရွယ်အစားရှိ ဆောက်လုပ်ရေး ကုမ္ပဏီစာတမ်းနှင့် အမှတ်တံဆိပ်တို့အား ထင်ရှားစွာထားရှိဆောင်ရွက်ပေးရမည်ဖြစ်ပါသည်။ သယ်ယူစဉ် လမ်းမများပေါ်သို့ မြေကြီးများ ဖိတ်စင်မကျစေရန် ကြပ်မတ်ဆောင်ရွက်ပေးရန်နှင့်ကျခဲ့လျှင်လည်း သက်ဆိုင်ရာကုမ္ပဏီမှ နံနက် ၀၅:၀၀ နာရီ မတိုင်မီ သန့်ရှင်းရေးအပြီး ဆောင်ရွက်ပေးရန်ဖြစ်ပါသည်။ လုပ်ငန်းများအဆင်ပြေချောမွေ့စွာ ဆောင်ရွက်နိုင်ရေး

အတွက် BYMA MYANMAR Limited မှ တာဝန်ပေးအပ်ထားသည့် Contact Person များကို ဌာနအနေဖြင့် ဆက်သွယ်ဆောင်ရွက်သွားမည်ဖြစ်ပြီး၊ ကုမ္ပဏီမှ တာဝန်ပေးအပ်ထားသည့် Contact Person များအနေဖြင့်လည်း မြေကြီးသယ်ယူမှုလုပ်ငန်း အဆင်ပြေစေရေးအတွက် တာဝန်ခံကြီးကြပ်ဆောင်ရွက်ပေးရမည်ဖြစ်ပါသည်။

၃။ အသုံးပြုသောယာဉ်များ၏ လုံခြုံစိတ်ချရမှုအား ကော်မတီမှ စစ်ဆေး၍ ကန့်ကွက်ပါက ၎င်းယာဉ်အား အသုံးပြုခွင့်ရရှိမည်မဟုတ်ကြောင်းနှင့် သန့်ရှင်းမှုအတွက် စနစ်တကျဆောင်ရွက်ပေးမှုမရှိ၍ ကော်မတီ၏ အစီအစဉ် ဖြင့် လမ်းများကို ရှင်းလင်းရပါက ကုန်ကျငွေ၏ (၁၀)ဆအား ဒဏ်ကြေးငွေအဖြစ် ကော်မတီရန်ပုံငွေစာရင်းသို့ ပေးသွင်းပေးရမည်ဖြစ်သည့်အပြင် ရပ်ကွက်အတွင်းလမ်းများ အသုံးပြုမှုကြောင့် ရပ်ကွက်နေပြည်သူများနှင့် လမ်းသာယာရေးကော်မတီတို့မှ ကန့်ကွက်တိုင်ကြားမှုများ ဖြစ်ပေါ်လာပါက မြေကြီးသယ်ဆောင်ခွင့်ကိုလည်း ပြန်လည်ရုတ်သိမ်းသွားမည်ဖြစ်ကြောင်းနှင့် သယ်ဆောင်စဉ်စစ်ဆေးတွေ့ရှိရသော အခြေအနေပေါ် မူတည်၍ နေ့စဉ်ခွင့်ပြုပေးလျက်ရှိသော သယ်ဆောင်ခွင့်အား အခါအားလျော်စွာ ပြင်ဆင် ဖြည့်စွက်သွားမည်ဖြစ်ကြောင်း ဖြည့်စွက်ဖော်ပြပါသည်။

ဌာနမှူး(ကိုယ်စား)
(စိုးသိန်းအောင်) ဒုတိယဌာနမှူး
၂၀/၅/၁၆

မိတ္တူကို

- အတွင်းရေးမှူး၊ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ
- ဌာနမှူး၊ စီမံရေးရာဌာန၊ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ
- ဌာနမှူး၊ အင်ဂျင်နီယာဌာန(အဆောက်အအုံ)၊ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ
- ဌာနမှူး၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် သန့်ရှင်းရေးဌာန၊ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီ
- ယာဉ်ထိန်းရဲတပ်ဖွဲ့၊ ရန်ကုန်တိုင်းဒေသကြီး
- အုပ်ချုပ်ရေးမှူး၊ ခရိုင်စည်ပင်သာယာအုပ်ချုပ်ရေးမှူးရုံး(အရှေ့ပိုင်း၊ အနောက်ပိုင်း၊ တောင်ပိုင်း၊ မြောက်ပိုင်း)
- အုပ်ချုပ်ရေးမှူး၊ မြို့နယ်စည်ပင်သာယာအုပ်ချုပ်ရေးမှူးရုံး (ပန်းဘဲတန်း/မင်္ဂလာဒုံ)မြို့နယ်
- အမှုတွဲ/မျှောစာတွဲ/ရုံးလက်ခံ

၂၀၁၈ ခုနှစ်၊ ဇွန်လ ၅ ရက်နေ့မှ ၁၁ ရက်နေ့ထိ
 ည ၂၁:၀၀ နာရီအချိန်မှ နောက်တစ်နေ့နံနက် ၀၅:၀၀ နာရီအချိန်ထိ
 သတ်မှတ်လမ်းကြောင်းအတိုင်း သယ်ယူခွင့်ပြုမည့် BYMA MYANMAR Limited မှ
 ယာဉ်များစာရင်း

စဉ်	ကားနံပါတ်	လမ်းကြောင်း	မှတ်ချက်
၁	1N-7316	ဗိုလ်ချုပ်အောင်ဆန်းလမ်း-ဆူးလေဘုရားလမ်း-အနော်ရထာလမ်း-ရွှေဘုံသာလမ်း	
၂	9M-3810	ကမ်းနားလမ်း-ဘုရင့်နောင်လမ်း-ပါရမီလမ်း-မင်းဓမ္မလမ်း-တော်ဝင်လမ်း-ပြည်လမ်း-	
၃	5N-9576	ဥက္ကလာလမ်းမှတစ်ဆင့် လေကြောင်းရန်ကာကွယ်ရေးတပ်ရင်း၊ အမှတ်(၃၀၁၇)အတွင်းသို့-	
၄	6M-5573		
၅	7L-2199		
၆	6F-4170		
၇	6J-9217		
၈	5K-8142		
၉	9K - 5480		
၁၀	7L-1931		
၁၁	4P-7750		
၁၂	4N-8040		
၁၃	5M-7218		
၁၄	7L-5575		
၁၅	1N-1882		
၁၆	4N-8035		
၁၇	7K-3282		
၁၈	7J-6055		
၁၉	6M-1411		
၂၀	9L-4857		
၂၁	3M-7331		
၂၂	7L-1935		
၂၃	2N-1925		
၂၄	2N-1926		

စဉ်	ကားနံပါတ်	လမ်းကြောင်း	မှတ်ချက်
၂၅	2N-1916	ပိုလ်ချုပ်အောင်ဆန်းလမ်း-ဆူးလေဘုရားလမ်း-အနော်ရထာလမ်း-ရွှေဘုံသာလမ်း	
၂၆	1P-8347	ကမ်းနားလမ်း-ဘုရင့်နောင်လမ်း-ပါရမီလမ်း-မင်းဓမ္မလမ်း-တော်ဝင်လမ်း-ပြည်လမ်း-	
၂၇	1P-3946	ဥက္ကလာလမ်းမှတစ်ဆင့် လေကြောင်းရန်ကာကွယ်ရေးတပ်ရင်း၊ အမှတ်(၃၀၁၇)အတွင်းသို့-	
၂၈	9N-9303		
၂၉	1N-2857		
၃၀	6M-1566		
၃၁	5N-9587		
၃၂	1N-2707		
၃၃	1J-7827		
၃၄	7H-6165		
၃၅	7N-9106		
၃၆	2M-4839		
၃၇	9J-6515		
၃၈	3K-5576		
၃၉	7K-8618		
၄၀	3K-5590		
၄၁	6P-5501		
၄၂	2H-9487		

Annex 4 Traffic Impact Assessment

The Landmark Project, Yangon

Final Traffic Impact Assessment

Date : 16th January 2017

Submitted to:

Prime Estate Developments Limited.
PO Box 957, Offshore Incorporations Centre,
Road Town, Tortola,
British Virgin Island

Date	Revision	Prepared By	Checked By	Approved By
16 January 17	
		JPW/ANC	NTP	KRL

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TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	PROJECT DESCRIPTION.....	1
1.2	STUDY OBJECTIVES.....	2
1.3	METHODOLOGY.....	2
1.4	REPORT STRUCTURE.....	3
2.0	EXISTING SITUATION.....	4
2.1	SITE LOCATION.....	4
2.2	EXISTING ACCESS.....	4
2.3	EXISTING ROAD CHARACTERISTICS.....	9
2.4	EXISTING TRAFFIC VOLUME.....	11
2.5	PEDESTRIAN MOVEMENTS.....	14
2.6	PUBLIC TRANSPORT ACCESSIBILITY.....	16
3.0	DEVELOPMENT PROPOSALS.....	18
3.1	PROPOSED DEVELOPMENT.....	18
3.2	PRINCIPLES OF ACCESS AND CIRCULATION.....	18
3.3	ACCESS LOCATION.....	20
3.4	SERVICE AND FIRE ACCESS.....	22
3.5	SWEPT PATH TESTS.....	22
3.6	CAR PARKING PROVISION.....	26
4.0	TRAFFIC AND PARKING GENERATION.....	34
4.1	BACKGROUND TRAFFIC IN YANGON.....	34
4.2	DEVELOPMENT TRAFFIC GENERATION.....	35
4.3	PEAK PERIOD SUMMARY.....	36
4.4	FUTURE TRANSPORTATION PROJECT.....	41
5.0	TRAFFIC IMPACT ANALYSIS & MITIGATION.....	43
5.1	INTRODUCTION.....	43
5.2	EXISTING BASE YEAR ANALYSIS.....	43
5.3	FUTURE BASE YEAR ANALYSIS.....	46
5.4	FUTURE YEAR WITH DEVELOPMENT.....	49
5.5	TRAFFIC AND PEDESTRIAN IMPROVEMENT MEASURES.....	55
6.0	SUMMARY.....	65

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

Meinhardt (Thailand) Limited is appointed by Meeyahta International Hotel Ltd to undertake the Traffic Impact Assessment (TIA) study for the proposed Landmark Project, Yangon. The project is a mixed use development, consisting of Residential, Retail, Hotel, and Office as Shown in **Figure 1.1**.

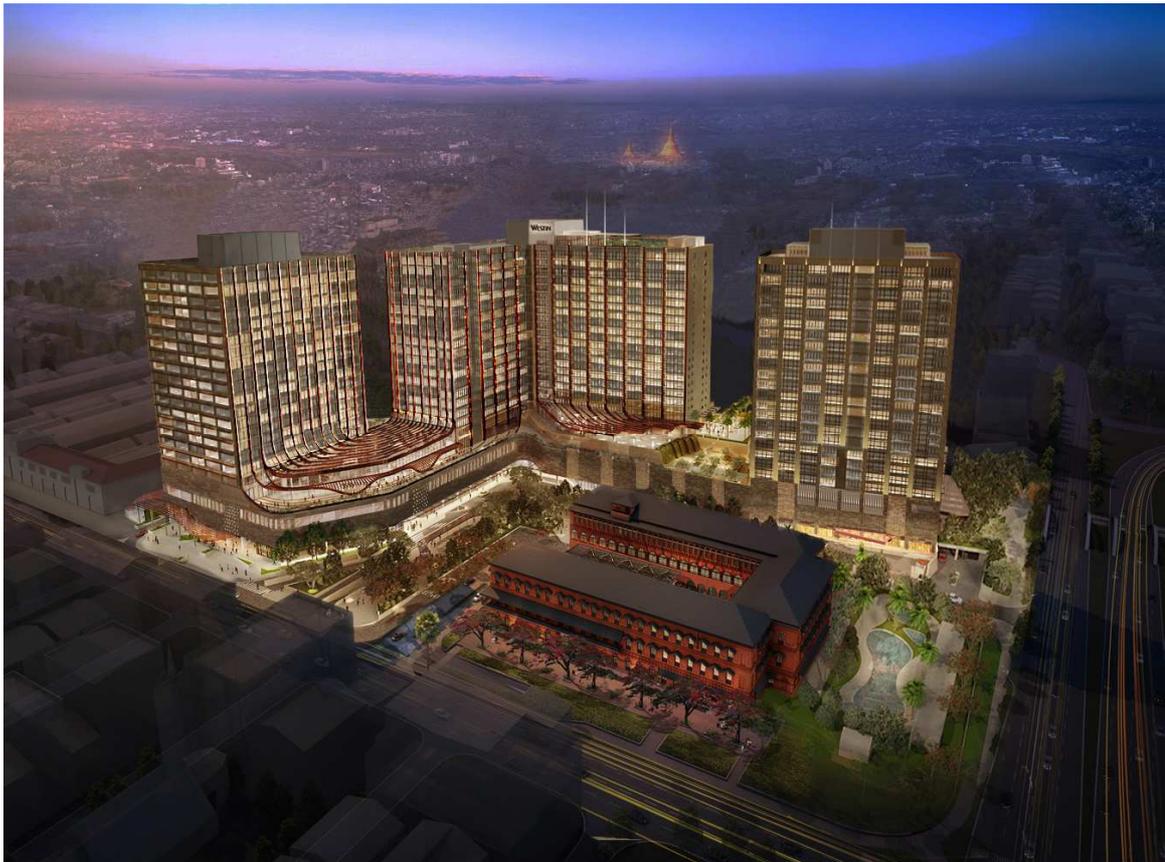


Figure 1.1: Landmark Yangon

The Project is required to submit an Environmental Impact Assessment (EIA) and this report provides the TIA study for submission with the EIA to the Authorities.

This TIA is prepared based on a new design for Landmark Project, which includes minor amendments from a previous scheme granted planning permission by HIC in November 2014. This TIA builds on and updates the principles as previously agreed during discussions with YCDC Engineering Department Roads & Bridges

1.0 INTRODUCTION

1.2 STUDY OBJECTIVES

The objectives of Traffic Impact Assessment (TIA) study are;

- Establish the proper study and survey area for investigating the traffic impacts caused by the site on the surrounding road network. This aims to provide the necessary impact mitigation measures required for the development project;
- Measure and define the existing traffic flows, movements and road conditions;
- Predict future traffic conditions for the study area by application of recognized traffic engineering techniques and projections for multiple periods throughout the study;
- Propose measures to resolve traffic problems identified by the study and analysis;
- Prepare a clear traffic study report containing all factual data, analysis, recommendations and conclusions for use by the project.
- Support the proposed parking provision and the safety of the proposed ingress and egress locations.

1.3 METHODOLOGY

There is not an official guideline regarding the TIA study in Myanmar, so the study scope has been established based on the available TIA guidelines in other countries such as Singapore, UK and Thailand.

The study starts with establishing the scope and data required for this study and defining site access and survey areas and locations. It is important to review relevant future projects in the site vicinity such as infrastructure projects, road expansions, and other major construction projects as these are potential sources for traffic generations in the future. Additionally, population, car ownership etc. data is also reviewed in order to justify the potential traffic growth rates in the future years.

There are three scenarios for the study to include;

- Scenario 1: Site access and existing traffic conditions (2016) – this stage is to establish site access, traffic survey, assess existing traffic conditions e.g. road characteristics, current traffic problems, to understand current background traffic, public transportation, and transportation facilities;
- Scenario 2: Future traffic conditions without development project (2021) – this stage is to project future traffic conditions and flows in the development opening year-2021-by applying projected growth rate from reliable sources and combine with other relevant private developments e.g. residences, retails, etc. which may impact traffic conditions but exclude traffic generated from The Landmark Project;

1.0 INTRODUCTION

- Scenario 3: Future traffic conditions with development project (2021) – this stage is similar to Scenario 2 but include traffic generated from The Landmark Project. Based on the database of traffic surveys undertaken at similar developments in Thailand with some adjustments made to reflect the differences in Yangon.

For the analysis, this study involves three scenarios as explained above using SIDRA Intersection version 6.1 as a traffic analysis software.

1.4 REPORT STRUCTURE

This TIA report consists of six chapters;

Chapter 1: Introduction

Chapter 2: Existing Situation - review of the existing traffic, pedestrian and public transport conditions in the vicinity of the Project site;

Chapter 3: Development Proposals - highlighting the key proposals for access, circulation, parking, and servicing within the Project;

Chapter 4: Traffic and Parking Generation - calculation of daily and hourly traffic demand and estimated parking accumulation;

Chapter 5: Traffic Impact and Mitigation - capacity analysis of the road network or junction and proposed improvement to the traffic, pedestrian and public transport networks;

Chapter 6: Summary

2.0 EXISTING SITUATION

2.1 SITE LOCATION

The Landmark project is located in Pabedan Township in the commercial center of Yangon at the corner between Bogyoke Aung San Road and Alan Pya Pagoda Road, near other major destinations such as Bogyoke Aung San Market, Sakura Tower, and Sule Shangri-La Hotel. Yangon Central Railway Station is within walkable distance, approximately 380m from the site. There are many communities, school, hospital, church, hotel, and retail facilities within the vicinity of the site. The location of the development site is shown in **Figure 2.1**

The existing site comprises the FMI retail and office building and the Grand Mee Ya Hta serviced apartments (the latter has recently been vacated to allow for demolition). The site area also includes the Zaw Gyi Restaurant (also closed) which fronts Bogyoke Aung San Road next to FMI. The remainder of the site is made up of the disused buildings (already demolished) associated with the Myanmar Railways Headquarters and supporting structures for FMI and serviced apartments.

2.2 EXISTING ACCESS

Existing access to the site is from Bogyoke Aung San Road with one entry and exit to serve the FMI building and one entry and exit to serve the Grand Mee Ya Hta apartments. The Grand Mee Ya Hta access from Bogyoke Aung San Road is currently being used for FMI, KFC parking and to access to site as shown in **Figure 2.2**. There are other curb cuts and access points that are no longer in operation and were historically used to access the Myanmar Railways Headquarters, see **Figure 2.3**.

Bogyoke Aung San Road is one way eastbound meaning that there is a cross-over between traffic entering and exiting the FMI or Grand Mee Ya Hta. Access to the proposed development will aim to remove this conflict by proposing left in / left out access at Bogyoke Aung San Road.

The Developer is aware that YCDC review its road network on an ongoing basis. All vehicular movement on Yangon public roads as a result of the development would be as per regulations. Figure 2.4 presents the access routings.

2.0 EXISTING SITUATION

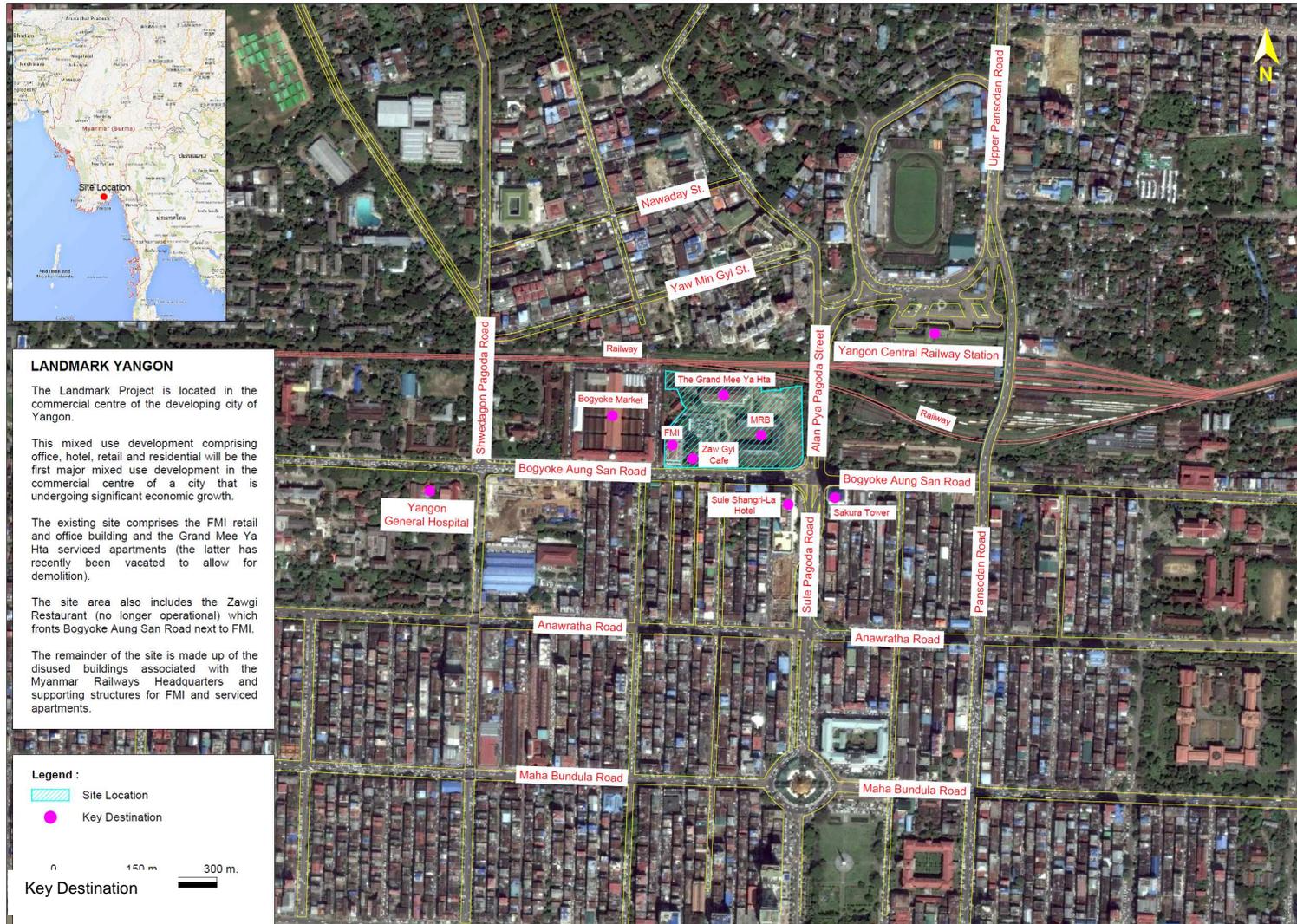


Figure 2.1: Site Location

2.0 EXISTING SITUATION



Figure 2.2: Grand Mee Ya Hta Access from Bogyoke Aung San Road



Figure 2.3: The Historic Curb Cut and Access Point

2.0 EXISTING SITUATION

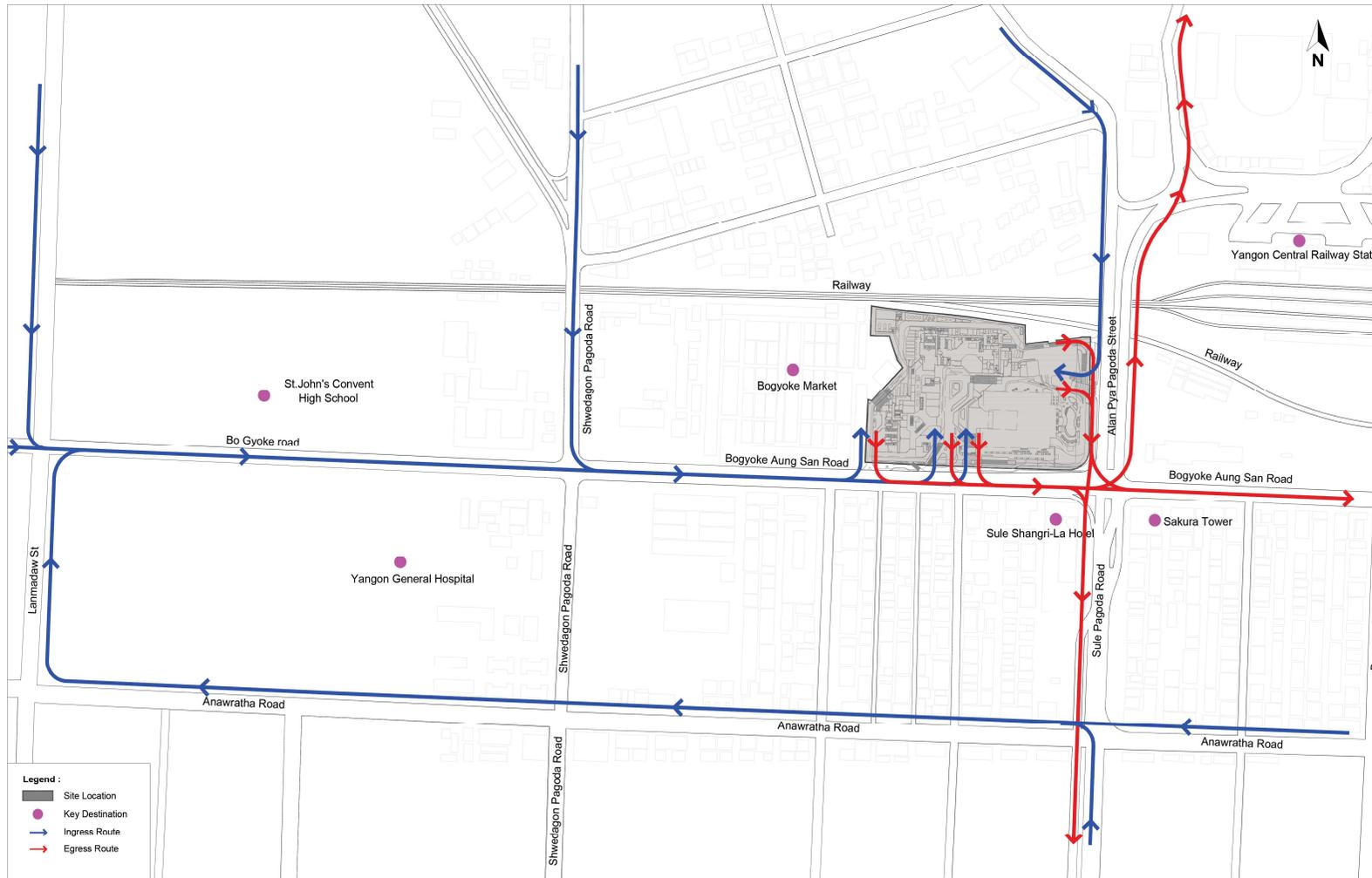


Figure 2.4: Proposed Access Routings

2.0 EXISTING SITUATION

2.3 EXISTING ROAD CHARACTERISTICS

Figure 2.5 shows the existing road characteristics around the development.

- Bogyoke Aung San Road is a primary road with one-way traffic direction. At the western end of this block (toward Shwedagon Pagoda Road), Bogyoke Aung San is 4-lane; but expands to 6 lanes toward Alan Pya Pagoda Road. There is a raised median and barrier along the center of the road that starts approximately 100 m. from the west junction and 100 m. from the east. The road runs in west-east direction and connects Shwedagon Pagoda Road in the west to Lower Pazundaung Road in the east. Adjacent to the site there is existing parking within lay-by's used mainly by taxis;
- Alan Pya Pagoda Road is another major road with two way traffic in a north-south direction. The carriageway is three lanes in each direction and expands to four lanes for north bound direction and five lanes for south bound at the intersection of Bogyoke Aung San Road. However, after the road widening works in November 2016, the south bound approach to the junction will be expanded to 6-lane as shown in **Figure 2.6**. The road connects to Kan Yiek Thar Road to the north and Bogyoke Aung san road to the south. Adjacent to the site there is no street parking;
- Sule Pagoda Road is a three-lane two-way road with raised median and expands to four lanes in each direction toward Bogyoke Aung San Road. The road runs in north-south direction connects Bogyoke Aung San road to the north and Strand Road to the south. There are service roads alongside the northbound (north part) and southbound (south part) of the road;
- Shwedagon Pagoda Road is a four-lane two-way road. The road runs in north-south direction and connects U Htaung Bo Road on the north and Strand Road to the south.

2.0 EXISTING SITUATION

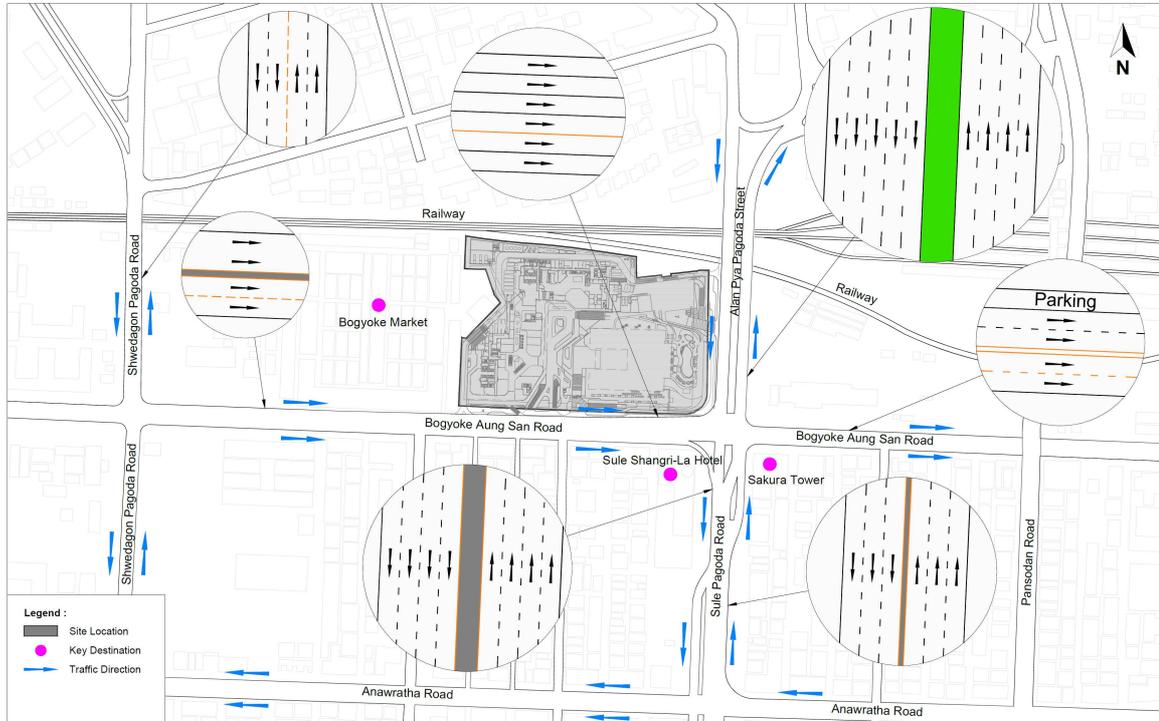


Figure 2.5: External Road Characteristic

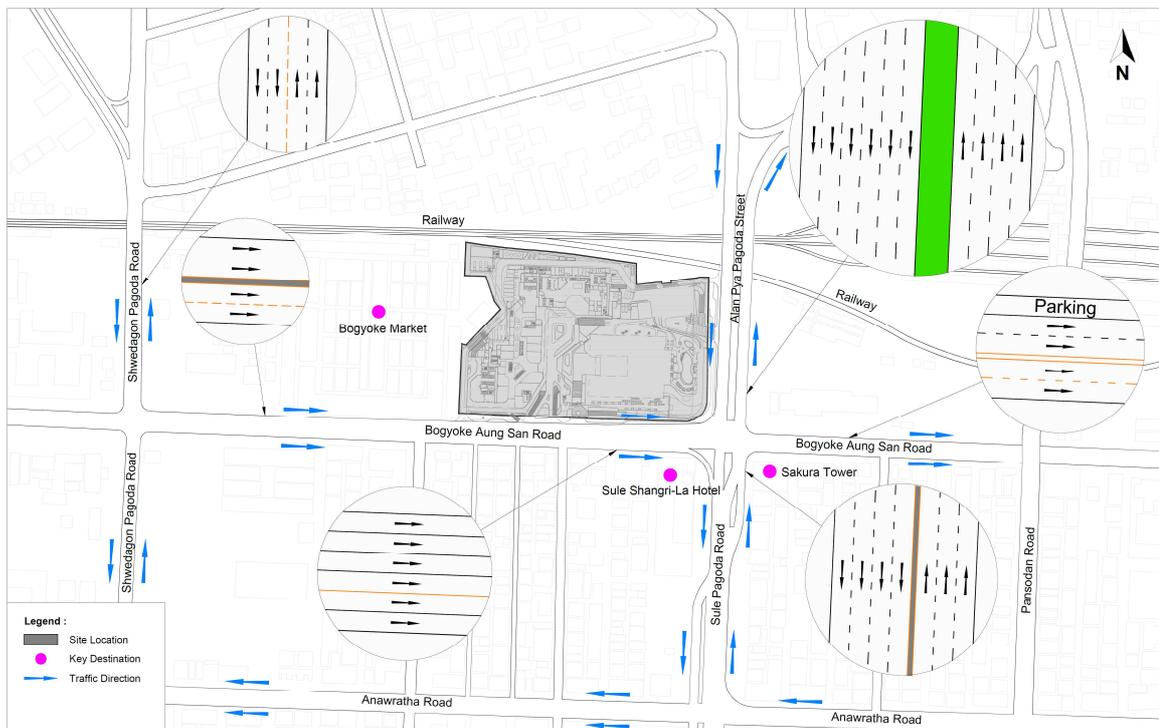


Figure 2.6: External Road Characteristic (after the road widening works)

2.0 EXISTING SITUATION

2.4 EXISTING TRAFFIC VOLUME

The site is immediately adjacent to the 'Bogyoke & Alan Pya Junction' and all traffic whether entering or exiting the Landmark site will need to pass through this junction. To establish the existing traffic conditions, videos traffic survey were conducted at the location of Bogyoke & Alan Pya Junction, Mid-block of Bogyke Aung San Road (at FMI) and Shwedagon & Bogyoke Junction for the weekday peak periods, including 10:00 - 11:00 and 18:00 - 19:00 on 30th November 2016.

From the traffic surveys, in order to assess different types of vehicles in the same scale, passenger car unit (PCU) is introduced and used to uniformly measure the volume and capacity of roads from mixed traffic flows. In this study, PCU set by Land Transport Authority, Singapore (LTA) is used as presented based on each vehicle classification in **Table 2.1**.

Table 2.1: PCU of Each Vehicle Classification

Vehicle Classification	PCU
Motorcycles	0.7
Passenger cars & vans	1.0
Single unit trucks: - LGV: Light good vehicles with laden weights up to 3 tonnes - HGV: Heavy goods vehicle with laden weights more than 3 tonnes or with 3 or more axles	1.3 2.25 – 2.75
Buses: - Small (Small bus includes up to 30 seats) - Large (Large bus more than 30 seats)	1.6 2.5
Articulated trucks / Buses	2.9

Source: Land Transport Authority (LTA), Singapore

The traffic volume and surveyed locations is shown in **Figure2.7**.

2.0 EXISTING SITUATION

It should be noted that there is a road median along Bogyoke Aung San Road. This median separates the one way four lanes traffic into two lanes for each side, this is because in the past it was managed by two way traffic with a median. The through traffics on Bogyoke Aung San Road normally use two lanes of the right side in order to avoid congestion or queue lengths generated at the accesses of Bogyoke Market. The most traffics on the left side of Bogyoke Aung San Road mainly intend to entry to Bogyoke Market. This results to the lower traffic volumes or densities on the left two lanes of Bogyoke Aung San Road, compared with the other two lanes on the right side, for example in **Figure 2.7** during the morning peak while traffic volumes on the right two lanes are 1,778 PCU/hour, the volumes on the left two lanes are 1,362 PCU/hour only. This can be considered as an advantage for the development site traffics, since they can get in and out from the development with the lesser impacts on Bogyoke Aung San Road, as a result of lower traffic densities on the road section in front of the site.

2.0 EXISTING SITUATION

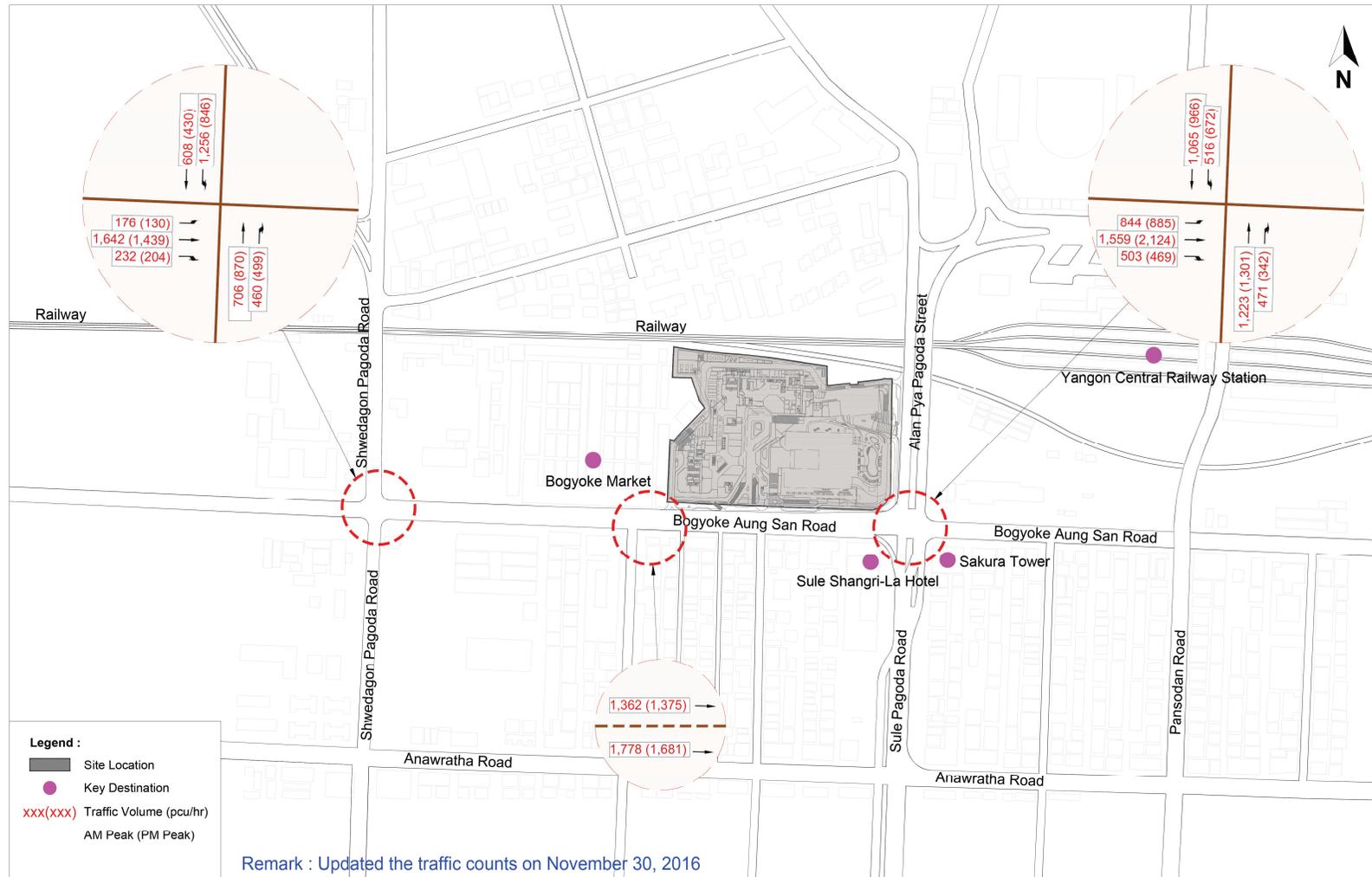


Figure 2.7: Existing Traffic Volume

2.0 EXISTING SITUATION

Table 2.2 Summary of Existing Traffic Volumes (All Directions)

Surveyed Location	Traffic Volumes at AM Peak (PCU/hr.)	Traffic Volumes PM Peak (PCU/hr.)
Bogyoke & Alan Pya Junction	6,181	6,760
Mid-block of Bogyoke Aung San Road	3,140	3,056
Shwedagon & Bogyoke Junction	5,080	4,417
Total	14,401	14,232

2.5 PEDESTRIAN MOVEMENTS

There are existing footways surrounding the site on Bogyoke Aung San Road and Alan Pya Pagoda Road. The footway along the boundary of the Myanmar Railways Building is narrower than other footways surrounding it and this will be improved with development of the site.

There is a pedestrian crossing to the west of the existing Grand Mee Ya Hta access. This is an uncontrolled pedestrian crossing with striping. It is regularly used and the development will make improvements to this as currently people are required to step out in front of a lot of traffic. **Figure 2.8** shows the footway and crossing conditions near to the site.

The central barrier on Bogyoke Aung San Road was constructed to prevent pedestrians crossing freely across the street and conflicting with vehicles. Instead pedestrians are channeled to use the pedestrian crossing near Grand Mee Ya Hta, the footbridge to the west of the Bogyoke Aung San Market or cross at the traffic signal junctions.

2.0 EXISTING SITUATION

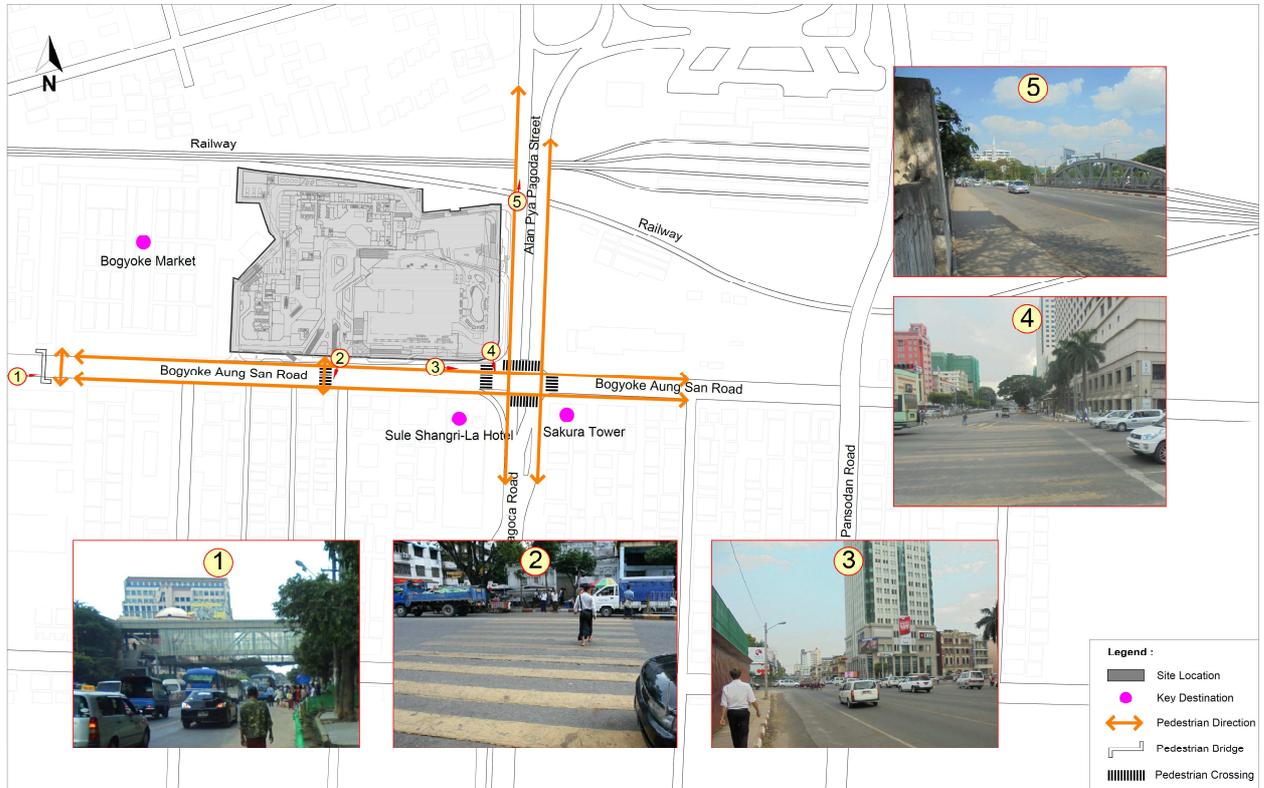


Figure 2.8: Major Pedestrian Routes Surrounding the Site

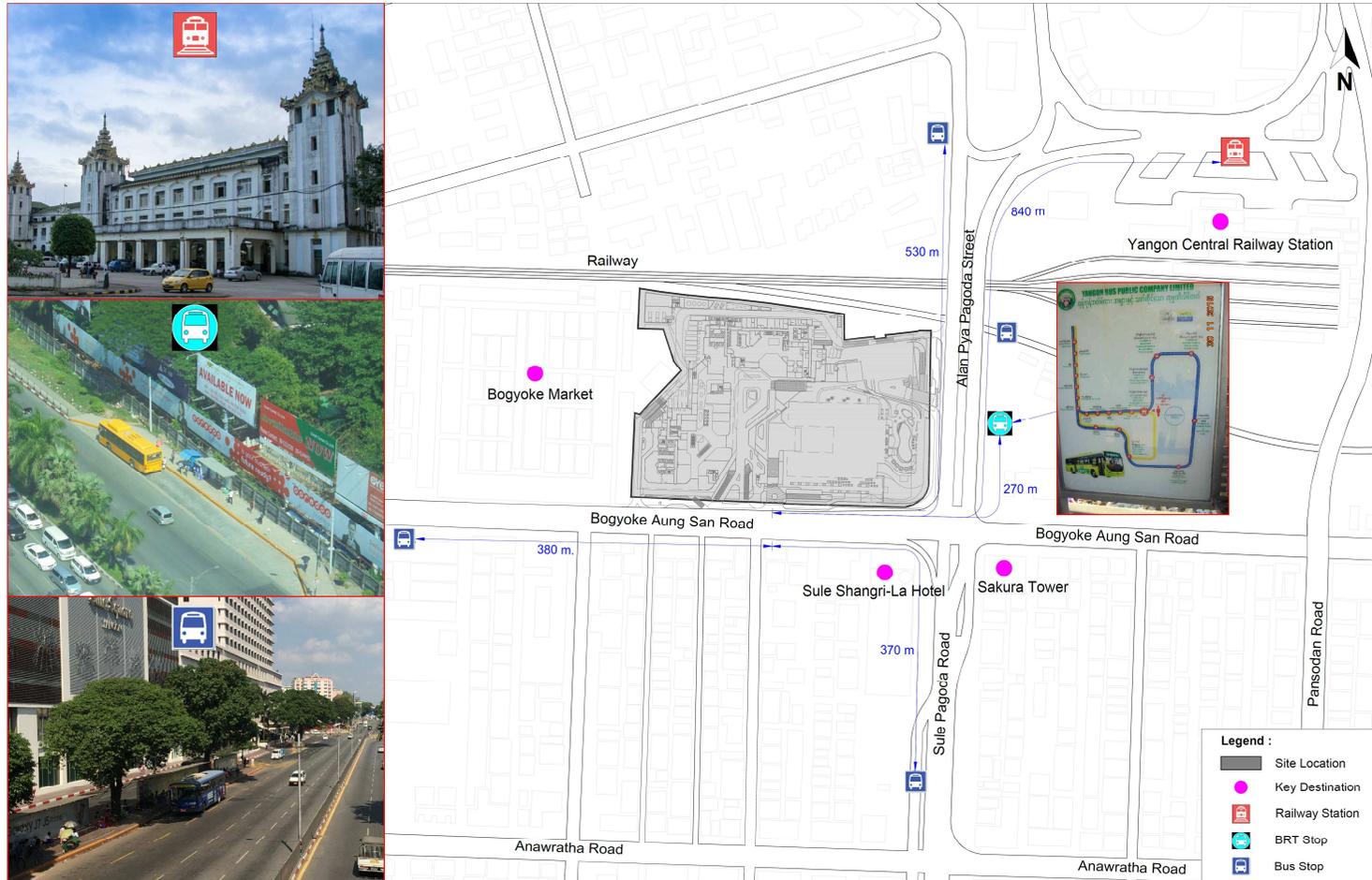
2.0 EXISTING SITUATION

2.6 PUBLIC TRANSPORT ACCESSIBILITY

The development is conveniently located within walking distance of the public transport network. The York Street bus stop and Yangon Central Railway Station are located on Alan Pya Pagoda Road approximately 530 and 840 m. from the site, respectively. The BRT Station located on Alan Pya Road in front of the development approximately 270 m. There are also Bogyoke Zay (Scott Market) bus stop on Bogyoke Aung San Road and Sule Bus Stop on Sule Pagoda Road approximately 380 and 370 m. from the site respectively, as shown in **Figure 2.10**. The bus stop on Sule Pagoda Road is a major bus stop with bus routes to / from across the city.

In the future there is expected to be many changes to the public transport network such as improved bus fleet and safer services, renovated rail service, metro system (expected by 2035) and bus priority measures all to maintain the popularity of public transport and reduce the impacts of rapid traffic growth.

2.0 EXISTING SITUATION



Remark: Distances shown based on SPAPM study

Figure 2.10: Public Transport Surrounding Landmark Project

3.0 DEVELOPMENT PROPOSALS

3.1 PROPOSED DEVELOPMENT

The Landmark Project is located in the commercial center of the developing city of Yangon. This mixed use development comprising office, luxury hotel (PYN), business hotel, retail and residential will be a key major mixed use development in the commercial center of a city that is undergoing significant economic growth. The Gross Floor Area (GFA) is 222,224 m². The proposed building uses schedule is shown in **Table 3.1**.

Table 3.1 Building Uses Schedule

Land Use		NLA (m2)	GFA (m2)	Efficiency (%)
RETAIL PODIUM		23,282	37,191	63%
LUXURY HOTEL*	MRB	7,665	14,050	55%
LUX RESIDENTIAL	Tower 1	31,056	37,253	83%
BUSINESS HOTEL	Tower 2	31,089	49,778	62%
OFFICE	Tower 3	40,779	44,662	91%
OFFICE	Tower 4	36,369	39,290	93%
TOTAL		170,240	222,224	77%

Remarks: The area estimated based on HIC Second Submission 18th May 2016

3.2 PRINCIPLES OF ACCESS AND CIRCULATION

The Landmark project is a complex mixed use development with access and parking requirements for a variety of building uses. Mixed use developments can reduce the overall demand for travel as people can live, work, shop and play without the need to travel by car. However, a significant amount of trips will be carried out by private vehicle particularly as this will be one of the first high-end mixed use developments in Yangon.

The aim is to achieve good accessibility for all while not dominating the site with road traffic and to enable convenient walking movement within the site.

3.0 DEVELOPMENT PROPOSALS

A summary of the main principles for vehicle access are below:

- Office - main entry and exit from Bogyoke Aung San Road with access to/from parking also from Alan Pya Pagoda Road. Drop off and pick up from Bogyoke Aung San Road. Sufficient weekday daytime parking to meet estimated demand;
- Retail - entry and exit from Bogyoke Aung San Road with additional access to/from parking from Alan Pya Pagoda Road. Drop off and pick up access from Bogyoke Aung San Road with secondary drop off and pick up in Basement 1 next to Supermarket. Sufficient parking provided (the peak times for retail are opposite for Office so parking space will be 'shared');
- Tower 2 Business Hotel - entry and exit from Bogyoke Aung San Road with access to/from parking from Alan Pya Pagoda Road. Drop off and pick up access from Bogyoke Aung San Road. Drop off designed for coaches;
- Tower 2 Serviced Apartments - as above for Business Hotel. Generally it is expected that parking demand will be low as the Clientele will mostly be travelling professionals;
- Tower 1 Luxury Residence – all accesses (entry, exit, drop off and pick up) to/from Alan Pya Pagoda Road with access to parking also to/from Alan Pya Pagoda Road;
- Luxury Hotel (PYN) - exclusive drop off and pick up from Bogyoke Aung san Road with dedicated valet ramp. Parking can be accessed from Bogyoke Aung San Road or Alan Pya Pagoda Road;

All these principles provide the foundation for design of access and circulation for vehicles. In order to maintain the attractiveness of the development for pedestrians and limit vehicles within the ground level of the development then convenient and direct ramps to and from the car park are provided.

3.0 DEVELOPMENT PROPOSALS

3.3 Access Location

Access to the development for vehicles is provided from Bogyoke Aung San Road (in approximate location of existing FMI / Grand Mee Ya Hta access) and Alan Pya Pagoda Road as shown in **Figure 3.1**. There are three access points on Bogyoke Aung San Road, service access, the main Landmark access and PYN access. The access points on Bogyoke Aung San Road are left in / left out to avoid crossover of traffic at street level. Within the site, where there is two way traffic circulation along the main internal road then a physical separation will be provided to avoid confusion for drivers.

The separation distance between main access and PYN access on Bogyoke Aung San Road is over 20 m. to improve pedestrian safety and avoid obstruction between the main Landmark "out" and PYN "in".

The service access road has entry from Bogyoke Aung San Road and exit onto Alan Pya Pagoda Road for service vehicles. The T4 office drop off is accessed from the service road. Between T4 drop-off and Bogyoke Aung San Road the service road is two way (for cars). Beyond T4 drop-off, the service road is one way.

For the access on Alan Pya Pagoda Road, there are two access points, T1 access and service access. The access at T1 provided for public entry and private exit (only for T1 resident) and service access is one-way traffic for egress only to avoid conflict with the traffic on external road.

These principle access points are in line with the access points as agreed with the Authorities as part of the Approval in Principal dated 14th November 2014.

3.0 DEVELOPMENT PROPOSALS

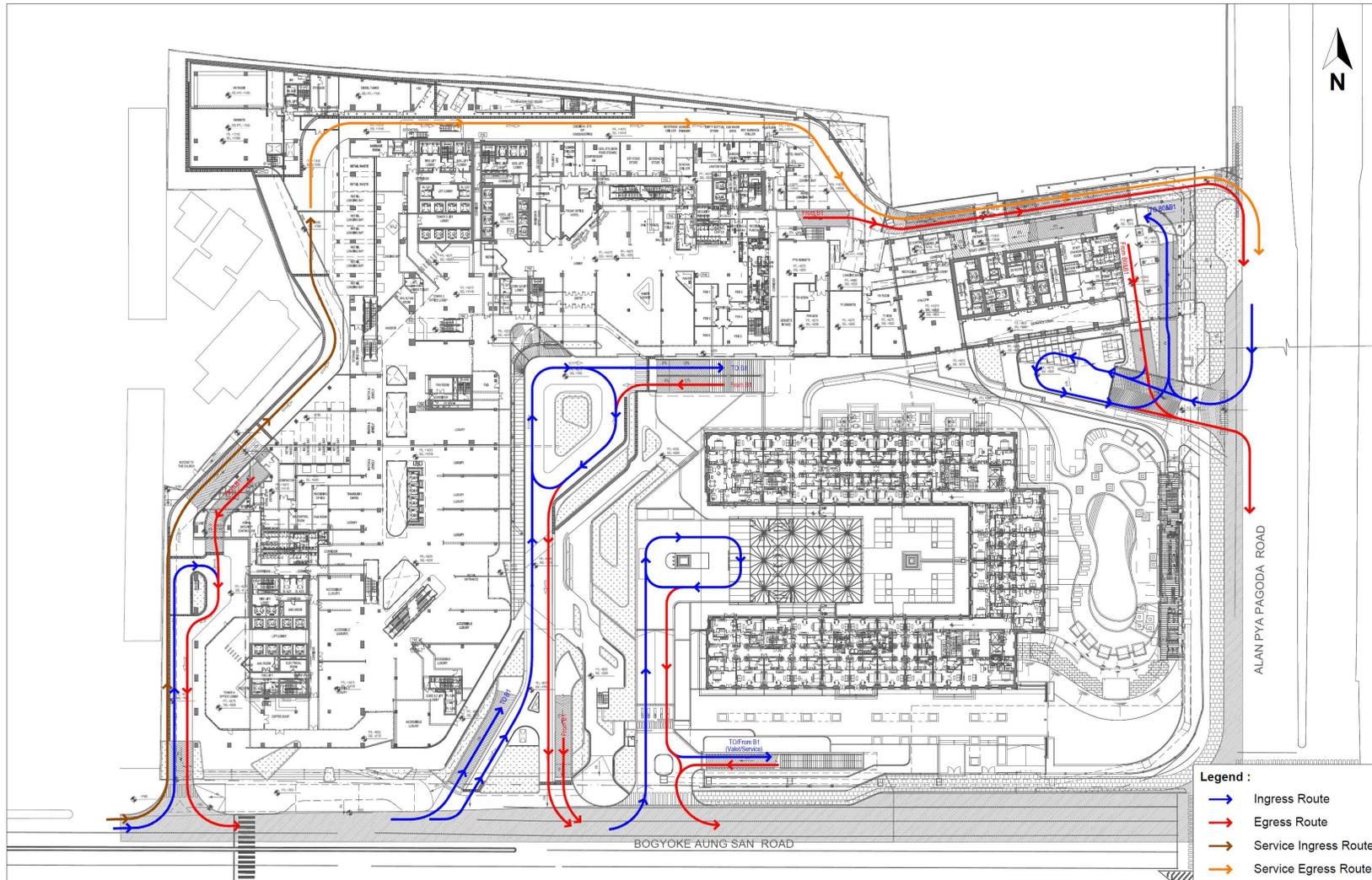


Figure 3.1: Traffic Circulation at L1

3.0 DEVELOPMENT PROPOSALS

3.4 SERVICE AND FIRE ACCESS

Based on the existing distribution of traffic, most traffic will arrive from Bogyoke Aung San Road. So servicing and fire access will be provided on Bogyoke Aung San Road with one-way traffic. Provision of this access routing will help to reduce traffic volume and traffic congestion in Bogyoke Aung San Road in front of the site as shown in **Figure 3.1**. The fire truck can also access the front of the development and the landscaping is designed to allow fire truck access to serve each building.

A total of 14 loading bays are provided, 9 for retail, 2 for PYN, 1 and 2 for Towers 1 and 2 respectively with additional of 5 bays for waste (total of 19 bays). The site has been designed to accommodate the maneuvering of a 10-wheel / 10-meter rigid trucks. It is expected that most deliveries will be carried out by small trucks or pick up vehicles. The PYN servicing in Basement 1 is for day to day vans / pickup trucks. Larger vehicles will use the main loading areas. The main loading areas at the north boundary of the site will be mostly shared between office, retail and hotel to maximize the efficiency of the space.

3.5 SWEPT PATH TESTS

Figures 3.2 – 3.3 illustrate the swept path tests at the critical points of turning in each design vehicles access to The Landmark Project.

3.0 DEVELOPMENT PROPOSALS

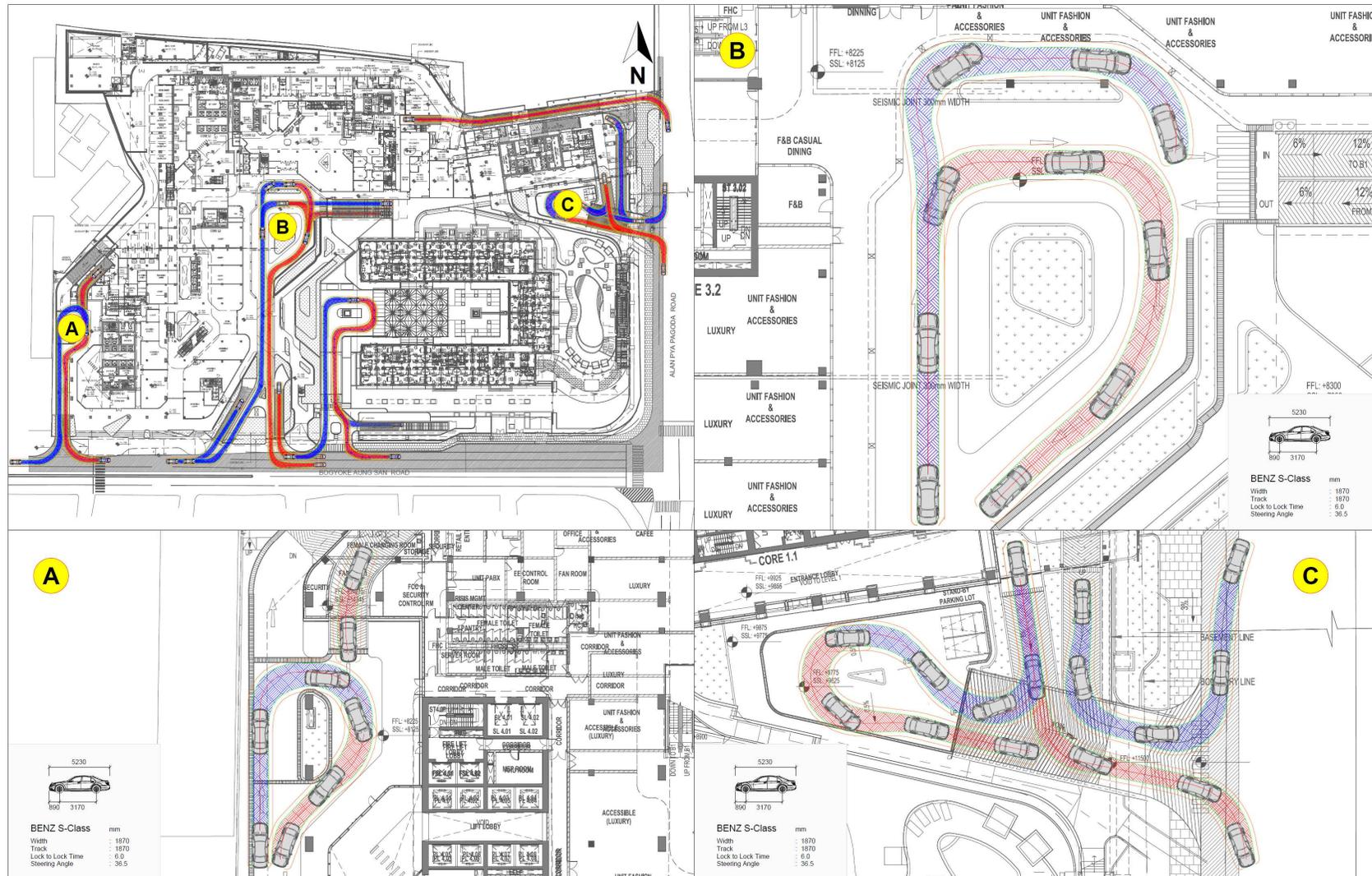


Figure 3.2: Swept Path of a Large Car at L1

3.0 DEVELOPMENT PROPOSALS

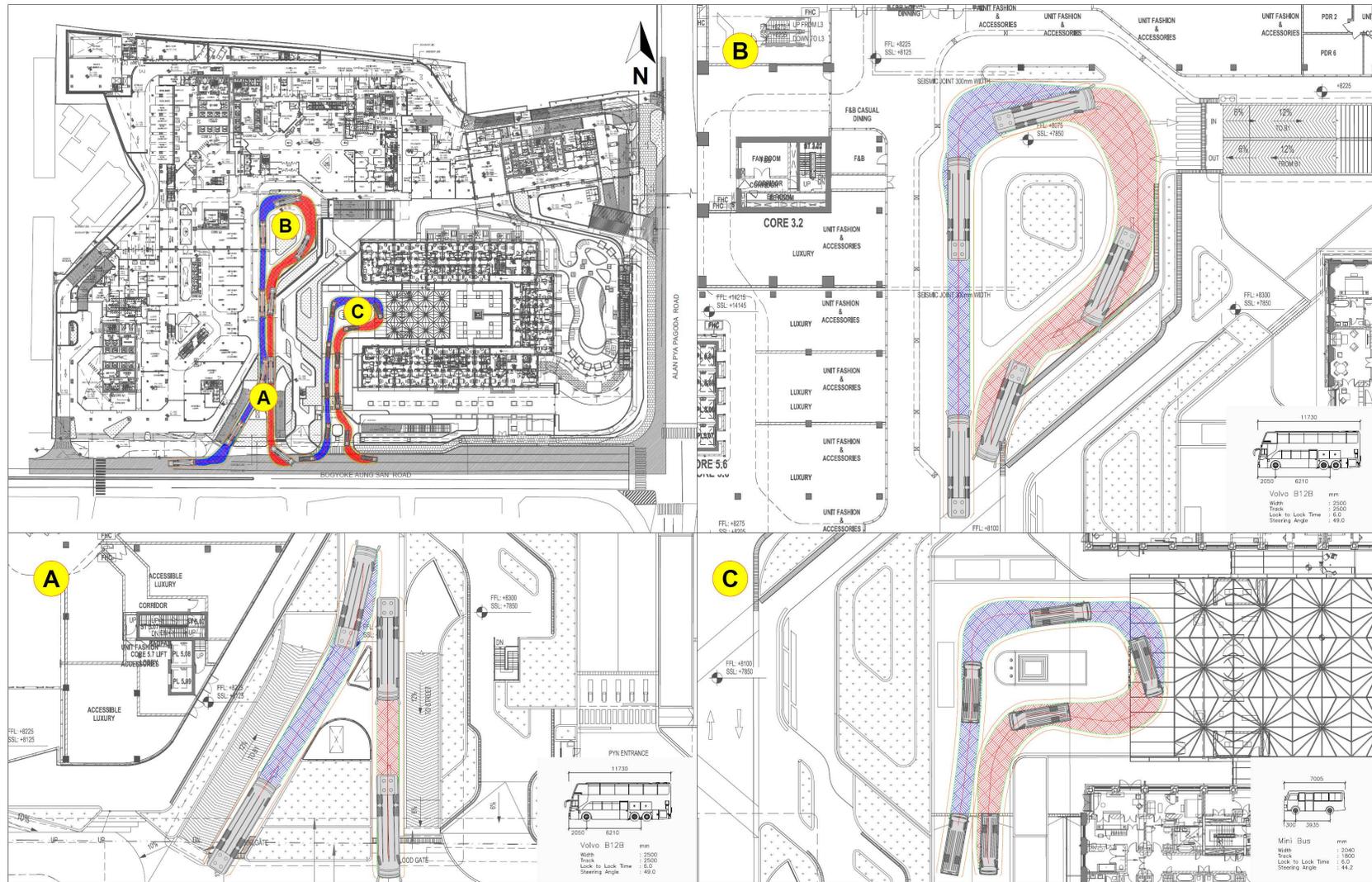


Figure 3.3: Coach/Bus Swept Path

3.0 DEVELOPMENT PROPOSALS

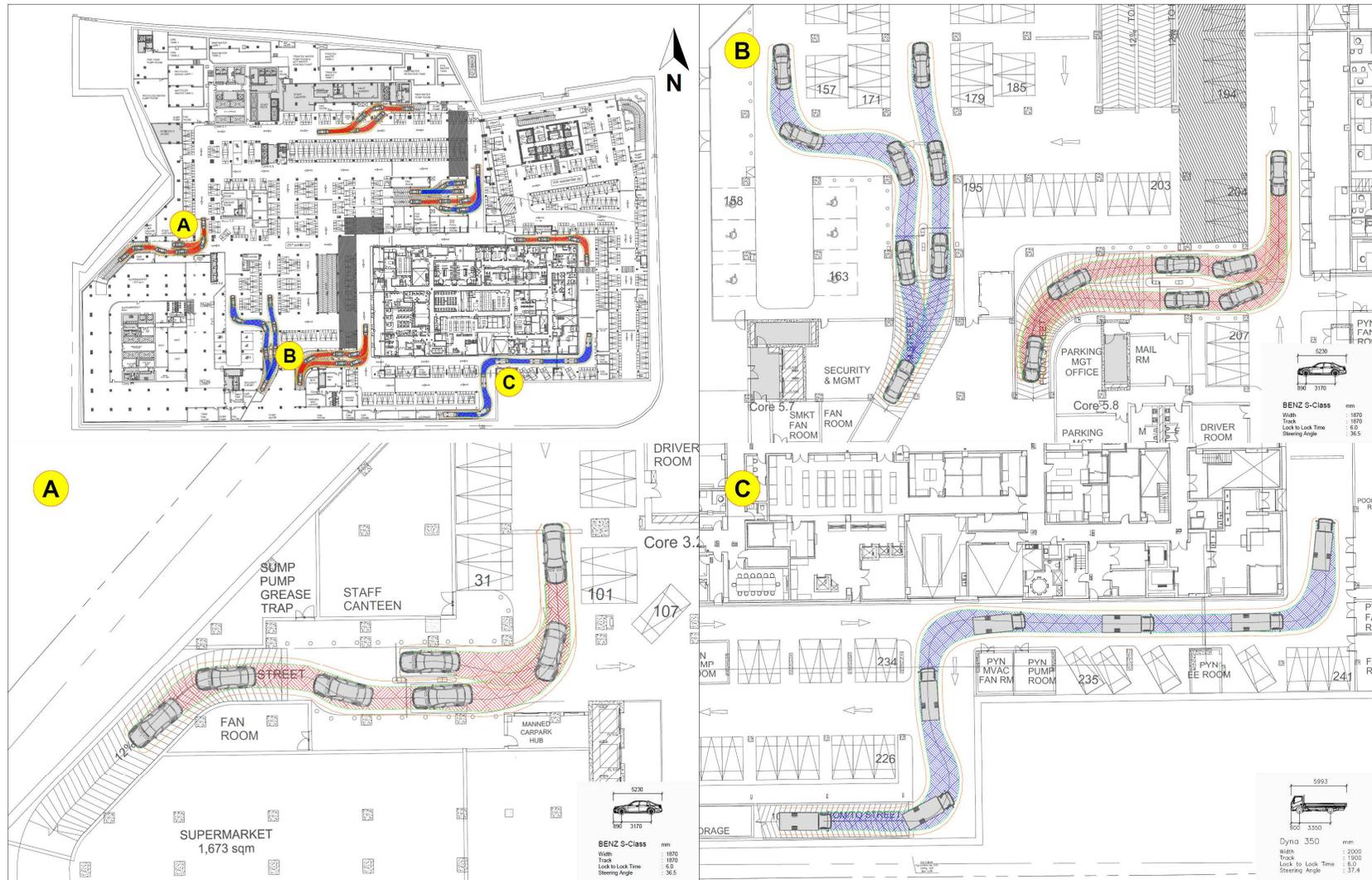


Figure 3.4: Swept Path of Large Car at B1

3.0 DEVELOPMENT PROPOSALS

3.6 CAR PARKING PROVISION

The ratios applied to calculate car parking requirement are based on the YCDC criteria in force at the time of original Approval in Principal (14th November 2014). During consideration of the HIC Plan Substitution submitted 20th July 2015, it was agreed with HIC that the same ratios should be applied as per the approved scheme, with small adjustment to the office parking (to accommodate increase in NLA). Based on the area schedules of the HIC Second Submission dated 18th May 2016, the total required car parking is 1,126. The current design provides 1,226 spaces, and therefore exceeds the ratio requirements applied. This detail is below

	14 th Nov 2014 Approval in Principal				18 th May 2016 Second Submission			
	Ratio applied	Sqm / count	Car Park required	Car Park provided	Ratio applied	Sqm / count	Car Park required	Car Park provided
Hotel PYN	1 space per 200sqm NLA plus 20%	7,454	45	1,130	1 space per 200sqm NLA plus 20%	7,665	46	1,226
Hotel T2		18,456	111			21,888	131	
Office T3	1 space per 200sqm NLA plus 20%	29,539	177		Previous provision	40,779	289	
Office T4		29,539	177		plus increase from 14 Nov 2014 scheme to 18 May 2016 of 1 space per 100sqm NLA	36,369	245	
Residential T1	1 space per unit plus 20%	82	98		1 space per unit plus 20%	101	121	
Residential T2		90	108			90	108	
Retail	1 space per 150sqm NLA plus 20%	27,333	219		1 space per 150sqm NLA plus 20%	23,282	186	
Total			935		1,130			

Table 3.2 shows the minimum parking provision required for the LMK Project to meet HIC Second Submission dated 18th May 2016 as agreed during the previous planning process.

3.0 DEVELOPMENT PROPOSALS

Table 3.2: Parking Requirement based on HIC Second Submission 18th May 2016

No.	Use Categories	Net Lettable Area (NLA)		Circulation/Service Floor Area (SFA)		Gross Floor Area (GFA)		No. of Units / Keys		No. of car Park			
		(m2)	(ft2)	(m2)	(ft2)	(m2)	(ft2)	Sub-Total	Total	Required	Provided		
1	Hotel	PYN	7,665	82,505	6,385	68,728	14,050	151,233	88	368	46	1,226 COMBINED PARKING	
		T2 (Hotel)	21,888	235,600	15,036	161,846	36,924	397,446	280		131		
2	Office	T3	40,779	438,941	3,883	41,796	44,662	480,737	-	-	289		
		T4	36,369	391,472	2,921	31,441	39,290	422,914	-		245		
3	Residential	T1	31,056	334,284	6,197	66,704	37,253	400,988	101	191	121		
		T2 (Serviced Apartments)	9,201	99,039	3,653	39,321	12,854	138,359	90		108		
4	Retail		23,282	250,605	13,909	149,715	37,191	400,320	-	-	186		
TOTAL						222,224	2,391,997				1126		1,226

Remark: Parking spaces required based on HIC Second Submission 18th May 2016 and total parking spaces provided is based on current design as at date of TIA report.

3.0 DEVELOPMENT PROPOSALS

The design criteria for internal traffic circulation and parking facilities can be summarized below.

- Parking lot - minimum of 2.40m x 4.80m
- Driveway width - 6.0m for one-way traffic and 6.60m for two-way
- Straight ramp width - 3.60m
- Curve ramp width - 4.20m
- Ramp gradient - maximum 12%

The traffic generation and accumulated parking is detailed in Section 4 of this report but the peak weekday parking is expected to be 1,117 spaces (1,156 for special event). The development will provide valet parking service for both hotels that will assist to maximize the parking area. The parking provision is tabulated above in **Table 3.2**, the total parking is 1,226 spaces (based on current design) which is more than the requirements.

The parking floors layouts are shown in **Figures 3.5 - 3.9**.

3.0 DEVELOPMENT PROPOSALS

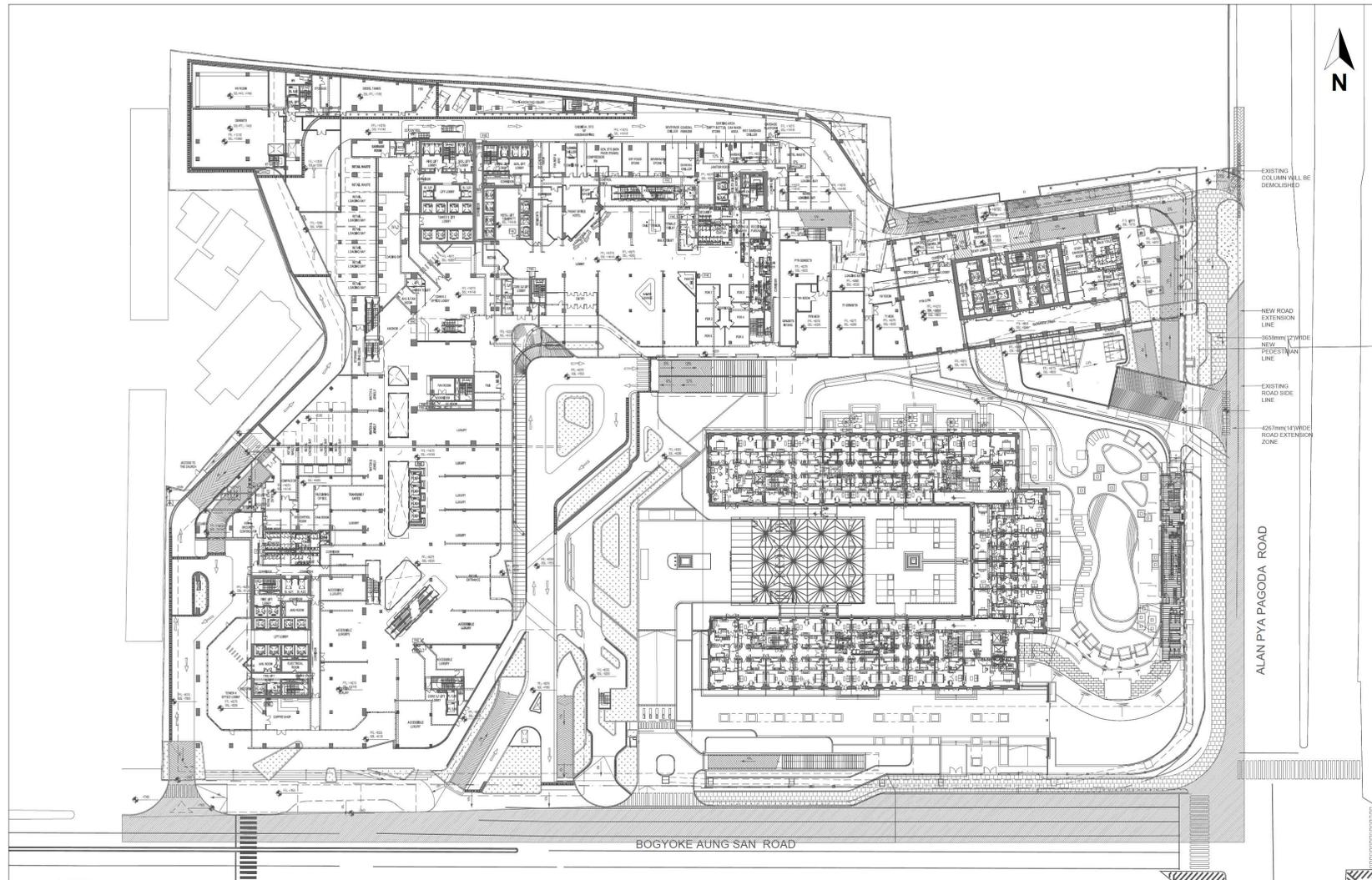


Figure 3.5: Ground Floor Layout (L1) with L2 overlay

3.0 DEVELOPMENT PROPOSALS

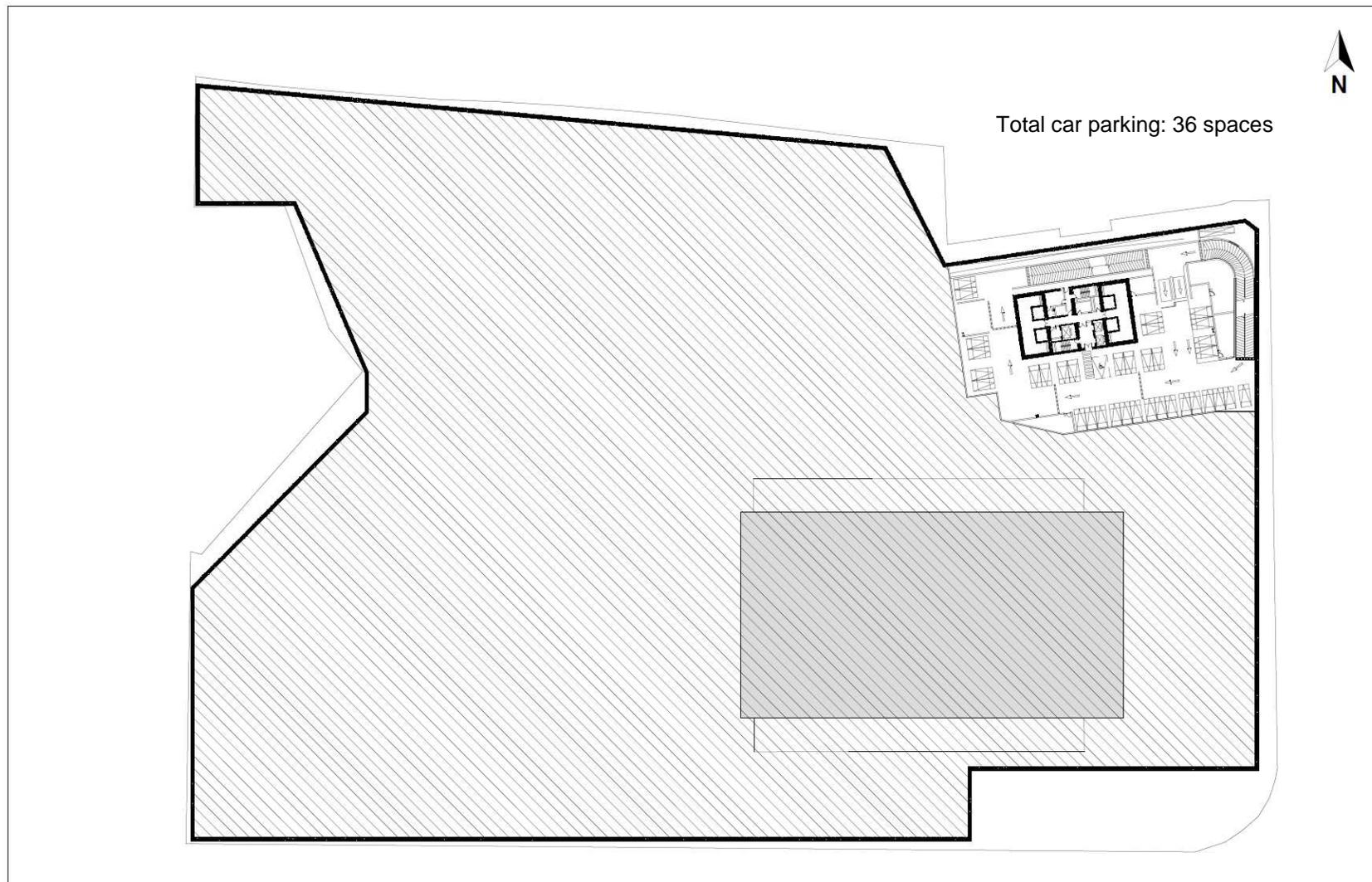


Figure 3.6: Parking Provision on Basement 0

3.0 DEVELOPMENT PROPOSALS

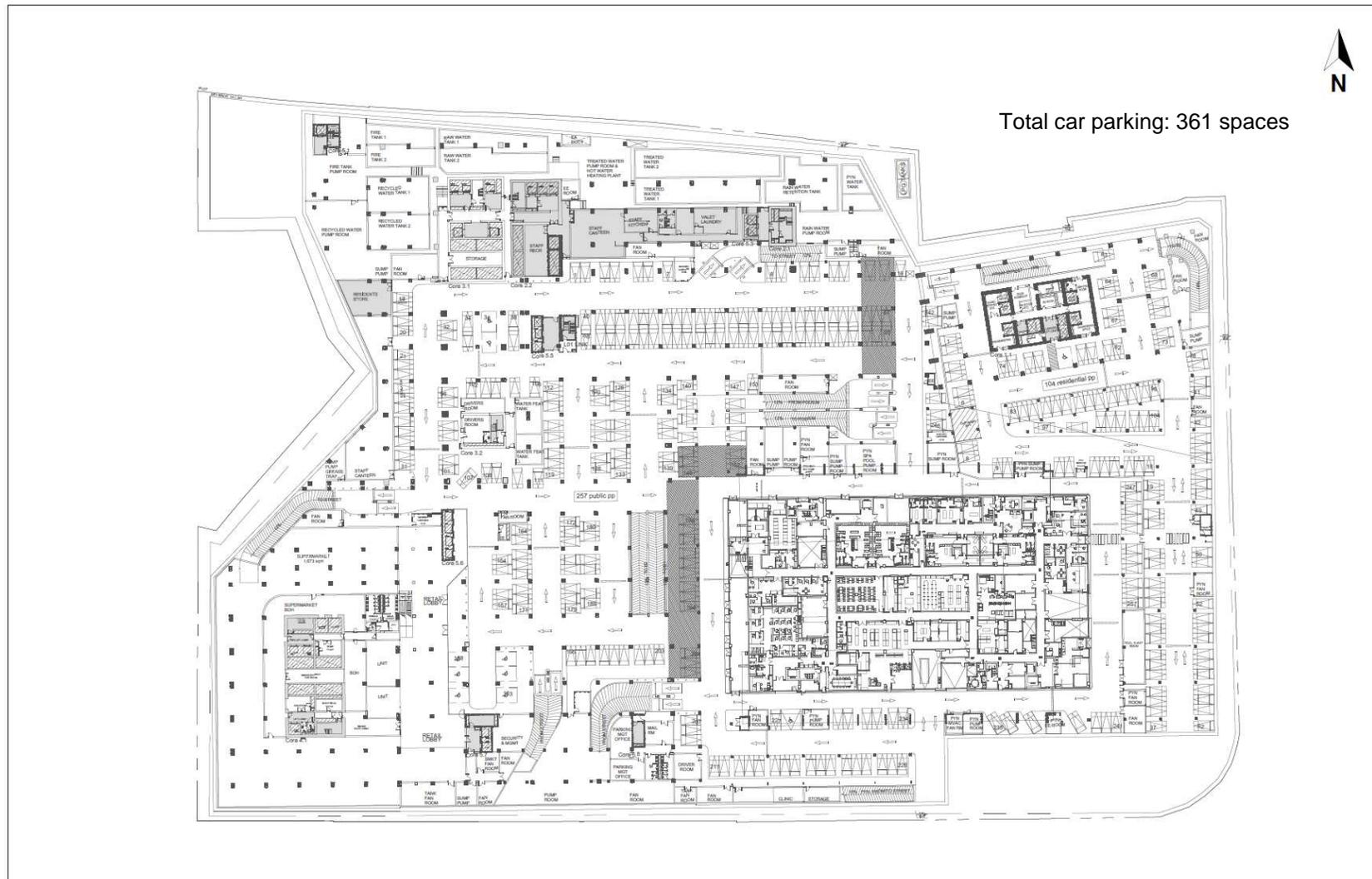


Figure 3.7: Parking and Loading Provision on Basement 1

3.0 DEVELOPMENT PROPOSALS

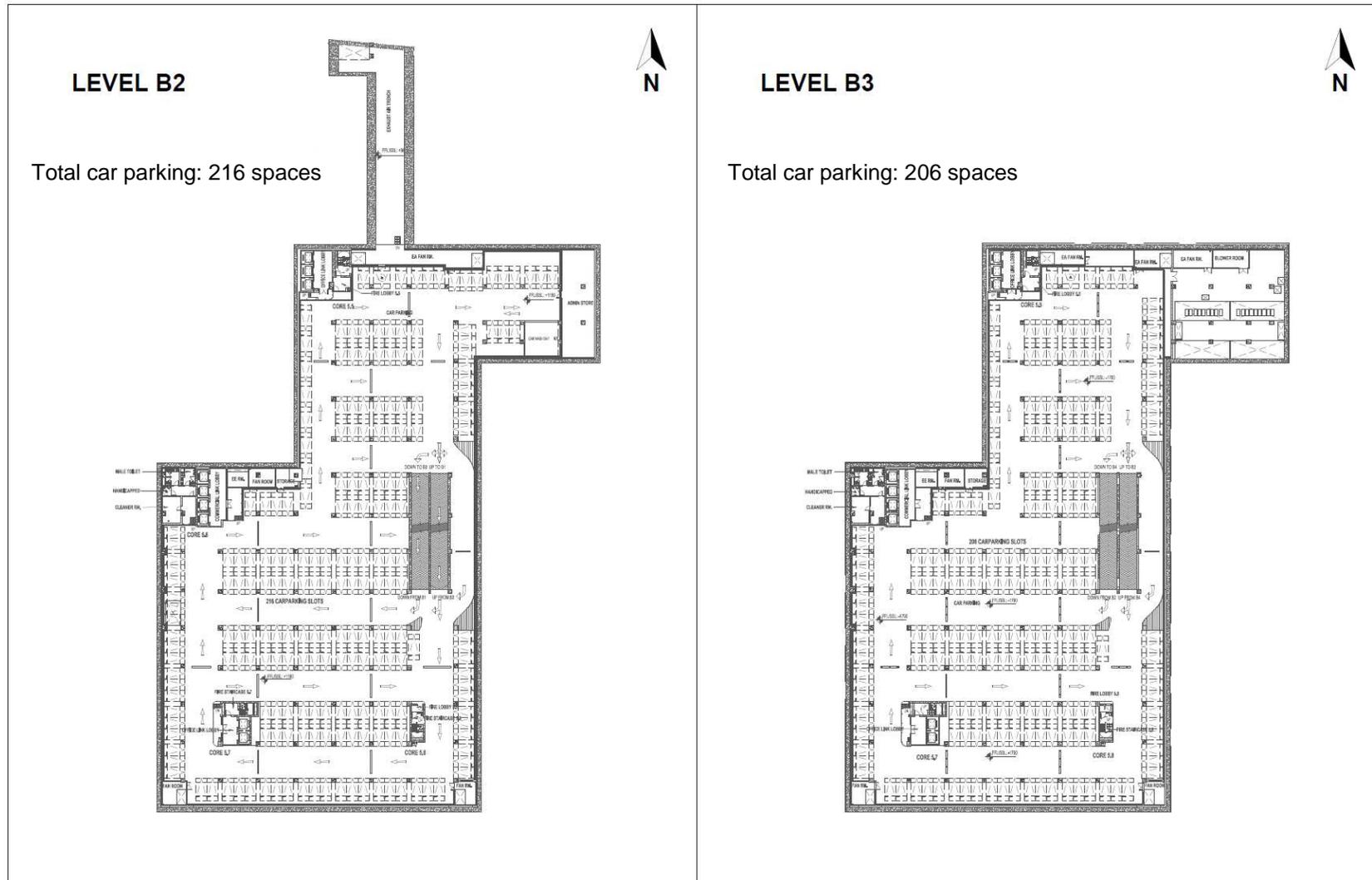


Figure 3.8: Parking Provision on Basement 2 and Basement 3

3.0 DEVELOPMENT PROPOSALS

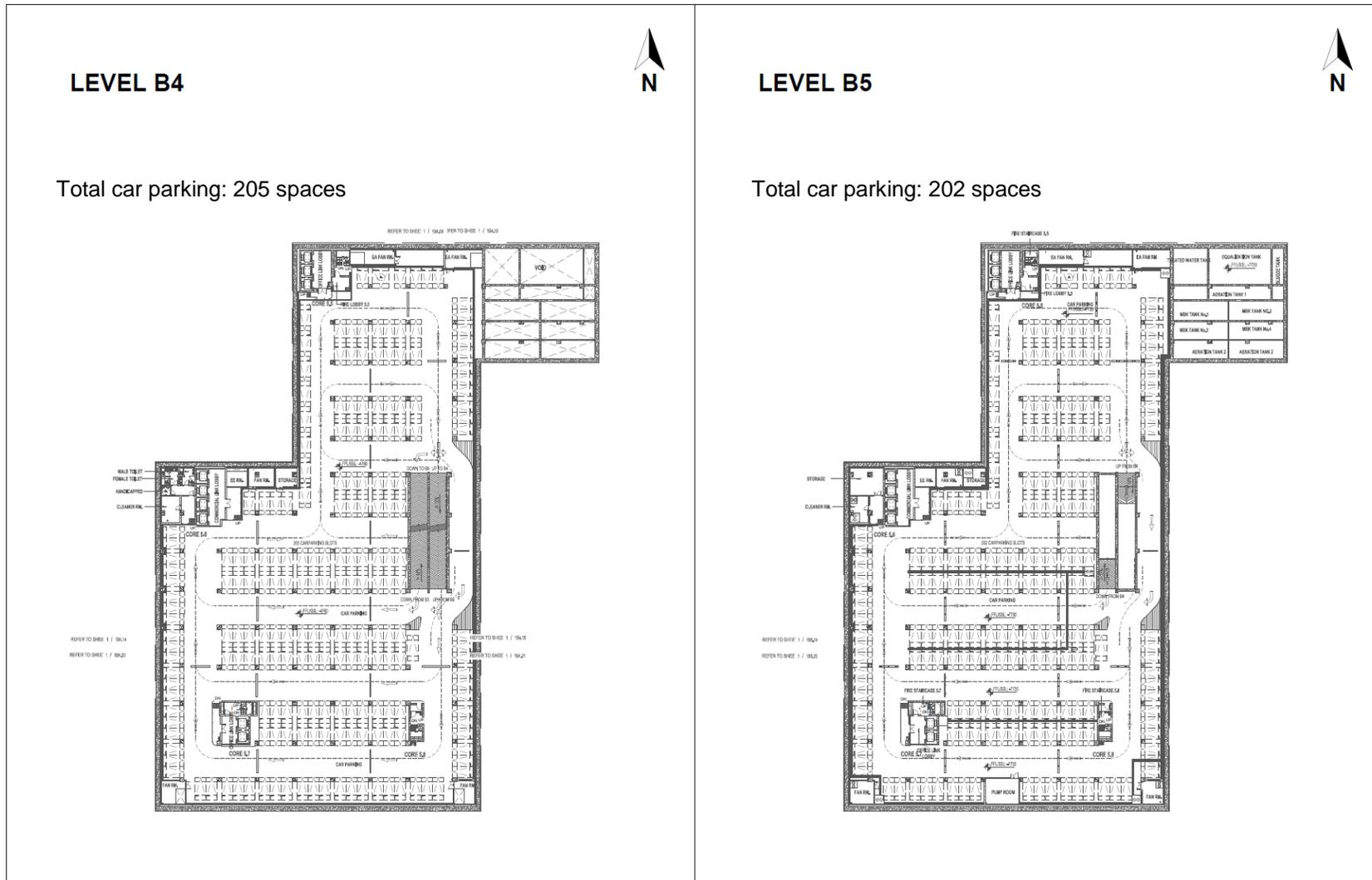


Figure 3.9: Parking Provision on Basement 4 and Basement 5

4.0 TRAFFIC AND PARKING GENERATION

4.1 BACKGROUND TRAFFIC IN YANGON

The population of Yangon is estimated to be 7.36 million¹ (2014 latest available data) with estimated annual growth of 3% per annum². The expected Yangon population in 2016 is 7.81 million and the population for Myanmar is 53.9³ million. However, Myanmar and particularly Yangon will undergo tremendous development in the coming years, and Landmark Yangon Project will be one of the first major commercial developments and is likely to instigate further investment in developing Yangon commercial center.

It is important to note that, before 2010, most vehicle imports were banned. The restrictions were lifted since 2010 which had resulted in worsened traffic conditions in Yangon.

The number of registered motor vehicles in Yangon as of June 2016 is shown in **Table 4.1**.

Table 4.1: Vehicles in Yangon and Myanmar (June 2016)⁴

Region	Private car	Passenger car	Truck (light Duty)	Truck (Heavy Duty)	Other	Two wheelers	Three wheelers	Traw lergi	Machinery	Total
Yangon	329,793	15,524	123,700	17,257	29,902	249,329	4,111	3,044	577	773,237
Myanmar	476,679	28,970	203,538	55,953	53,791	4,781,286	75,214	43,383	1,442	5,720,256

From the information in **Table 4.1**, it is estimated the car ownership in Yangon is 44 cars per 1,000 people.

The figure of 44 cars per 1,000 people in Yangon will increase in the future but it is still less than most comparable cities in Asia, see below.

- Singapore = 112 cars per 1,000 people
- Jakarta = 203 cars per 1,000 people
- Bangkok = 330 cars per 1,000 people
- Mumbai = 29 cars per 1,000 people

Currently motorcycles are prohibited in the Yangon city center and bus travel counts for over 80% of daily trips⁵.

¹ The 2014 Myanmar Population and Housing Census, Census Report Volume 3-L: Department of Population, Ministry of Immigration and Population, May 2015

² Population estimates of Yangon in 2010/2011 vary between 4 and 6 million people. Source of estimate is: Yangon Circular Railway Development Project' (GraSSP Policy Research Paper E-12-001, March 2012)

³ <http://data.worldbank.org/indicator/SP.POP.TOTL?locations=MM> (the World Bank, 2016)

⁴ <http://www.myanmarrtad.com/?q=en/article/68> (Road Transport Administration Department, 2016)

⁵ Bus trips estimated to be 84% of total daily trips in Yangon. Source: 'Feasibility analysis for the introduction of a bus rapid transit system in Yangon, Myanmar, Journal of the Eastern Asia Society for Transportation Studies, Vol.9,pp.914–929' (Kato, Hironori, Akihiro Inagi, Nozomi Saito, and Phyo Thet Thet Htun, 2011)

4.0 TRAFFIC AND PARKING GENERATION

4.2 DEVELOPMENT TRAFFIC GENERATION

When calculating the traffic and parking demand for a new development it is best practice to utilize a database of traffic surveys undertaken at similar developments. With the absence of any developments with the same quantum of land use in Yangon plus the rapidly changing travel characteristics and car ownership levels, this assessment utilizes the database for traffic surveys in Thailand with some adjustments made to reflect the differences in Yangon. Based on our experience with other planning Authorities in Asia this would be an acceptable method to calculate the traffic and parking demand. The assumptions and information used in the analysis has already been agreed with YCDC Roads & Bridges, and summarized below:

- Gross Floor Area applied to the traffic and parking estimates are as shown in **Table 3.1**;
- Trip rate is hourly vehicle rate per 100 sq.m. (for Office and Retail) or hourly rate per unit (for Hotel and Residential);
- Trip Rate is calculated from counted traffic in and out of example sites and divided by occupied units for hotel and residential or divided by GFA (sq.m.) and then multiplied by 100 for office and retail to obtain the number of vehicles;
- For ballroom, trip rate used based on a site reference in Bangkok with similar size and event functions during special events;
- Example sites from Bangkok are best available data with the absence of similar existing sites and data in Yangon;
- It is reasonable to assume the overall 30% reduction of retail car trip rates from Bangkok's trip rates due to the lower car ownership in Yangon (even in the future). This method has been explained and accepted by YCDC;
- The study also reduces the trip rates of Office and Hotel (with Special Events) by 30%. The no. of vehicles per capita of Myanmar and Thailand in 2012 presented the car ownerships in Myanmar is only one fifth (or about 23%) of Thailand's, as their no. of vehicles per capita were 47⁶ and 206⁷, respectively. The development traffic generated in Bangkok may probably be much higher than the ones actually happened in Yangon. However instead of 70-80% reduction in trip rates (according to vehicles per capita) only 30% reduction was applied to be conservative for providing mitigation plan and transport facilities in the worst case scenario.

⁶ Rural Road 2013 Towards Sustainable Road Development, Current Situation in Myanmar, Government of the Republic of the Union of Myanmar Ministry of Construction, Public Works, Bangkok, 4 Dec, 2013

⁷ Motor vehicles (per 1,000 people), <http://web.archive.org/web/20140209114811/http://data.worldbank.org/indicator/IS.VEH.NVEH.P3>
The World Bank , Accessed on Oct 2015

4.0 TRAFFIC AND PARKING GENERATION

To obtain the estimated number of vehicles in and out of the development, the hourly vehicle trip rate is applied to The Landmark Project floor area (divided by 100) or number of units depending on land use.

To estimate the parking demand then the hourly rate per 100 sq.m. for number of parked vehicles at the start of the example survey is obtained and multiplied by The Landmark Project GFA. Then the hourly entry is added and hourly exit subtracted to obtain parking accumulation / demand estimate for each hour of the day (where data exists). The surveys as a minimum cover the time period between 06:00 and 21:00.

For a mixed use development where residential or office is the majority use then the peak traffic and parking demand is on a weekday. Therefore this assessment reviews the worst case, weekday traffic and parking demand. While the retail uses may peak at the weekend, this will be less than the combined peak for all uses during the weekday.

4.3 PEAK PERIOD SUMMARY

Table 4.3 (Weekday) and **Table 4.4** (Weekend) show the hourly traffic and parked vehicles expected at The Landmark Project without a special function in the Ballroom. **Table 4.5** presents the parking demand with special event on weekday at day and night times (worst case scenario). **Figure 4.1** and **Figure 4.2** show the graphical profiles of parking demand for each land use within the project for weekday and weekend respectively. **Figure 4.3** presents profile of parking demand on weekday during special event.

4.0 TRAFFIC AND PARKING GENERATION

Table 4.3: Traffic and Parking Demand without Special Event (Weekday)

Time	T3 Office				T4 Office				Retail				T2 Hotel				PYN Luxury Hotel				T2 Serviced Apartment				T1 Residential				Summary			
	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park*	In	Out	In+Out	Park
Initial				36				32				41				10				11				175				121				390
06:00-06:59	31	4	35	63	27	4	31	56	11	7	18	45	5	3	8	12	6	3	8	14	29	63	92	141	9	20	29	121	117	103	220	451
07:00-07:59	74	5	78	131	64	5	69	115	13	11	25	47	8	5	13	15	8	6	14	17	45	76	121	110	14	24	38	121	226	132	358	556
08:00-08:59	119	10	129	240	105	8	113	212	23	14	37	56	10	6	16	18	11	7	18	20	27	74	101	63	8	23	31	121	302	143	445	731
09:00-09:59	88	28	116	300	77	25	102	264	46	25	71	78	10	7	17	21	11	8	18	23	40	36	76	67	13	11	24	121	284	139	423	874
10:00-10:59	45	34	79	310	39	30	69	274	98	43	141	132	6	6	11	21	6	6	13	23	24	30	54	61	8	9	17	121	226	159	385	942
11:00-11:59	44	34	78	321	39	29	68	283	129	75	204	186	6	4	11	23	7	5	12	25	31	31	62	61	10	10	20	121	266	188	454	1,020
12:00-12:59	46	46	91	321	40	40	80	283	132	98	230	220	5	4	8	25	6	4	10	26	28	36	64	53	9	11	20	121	265	238	503	1,048
13:00-13:59	46	50	95	317	41	44	85	279	127	111	239	236	6	6	12	25	7	6	13	27	45	39	84	59	14	12	26	121	286	268	554	1,064
14:00-14:59	50	42	92	325	44	36	81	287	132	127	258	241	8	8	15	25	8	8	17	27	50	39	89	70	16	12	28	121	308	272	580	1,096
15:00-15:59	48	50	97	323	42	44	86	285	130	130	260	240	5	5	10	25	6	6	11	27	61	35	96	96	19	11	30	121	310	281	590	1,117
16:00-16:59	32	68	99	287	27	60	87	253	127	136	263	232	4	7	11	22	4	8	12	24	49	44	93	101	16	14	30	121	259	336	595	1,038
17:00-17:59	22	80	102	229	20	70	90	202	142	133	275	241	9	9	18	22	10	10	20	24	61	35	96	127	19	11	30	121	283	348	631	966
18:00-18:59	15	67	82	177	13	59	71	156	155	139	295	257	12	10	22	24	13	11	24	26	65	43	108	149	21	13	34	121	294	342	636	910
19:00-19:59	6	47	53	136	6	41	47	120	125	146	271	235	8	9	18	23	9	10	19	26	60	35	95	174	19	11	30	121	233	299	532	836
20:00-20:59	6	43	48	99	5	38	43	87	77	148	225	164	6	8	14	22	7	8	15	24	31	7	38	198	10	2	12	121	142	254	396	715
Sum	669	606	1,275	3,615	588	533	1,121	3,187	1,467	1,344	2,811	2,650	107	95	202	335	118	105	223	364	646	623	1,269	1,705	205	194	399	1,936	3,800	3,500	7,300	13,755
Max	119	80	129	325	105	70	113	287	155	148	295	257	12	10	22	25	13	11	24	27	65	76	121	198	21	24	38	121	310	348	636	1,117

Table 4.4: Traffic and Parking Demand without Special Event (Weekend)

Time	T3 Office				T4 Office				Retail				T2 Hotel				PYN Luxury Hotel				T2 Serviced Apartment				T1 Residential				Summary			
	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park*	In	Out	In+Out	Park
Initial				18				16				48				10				11				175				121				381
06:00-06:59	2	5	7	15	2	4	6	14	7	4	11	50	5	3	8	12	6	3	8	14	29	63	92	141	9	20	29	121	60	102	162	349
07:00-07:59	13	5	18	23	11	4	15	21	13	9	22	55	8	5	13	15	8	6	14	17	45	76	121	110	14	24	38	121	112	129	241	343
08:00-08:59	19	11	29	31	16	9	25	28	31	16	47	69	10	6	16	18	11	7	18	20	27	74	101	63	8	23	31	121	121	146	267	333
09:00-09:59	23	13	36	41	20	12	32	36	60	28	88	102	10	7	17	21	11	8	18	23	40	36	76	67	13	11	24	121	177	115	292	393
10:00-10:59	22	15	37	47	19	13	32	42	116	51	167	166	6	6	11	21	6	6	13	23	24	30	54	61	8	9	17	121	200	131	331	463
11:00-11:59	13	17	30	44	12	15	27	39	143	80	223	229	6	4	11	23	7	5	12	25	31	31	62	61	10	10	20	121	222	161	384	524
12:00-12:59	11	15	27	40	10	13	23	36	159	107	266	281	5	4	8	25	6	4	10	26	28	36	64	53	9	11	20	121	227	191	418	563
13:00-13:59	13	18	30	35	11	15	27	31	147	120	267	307	6	6	12	25	7	6	13	27	45	39	84	59	14	12	26	121	243	216	459	588
14:00-14:59	12	9	21	38	11	8	18	34	143	137	280	313	8	8	15	25	8	8	17	27	50	39	89	70	16	12	28	121	247	221	468	610
15:00-15:59	12	19	31	31	11	17	27	28	137	146	284	304	5	5	10	25	6	6	11	27	61	35	96	96	19	11	30	121	250	239	489	614
16:00-16:59	13	21	34	23	11	19	30	20	130	151	281	284	4	7	11	22	4	8	12	24	49	44	93	101	16	14	30	121	227	263	491	576
17:00-17:59	6	11	17	17	5	10	15	15	139	142	281	280	9	9	18	22	10	10	20	24	61	35	96	127	19	11	30	121	248	228	476	588
18:00-18:59	15	12	27	20	13	11	24	18	141	148	290	273	12	10	22	24	13	11	24	26	65	43	108	149	21	13	34	121	281	247	528	614
19:00-19:59	17	10	27	27	15	8	23	24	113	145	258	241	8	9	18	23	9	10	19	26	60	35	95	174	19	11	30	121	241	228	469	618
20:00-20:59	18	11	28	34	15	9	25	31	70	151	221	160	6	8	14	22	7	8	15	24	31	7	38	198	10	2	12	121	157	195	352	572
Sum	207	191	398	484	182	167	349	434	1,548	1,436	2,984	3,161	107	95	202	335	118	105	223	364	646	623	1,269	1,705	205	194	399	1,936	3,014	2,811	5,825	8,130
Max	23	21	37	47	20	19	32	42	159	151	290	313	12	10	22	25	13	11	24	27	65	76	121	198	21	24	38	121	281	263	528	618

4.0 TRAFFIC AND PARKING GENERATION

Table 4.5: Traffic and Parking Demand with Special Event at Day and Night (Weekday)

Time	T3 Office				T4 Office				Retail				T2 Hotel				PYN Luxury Hotel				T2 Serviced Apartment				T1 Residential				Summary			
	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park	In	Out	In+Out	Park*	In	Out	In+Out	Park
<i>Initial</i>				36				32				41				10				11				175				121				390
06:00-06:59	31	4	35	63	27	4	31	56	11	7	18	45	5	3	8	12	6	3	8	14	29	63	92	141	9	20	29	121	117	103	220	451
07:00-07:59	74	5	78	131	64	5	69	115	13	11	25	47	8	5	13	15	8	6	14	17	45	76	121	110	14	24	38	121	226	132	358	556
08:00-08:59	119	10	129	240	105	8	113	212	23	14	37	56	10	6	16	18	11	7	18	20	27	74	101	63	8	23	31	121	302	143	445	731
09:00-09:59	88	28	116	300	77	25	102	264	46	25	71	78	18	15	32	21	11	8	18	23	40	36	76	67	13	11	24	121	292	146	438	874
10:00-10:59	45	34	79	310	39	30	69	274	98	43	141	132	122	13	135	130	6	6	13	23	24	30	54	61	8	9	17	121	342	166	509	1,051
11:00-11:59	44	34	78	321	39	29	68	283	129	75	204	186	72	43	115	159	7	5	12	25	31	31	62	61	10	10	20	121	332	227	558	1,156
12:00-12:59	46	46	91	321	40	40	80	283	132	98	230	220	36	100	136	94	6	4	10	26	28	36	64	53	9	11	20	121	295	335	630	1,118
13:00-13:59	46	50	95	317	41	44	85	279	127	111	239	236	14	60	74	49	7	6	13	27	45	39	84	59	14	12	26	121	294	322	616	1,087
14:00-14:59	50	42	92	325	44	36	81	287	132	127	258	241	8	27	35	29	8	8	17	27	50	39	89	70	16	12	28	121	308	292	600	1,100
15:00-15:59	48	50	97	323	42	44	86	285	130	130	260	240	5	5	10	29	6	6	11	27	61	35	96	96	19	11	30	121	310	281	590	1,121
16:00-16:59	32	68	99	287	27	60	87	253	127	136	263	232	4	7	11	26	4	8	12	24	49	44	93	101	16	14	30	121	259	336	595	1,042
17:00-17:59	22	80	102	229	20	70	90	202	142	133	275	241	24	24	49	26	10	10	20	24	61	35	96	127	19	11	30	121	298	363	661	969
18:00-18:59	15	67	82	177	13	59	71	156	155	139	295	257	239	25	264	240	13	11	24	26	65	43	108	149	21	13	34	121	521	357	878	1,126
19:00-19:59	6	47	53	136	6	41	47	120	125	146	271	235	137	85	222	292	9	10	19	26	60	35	95	174	19	11	30	121	362	375	737	1,105
20:00-20:59	6	43	48	99	5	38	43	87	77	148	225	164	67	197	264	162	7	8	15	24	31	7	38	198	10	2	12	121	202	444	646	856
Sum	669	606	1,275	3,615	588	533	1,121	3,187	1,467	1,344	2,811	2,650	768	616	1,383	1,313	118	105	223	364	646	623	1,269	1,705	205	194	399	1,936	4,461	4,020	8,481	14,733
Max	119	80	129	325	105	70	113	287	155	148	295	257	239	197	264	292	13	11	24	27	65	76	121	198	21	24	38	121	521	444	878	1,156

4.0 TRAFFIC AND PARKING GENERATION

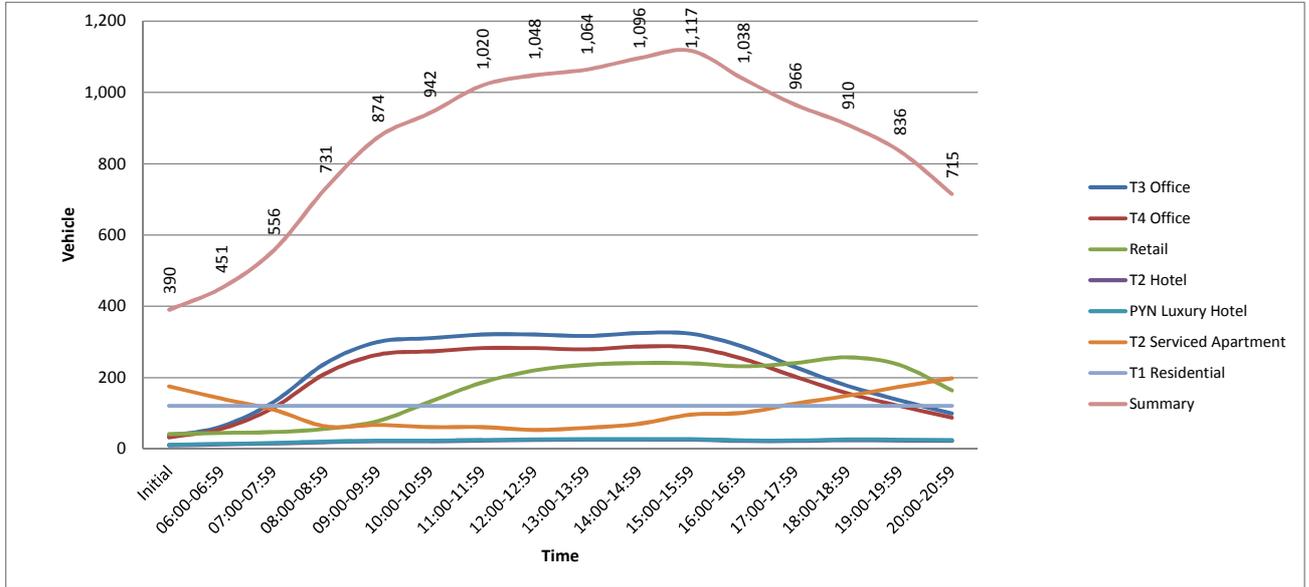


Figure 4.1: Traffic and Parking Demand (Weekday)

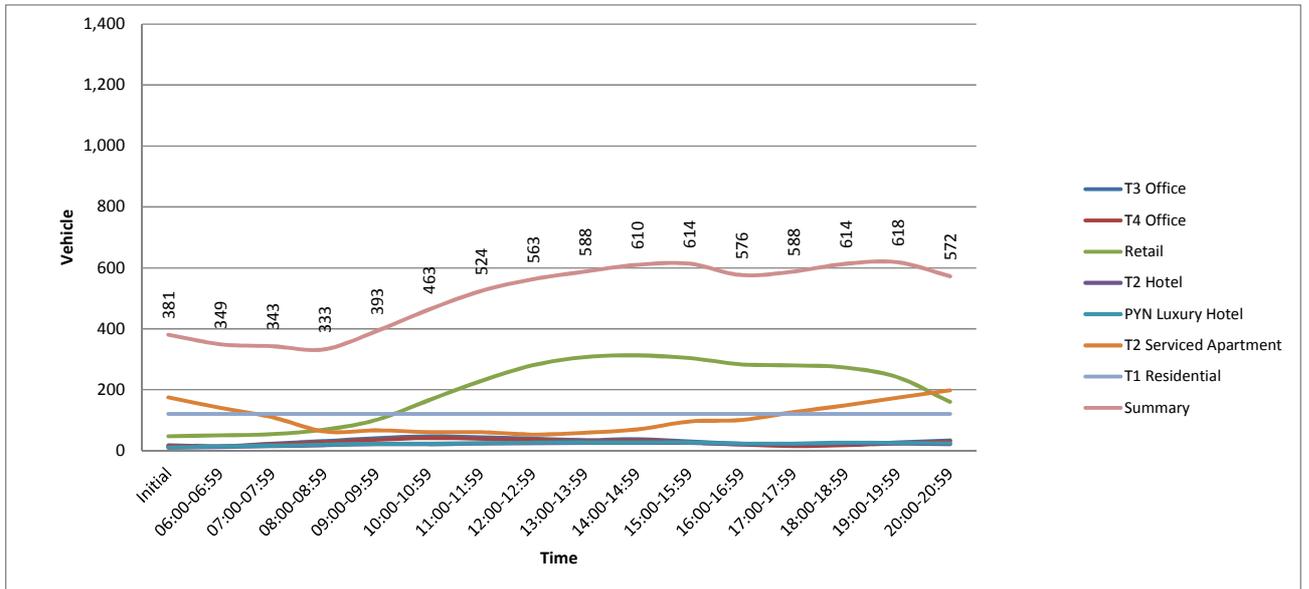


Figure 4.2: Traffic and Parking Demand (Weekend)

4.0 TRAFFIC AND PARKING GENERATION

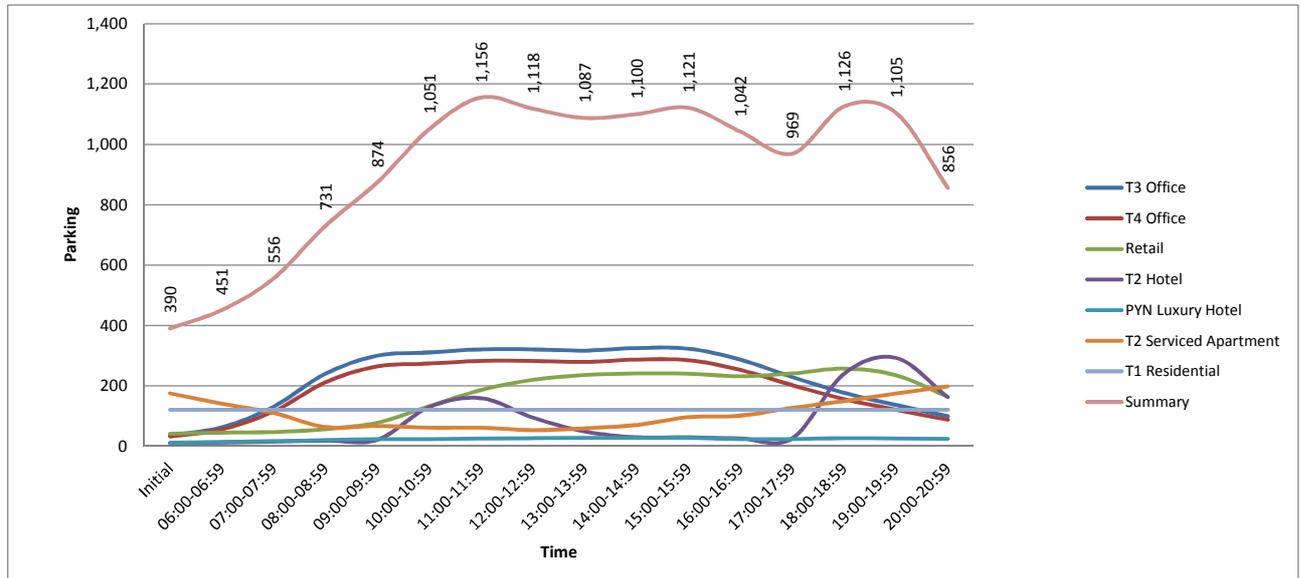


Figure 4.3: Traffic and Parking Demand (Weekend) with Special Event

In summary the peaks are:

- Completed development weekday peak number of cars parked = 1,117 at 15:00 - 16:00. At the weekend this is estimated to be 618 parked vehicles between 19:00 - 20:00. And 1,156 is the maximum parking demand during day and night special events on weekdays;
- The peak hour of two way traffic to and from the development is estimated to be 16:00 - 18:00 as traffic from the office leaves, residents arrive home, events at the hotel start or finish and retail customers are coming and going;
- The two-way peak hour traffic (weekday) is estimated as 636 vehicles and 878 vehicles on weekday with both day and night events;
- The parking is majority shared parking with some zoning for residents and hotel use;
- During the weekend, additional retail traffic is expected but there would be little or no parking demand from the offices so therefore the retail visitors can utilize the spaces vacated by office traffic;
- As the parking demand for no-event scenario on weekday is significantly higher than weekend (presented in **Tables 4.3** and **4.4** respectively), hence when considering parking demand with special events (e.g. wedding, ballroom, etc.) at Tower 2 Hotel, highlighted in yellow in **Table 4.6**, demand on weekday is considered;
- In summary, the peak parking demand for the development (shown in Table 4.6) is occurred during special events (day and night) in weekday at 1,156 spaces (11:00-12:00) and the peak traffic at 878 vehicles (521 in and 357 out) at 18:00 – 19:00. The parking spaces provided is 1,226 so it is more than the estimated demand.

4.0 TRAFFIC AND PARKING GENERATION

4.4 FUTURE TRANSPORTATION PROJECT

Based on existing data and available information, the total number of trips using the various transport modes is estimated at 6 million trips per day. More than 80% of modal share is by bus and the remaining 20% are by railway, passenger car, taxi etc. total number of trips in Yangon in 2040 is projected to be 11.7m trips with the current trip rate. Thus it is expected that the motorization will spread widely following the economic development and it will change the composition of traffic demands and modal share largely in the future. Development of private vehicle oriented transport system will cause various urban issues both socioeconomically and environmentally as shown by experiences of the major cities in neighboring countries. It is therefore critical to further improve and modernize the existing public transport network system, targeting a future modal share of 30% for railway, 40% for bus and the remaining 30% for private vehicles (page 76, 5.1.1, JICA SUDP 2013)

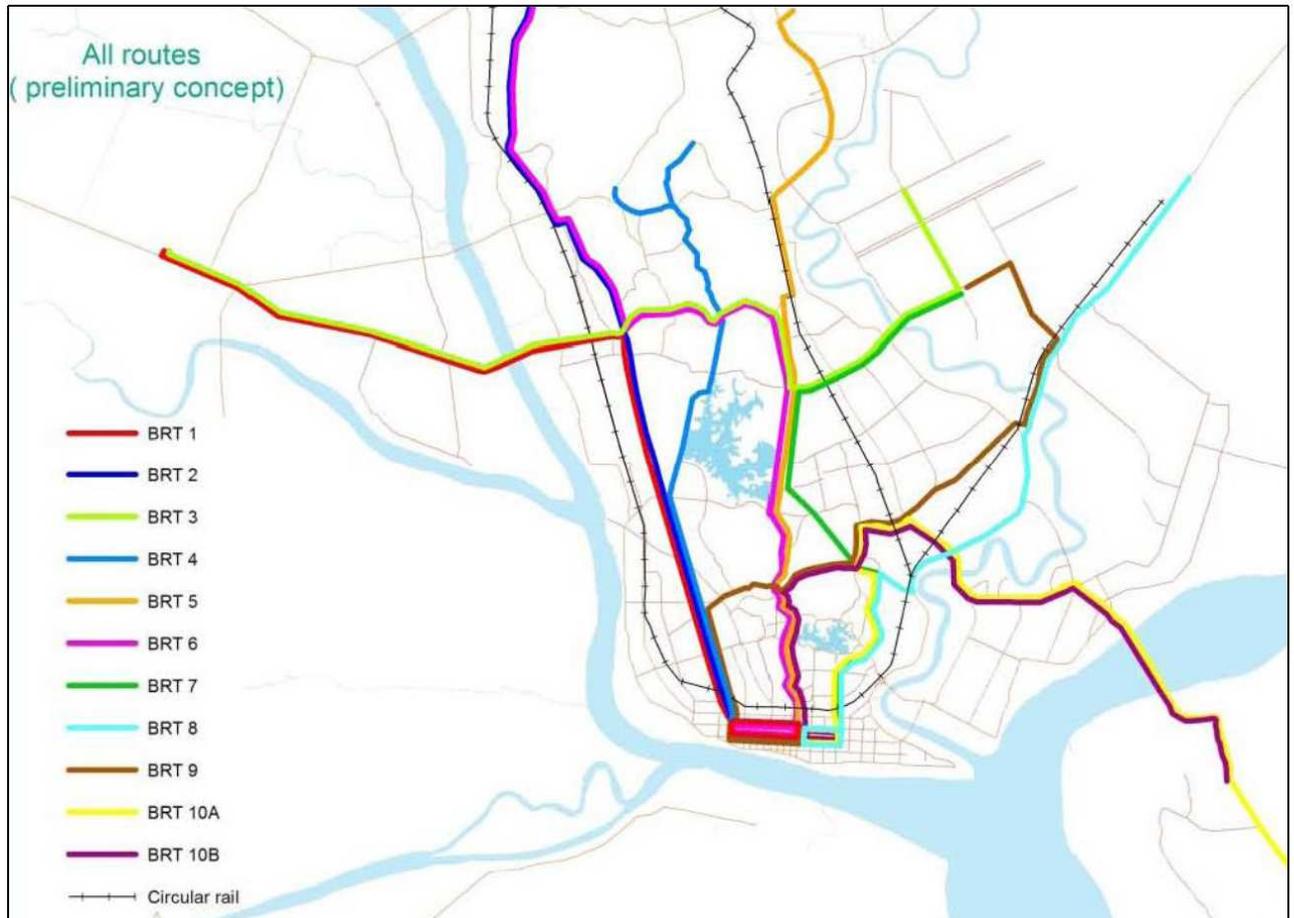
Proposed BRT

Further to the extensive bus system in Yangon, YCDC has planned to operate bus rapid system (BRT) to connect the outskirts of Yangon to the city center. Currently, the proposed BRT has 11 routes⁸ (as shown in **Figure 4.4**) with the first two routes already operated along Pyay and Kabar Aye Pagoda Road with 45 vehicles⁹. Having operated the proposed BRT network should reduce the number of vehicles (including site generated traffics) on the road by providing an alternative mode of public transport and improve the traffic congestion problem after all.

⁸ http://www.greengrowthdialogue.org/sites/greengrowthdialogue.org/files/publication_docs/Transportation_Policy_YCDC.pdf (May 2014)

⁹ <http://www.mmbiztoday.com/articles/brt-expand-routes-august> (Dec 2016)

4.0 TRAFFIC AND PARKING GENERATION



Source: YUTRA Project Team

Figure 4.4: Proposed BRT Routes

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

5.1 INTRODUCTION

SIDRA Intersection Version 6.1 was used to analyze the capacity and traffic condition of the existing junctions. The key measurement of signalized intersection is Level of Service (LOS), LOS is the letter designation that describes a range of operating conditions. In the SIDRA Intersection software, LOS is determined from delay which is based on the HCM 2000 (Highway Capacity Manual). The LOS is ranged from A to F (A is the best, F is the worst). HCM 2000 is determined LOS indicator by control delay of traffic at intersection as shown in **Table 5.1**.

Table 5.1: Level of Service definitions

Level of Service	Control Delay per vehicle in second (d)
A	$d < 10$
B	$10 < d < 20$
C	$20 < d < 35$
D	$35 < d < 55$
E	$55 < d < 80$
F	$80 < d$

Source: *Highway Capacity Manual 2010*

Other key measurement of SIDRA Intersection is degree of saturation (DOS) which describe by following below;

- DOS less than or equal to 0.9 is under capacity, reflecting satisfactory operating conditions;
- DOS of between 0.9 and 1.00 is considered to be at capacity; and
- DOS of greater than 1.0 may be achievable, but it indicates that the junction is operating beyond its design capacity. DOS approaching about 1.2 would indicate overload of the junction, with likelihood of queuing and delays

5.2 EXISTING BASE YEAR ANALYSIS

From existing junction geometry and traffic volume from surveyed, **Figure 5.1** shows the existing base year traffic volume, The Sidra analysis results for assessment hours (10:00 - 11:00 and 18:00 - 19:00) in the existing base year are shown in **Table 5.2**. This is based on observed signal timings during the respective peak hours.

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

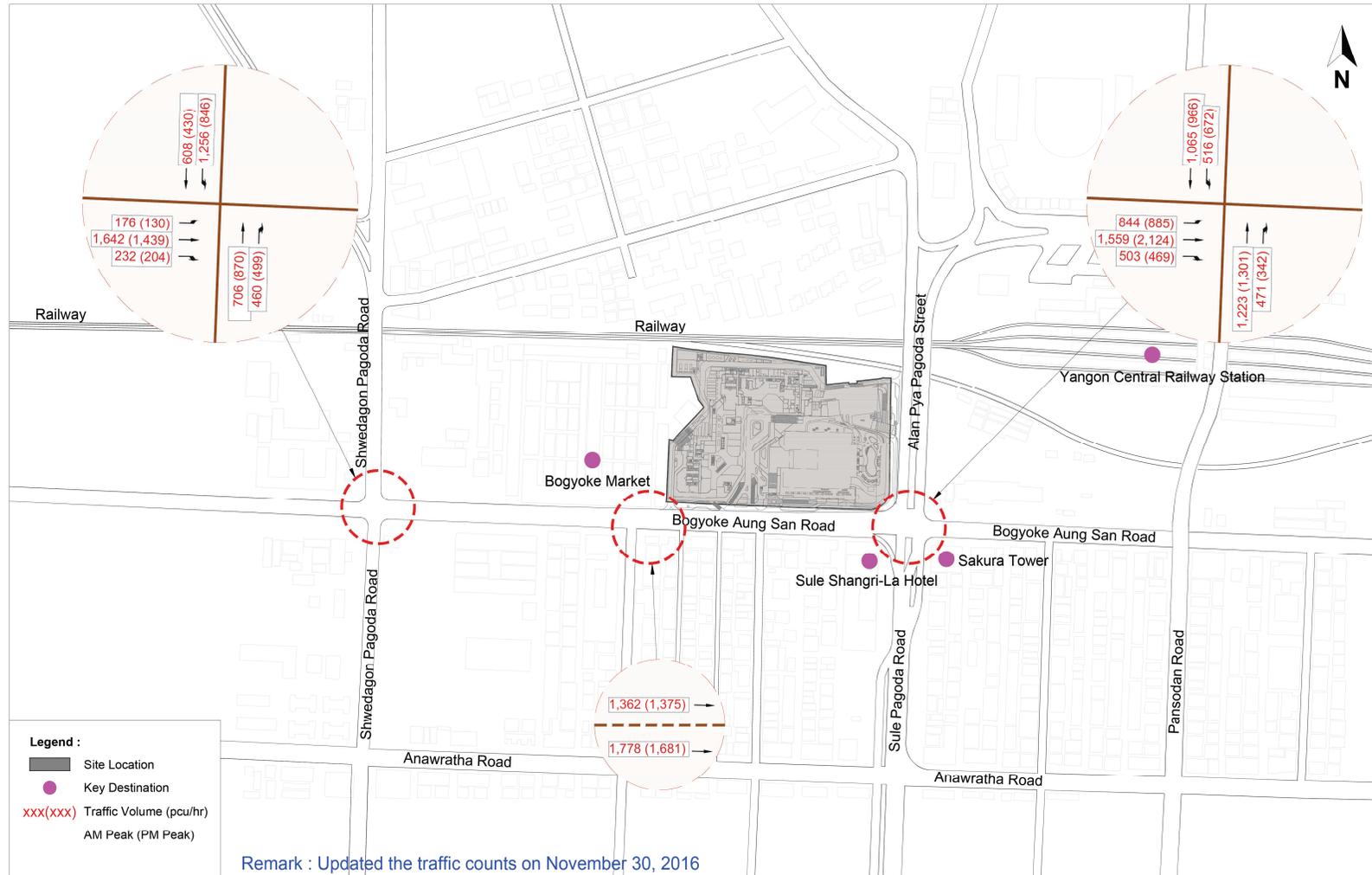


Figure 5.1: Existing Base Year Traffic Volume (surveyed on 30th Nov 2016)

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

Table 5.2: Existing Base Year Analysis Results at Junctions

Road	Movement	AM Peak 2016 (10:00 – 11:00)				PM Peak 2016 (18:00 – 19:00)			
		DOS (V/C)	Average Delay (s)	LOS	Queue (m)	DOS (V/C)	Average Delay (s)	LOS	Queue (m)
Boyoke Aung San&Alan Pya Junction									
Sule Pagoda Rd.	Straight	0.717	41.1	LOS D	149.9	0.623	39.7	LOS D	169.8
	Right Turn	0.480	14.7	LOS B	85.5	0.297	19.6	LOS B	70.8
Approach		0.717	33.7	LOS C	149.9	0.623	35.5	LOS D	169.8
Alan Pya Pagoda St.	Left Turn	0.790	40.6	LOS D	75.8	0.668	36.5	LOS D	93.5
	Straight	0.397	22.9	LOS C	95.1	0.272	13.6	LOS B	70.6
Approach		0.790	28.7	LOS C	95.1	0.668	23.0	LOS C	93.5
Boyoke Aung San Rd.	Left Turn	0.496	32.2	LOS C	119.9	0.815	57.2	LOS E	168.5
	Straight	0.581	25.5	LOS C	155.5	1.204	264.5	LOS F	802.7
	Right Turn	0.460	13.7	LOS B	108.6	0.484	10.7	LOS B	74.1
Approach		0.581	25.4	LOS C	155.5	1.204	177.5	LOS F	802.7
All Vehicles		0.790	28.5	LOS C	155.5	1.204	105.6	LOS F	802.7
Shwedagon Junction									
Shwedagon Pagoda Rd. (South)	Straight	0.754	40.4	LOS D	117.6	0.929	59.3	LOS E	185.3
	Right Turn	0.281	8.7	LOS A	12.7	0.305	8.7	LOS A	14.2
Approach		0.754	27.9	LOS C	117.6	0.929	40.8	LOS D	185.3
Shwedagon Pagoda Rd. (North)	Left Turn	1.166	220.1	LOS F	530.0	0.785	46.8	LOS D	141.7
	Straight	0.528	13.0	LOS B	122.2	0.374	11.4	LOS B	76.1
Approach		1.166	152.6	LOS F	530.0	0.785	34.9	LOS C	141.7
Boyoke Aung San Rd.	Left Turn	0.327	38.3	LOS D	47.4	0.241	37.5	LOS D	34.0
	Straight	0.968	69.8	LOS E	260.6	0.848	43.0	LOS D	173.4
	Right Turn	0.431	39.4	LOS D	64.7	0.379	38.8	LOS D	55.9
Approach		0.968	63.6	LOS E	260.6	0.848	42.1	LOS D	173.4
All Vehicles		1.166	88.1	LOS F	530.0	0.929	39.6	LOS D	185.3

Note : DOS : Degree of saturation
LOS : Level of service

Table 5.3: Existing Base Year Analysis Results on Bogyoke Aung San Road (Mid-Block)

Road	AM Peak 2016 (10:00 – 11:00)				PM Peak 2016 (18:00 – 19:00)			
	Left		Right		Left		Right	
	DOS (V/C)	LOS	DOS (V/C)	LOS	DOS (V/C)	LOS	DOS (V/C)	LOS
Boyoke Aung San Rd.	0.757	LOS C	0.988	LOS E	0.764	LOS C	0.934	LOS E

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

As shown in the tables above, the junctions in base scenario (existing year 2016) are generally operating under capacity in term of LOS and DOS, and there is reserve capacity for the traffic flows in the future. Some extended queuing may occur during peak flow periods but delay to vehicles is not excessive most of the time.

5.3 FUTURE BASE YEAR ANALYSIS

To estimate the growth factor of background traffic, the study considers not only the growths of number of registered cars in Yangon, but also the increase of traffic surveyed in 2013 and 2016 as shown in **Figure 5.2**. It can be seen that the actual growth rates of AM and PM peak traffic are about 6% and 4% respectively. This can be ensure that the employed growth factor in this study, about 10%, is higher than the traffic growth observed from the field.

In additional, there is still a gap of growth rate, about 4% - 6%, which can cover the traffic generated by other developments. The 10% growth factor is employed to annually forecast the future traffics up to year 2021. These inform that the proposed study is a very conservative case study.

Figure 5.3 presents the future base year traffic volume.

The Sidra analysis results for assessment hours (10:00 - 11:00 and 18:00 - 19:00) in the future base year 2021 without development as shown in **Table 5.4**.

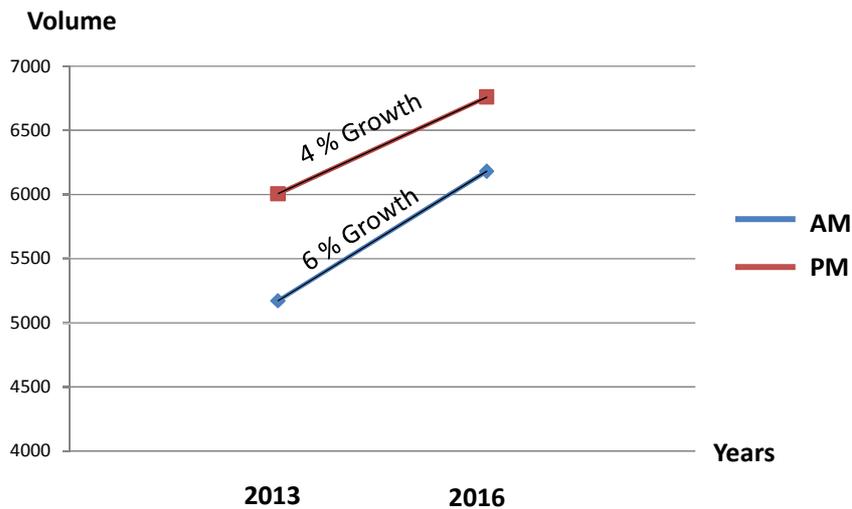


Figure 5.2: Actual Traffic Growth Rates

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

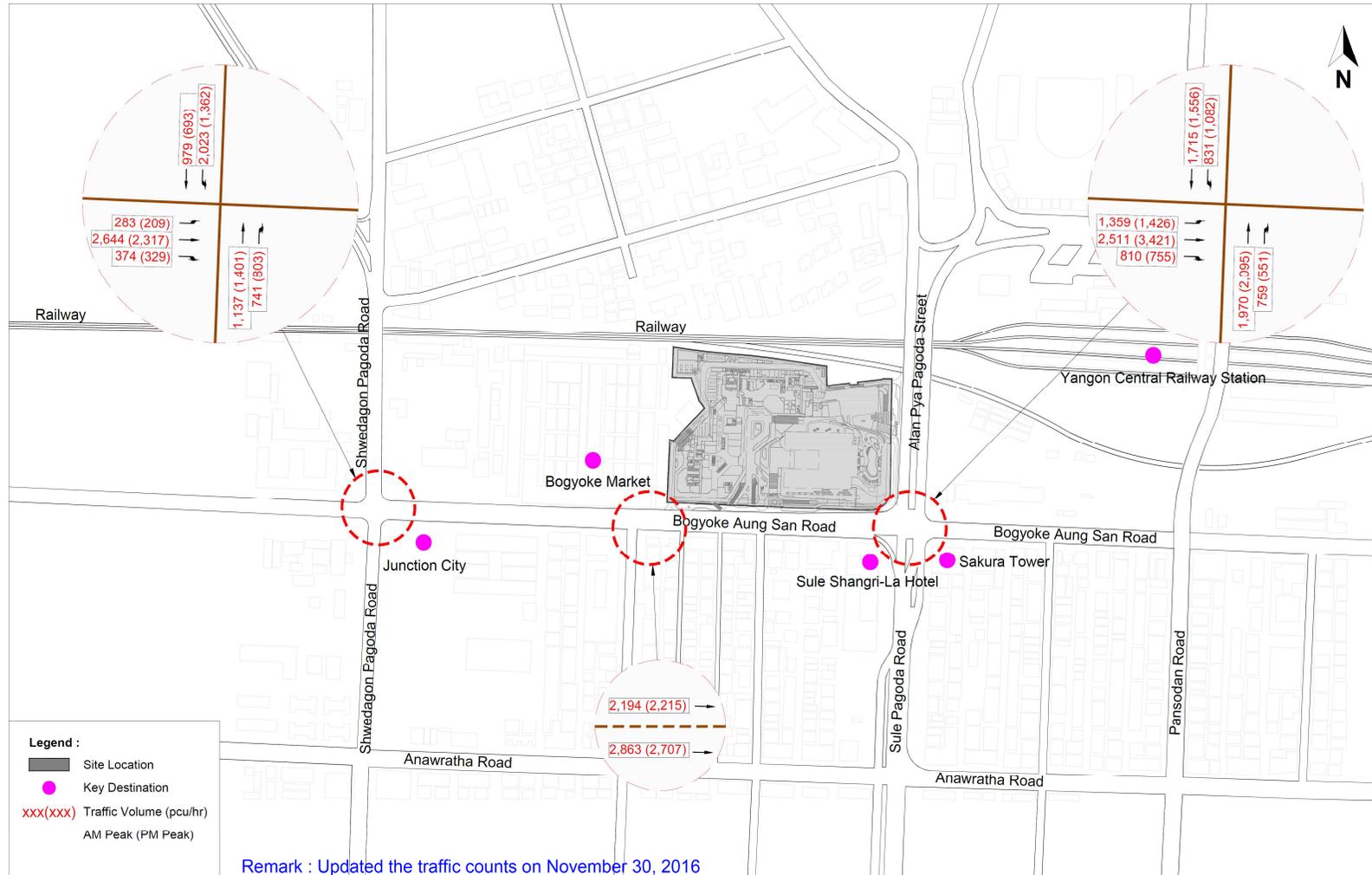


Figure 5.3: Future Base Year Traffic Volume

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

Table 5.4: Future Base Year Traffic Analysis Results at Junctions

Road	Movement	AM Peak 2016 (10:00 – 11:00)				PM Peak 2016 (18:00 – 19:00)			
		DOS (V/C)	Average Delay (s)	LOS	Queue (m)	DOS (V/C)	Average Delay (s)	LOS	Queue (m)
Boyoke Aung San&Alan Pya Junction									
Sule Pagoda Rd.	Straight	1.209	260.2	LOS F	685.1	1.086	163.9	LOS F	636.1
	Right Turn	0.863	42.9	LOS D	240.4	0.478	21.4	LOS C	131.6
Approach		1.209	199.8	LOS F	685.1	1.086	134.2	LOS F	636.1
Alan Pya Pagoda St.	Left Turn	1.394	409.9	LOS F	471.9	1.190	232.7	LOS F	454.8
	Straight	0.480	24.0	LOS C	120.5	0.329	14.2	LOS B	89.1
Approach		1.394	149.9	LOS F	471.9	1.190	103.8	LOS F	454.8
Boyoke Aung San Rd.	Left Turn	1.062	153.5	LOS F	510.7	1.479	528.1	LOS F	1,059.8
	Straight	1.039	115.5	LOS F	633.7	1.939	926.4	LOS F	2,343.2
	Right Turn	0.818	31.5	LOS C	221.1	0.938	75.1	LOS E	375.6
Approach		1.062	112.0	LOS F	633.7	1.939	710.3	LOS F	2,343.2
All Vehicles		1.394	145.8	LOS F	685.1	1.939	423.3	LOS F	2,343.2
Shwedagon Junction									
Shwedagon Pagoda Rd. (South)	Straight	1.215	254.4	LOS F	525.8	1.497	505.5	LOS F	943.6
	Right Turn	0.453	8.8	LOS A	25.7	0.491	8.9	LOS A	29.5
Approach		1.215	157.5	LOS F	525.8	1.497	324.6	LOS F	943.6
Shwedagon Pagoda Rd. (North)	Left Turn	1.878	857.6	LOS F	1,752.0	1.264	305.7	LOS F	693.6
	Straight	0.851	21.9	LOS C	296.0	0.602	13.9	LOS B	148.8
Approach		1.878	585.0	LOS F	1,752.0	1.264	207.3	LOS F	693.6
Boyoke Aung San Rd.	Left Turn	0.525	40.5	LOS D	81.7	0.388	39.0	LOS D	57.5
	Straight	1.559	560.0	LOS F	1,256.3	1.366	386.8	LOS F	907.9
	Right Turn	0.694	42.7	LOS D	115.2	0.611	41.5	LOS D	97.9
Approach		1.559	456.8	LOS F	1,256.3	1.366	321.6	LOS F	907.9
All Vehicles		1.878	435.2	LOS F	1,752.0	1.497	289.5	LOS F	943.6

Table 5.5: Future Base Year Traffic Analysis Results on Boyoke Aung San Road (Mid-Blok)

Road	AM Peak 2016 (10:00 – 11:00)				PM Peak 2016 (18:00 – 19:00)			
	Left		Right		Left		Right	
	DOS (V/C)	LOS	DOS (V/C)	LOS	DOS (V/C)	LOS	DOS (V/C)	LOS
Boyoke Aung San Rd.	1.219	LOS F	1.591	LOS F	1.231	LOS F	1.504	LOS F

As shown in the above table, the junction will begin to experience more significant delay and queuing.

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

5.4 FUTURE YEAR WITH DEVELOPMENT

Analysis of the Junctions has been undertaken for 2021 with The Landmark Project. The development traffic distribution is based on the existing percentage distribution at the junctions. This is shown in **Figure 5.4**. And traffic generated from the site in opening year (with special event) is shown in **Figure 5.5**.

Even though the traffic is shown to access from the south it is assumed that this traffic will also enter from north or west (only passing through the junction once on entering).

In the opening year, the total combined traffic from future base traffic with development traffic is shown in **Figure 5.6**.

Table 5.6 shows the 2021 with development SIDRA junctions capacity results and **Table 5.7** shows the volume capacity on mid-block of Bogyoke Aung San Road based on 10% annual traffic growth from 2016 to 2021 (5 years).

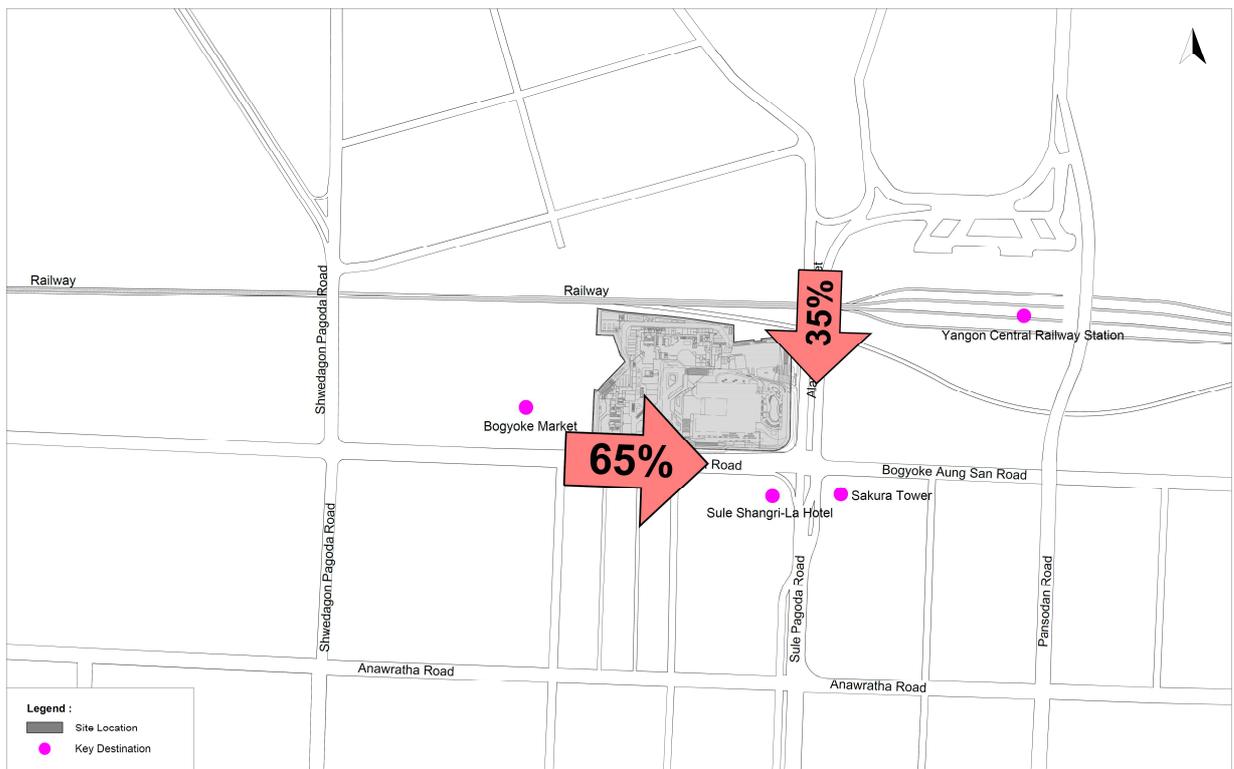


Figure 5.4: Distribution of Traffic at Bogyoke & Alan Pya Junction

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

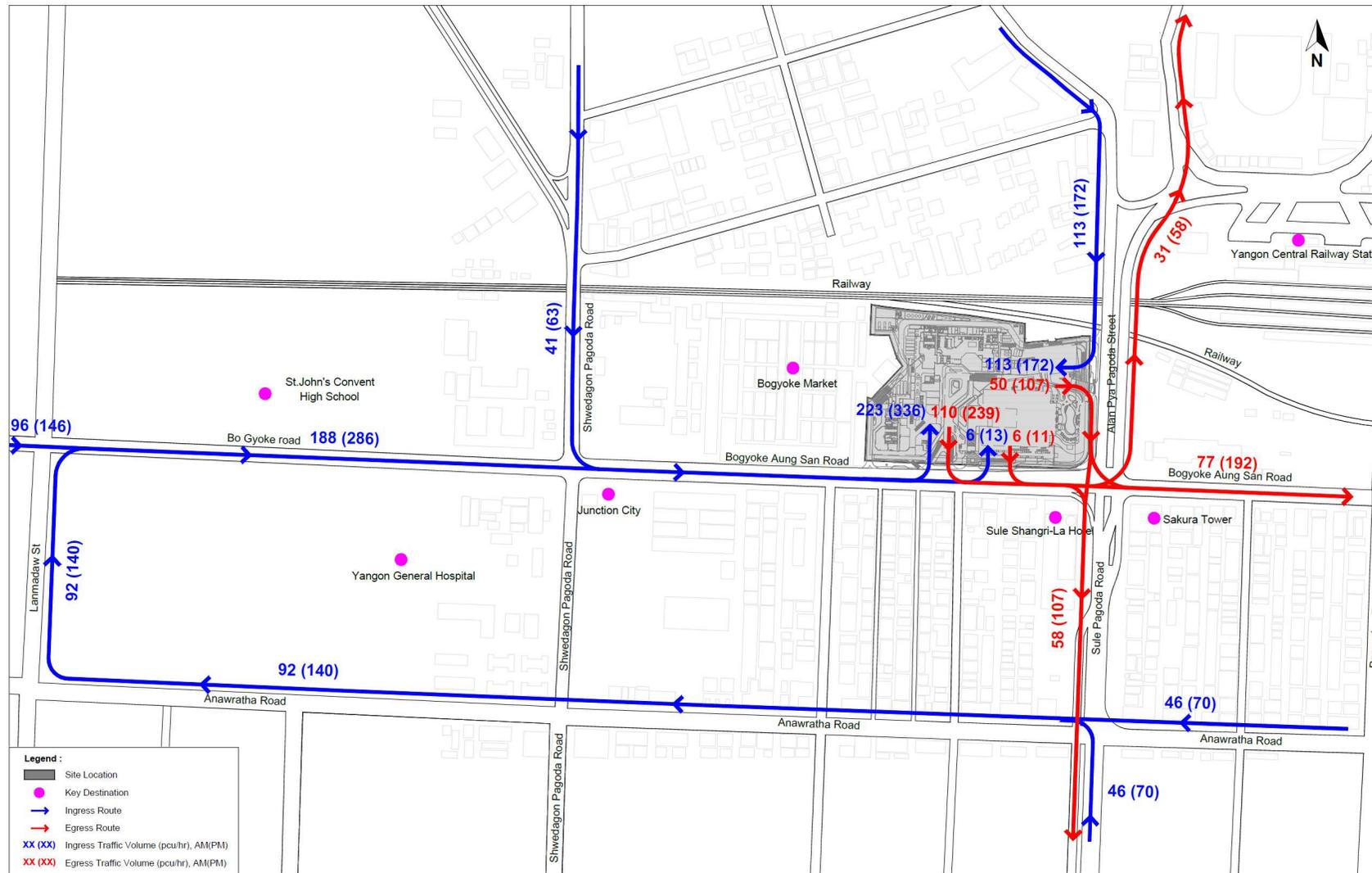


Figure 5.5: Development Traffic Volume

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

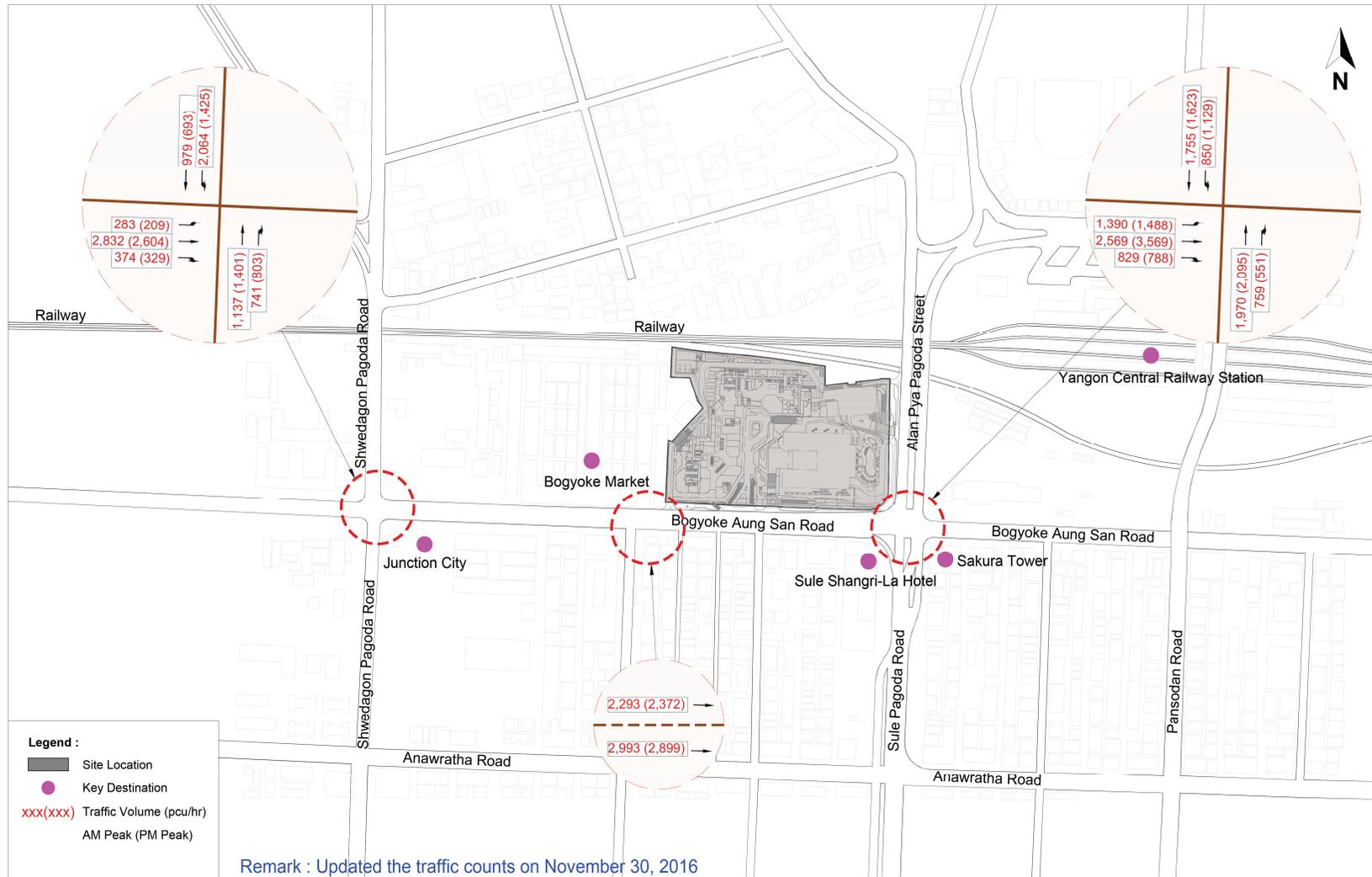


Figure 5.6: Combined Future Base with Development Traffic

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

Table 5.6: Future Base Year with Development Traffic Analysis Results at Junctions

Road	Movement	AM Peak 2016 (10:00 – 11:00)				PM Peak 2016 (18:00 – 19:00)			
		DOS (V/C)	Average Delay (s)	LOS	Queue (m)	DOS (V/C)	Average Delay (s)	LOS	Queue (m)
Boyoke Aung San&Alan Pya Junction									
Sule Pagoda Rd.	Straight	1.209	260.2	LOS F	685.1	1.086	163.9	LOS F	636.1
	Right Turn	0.863	42.9	LOS D	240.4	0.478	21.4	LOS C	131.6
Approach		1.209	199.8	LOS F	685.1	1.086	134.2	LOS F	636.1
Alan Pya Pagoda St.	Left Turn	1.425	438.4	LOS F	501.6	1.242	277.7	LOS F	526.3
	Straight	0.491	24.1	LOS C	124.1	0.343	14.3	LOS B	93.9
Approach		1.425	159.3	LOS F	501.6	1.242	122.4	LOS F	526.3
Boyoke Aung San Rd.	Left Turn	1.086	172.0	LOS F	554.8	15.430	586.1	LOS F	1,163.5
	Straight	1.063	133.3	LOS F	693.5	2.021	1,000.6	LOS F	2,516.2
	Right Turn	0.842	35.3	LOS D	250.8	0.996	111.8	LOS F	505.0
Approach		1.086	127.6	LOS F	693.5	2.021	775.2	LOS F	2,516.2
All Vehicles		1.425	155.2	LOS F	693.5	2.021	464.6	LOS F	2,516.2
Shwedagon Junction									
Shwedagon Pagoda Rd. (South)	Straight	1.215	254.4	LOS F	525.8	1.497	505.5	LOS F	943.6
	Right Turn	0.453	8.8	LOS A	25.7	0.491	8.9	LOS A	29.5
Approach		1.215	157.5	LOS F	525.8	1.497	324.6	LOS F	943.6
Shwedagon Pagoda Rd. (North)	Left Turn	1.916	892.0	LOS F	1,818.2	1.323	357.6	LOS F	792.8
	Straight	0.851	21.9	LOS C	296.0	0.602	13.9	LOS B	148.8
Approach		1.916	612.1	LOS F	1,818.2	1.323	245.1	LOS F	792.8
Boyoke Aung San Rd.	Left Turn	0.525	40.5	LOS D	81.7	0.388	39.0	LOS D	57.5
	Straight	1.669	660.0	LOS F	1,457.7	1.535	538.7	LOS F	1,213.5
	Right Turn	0.694	42.7	LOS D	115.2	0.611	41.5	LOS D	97.9
Approach		1.669	543.5	LOS F	1,457.7	1.535	453.4	LOS F	1,213.5
All Vehicles		1.916	482.1	LOS F	1,818.2	1.535	356.3	LOS F	1,213.5

Table 5.7: Future Base Year with Development Traffic Analysis Results on Bogyoke Aung San Road (Mid-Blok)

Road	AM Peak 2016 (10:00 – 11:00)				PM Peak 2016 (18:00 – 19:00)			
	Left		Right		Left		Right	
	DOS (V/C)	LOS	DOS (V/C)	LOS	DOS (V/C)	LOS	DOS (V/C)	LOS
Boyoke Aung San Rd.	1.274	LOS F	1.663	LOS F	1.318	LOS F	1.611	LOS F

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

The above assessments in three scenarios (existing, future base year, and future base year with development traffic) are based on the existing signal timing and phasing. **Table 5.8** and **Table 5.9** present the analysis comparison of future base year without and with development traffic.

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

Table 5.8: Comparison of Future Base Year without and with Development Traffic at Junctions

Road	AM Peak						PM Peak					
	without			with			without			with		
	DOS (V/C)	Average Delay (s)	LOS	DOS (V/C)	Average Delay (s)	LOS	DOS (V/C)	Average Delay (s)	LOS	DOS (V/C)	Average Delay (s)	LOS
Boyoke Aung San&Alan Pya Junction	1.394	145.8	LOS F	1.4	155.2	LOS F	1.9	423.3	LOS F	2.0	464.6	LOS F
Shwedagon Junction	1.878	435.2	LOS F	1.9	482.1	LOS F	1.5	289.5	LOS F	1.5	356.3	LOS F

Table 5.9: Comparison of Future Base Year without and with Development Traffic on Bogyoke Aung San Road (Mid-Block)

Road	AM Peak								PM Peak							
	without				with				without				with			
	Left		Right		Left		Right		Left		Right		Left		Right	
	DOS (V/C)	LOS														
Boyoke Aung San Rd.	1.219	LOS F	1.591	LOS F	1.274	LOS F	1.663	LOS F	1.231	LOS F	1.504	LOS F	1.318	LOS F	1.611	LOS F

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

5.5 TRAFFIC AND PEDESTRIAN IMPROVEMENT MEASURES

Traffic Signal Optimization at Bogyoke Aung San – Alan Pya Junction

Due to the recent rapid traffic growth and no coordination of traffic signals for intersections, long waiting times and queue lengths are often observed at these intersections. These delays and long queues are mainly caused by inappropriate traffic signalizations. Therefore, the improvement of signal operations and control is very necessary to provide smooth traffics together with efficient traffic demand management (Revised from page 25 2.3.2, JICA SUDP 2013).

As seen from **Table 5.8**, after adding the development traffic into the study networks, the junction capacity is impacted. In order to alleviate the impact, the junction improvement measures are recommended. Signal phasing optimization is used in this study as this measure is an efficient and simple measure and less impact on shared lane configuration on eastbound and southbound directions as well (graphical details illustrated in **Figure 5.7**).

Figure 5.7 shows the junction layouts of existing and after project opening conditions with minor shared lane changes shown in red and orange boxes. **Table 5.10** and **Figure 5.8** indicate the optimized phasing times for both AM and PM peaks. The optimized cycle time for AM and PM peaks are 80 and 75 seconds respectively.

Further to the proposed mitigation, the junction performance analysis results with improvements are shown in **Table 5.11** and the comparison of before and after improvements are presented in **Table 5.12**.

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

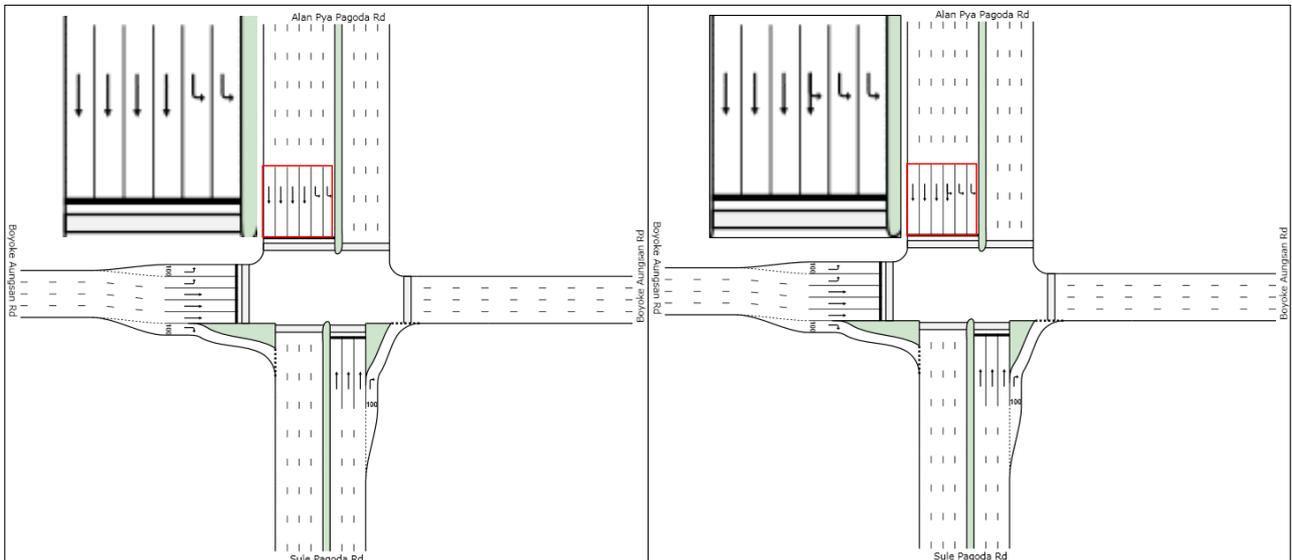


Figure 5.7: Comparison of Existing (left) and Proposed (right) Lane Configuration at Bogyoke Aung San – Alan Pya Junction

Table 5.10: Phase Timing Configuration Summary for AM (left) and PM (right) Peaks at Bogyoke Aung San – Alan Pya Junction

Phase (see figure below)	AM			PM		
	A	B	C	A	B	C
Green Time (sec)	34	8	23	34	7	19
Yellow Time (sec)	3	3	3	3	3	3
All-Red Time (sec)	2	2	2	2	2	2
Phase Time (sec)	39	13	28	39	12	24
Phase Split	49 %	16 %	35 %	52 %	16 %	32 %

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

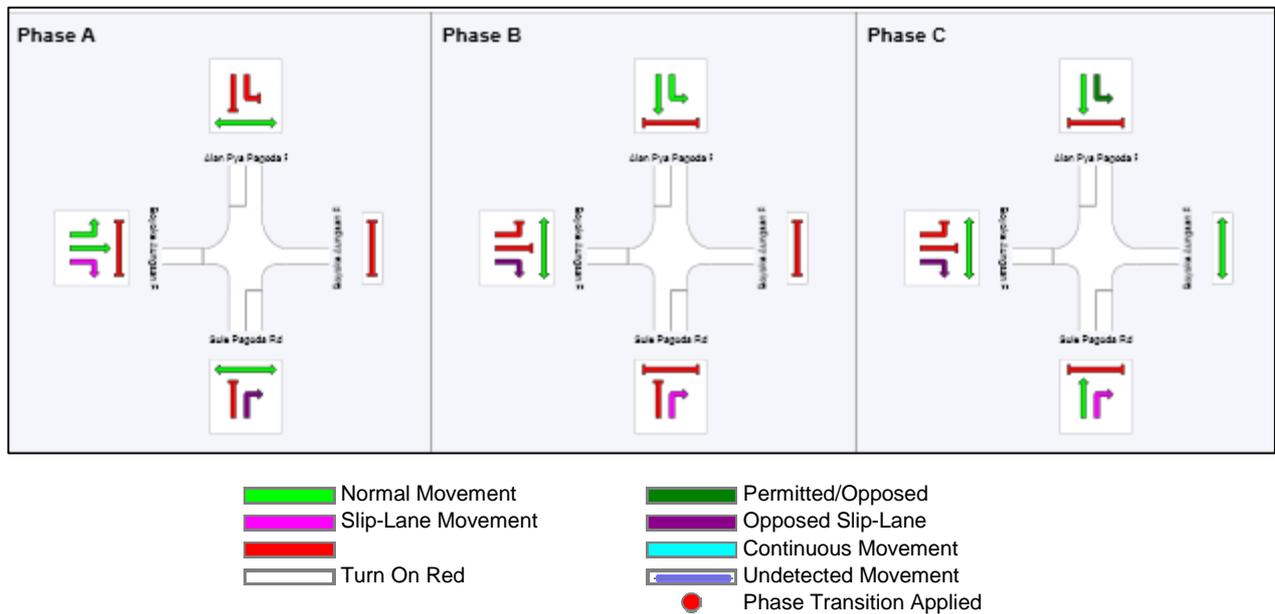


Figure 5.8: Proposed Signal Phasing at Bogyoke Aung San – Alan Pya Junction

Table 5.11: Future Base Year with Development Traffic and Improvements Traffic Analysis Results at Bogyoke Aung San – Alan Pya Junction

Road	Movement	AM Peak 2016 (10:00 – 11:00)				PM Peak 2016 (18:00 – 19:00)			
		DOS (V/C)	Average Delay (s)	LOS	Queue (m)	DOS (V/C)	Average Delay (s)	LOS	Queue (m)
Sule Pagoda Rd.	Straight	1.171	206.2	LOS F	508.9	1.414	418.2	LOS F	800.4
	Right Turn	0.864	34.8	LOS C	174.6	0.677	24.0	LOS C	100.8
Approach		1.171	158.5	LOS F	508.9	1.414	336.1	LOS F	800.4
Alan Pya Pagoda St.	Left Turn	0.995	65.6	LOS E	91.6	1.349	353.4	LOS F	361.0
	Straight	0.667	18.7	LOS B	126.1	0.671	19.4	LOS B	113.5
Approach		0.995	34.0	LOS C	126.1	1.349	156.4	LOS F	361.0
Bogyoke Aung San Rd.	Left Turn	0.881	41.2	LOS D	214.9	0.884	39.1	LOS D	218.6
	Straight	1.076	126.2	LOS F	539.2	1.387	392.0	LOS F	1,380.4
	Right Turn	0.884	39.4	LOS D	222.0	0.789	24.4	LOS C	134.7
Approach		1.076	86.5	LOS F	539.2	1.387	252.6	LOS F	1,380.4
All Vehicles		1.171	92.4	LOS F	539.2	1.414	248.7	LOS F	1,380.4

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

Table 5.12: Comparison of Before and After Improvements Analysis Results at Bogyoke Aung San – Alan Pya Junction

AM Peak						PM Peak					
without improvement			with improvement			without improvement			with improvement		
DOS (V/C)	Average Delay (s)	LOS	DOS (V/C)	Average Delay (s)	LOS	DOS (V/C)	Average Delay (s)	LOS	DOS (V/C)	Average Delay (s)	LOS
1.425	155.2	LOS F	1.171	92.4	LOS F	2.021	464.6	LOS F	1.414	248.7	LOS F

In summary, the junction will be operated in overcapacity conditions in the future base year without and with development traffic in both AM and PM peaks, as seen from **Table 5.8**. Having added the development traffic to the network will of course impact on the junction performance which is already in overcapacity stage in both peaks. However, after implemented junction improvement measure by using optimized traffic signal, the junction performance is significantly improved especially in AM peak (shown in **Table 5.12**). Hence, the traffic signal improvement is considered a good and viable measure.

Access Management on Bogyoke Aung San Road

As the main access of Landmark and PYN are separated on Bogyoke Aung San Road, the concern about the obstruction of main egress and PYN ingress should be considered.

Figure 5.9 presents the mitigation and access management on Bogyoke Aung San Road which can be summarized below;

- The PYN Hotel is the heritage building, so it needs a high security control system. The check points will be provided on the ground floor (at the PYN access) and in the PYN Basement (See **Figures 5.9**);
- To protect its old building structures from unauthorized vehicles (especially car bomb), the cautious vehicle screening is required with longer checking process. This may require 1-2 minutes a car, and it would cause long delays for the majority of site traffic. In the peak period, PYN traffics (In & Out = 13 & 11 cars/hour) are only 5% of total site traffic (In & Out = 317 & 217 cars/hour) using Bogyoke Aung San Road. The single check point therefore possibly disturbs or obstructs the external traffic flows and generate severe congestion on Bogyoke Aung San Road;

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

- Due to these low PYN traffic volumes (See **Figure 5.9**), a separated access for PYN hotel is proposed by locating the check point away from Bogyoke Aung San Road about 20.0 meters (3-4 cars for queue storage) in order to minimize any impact on surrounding vehicular and pedestrian traffics. The rejected route is also proposed in order to accommodate the rejected vehicle smoothly without any obstacle on Bogyoke Aung San Road;
- The PYN access can exclusively provide the strict vehicle screening process for the PYN Hotel, which is the heritage building (the Myanmar Railways Headquarters). The security control can be operated with minimal effect out the obstruction on the main site access and Bogyoke Aung San Road. This is one of congestion mitigation measures on the surrounding public roads;
- It is worth to note that about 20m median is provided between the main accesses of Landmark and PYN to accommodate convenient and safe pedestrian crossing;
- Staff should be provided also to manage traffic and control safety of pedestrian at the main access and PYN access.

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

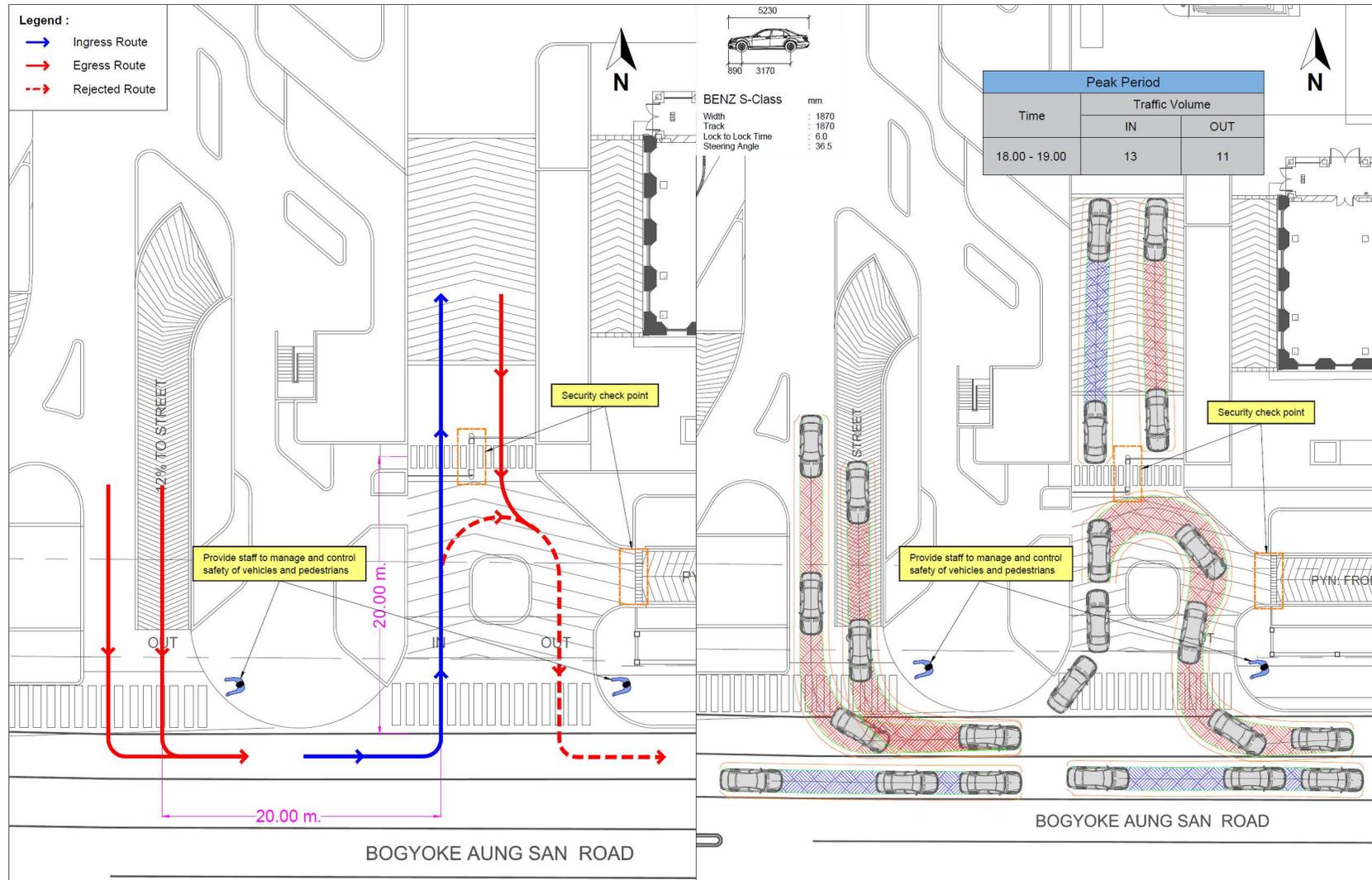


Figure 5.9: Queuing Analysis and Access Management on Bogyoke Aung San Road

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

Access Management on Alan Pya Pagoda Road

There are two accesses on Alan Pya Pagoda Road, consisting of service road (egress only) and T1 access (public and private ingress & private egress).

As these accesses located on the slope of the road and near to the bridge, to improve the visibility of driver, the below improvement measures should be implemented. **Figure 5.10** presents the sight distance analysis, which can be improved after the existing wall and Up-stand Columns demolished.

- Wall and Up-stand Columns next to the bridge should be demolished to increase visibility;
- At the design speed of 50 km/hr on the south bound direction and 3% downgrading slope, the minimum total stopping sight distance required is 65 m (based on Austroads 2010). It can be seen that after all obstacles demolished the available sight distance is approximately 70 m., so which is the sufficient distance for safe driving and stopping;
- To increase safety for egress vehicles on service road, provision of convex mirror at the median of Alan Pya Pagoda Road is strongly recommended.
- As only T1 residents can exit at T1 access on Alan Pya Pagoda Road, so there will be a low traffic volume, about 9 cars per hour during morning peak on Alan Pya Pagoda Road. This can help to avoid any critical conflict. However, it strongly recommends to provide a security guard to control and manage in and out traffics at this access in order to provide smooth and safe traffic movements.

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

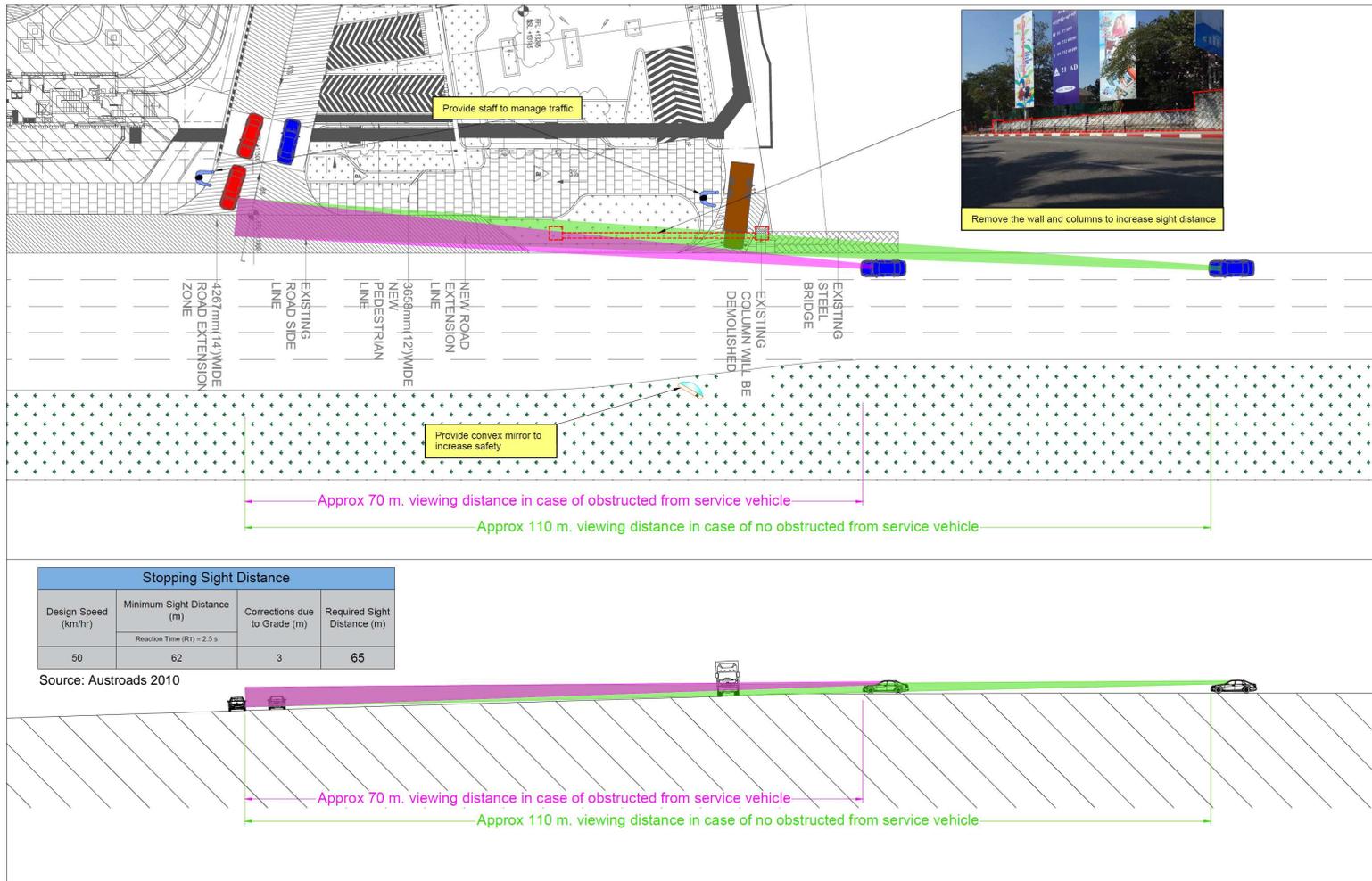


Figure 5.10: Sight Distance Analysis and Access Management on Alan Pya Road

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

Additional Improvement Measures

The Landmark Project will include some improvements to the pedestrian and traffic in the vicinity of the site such as (see **Figure 5.11**):

- Improvement and widen the footway surface along the boundary of the site;
- Due to the existing pedestrian crossing located at the main entrance and exit driveway, it needs to relocate pedestrian crossing with partial opening the fence at the median and propose a pedestrian signal at the crossing in front of the development. It also recommends to provide a new taxi layby (4 spaces) on Bogyoke Aung San Road.
- The pavement marking to clearly segregate entrance and exit from T4 drop-off is also recommended to manage the traffic movements on Bogyoke Aung San Road efficiently and safely, as shown in **Figure 5.11**.
- Removal of on street parking along Bogyoke Aung San Road (in front of the development site) is proposed to improve traffic flows.
- The warning sign of crossing is recommended to be installed at all site accesses to inform drivers to drive carefully at entrances and exits, see **Figure 5.11**;

5.0 TRAFFIC IMPACT ANALYSIS & MITIGATION

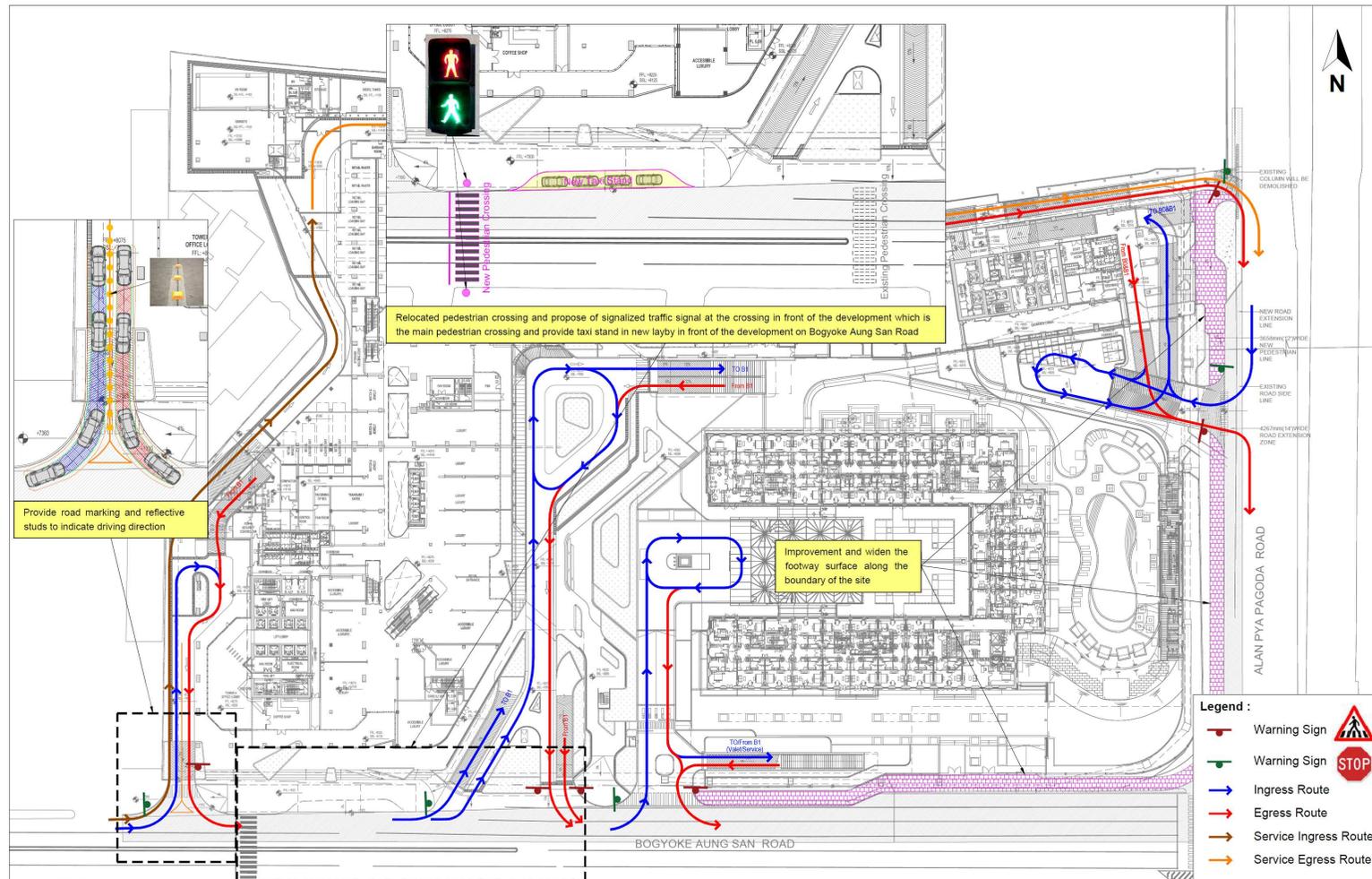


Figure 5.11: Improvement Recommendations (1)

6.0 SUMMARY

- This Traffic Impact Assessment report has been prepared to accompany with the Environmental Impact Assessment for The Landmark Project in Yangon;
- The Project is located on the corner of Alan Pya Pagoda Road and Bogyoke Aung San Road. The site currently includes the FMI Center, Grand Mee Ya Tha Residences and the disused Myanmar Railways Board (MRB) Headquarters;
- The Landmark Project is a mixed use development comprising two hotels, residential towers, two office towers and a retail podium with an approximately GFA of 222,224 sq.m. plus 1,226 car parking spaces which is over the requirement and sufficient for the parking demands estimated from the engineering practices;
- The development is designed to allow pedestrian permeability throughout and includes improvements to the pedestrian footway and crossing points surrounding the site. Specifically, signaling the main pedestrian crossing near the site on Bogyoke Aung San Road;
- As per recommendation from YCDC, the developer proposes to improve the layout and mitigate the additional traffic flow along Bogyoke Aung San Road along the site boundary such as removing street side parking and improving the street frontage. The aim is to minimize conflicts between vehicles entering and exiting the site and through traffic;
- The development is expected to open in 2021. Based on the existing trend, 10% is assumed as an annual growth rate in this study. In addition, the traffic volumes surveyed in Year 2013 and 2016 presents that the traffic annual growth rates for AM and PM peaks are 6% and 4%, respectively, which are lower than 10% employed in this study. The study therefore can be considered as a very conservative case to cover any critical impact;
- The total predicted traffic flowing through the Bogyoke & Alan Pya Junction in 2021 when the project opens is 11,243 pcu/hr in 2021. The Landmark development will add 357 pcu/hr which is an additional 3.1% i.e. a small increase compared to the overall assumed growth rates of 10% per year;
- It is recommended to adjust the traffic signal timing at Bogyoke & Alan Pya Junction to synchronize with the future traffic including development generated and also proposing traffic warning signs and safety devices internally and externally for safety purpose of vehicles especially at the exit on Alan Pya Pagoda Road where situated at the foot of the bridge. Moreover, providing staff to facilitate traffic for safer operation is recommended;
- In conclusion, the traffic and transport planning for the Landmark Project has been undertaken applying best practice to ensure that the additional traffic from the development will not adversely impact on the surrounding roads. The signalization and relocation of the pedestrian crossing at Bogyoke Aung San Road are also proposed to manage traffics efficiently and benefit to the local area. Altering the phasing and signal timing at Bogyoke & Alan Pya Junction will improve safety and alleviate travel delays caused by the site traffics.

**Annex 5 SPA Minimum Health & Safety Standards
for Major Works**



Revision: March-2015

SPA Minimum Health & Safety Standards
for MAJOR WORKS

For Use
at
Landmark Project,

CONTENTS

- 1.0 Preliminary
- 2.0 Safety And Management Arrangement
- 3.0 Permit-To-Work System
- 4.0 General Provisions
- 5.0 Electrical Safety
- 6.0 Ladders
- 7.0 Material Platforms
- 8.0 Disposal of Materials
- 9.0 Formwork Structures
- 10.0 Scaffolding
- 11.0 Demolition
- 12.0 Excavation
- 13.0 Piling
- 14.0 Cranes and Lifting
- 15.0 Welfare and Miscellaneous

1.0 PRELIMINARY

1.1 Definitions

“brace” or “bracing” means a member incorporated in a formwork structure for stability;

“competent person”, in relation to any work to be carried out, means a person who has sufficient experience and training to perform the work;

“contractor” means a person (whether or not he is also a main contractor or sub-contractor) who has entered into a contract for the purpose of carrying out any building operation or works of engineering construction;

“demolition work” means the work incidental to or connected with the total or partial dismantling or razing of a building or any other structure, and includes the removing or dismantling of any machinery or other equipment;

“designated person” means a competent person appointed in writing by —

(a) an occupier of a worksite;

(b) an employer of persons carrying out work in a worksite; or

(c) a principal who gives direction to persons on the work carried out by those persons in the worksite, to perform any task or duty prescribed under this specification in connection with the worksite;

“employee’s lift” means a powered car operating in guides and used primarily to carry persons in a substantially vertical direction;

“excavation” means a man-made cut, cavity or depression in an earth surface, formed after the removal of earth, rock or other material;

“excavation work” means the removal of earth, rock or other materials in connection with any building operation or works of engineering construction;

“falsework” means the structural supports and bracing for formworks or forms;

“flashpoint” means the minimum liquid temperature at which a spark or flame causes an instantaneous flash in the vapour space above the liquid;

“formwork” means any mould, surface, support or framing used to define the shape of concrete until the concrete is self-supporting;

“formwork structure” includes formwork, falseworks, shores and any other support;

“guard-rail” means a horizontal rail secured to uprights and erected along the open or exposed sides of scaffolds, floor openings, runways, gangways and other places in a worksite to prevent persons from falling;

“medical practitioner” means a person registered as a medical practitioner

“pressure” means air pressure in bars above atmospheric pressure;

“professional engineer” means a person registered as a professional engineer, either under the Myanmar Board of Engineers, or any other professional engineering body worldwide. The professional engineer should be engaged by the contractor of the worksite.

“project manager” means the person employed by the contractor who has overall control of all the works carried out in the worksite; and includes any competent person appointed by the contractor the event that the project manager is unable to perform his duties under this specification;

“safety assessor” means a competent person who is designated in writing the role of safety assessor

“scaffold” means any temporary structure —

(a) on or from which persons perform work in any worksite; or

(b) which enables persons to obtain access to or which enables materials to be taken to any place at which such work is performed, and includes any work platform, gangway, run, ladder or step-ladder (other than an independent ladder or step-ladder which does not form part of such a structure) together with any guard-rail, toe-board or other safeguards and all fixings; but does not include a lifting appliance, a lifting machine or a structure used merely to support the lifting appliance or lifting machine or to support other plant, equipment, gear, machinery, apparatus or appliance, or any part thereof;

“sole plate” means a member used to distribute the load from a standard to the supporting surface;

“temporary electrical installation” means any electrical installation used for the purpose of supplying electricity for any building operation or work of engineering construction and includes an extension socket-outlet or an extension cable, comprising either a connector or a socket-outlet which is joined to a cable;

“vehicle” means a vehicle propelled or driven by mechanical or electrical power and includes a trailer, traction engine, tractor and road-building machine;

“work platform” means a platform which is used to support workmen or materials;

“worksite” means any premises where any building operation or works of engineering construction is or are being carried out by way of trade or for purposes of gain, and includes any line or siding which is used in connection with the building operation or works of engineering construction.

1.2 Fines

- A. A fining regime is applicable to this specification, whereby a contractor who contravenes any aspect of this specification shall be liable to a fine deducted from progress payments, as specified in Appendix A.
- B. The fines will be used only for the purpose of improve the safety and health of workers on the worksites.

2.0 SAFETY AND MANAGEMENT ARRANGEMENT

2.1 Safety and health management system

- A. The contractor must prepare a Safety and Health Management Plan for the project, to be submitted and approved by the client before any works can commenced on site
- B. The plan can be arranged as the contractor feels most appropriate, however it must contain at a minimum;
 - a) Safety policy
 - b) Safe work practices
 - c) Safety training (including that of all local sub-contractors)
 - d) Group meetings
 - e) Incident investigation and analysis
 - f) In-house safety rules and regulations
 - g) Safety promotion (including that to local sub-contractors)
 - h) Evaluation, selection and control of sub-contractors
 - i) Safety inspections
 - j) Maintenance regime for machinery and equipment
 - k) Hazard analysis
 - l) Control of movement and use of hazardous substances
 - m) Emergency preparedness
 - n) Occupational health programs

2.2 Site Coordination Meeting

- A. The contractor must organize site coordination meetings as necessary to ensure the health, safety and welfare or persons at the worksite
- B. Such meetings must be presided by the contractor's project manager and attended by persons involved in all aspects of work on site
- C. The frequency of meetings should be as required by the progress of works on site, but not less than one time per month
- D. The minutes of meeting are to be circulated for comment to the client.

2.3 Safety Officer

- A. The contractor shall appoint a full time safety officer at the worksite
- B. The person appointed as safety officer shall have adequate training, and have at least 2 years relevant experience, and is believed competent to perform the duties of a safety officer

2.4 Duties of the Safety Officer

- A. To identify and highlight to the contractor any unsafe condition or working practice in the worksite
- B. To recommend to the contractor and assist to implement reasonably practicable measures to remedy the issue identified in Paragraph A
- C. Record and filling any accident or incident occurring on site.
- D. Report on and follow up immediately on any comments from client.

2.5 Powers of the Safety Officer

- A. To inspect the worksite at any reasonable time as required
- B. To inspect any machinery or equipment at the worksite
- C. To inspect any worksite documentation of the contractor
- D. To make relevant enquiries to any person at the worksite as necessary
- E. To assess the levels of noise, illumination, heat or hazardous substances at the worksite
- F. To investigate any accident or dangerous occurrence at the worksite

2.6 Safety and Health Training

- A. All workers on the worksite (including those of subcontractors) must have received adequate safety and health training for the purpose of familiarizing that worker with the hazards associated with the work they are required to undertake
- B. All supervisors on the worksite (including those of subcontractors) must have received adequate safety and health training to ensure that those tasks that the person oversees can be carried out safely
- C. A detailed plan of the training requirements in advance of work starting on site must be supplied by the contractor as part of the tender submission, and timing/duration indicated on the tender stage preliminary construction programme.
- D. Records of training and certificates of attendance must be issued to the client upon completion, and subsequently kept on site for the duration of the works.

3.0 PERMIT-TO-WORK SYSTEMS

3.1 Application

- A. Permit-to-work procedures must be used for at least the following activities which are classified as high-risk;
 - a. Demolition work
 - b. Excavation and trenching deeper than 1.5m
 - c. Lifting operations involving tower, mobile, or crawler crane
 - d. Piling work
 - e. Tunneling work
 - f. Work on a scaffold where a person could fall more than 2 meters
 - g. Work involving entry into a confined space
 - h. Welding and other hot works
 - i. Erection, alteration, and dismantling of scaffolding
- B. Daily general permit-to-work also required.

3.2 Implementation of permit-to-work

- A. The contractor shall appoint a Project Manager and a Safety Assessor (who could be the Safety Officer or another competent person)
- B. The permit-to-work system shall ensure that:
 - a. The high-risk construction work is planned and carried out with due regard for safety and health
 - b. Persons involved in the work are informed of the hazards involved and the precautions necessary
 - c. The necessary safety precautions are enforced before work is commenced

3.3 No high-risk construction work without permit-to-work

- A. No high-risk construction work shall be performed without a permit-to-work
- B. It should be noted that nothing mentioned above shall interfere or prevent any rescue work

3.4 Application for permit-to-work

- A. Application for permit-to-work should be made by the supervisor of that activity
- B. The application form shall state the precautionary measures necessary to ensure safety and health on the worksite
- C. The application is submitted to the safety assessor and project manager for approval

3.5 Evaluation of permit-to-work

- A. On receipt of the permit-to-work application, the safety assessor shall;
 - a. Assess whether all reasonably practicable measures have been taken to ensure safety and health on the worksite
 - b. Inspect the site with the supervisor to ensure that the work can be carried out safely
 - c. When satisfied by (a) and (b), the safety assessor shall endorse the permit-to-work and forward to the project manager

3.6 Issue of permit-to-work

- A. On receipt of the permit-to-work that has been endorsed by the safety assessor, the project manager shall;
 - a. Ensure that a proper evaluation has been performed
 - b. Ensure that no incompatible work (creating risks to health and safety) is occurring at the same time on the worksite
 - c. Ensure that all reasonably practicable measures are implemented to ensure health and safety
 - d. Ensure that all persons involved in the works are informed of the associated hazards
 - e. Issue the permit-to-work and state the period of validity for the permit
 - f. Retain a copy of the permit-to-work on the worksite, ready for inspection by client as required

3.7 Posting of permit-to-work and supervisor's duty

- A. The approved permit-to-work must be clearly posted at the location of the high-risk construction activity, and at a central PTW display board for the duration of its validity

3.8 Monitoring of Work

- A. The project manager must ensure that the worksite is continually reviewed with due regard for the safety, health and welfare of persons carrying out the high-risk construction work
- B. The supervisor of the works must ensure that;
 - a. Ensure precautionary safety measures stay in place for the duration of the works
 - b. The project manager is informed upon completion of the high-risk construction work

3.9 Duty to report incompatible work

- A. It is the duty of any person who is aware of any incompatible work occurring on-site that increases risks to health and safety, to immediately inform the project manager

3.10 Revocation of permit-to-work

- A. If the project manager is at any time of the view that the high-risk work activity is increasing risks to health and safety, he may order the high-risk work to cease immediately and revoke the permit-to-work

4.0 GENERAL PROVISIONS

4.1 Structures and supports

- A. Every supporting structure in a worksite, including its foundation, shall be of sound design to withstand any foreseeable load likely to be imposed, good construction, properly maintained and checked periodically

4.2 Stability of structures

- A. No structure or part of structure shall be left unsecured or unshored in such a condition that it may collapse under foreseeable loadings

4.3 Falling Hazards & Guard Rails

- A. Every open side or opening into or through which a person is liable to fall more than 1 meter shall be covered or guarded by effective guard rails, barriers or other equally effective means to prevent fall
- B. Those means to prevent fall provided under Paragraph A shall be of good construction, placed on the inside of uprights, and be placed to prevent the fall of any person
- C. Those means to prevent fall provided under Paragraph A may be removed where free access is required for work in progress, however they must be reinstated immediately when access of persons or materials is not taking place at that opening.

4.4 Work on roofs

- A. For all work carried out on roofs where a person is liable to fall more than 2 meters, sufficient anchorage for use of a safety harness must be provided for, as well as the use of protection of the person against any sliding or fall from the roof

4.5 Storage and placement of materials and equipment

- A. Materials and equipment must not be stored, stacked or placed so close to any opening or edge of floor, scaffold, platform or structure as to endanger the persons below the opening or edge. The minimum distance shall be 1 meter from the edge of opening to the stored materials and equipment.
- B. Storage area must be maintained with proper escape route in case of any emergency.

4.6 Protection against falling objects

- A. Adequate overhead protection against falling objects that could hit persons shall be provided

4.7 Slip and trip hazards

- A. All passageways, scaffolds, platforms or other elevated working surfaces shall be kept free from slipping and tripping hazards, as well as any sharp objects

4.8 Vehicular hazards

- A. Where a worksite is located nearby to a road with vehicular traffic, the worksite must be barricaded and suitable warning signs displayed to direct traffic away from the worksite. Where necessary traffic must be controlled by designated persons.
- B. Any vehicles used in the worksite must be of good construction and roadworthy
- C. No person shall drive a vehicle into the worksite without authorization of the contractor
- D. Any person driving a vehicle in the worksite must first be fully instructed as to the dangers likely to arise in connection therewith, the precautions observed, and has received sufficient training to operate or drive the vehicle
- E. It is noted that nothing in this specification shall derogate from the effect of the laws of Myanmar.

4.9 Runways and ramps

- A. Every runway and ramp in the worksite shall be adequately constructed
- B. Every runway and ramp used for motor vehicles in the worksite shall be constructed in accordance with the drawings of a professional engineer
- C. The professional engineer who has designed the runway or ramp shall ensure that its design is adequate for its intended use and that those responsible for its construction
- D. The professional engineer who has designed the runway or ramp shall issue a certificate upon its construction to certify it is safe for its intended use
- E. No person in the worksite shall use any runway or ramp for motor vehicles unless a certificate as per Paragraph C has been issued

4.10 Entry into a building under construction or demolition

- A. Where a building is over 2 stories high, a designated entry and access at ground floor with adequate overhead protective cover must be provided for persons entering or leaving the building.
- B. Where Paragraph A applies, measures should also be taken to prevent any person entering or leaving the building by any other means of entry or access

4.11 Safe means of access and egress between different working levels

- A. Safe means of access and egress between different working levels shall be provided as far as reasonably practicable.
- B. Contractor to ensure proper access is provided to the working/construction area for client to inspect at any time.

4.12 Lighting

- A. Sufficient lighting, whether natural or artificial, must be provided in every area of the worksite in which persons are working or passing
- B. Emergency lighting for use in the event of power failure must also be provided and be of sufficient intensity to allow safe evacuation of the worksite.

4.13 Personal Protective Equipment (PPE)

- A. Appropriate PPE must be provided and maintained, including;
 - a. Eye protection
 - b. Fall protection
 - c. Foot protection
 - d. Hand protection
 - e. Head protection
 - f. Hearing protection, and
 - g. Respiratory protection

5.0 ELECTRICAL SAFETY

5.1 Electrical power circuits

- A. Before any work is carried out at a worksite, the worksite shall be inspected to ascertain whether there is any electrical power circuit, tool or machine that a person may come into contact with
- B. Where there are electrical power circuits, tools or machines as identified in Paragraph A, appropriate warning signs understood by the persons carrying out the work shall be clearly posted at the place where that circuit, tool or machine is located.
- C. No person shall be permitted to work in a worksite where he may come into contact with any part of an electrical power circuit unless he has been advised of the location and hazards involved with that circuit and he is protected against electric shock either by;
 - a. De-energizing the circuit and earthing it, or
 - b. Guarding it with effective insulation or other means

5.2 Installation of electric wiring and power lines

- A. All electric wiring in a worksite shall be supported on proper insulators and not be looped over nails or brackets
- B. Except flexible cables that are less than 3m in length or used to connect an electrical equipment to a plug, no electric wiring or cable shall be laid on the ground or floor of a worksite unless it is:
 - a. of the weather-proof type
 - b. provided with adequate protection to withstand wear and tear

- c. maintained in good and safe working order
- C. All elevated power lines shall have sufficient vertical clearance where they cross any road or access ways, and be at least 5 metres above the ground level.
- D. Generator for temporary electrical supply should be provided with proper earthing, fencing, warning signs and secured to prevent unauthorized access.

5.3 Bare wires and exposed live conductors

- A. All electrical installations, electrical appliances and current carrying equipment must be effectively earthed where provisions have been made for earthing
- B. The exposed metal part of electrical installations, electrical appliances and current carrying equipment (other than the current carrying part) which are liable to become energised in the event of a failure in the insulation, must be effectively earthed
- C. Where the electrical installation is connected to any bare wire or other uninsulated live conductor, no bare wires or other uninsulated live conductors shall be located at any place where a person may pass unless:
 - a. Such wires and conductors are effectively insulated or guarded by a fence or barrier; or -
 - b. the person working or passing is a licensed electrical worker and competent to carry out such electrical works on the wires or conductors

5.4 Residual current circuit breakers and overcurrent protective devices

- A. Residual current circuit breakers must be installed for all temporary electrical installations to provide earth leakage protection
- B. Overcurrent protective devices with the appropriate ratings are installed in the distribution board to provide over-current or short-circuit protection

5.5 Prohibition on use of fuse

- A. No fuse shall be used in the final circuit of any electrical installation

5.6 Welding sets

- A. All alternating current welding sets are fitted with an effective voltage limiting device or shock preventor.
- B. All welding sets are inspected and certified by a competent person before arrival to the site.

5.7 Industrial plug and socket-outlet

- A. All plugs and socket-outlets used for connecting any electrical equipment to a temporary electrical installation, must be of heavy duty industrial type.

5.8 Distribution board and socket-outlet assembly

- A. Circuit breakers used for the final circuits of any distribution board and socket-outlet assembly in the worksite shall be housed in an enclosure which is constructed so as:
 - a. to fully enclose all live electrical parts within the enclosure;
 - b. to allow any of the circuit breakers to be switched on or off without having to open the enclosure; and

- c. to be of weather-proof construction

5.9 Electrical installations and equipment used underground or in confined space

- A. When working underground or in a confined space, the electricity supply for lighting and electric hand-held tools is provided by means of a step-down transformer having a secondary voltage not exceeding 110 volts centre point earthed

6.0 LADDERS

6.1 Construction

- A. Ladders shall be of good construction, sound material and adequate strength for the purpose for which it is used.

6.2 Resting surface and prevention against slipping

- A. The surface on which the ladders rests and bears shall be stable, level, firm, and of sufficient strength to safely support the ladder and any person or load intended to be placed on it
- B. Every ladder shall be positioned and securely fixed when used by any person carrying out any work so as to prevent slipping, swaying or sagging
- C. If such fixing is impracticable, the ladder shall be held in place by a person.

6.3 Landing place

- A. Every ladder or run of ladders used by a person carrying out work exceeding 9 metres in vertical height shall, if practicable, be provided with intermediate landing places at vertical distances between landing places not exceeding 9 metres
- B. Landing places as per Paragraph A shall be provided with suitable guard-rails to prevent falls
- C. Where any ladder used by a person carrying out work rises a vertical distance of more than 3 metres, there shall be a safety cage or other practicable measures to prevent fall of persons

7.0 MATERIAL PLATFORMS

7.1 Cantilevered and material platforms

- A. The requirements on cantilevered and material platforms (hereon after referred to as material platforms) shall apply to;
 - a. any cantilevered platform erected for the purposes of loading and unloading of any material or equipment; and
 - b. any material platform which is used for the purposes of loading and unloading of any material or equipment, or which is subjected to a load weighing 1,000 kilogrammes or more
- B. All material platforms in a worksite must;
 - a. be designed such that is capable of bearing a load of at least twice its safe working load
 - b. be constructed, installed and re-positioned in accordance with the design and drawings or a professional engineer who designed the platform

- c. be restricted so that no person shall use the platform unless a certificate as per Paragraph D has been issued
- d. clearly display sign boards showing the safe working load of the platform
- C. The platform must be designed by a professional engineer so that it can be executed safely by any person who constructs or uses the platform. The professional engineer must provide all design information (including all relevant calculations, drawings and construction procedures) as is necessary to facilitate the proper construction of the platform according to his design
- D. The platform must be constructed in accordance with the design of the professional engineer and a certificate must be issued stating that the platform is safe for its intended use when completely constructed.
- E. The platform must not be loaded beyond its safe working load except by an inspector or a professional engineer when testing the platform
- F. Materials and equipment shall not remain on a platform for a period longer than is necessary for loading or unloading

7.2 Guard-rails and toe-boards

- A. Every open side of a platform from which any person or material could fall more than 2 metres shall be provided with guard-rails and toe-boards
- B. Where any gate is constructed in place of guard-rails, it must be constructed to open inwards to the platform

7.3 Use of wire rope

- A. No wire rope shall be used as a load bearing element in a cantilevered platform unless it is terminated with eyes that have been fitted with thimbles (not wire rope clips).

7.4 Inspection by designated person

- A. Every material platform must be inspected by a designated person at least once every 7 days
- B. Any unsafe condition discovered during the inspection must be rectified immediately
- C. The result of the inspection must be entered by the designated person into a register
- D. The register must be kept at the worksite and produced for inspection upon request of the client

8.0 DISPOSAL OF MATERIALS

8.1 Accumulation of debris

- A. Debris shall not be allowed to accumulate so as to constitute a hazard in the worksite

8.2 Method of removal of debris, etc.

- A. Any debris, brick or other materials in the worksite shall be removed by means of chutes, buckets, hoists or any other method which will not endanger any person in the worksite

8.3 Floor openings for debris removal

- A. Every opening used for the removal of debris on every floor which is not closed to access, except on the top or working floor, is provided with an enclosure from floor to ceiling
- B. Where it is impractical to provide an enclosure under Paragraph A, the opening must be barricaded so that no person has access to within a horizontal distance of 6 metres from any opening above through which debris is being dropped

8.4 Chutes

- A. Any chute provided for the removal of materials in a worksite must be entirely closed on all sides, except at openings used for the receiving or discharging of materials
- B. Any opening of any chute (except the top opening) must be closed when not in use

8.5 Construction of chutes

- A. Every chute shall be of good construction, sound material, adequate strength and rigidly supported throughout its length

8.6 Debris collection area

- A. The discharge of every chute shall be directed to a designated debris collection area
- B. The debris collection area shall be within an enclosure fitted with a gate to effectively protect persons from the hazard of falling debris, and shall be of adequate strength and of at least 2 metres height
- C. The gate under Paragraph B must be kept closed unless removal of debris is taking place
- D. The distance between the discharge end of chute and the designated debris collection area shall not be more than 3 metres
- E. A warning notice indicating the hazard of falling debris shall be placed in a conspicuous position at the debris collection area
- F. Paragraphs A to C shall not apply where a skip or container with sides extending to height of at least 2 metres is placed directly below the chute as a debris collection area

8.6 Design of chute by professional engineer

- A. Any chute exceeding 12 metres in height shall be constructed, installed or repositioned in accordance with the design and drawings of the professional engineer who designed the chute. The professional engineer's design must be such that it can be executed safely in construction and use, and all relevant design documentation (including all relevant calculations, drawings and construction procedures) must be provided to relevant persons.
- B. No person shall use the chute unless a certificate under Paragraph C has been issued in respect of it
- C. The professional engineer who designed the chute exceeding 12 metres in height (or any other professional engineer appointed by the contractor) must ensure that it is constructed correctly and, after checking that it is safe for its intended use, issue a certificate to that effect.

9.0 FORMWORK STRUCTURES

9.1 General requirement

- A. Every formwork structure shall:
 - a. be of sound material, good construction and adequate strength
 - b. be free from patent defect

- c. be suitable and safe for the purpose for which it is intended, and
 - d. be properly braced or tied together so as to maintain position and shape
- B. Every formwork structure shall be capable of sustaining the total dead, live and impact loads imposed on the structure with a minimum safety factor of 2
- C. Where a formwork structure is of 2 or more tiers, frames or shores;
 - a. the tiers, frames or shores shall be effectively connected vertically
 - b. safe means of access to and around the formwork structure shall be provided for inspection purposes
 - c. every designated entry point shall be safe for entry and clearly marked
- D. All reasonably practicable measures must be taken to ensure that formwork structures do not collapse at any stage of erection, construction or use
- E. No load is to be applied to unsecured structures in a worksite except as permitted in the design documentation

9.2 Supports and shores

- A. Horizontal and diagonal bracing shall be provided in both longitudinal and transverse directions, as may be necessary to provide stability and rigidity to any formwork structure unless it has been designed to be stable and rigid without such bracing
- B. Shores shall be properly seated top and bottom and secured in place to prevent displacement
- C. Where shores rest upon the ground, sole plates shall be provided
- D. All shores for the formwork structure shall be of adequate size and spacing

9.3 Appointment of a formwork supervisor

- A. A formwork supervisor shall be appointed to supervise the construction, erection, alteration and dismantling of any and all formwork structures in the worksite
- B. No person shall be appointed as a formwork supervisor in a worksite unless he has received adequate safety and health training to familiarise him with the associated hazards and precautionary measures

9.4 Duties of formwork supervisor

- A. As far as reasonably practicable, all measures as necessary must be taken by the formwork supervisor to ensure that during the erection of the formwork structure, all components are properly erected, seated, connected, braced and tied so as to maintain its position and shape
- B. The formwork supervisor must make an inspection of the completed formwork structure to ensure it is in accordance with the design and drawings
- C. The formwork supervisor must notify the contractor upon discovering any unsafe condition

9.5 Register

- A. The formwork supervisor shall enter the results of every inspection in Section 9.3 (B) into a register which is kept at the worksite, and produce the register for inspection by the client as requested

9.6 Design and construction of formwork structure

- A. The following types of formwork structure must comply with Paragraphs B to E below:
 - a. exceeds 9 metres in height
 - b. consists of any formwork which is supported by shores constructed in 2 or more tiers

- c. consists of any formwork where the thickness of the slab or beam to be cast in the formwork exceeds 300mm
- B. Any formwork structure referred to in Paragraph A shall be designed by a professional engineer
- C. No alteration shall be made to formwork structures under Paragraph A unless its design and drawings have been endorsed by a professional engineer
- D. The design and drawings of a formwork structure under Paragraph A shall be kept at the worksite and produced for inspection of the client upon request
- E. No formwork structure under Paragraph A shall be used unless a certificate has been issued stating it is safe for its intended use

9.7 Duties of professional engineer on formwork structure

- A. The professional engineer who designs the formwork must take measures, as far as reasonably practicable, to ensure that it can be executed safely in construction and use and that all design documentation as is necessary is provided
- B. The professional engineer (or other professional engineer appointed by the contractor) must take, as far as reasonably practicable, measures to ensure that it is constructed in accordance with the drawings and issue a certificate stating its safe for its intended use upon successful inspection

9.8 Concrete work

- A. Placement of concrete shall not be carried out in such manner as to affect the stability of the formwork structure
- B. Where formwork is designed by a professional engineer, placement of concrete shall not commence unless a certificate stating it is safe for its intended use has been issued
- C. No person shall be in the vicinity of a formwork structure during the placement of concrete unless his presence is incidental to the concrete work in progress
- D. The formwork supervisor shall regularly inspect a formwork structure during the placement of concrete to monitor its stability and soundness

9.9 Dismantling

- A. Dismantling of a formwork structure shall not commence until the concrete has achieved sufficient strength to be self supporting with or without additional temporary propping
- B. Cordon of the dismantling area to prevent unauthorized persons to enter.
- C. Materials dismantled shall be removed promptly or stock-piled in areas where persons are not required to work or pass
- D. Protruding nails, wire ties and other form of accessories not necessary to subsequent work shall be pulled, cut or otherwise made safe

9.10 Steel reinforcement

- A. All steel reinforcement must be adequately supported to prevent collapse

9.11 Reshoring

- A. Reshoring shall be provided where necessary to safely support slabs and beams after a formwork structure is dismantled, or where such slabs or beams are subjected to any superimposed load due to construction work above
- B. The reshoring shall be properly secured top and bottom and secured to prevent displacement
- C. Where reshores rest upon ground, sole plates shall be provided
- D. Reshoring shall be inspected by the formwork supervisor and the results entered into a register

10.0 SCAFFOLDING

10.1 Scaffold erector

- A. No person shall be involved in the construction, erection, installation, re-positioning, alteration, maintenance, repair or dismantling of a scaffold in a workplace unless he has successfully completed a suitable training course to equip him to perform the work of a scaffold erector.

10.2 Scaffold supervisor

- A. A designated scaffold supervisor shall be appointed before any construction, erection, installation, re-positioning, alteration, maintenance, repair or dismantling of a scaffold in a workplace.
- B. The scaffold supervisor shall have completed a suitable training course and be competent to perform the functions and duties of a scaffold supervisor who has successfully completed a training course acceptable to the Commissioner, to equip him to be a scaffold supervisor

10.3 Personal protective equipment for scaffold erectors

- A. Every scaffold erector shall use the following Personal Protective Equipment:
 - a. a safety harness attached with a shock absorbing device; and
 - b. sufficient and secured anchorage by means of an independent life line or other equally effective means.

10.4 Supervision of scaffolding works

- A. No scaffold shall be constructed, erected, installed, re-positioned, altered, maintained, repaired or dismantled in a workplace except under the immediate supervision of a scaffold supervisor.

10.5 Construction and materials

- A. Every scaffold, and every member or component thereof, in a workplace shall be —
 - a. of sound material, good construction and adequate strength;
 - b. free from patent defects; and
 - c. suitable and safe for the purpose for which it is intended.
- B. Every scaffold erected at a building under construction, so far as is reasonably practicable, shall be erected such that it precedes the construction of the uppermost permanent floor of the building by not less than one metre above that floor.
- C. Where the height of the scaffold extends beyond the uppermost permanent floor by 2 metres or more, the scaffold shall be adequately supported to prevent its collapse.

10.6 Foundation of scaffolds

- A. Every scaffold in a workplace shall be constructed, erected or installed on structures or foundations of adequate strength.

- B. Where a scaffold in a workplace is to be founded on soil, the soil shall be adequately consolidated.
- C. In the case of a scaffold in a workplace exceeding 15 metres in height or being erected on poorly drained soil, base plates shall bear upon sole plates that are —
 - a. of strength not less than 670 kgf per square metre; and
 - b. of a length suitable to distribute the load
- D. There shall be no cavity under the sole plate immediately below any standard of a scaffold in a workplace.

10.7 Scaffolds supported by buildings, ships or other structures

- A. No part of a building, ship or other structure shall be used as support for any part of a scaffold in a workplace unless it is sufficiently stable, and of sound material and adequate strength to afford safe support.
- B. Overhanging eaves gutters shall not be used as supports for any part of a scaffold in a workplace unless they have been specially designed as walkways and are of adequate strength.

10.8 Designated access point for scaffolds

- A. Every scaffold shall have at least one designated safe access point from which a person may gain access onto the scaffold, which is clearly marked with a sign or label
- B. Designated scaffold access point be displayed with “SAFE FOR USE” tag and weekly inspection signed by scaffold supervisor.

10.9 Stairs and ladders

- A. Stairs and ladders shall be provided to enable persons to gain access from one level of any scaffold in a workplace to another level, which are installed with the scaffold as far as is reasonably practicable

10.10 Standards and ledgers

- A. Standards shall be plumb where practicable, fixed sufficiently close together to secure the stability of the scaffold, having regard to all the circumstances
- B. In the case of a timber scaffold, standards shall be spaced not more than 1.5 metres apart
- C. In the case of a metal scaffold spaced not more than 2.5 metres apart.
- D. A standard or foot of any scaffold in a workplace shall be placed on an adequate and secured sole plate in order that the foot of the standard does not rest directly on the ground or supporting surface (unless that surface is adequately firm), so as to prevent any vertical displacement of the foot.
- E. The ledgers of a metal scaffold in a workplace shall be spaced at vertical intervals of not more than 2 metres.
- F. The ledgers of a timber scaffold in a workplace shall be horizontal as far as possible, be spaced at vertical intervals of not more than 1.8 metres, and be securely fastened to the standards.

10.11 Transoms

- A. Transoms shall be located at or near the intersections of standards and ledgers of a scaffold in a workplace.

10.12 Bracing

- A. Every scaffold in a workplace shall be effectively braced by means of longitudinal and transverse bracing systems which shall extend from the base to the top of the scaffold.
- B. The joints in bracing members shall be lapped or spliced.
- C. Longitudinal bracing members shall be continuous and fixed at approximately 45° to the horizontal.

- D. Each lift shall be crossed by at least one longitudinal bracing member in every 10 metres length of the scaffold.
- E. A transverse bracing system shall be provided at each end of the scaffold and at intervals of not more than 10 bays.
- F. Every frame scaffold in a workplace shall be provided with horizontal bracings or lacings at intervals of not more than every 5 lifts.

10.13 Gear for suspension of scaffolds

- A. Every chain, rope and lifting gear used for the suspension of a scaffold in a workplace shall be of sound material, adequate strength and suitable quality, and in good condition.
- B. Any chain, rope and metal tube used for the suspension of a scaffold in a workplace, other than a suspended scaffold, shall be —
 - a. properly and securely fastened to safe anchorage points and to the scaffold ledgers or other main supporting members;
 - b. positioned so as to ensure stability of the scaffold;
 - c. approximately vertical; and
 - d. kept taut.
- C. Every scaffold in a workplace that is suspended by means of chains or ropes shall be secured to prevent undue horizontal movement while it is used as a work platform.

10.14 Work platforms

- A. Work platforms in a workplace shall be provided -
 - a. at any place of work which does not afford a proper and secure foothold; and
 - b. in the case of a building under construction, around the edge of the building at every uppermost permanent floor which is under construction.
- B. Notwithstanding Paragraph A, work platforms shall be provided at intervals of not less than every alternate lift of any scaffold, except a tower scaffold or a trestle scaffold
- C. The vertical distance between any 2 work platforms shall not exceed 4 metres.
- D. Every work platform provided under paragraph C shall cover the lift of a scaffold throughout its entire length.
- E. Every work platform shall —
 - a. be closely boarded, planked or decked;
 - b. be at least 500 millimeters wide; and
 - c. not have any opening except to allow access to that work platform.
- F. The distance between a work platform and any building, ship or other structure shall be as narrow as is reasonably practicable and shall not exceed 300 millimetres.

10.15 Loading requirements for scaffolds

- A. Signboards stating the maximum permissible weight of tools and materials and the maximum number of persons permissible on each bay shall be prominently displayed at suitable locations on the scaffold in a workplace, which shall be displayed at all times until the scaffold is dismantled.
- B. A scaffold in a workplace shall not be overloaded and, so far as is reasonably practicable, the load thereon shall be evenly distributed.
- C. When any material is transferred to or from a scaffold in a workplace, the material shall be moved or deposited without imposing any violent shock.

- D. The maximum loading for persons and materials allowed on any work platform in any bay of a scaffold in a workplace shall be —
 - a. in the case of a timber scaffold, 75 kgf per square metre; or
 - b. in any other case, 220 kgf per square metre.
- E. The maximum number of persons allowed on any work platform in any bay of a timber or metal scaffold in a workplace shall be —
 - a. in the case of a timber scaffold, not more than 2 persons; and
 - b. in the case of a metal scaffold, not more than 4 persons.
- F. The maximum number of persons allowed in any bay of a timber or metal scaffold in a workplace shall be —
 - a. in the case of a timber scaffold, not more than 4 persons; and
 - b. in the case of a metal scaffold, not more than 8 persons.

10.16 Boards, planks and decking

- A. All boards, planks or decking used in the construction of work platforms in a workplace shall —
 - a. be of uniform thickness;
 - b. be capable of supporting a load of 670 kgf per square metre with due regard to the spacing of the supports; and
 - c. be flushed along their lengths and effectively secured to prevent tipping or uplift.
- B. Any metal decking which forms part of a work platform in a workplace shall be provided with non-skid surfaces.
- C. Any board or plank which forms part of a work platform in a workplace shall project beyond its end support to a distance of not less than 50 millimetres and not more than 4 times the thickness of the board or plank.

10.17 Toe-boards and guard-rails

- A. Every side of a work platform or workplace from which a person is liable to fall more than 2 metres shall be provided with toe-boards and 2 or more guard-rails or adequate construction and
- B. The uppermost guard-rail shall be at least one metre above the work platform or workplace for which the guard-rail is provided.
- C. The height of the toe-boards shall not be less than 90 millimetres.
- D. The vertical distance between any 2 adjacent guard-rails shall not exceed 600 millimetres.

10.18 Overlay and screening nets

- A. Overlay or screening nets shall be used to envelope any timber or metal scaffold in a workplace which is erected on the outside of a building (except tower scaffolds)

10.19 Scaffolds to be free of material which endanger safety

- A. Any material, including waste material or debris, from the scaffold which may endanger the safety of any person, shall be removed.

10.20 Measures against electrical hazards

- A. All practicable measures shall be taken to protect the person from electric shock by electrical wires or equipment when using the scaffold.

10.21 Inspection of scaffolds

- A. No scaffold shall be used unless it has been inspected by a scaffold supervisor —
 - a. upon completion of its construction, erection or installation, as the case may be;
 - b. thereafter, at intervals of not more than 7 days immediately following the date of the last inspection by the scaffold supervisor; and
 - c. after exposure to weather conditions likely to have affected its strength or stability or to have displaced any part.
- B. The scaffold supervisor shall enter the results of every inspection in a register which is available on site at all times
- C. This requirement is not applicable to trestle scaffolds or any scaffolds which from not part a person is liable to fall more than 2 metres.

10.22 Labelling of scaffolds after inspection

- A. After inspection, the scaffold supervisor shall display a notice or label indicating whether the scaffold is safe for use or otherwise, which shall be clearly displayed at every designated access point.
- B. No person shall use the scaffold unless a notice or label is displayed at the designated access point indicating that the scaffold is safe for use (except the scaffold supervisor and scaffold erectors as required)

10.23 Approved metal scaffolds

- A. Metal scaffolding shall be an acceptable system with testing certificates available upon request

10.24 Design of certain metal scaffolds by professional engineer

- A. Scaffolding exceeding 30 metres in height shall be erected or installed in accordance with the design and drawings of a professional engineer.
- B. The professional engineer shall take, so far as is reasonably practicable, such measures to ensure that his design can be executed safely in construction and use, and provide all necessary design documentation
- C. Such scaffolds shall not be used unless it has been examined by the professional engineer after its erection or installation, and a certificate stating that the scaffold is safe for use has been obtained from the professional engineer
- D. The design, drawings and certificate shall be kept on site for inspection upon request
- E. The scaffold shall be inspected by a professional engineer at least once every 3 months to ensure that it is safe for use, or to inform the contractor immediately of any defects, which should be rectified immediately

10.25 Ties for metal scaffolds

- A. Every alternate lift and every uppermost lift of an independent tied metal scaffold in a workplace shall be effectively tied to the building or structure by means of ties.
- B. Ties shall be located no further than one bay from the ends of the independent tied metal scaffold and thereafter, at intermediate spacing of not more than 3 bays or 7.5 metres apart, whichever is the lesser.
- C. Ties other than tie tubes and couplers shall not be used
- D. Every tie under this specification shall conform with the following:
 - a. tie tubes shall be attached by right angle couplers to the outside ledger or standard or, in the case of an independent scaffold, to both the inside and outside standards as close as possible to the junction of the standards and ledgers; and

- b. the ends of the tie tubes shall be attached to the building or structure by one of the following methods:
 - i. the tie tubes shall form part of a yoke constructed of tubes and couplers which passes around and bears hard against the sides of a column, pier, beam or similar structural members;
 - ii. each tie tube shall pass through the wall and be secured with 2 pieces of tube of minimum length of 300 millimetres and shall be attached one on each side of, and bear hard against, the wall;
 - iii. each tie tube shall be attached to a reveal tie not greater than 1.5 metres in length but reveal ties shall not be used where a horizontal diagonal plan bracing is used; or
 - iv. each tie tube shall pass through ring bolts which shall be secured by casting in or being anchored in the wall.
- E. Every tie tube shall be perpendicular to the longitudinal plane of the scaffold and, where this is not practicable, the deviation from the perpendicular shall not exceed 15°.
- F. Every tie shall be capable of withstanding a force of 1,000 kgf applied in either direction along the length of the tie.

10.26 Transoms for modular or tube-and-coupler scaffold

- A. Every modular scaffold or tube-and-coupler scaffold in a workplace shall be provided with transverse horizontal members or transoms for each lift.

10.27 Spigots, jointpins or sleeves

- A. Spigots, jointpins or sleeves shall be used to connect one standard of a metal scaffold in a workplace to another standard, which shall permit full bearing over the whole bearing area at the ends of standards, and have such external or internal dimensions that the maximum difference of mating diameters in any part between the spigot, jointpin or sleeve and the other standard does not exceed 1.6 millimetres.
- B. Spigots and jointpins shall engage in the ends of the standards by at least 70 millimetres.
- C. Sleeves shall cover the end of the standard by at least 70 millimetres.
- D. The standards shall be securely held if they are connected by the spigots, jointpins or sleeves.

10.28 Adjustable base plates

- A. Where an adjustable base plate is used on a standard of a metal scaffold in a workplace and the adjustment exceeds 150 millimetres, the standard shall be tied longitudinally to the adjacent standard or standards at a height of not more than 460 millimetres above the supporting surface by right angle or swivel couplers.

10.29 Frame or modular scaffolds to be erected in one plane

- A. It shall be the duty of the responsible person to ensure that every frame or modular scaffold in a workplace is erected such that every lift is horizontal and in one plane.

10.30 Cross brace not to be used as means of access or egress

- A. No cross brace on the frame scaffold shall be used as a means of access or egress by the person.

10.31 Materials for timber scaffolds

- A. Timber used for any scaffold in a workplace —

- a. shall be of a suitable quality;
 - b. shall be in good condition;
 - c. shall have the bark completely stripped off; and
 - d. shall not be painted or treated in any way such that defects in the wood cannot be seen easily.
- B. Timber used for any scaffold in a workplace shall comprise —
- a. Bintangor rollers; or
 - b. any other species of timber rollers which are of similar strength, durability and resilience as Bintangor rollers and which are approved in writing in advance by the client
- C. Every standard of a timber scaffold in a workplace shall have a diameter of at least 50 millimetres throughout its length.
- D. Every timber roller used as a ledger or horizontal bracing, transom or putlog in a scaffold in a workplace shall have a diameter of at least 38 millimetres at the tip.
- E. The members or components of a timber scaffold in a workplace shall be lashed using rattan strips or other material of similar strength, durability and resilience
- F. The lashing shall be done with strips not less than 1.8 metres in length with a minimum of 6 turns per strip.

10.32 Construction of timber scaffolds

- A. Every timber scaffold in a workplace shall not exceed 15 metres in height.
- B. No timber scaffold with a single row of standards shall be erected in a workplace.
- C. Every timber scaffold in a workplace shall be secured tied and braced at the corners, and rigidly anchored to the building or other structure at regular close intervals.
- D. Transverse and longitudinal braces of a timber scaffold in a workplace shall be securely placed and lashed to the standards.

10.33 Ties for timber scaffolds

- A. A timber scaffold in a workplace shall be tied to a building or other structure by horizontal ties, which shall be secured at a right angle to another pole which shall be fixed firmly inside the building or structure.
- B. Ties made up of wires shall not be used.

10.34 Duration of use of timber scaffolds

- A. Timber scaffolds shall be dismantled within a period of 9 months after its erection.

10.35 Other Scaffolds

- A. If the contractor intends to use other types of scaffolds (including suspended scaffolds, tower scaffolds, scaffolds and work platforms erected on cantilever or jib supports, hanging scaffolds, and trestle scaffolds), the requirements for safety and health must be agreed in advance with the client

11.0 DEMOLITION

11.1 Preparation of demolition work

- A. Before commencing any demolition work:
 - a. all glass and cladding on the exterior of the building shall be removed
 - b. all gas, water, steam, electric and any other supply lines shall be shut off and capped
 - c. all hazardous materials shall be removed by competent persons

- B. Where it is necessary to maintain any supply lines during demolition, such lines shall be re-located or protected so as to afford safety to every person

11.2 Protection of adjacent structures

- A. Before demolition of a structure, the stability of all adjacent elements shall be determined, and supported by shoring or other means as appropriate

11.3 Removal of load bearing structures

- A. Demolition of any load bearing structure shall be done with due regard for the integrity of the remaining structure, and in accordance with the method statement prepared by a professional engineer

11.4 Demolition of walls, partitions etc.

- A. Demolition of walls and partitions shall be done in a systematic manner and all work above each tier of floor beams shall be completed before the safety of its supports is impaired
- B. Masonry shall neither be loosened or permitted to fall in such masses as to endanger the structural stability of any floor or structural support
- C. No wall, chimney or other part of structure shall be left in such a condition that it may fall inadvertently or weakened by external forces
- D. Where demolition is to take place with the use of hand-tools:
 - a. safe footing in the form of sound flooring or scaffolds shall be provided for persons working on an exterior wall, and
 - b. walls or partitions shall not be left standing more than one storey above the uppermost floor on which persons are working

11.5 Access to floor

- A. There shall be provided at all times safe access to and egress from the building, which shall be protected as to safeguard the persons using them from falling material

11.6 Barricades, catch platforms and warning signs

- A. A barricade with signs to warn persons of unauthorized entry shall be erected along every thoroughfare bordering the demolition operations
- B. During the demolition of an exterior masonry wall or roof, catch platforms shall be provided except where an exterior built-up scaffold provides equivalent protection

11.7 Mechanical method of demolition

- A. Where a swinging weight is used in demolition operations in a worksite, the remaining portion of building shall not exceed 24 metres in height, and a zone of demolition of radius 1.5 times the height or structure being demolished shall be maintained.
- B. Where a clamshell bucket is being used, a zone of demolition shall be maintained within 8 metres of the line of travel of the bucket

- C. Where other mechanical contrivances are being used, there shall be maintained an adequate zone of demolition to ensure the safety of the person
- D. No person other than any person essential to the demolition work shall be permitted to enter the zone of demolition, which shall be provided with substantial barricades

12.0 EXCAVATION

12.1 General requirements on excavation work

- A. Where the depth of any excavation in a worksite exceeds 1.5 metres, or where banks are undercut, adequate shoring shall be provided to prevent collapse
- B. No shoring shall be required under Paragraph A if the excavation has been examined and certified by a professional engineer to be safe
- C. Where the depth of any excavation in a worksite exceeds 4 metres, adequate shoring must be installed in accordance with the design of a professional engineer
- D. Where the depth of excavation exceeds 4 metres, no work (other than excavation or shoring operations) shall be carried out inside until a certificate has been issued stating the shoring is safe for its intended use
- E. During excavation work, all reasonably practicable measures shall be taken:
 - a. to prevent any person being trapped by the collapse of the excavation
 - b. to prevent any person being struck by an object, such as an excavating machine or dislodged material
 - c. to prevent any person falling into the excavation
 - d. to prevent any person inhaling, or otherwise being exposed to, carbon monoxide or another impurity in the air
- F. Excavated material shall be placed adequately far away from the edge of excavation so as to prevent the material falling in the excavation or cause collapse by surcharging
- G. The open side of any excavation which exceeds 2 metres in depth shall be provided with adequate guard-rails to prevent persons from falling into the excavation
- H. Notices shall be put up as appropriate to warn persons about the excavation
- I. The excavation shall be inspected by a designated person after every rainstorm or other hazard-increasing occurrence, and where revealed that the excavation is unsafe, the designated person shall immediately report the condition to the project manager
- J. Upon being informed, the project manager may order that all works cease immediately and revoke any permit-to-work issued for such work

12.2 Duties of professional engineers on excavation

- A. Where shoring is designed by a professional engineer, all reasonably practicable measures shall be taken to ensure that the design can be executed safely in construction and use, that all necessary design documentation is provided to relevant persons, and that nearby structures are safe.
- B. The professional engineer who designs the shoring (or another professional engineer appointed by the contractor) shall take all reasonably practicable measures to ensure that it is constructed in accordance with the drawings and issue a certificate stating that it is safe for its intended use after a satisfactory inspection

12.3 Access and egress from excavation

- A. Safe access to and egress from the excavation shall be provided in sufficient numbers and such locations as to be readily accessible

12.4 Plant and ancillary equipment

- A. All plant and ancillary equipment necessary for work in any excavation shall be:
 - a. of appropriate design and construction
 - b. of sufficient capacity
 - c. safe and without risks to health
 - d. adequately maintained

13.0 PILING

13.1 Stability of adjacent structures

- A. Before carrying out piling work which may affect the stability of a nearby structure, the structure must be adequately support by shoring or other means in accordance with the design of a professional engineer and a certificate issued in accordance with Paragraph C.
- B. All reasonably practicable measures shall be taken by the professional engineer to ensure that the design can be executed safely in construction and use, that all necessary design documentation is provided to relevant persons, and that nearby structures are safe.
- C. The professional engineer who designs the shoring (or another professional engineer appointed by the contractor) shall take all reasonably practicable measures to ensure that it is constructed in accordance with the drawings and issue a certificate stating that it is safe for its intended use after a satisfactory inspection

13.2 Inspection

- A. All piling equipment shall be inspected daily by a designated person before the start of any piling work for the day and that every defect is corrected before the equipment is used

13.3 Pile driver not in use

- A. When a pile driver is not in use, the hammer must be choked or blocked in the leads or lowered to the ground

13.4 Pile testing

- A. Testing of piles shall be conducted under the direct supervision of a designated person
- B. Reasonably practicable measures shall be taken to warn persons not to approach the pile test area in a worksite
- C. No person shall be allowed to approach a pile test area in a worksite while the process of increasing or decreasing test loading is being carried out
- D. No person shall be allowed to approach a pile test area in a worksite while the process of increasing or decreasing test loading is not in progress unless under the specific instruction of the designated person

13.5 Footing

- A. Before placing or advancing a piling frame, the ground shall be inspected by a designated person and made firm and level by suitable means where necessary
- B. After placing or advancing a piling frame, an inspection and correction of the footing shall be carried out to ensure stability

14.0 CRANES AND LIFTING

14.1 Strength and stability

- A. All cranes and material handling machinery must be of good construction, sound material, adequate strength, free from patent defects, and properly maintained
- B. All cranes and material handling material must be positioned and operated as to be stable

14.2 Capacity chart

- A. Where the capacity of a crane is variable, a capacity chart must be provided that shall:
 - a. be posted and maintained in the crane which is clearly visible to the operator
 - b. set out the safe loads for various lengths of jib at various angles and radial distances
 - c. be prepared and certified by a competent person, unless it is furnished by the manufacturer of the crane
- B. Where outriggers are provided, the safe loads with and without the use of outriggers shall be specified

14.3 Thorough examination and inspection

- A. Any crane or material handling equipment that is put into service for the first time in the worksite must be thoroughly examined by a competent person

14.4 Handling of suspended loads

- A. Measures must be taken, as far as reasonably practicable, to ensure that a suspended load is not moved over any person
- B. Loads that have a tendency to swing or turn freely during hoisting shall be controlled by tag-lines

14.5 Prohibition on riding on loads

- A. No person shall ride the loads, buckets, skips, cars, slings or hooks of the machinery.

14.6 Cranes or machinery at rest

- A. No load shall be left suspended when the machinery is not in use

14.7 Operators of employee's lift

- A. No employee's lift shall be operated unless it is in the charge of a designated person, who controls the movement and opening of the gate
- B. The designated person shall not move the lift car unless he is satisfied that the load is prepared for movement and shall exercise all care and due diligence when operating the lift

15.0 WELFARE AND MISCELLANEOUS

15.1 Welfare Facilities

- A. The contractor must provide reasonable welfare facilities for all workers on site

15.2 Disclaimer

- A. This specification has been adapted from the Singapore WSH (Construction) Regulations 2007
- B. Compliance with this specification does not guarantee safety on site
- C. In requiring the contractor to adhere to this specification, the client in no way assumes liability for health and safety on the worksite. The health and safety of all persons on the worksite remains the full responsibility of the contractor.
- D. Only minimum acceptable standards are contained in this specification, and the contractor is free to exceed any of these standards as they so wish
- E. Where the contractor considers that certain aspects of this specification will increase risk of incident on the worksite, the contractor should notify the client immediately for discussion.
- F. Any contractor claims for delay caused by failure to comply with this specification will not be entertained.
- G. This specification should in no way at any time deviate from the laws, regulations and building codes of Myanmar

Appendix A:

Finning Regime for Contravening of Health & Safety Specification

Appendix A: Fining Regime for Contravening of Health & Safety Specification

Specification Item Number	Item Summary	Fine for failure to comply (first time) / USD	Fine for failure to comply (repeat offence) / USD
Safety and health management system			
2.1	Safety and health management system	1000	2000
2.2	Site coordination meeting	300	600
2.3	Appointment of Safety Officer	1000	2000
2.4, 2.5	Duties and Powers of Safety Officer	1000	2000
2.6	Safety and health training	300	600
Permit to work systems			
3.1, 3.3	Performing high-risk work without a permit-to-work	1000	2000
3.2, 3.4-3.10	Using incorrect procedures for permit-to-work system	500	1000
General Provisions			
4.1, 4.2	Stability of structures and supports	1000	2000
4.3	Provision of guard rails	500	1000
4.4	Work on roofs anchorage	500	1000
4.5	Storage of equipment	300	600
4.6	Protection against falling objects	1000	2000
4.7	Slip and trip hazards	300	600
4.8	Vehicular hazards	500	1000
4.9	Runway and Ramps	500	1000
4.10	Entryway to building	300	600
4.11	Safe means of access between levels	500	1000
4.12	Lighting	500	1000
4.13	Personal Protective Equipment (PPE)	1000	2000
Electrical Safety			
5.1	Electrical circuits general requirements	1000	2000
5.2	Electric wiring	500	1000
5.3	Bare wires and exposed live conductors	500	1000
5.4	Residual current circuit breakers and overcurrent protective devices	500	1000
5.5	Prohibition on use of fuse	500	1000
5.6	Welding sets protection	500	1000
5.7	Industrial plug and socket outlet	500	1000
5.8	Distribution board and socket-outlet assembly	500	1000
5.9	Electrical equipment used underground or in confined spaces at 110V	500	1000
Ladders			
6.1	Construction	300	600
6.2	Resting surface	300	600
6.3	Landing place	300	600
Material Platforms			
7.1	Platform design and construction	500	1000

7.2	Guard-rails and toe-boards	500	1000
7.3	Use of wire ropes	500	1000
7.4	Inspection	1000	2000
Disposal of Materials			
8.1	Accumulation of debris	300	600
8.2	Method of removal of debris	300	600
8.3	Floor openings for debris removal	500	1000
8.4, 8.5	Chutes and construction	300	600
8.6	Debris collection area	300	600
8.7	Design of chutes by professional engineer	300	600
Formwork Structures			
9.1	General requirements	500	1000
9.2	Supports and shores	500	1000
9.3	Appointment of formwork supervisor	1000	2000
9.4	Duties of formwork supervisor	1000	2000
9.5	Register	500	1000
9.6	Design and construction of formwork structure	1000	2000
9.7	Duties of professional engineer	1000	2000
9.8	Concrete work	500	1000
9.9	Dismantling	500	1000
9.10	Steel reinforcement	500	1000
9.11	Reshoring	500	1000
Scaffolding			
10.1-10.35	Any one scaffolding requirement	500	1000
Demolition			
11.1	Preparation of demolition work	500	1000
11.2	Protection of adjacent structures	1000	2000
11.3	Removal of load bearing structures	500	1000
11.4	Demolitions of walls, partitions etc	500	1000
11.5	Access to floor	500	1000
11.6	Barricades, catch platforms and warning signs	300	600
11.7	Mechanical methods of demolition	500	1000
Excavation			
12.1	General requirement on excavation work	1000	2000
12.2	Duties of professional engineers on excavations	1000	2000
12.3	Access to and from excavation	500	1000
12.4	Plant and ancillary equipment	500	1000
Piling			
13.1	Stability of adjacent structures	1000	2000
13.2	Inspection	1000	2000
13.3	Pile driver not in use	500	1000
13.4	Pile testing	500	1000
13.5	Footing	500	1000
Cranes and lifting			
14.1	Strength and stability	500	1000
14.2	Capacity chart	500	1000
14.3	Thorough examination and inspection	1000	2000
14.4	Handling of suspended loads	1000	2000
14.5	Prohibition on riding on loads	500	1000
14.6	Cranes or machinery at rest	500	1000
14.7	Operators of employee's lift	500	1000
Welfare and Miscellaneous			
15.1	Welfare facilities	500	1000

Annex 6 Stormwater Drainage

SITE DRAINAGE PLAN DURING EARTHWORK

Overview of Plan:

Scope of work for this Site Drainage System is to discharge the surface run off water in rainy season from the subjected excavated work area in order to maintain the continuous earth work and any foundation related work between excavated level to L1 floor slab level.

Above work also includes the quality water monitoring from subjected soil erosion area. The major factor of water monitoring is to control and remove total suspended solids(TTS) with meeting requirement of 50mg/l.

Sedimentation system consists of three stage:

- 1) Sand layer of 400mm layer on ground and/or excavated soil surface and Sand drainage system to minimize the water from soil erosion area.
- 2) Vertical Drainage pit with tube well of depth=6m as water-catchment pit and sedimentation pit.
- 3) Metal sedimentation tank with water treatment plant(s) capacity of 10m³/hr. at minimum to meet TTS ≤ 50mg/l. (Near discharge point at north edge of this project site)

Site Drainage System consists of mainly two phases.

Phase 1 drainage stage is preparation period prior to excavation and during rainy season.

Phase 2 is for during excavation and foundation work till L1 floor slab completion.

Phase 1 Before Excavation:

Concrete gutter ϕ 900mm with slope 1/1000 will be provided around the site parameters except in-suite underground city drain area and south of D-wall area.

Sand thickness of 400 mm will be placed on existing working ground level to maintain the water-free of working area and to minimize the 'soil' contaminated surface run-off water to flow into Concrete Gutter.

Deep well/tube were not considered at this phase of construction work.

Phase 2 During Excavation and Foundation work till L1 floor slab completion:

During this stage of the work is the most critical point in term of run-off water control. Excavation work is expected to be carried out in rainy season and size of gutter and water flow rate were studied based on this phase of work.

Monthly rain fall record in millimeters was taken into account and average discharge flow rate was estimated to be 10m³/hrs. from the working site area in rainy season.

As excavation work in progress, sand drain trench (W)1.0m x (D)1.0m, vertical drainage pit (2.0m x 2.0m) and swamp pit (1.0m x 1.0m) will be provided to catches the surface run-off water before pump up to Concrete gutter using submersible pump.

Total of 13 numbers of Vertical drainage pit consists of (L)2.0m x (W)2.0m x (D)1.5m pit with Dia. 800mm and depth 6.0m of Tube-well will be provided to for the purpose of maximizing the surface run-off water catchment in a place and helping soil particle to settle down by sand drain/layer (working as sand filter) before pumping to concrete gutter.

At excavated level, 400 m thickness of sand will be also placed to maintain the water-free working area and to minimize the 'soil' contaminated surface run-off water to flow into Concrete Gutter. This sand layer also served as working platform for B1 reinforced concrete work and B1 level concrete slab will be casted directly on this and layer. Before discharging into the drainage system at north point as, the run-off water from subjected excavated work area collected in Concrete gutter system will be treated as necessary at discharge point from the site for quality monitor purpose.

REFERENCE DOCUMENT

1) STORM WATER DISCHARGE In EXCAVATION WORK AREA

STUDY OF PEEK RAIN FALL FOR SITE

1) FROM Rain fall (mm/mth) from DMH weather report 2014

	JUL		AUG	
2010	367	254.2	467	130 mm/mth
2011	574	47.2	615	-18 mm/mth
2012	717	-95.8	864	-267 mm/mth
2013	630	-8.8	464	133 mm/mth
2014	818	-196.8	575	22 mm/mth
mean	621.2		597	mm/mth
Variance	22,981		21,337	
Standard Deviation	152		146	

Upper limit	773.2	743 mm/mth
Lower limit	469.2	451 mm/mth

Therefore, rainfall in heavy rainy season per month = 760 mm/mth

Rainy days were 27 days in July and 24 days in August from DMH records therefore, mean value was taken and rainy days were assumed to be 26 days per month

Rainfall mm/day = $\frac{760 \text{ mm/mth}}{26 \text{ day}} = 29.2 \text{ mm/day}$

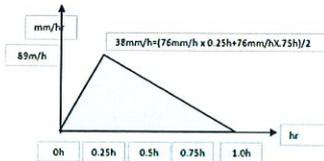
2) Reference as NPER Rain fall (mm/mth)

Suggested rainfall 89 mm/hr=3"/hr

Considering the rainfall pattern in one hour, average the intensity of rainfall per hour per 15 minutes cycle (Refer to the graph right)

Rate = $89.0 \times 0.25 + 0.75 \times 0.5 = 44.5 \text{ mm/hr}$

From 1) and 2), rainfall intensity per hour and daily maximum to be 44.5 mm/hr < 400 mm of sand layer



3) Volume of Surface Water

Surface Water Runoff Coefficient

For Surface run-off water, Total rainfall of 10% to 30% (factor 0.1-0.3) to be considered to be surface runoff for soil exposed area.

(Factor from Japanese Sewage Association)

Run-off factor 30% x 44.5 = 13.4 mm/hr < 400 mm of sand layer

Therefore we consider water height of 11mm stayed on excavated surfaces area which is less than sand layer of 400mm per daily basis

5) Amount of water to be caught in Sand layer

Area 1 (Zone 1, 2 & 3+ Part of Tank area)	9,768 m ²	13.4 mm/h	=	130 m ³ /h
Area 2 (Zone 7 & Part of Tank area)	9,199 m ²	13.4 mm/h	=	123 m ³ /h
Area 3 (Zone 5&6)	4,062 m ²	13.4 mm/h	=	54 m ³ /h
Area 4 (PYN) unpaved area	7,811 m ²	13.4 mm/h	=	104 m ³ /h
Total				412 m³/h
Total surface water	412	6.5 (from reference)	=	405 m ³ /h

Water Volume in SAND layer $6,746 \text{ m}^3 \times 0.36 \text{ Porosity} = 2,428 \text{ m}^3 > 405 \text{ m}^3/\text{h}$
6 Safe Factor OK



6) YCDC Drainage Discharge Capacity 2-Dia. 300mm pipes

2-Dia 300mm Pipes- MANNING'S FORMULA as indicated on the attachment

$Q = 1.49 \times A \times R^{2/3} \times S^{1/2}$

Where:

n=	0.015							
A=	3.14	x	0.15	x	0.15	0.75	=	0.053 m ²
P=	πD	=	3.14 x	0.3	0.75	=	0.707 m	
R=	A/P	=					0.075	
S=	1/300	(Slope of ditch)						

Substitute all these values into MANNING'S FORMULAS

$Q = 1.49 \times 0.015 \times 0.057 \times (0.075)^{2/3} \times (1/300)^{1/2} = 0.037 \text{ m}^3/\text{s}$
2-Dia 300 pipes = 0.074 m³/s = 266 m³/h < 405 m³/h NG

Therefore it is recommended not to pump out all surface water from excavated area to YCDC drain in one time to avoid over-flow.

So, let assume 10% water capacity is assigned for Yoma C project at North Discharge Point

Out of this capacity, 50% from water treatment 27 m³/h
50% for rainfall surface run-off water around this area

To minimize the over flow of YCDC Drain system and to minimize the excess run-off water in excavated area, Capacity of 10.0 m³/h has been proposed.

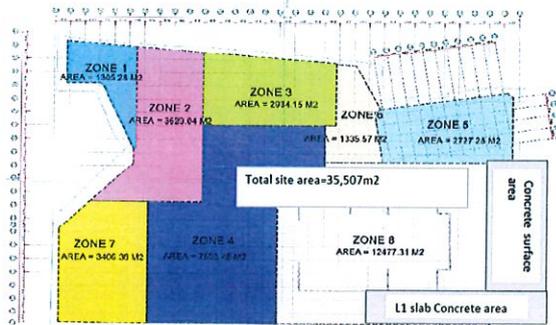


Table 3.1

Intensity - Duration - Frequency Relationship For Yangon Project Area

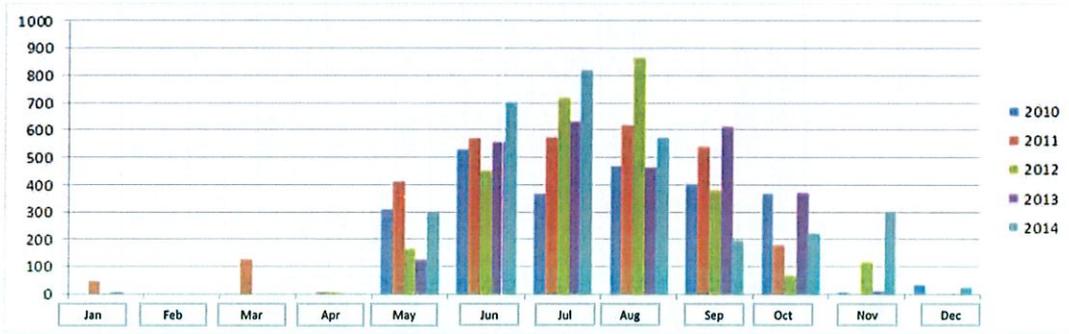
Duration	Rainfall (mm)										Rainfall Intensity (mm/hr)									
	2-Year	5-Year	10-Year	20-Year	50-Year	100-Yr	500-Yr	1000-Yr	2-Year	5-Year	10-Year	20-Year	50-Year	100-Yr	500-Yr	1000-Yr				
Minutes																				
5	15.70	22.12	26.98	31.84	38.26	43.12	54.40	59.25	188.39	265.45	323.75	382.04	459.11	517.40	652.76	711.06				
10	23.55	33.18	40.47	47.76	57.39	64.68	81.60	88.88	141.29	199.09	242.81	286.53	344.33	388.05	489.57	533.29				
15	29.83	42.03	51.26	60.49	72.69	81.92	103.35	112.58	119.31	163.12	205.04	241.96	290.77	327.69	413.42	450.34				
20	33.67	47.44	57.85	68.27	82.04	92.46	116.65	127.07	101.00	142.31	173.56	204.82	246.13	277.38	349.95	381.21				
25	37.50	52.84	64.45	76.05	91.40	103.00	129.95	141.55	90.01	125.83	154.68	182.53	219.35	247.20	311.87	339.73				
30	41.34	58.25	71.04	83.84	100.75	113.54	143.24	156.04	82.68	116.50	142.09	167.67	201.50	227.08	286.49	312.08				
60	52.33	73.74	89.93	106.12	127.53	143.72	181.32	197.52	52.33	73.74	89.93	106.12	127.53	143.72	181.32	197.52				
90	57.60	81.17	98.99	116.82	140.38	158.21	199.60	217.42	38.40	54.11	65.99	77.88	93.59	105.47	133.06	144.95				
120	62.88	88.60	108.05	127.51	153.23	172.69	217.87	237.33	31.44	44.30	54.03	63.76	76.62	86.34	108.93	118.66				
180	68.15	96.03	117.12	138.21	166.08	187.17	236.14	257.23	22.72	32.01	39.04	46.07	55.36	62.39	78.71	85.74				
360	81.54	114.89	140.12	165.35	198.71	223.94	282.53	307.76	13.59	19.15	23.35	27.56	33.12	37.32	47.09	51.29				
540	90.87	128.04	156.16	184.27	221.45	249.56	314.85	342.97	10.10	14.23	17.35	20.47	24.61	27.73	34.98	38.11				
720	98.57	138.90	169.40	199.91	240.23	270.73	341.56	372.06	8.21	11.57	14.12	16.66	20.02	22.56	28.46	31.01				
1080	109.53	154.33	188.22	222.12	266.92	300.81	379.51	413.41	6.08	8.57	10.46	12.34	14.83	16.71	21.08	22.97				
1440	121.70	171.48	209.14	246.80	296.58	334.24	421.68	459.34	5.07	7.14	8.71	10.28	12.36	13.93	17.57	19.14				
4320	186.17	253.39	303.66	353.55	419.19	468.68	586.14	633.89	2.59	3.52	4.22	4.91	5.82	6.51	8.14	8.80				
7200	241.59	315.58	369.78	423.03	493.19	544.64	678.91	734.94	2.01	2.63	3.08	3.53	4.11	4.54	5.66	6.12				

Rainfall per Month (2010-2014)

月別降水量 (2010年～2014年)

													Unit (mm)	
Year	Jan	Feb	Ma	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Rain	
2010	0	0	0	0	308	529	367	467	402	367	7	33	2480	
2011	48	0	127	5	412	567	574	615	538	178	0	0	3064	
2012	0	0	0	8	167	450	717	864	379	69	115	2	2771	
2013	6	0	0	0	125	556	630	464	612	371	13	3	2780	
2014	0	0	0	0	295	701	818	575	197	224	300	26	3136	

出典：JICA 調査団



出典：JICA 調査団

☒ 3.1.4.

Rainfall Graph per Month (2010-2014)

5) 降水量 Rainfall Data (2014)

降水量は毎日 6:00 に計測され、観測した日の 6:00 から 24 時間後の 6:00 までの累積雨量を日雨量として観測している。収集したデータを調査団が取り纏めた。その結果を、次表に示す。

表 3.1.7. 降水量データ (2014 年)

Station : KABA-AYE Year : 2014

Daily Rainfall (mm)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0	0	0	0	0	3	21	55	8	0	0	0
2	0	0	0	0	0	0	17	7	3	25	0	0
3	0	0	0	0	0	0	26	14	45	68	29	0
4	0	0	0	0	0	30	24	47	16	20	2	0
5	0	0	0	Trace	0	45	8	39	0	0	68	0
6	0	0	0	0	0	0	9	36	3	2	154	0
7	0	0	0	0	Trace	14	Trace	26	9	0	47	0
8	0	0	0	0	0	2	7	1	17	0	0	0
9	0	0	0	0	15	8	45	13	0	Trace	0	0
10	0	0	0	0	19	16	10	58	4	17	0	0
11	0	0	0	0	0	49	23	23	Trace	1	0	26
12	0	0	0	0	16	162	31	Trace	0	Trace	Trace	0
13	0	0	0	0	0	7	23	Trace	25	3	0	0
14	0	0	0	0	0	2	43	0	1	0	0	0
15	0	0	0	0	6	5	10	17	17	0	Trace	0
16	0	0	0	0	0	7	23	41	5	0	0	0
17	0	0	0	Trace	0	18	0	1	1	0	Trace	0
18	0	0	0	0	0	16	27	0	0	0	0	0
19	0	0	0	0	101	5	14	9	14	0	0	0
20	0	0	0	0	8	5	127	Trace	0	17	0	0
21	0	0	0	0	22	17	75	21	0	0	0	0
22	0	0	0	0	35	58	36	29	Trace	Trace	0	0
23	0	0	0	0	10	57	Trace	33	0	21	0	0
24	0	0	0	0	62	81	5	2	2	0	0	0
25	0	0	0	0	0	38	43	Trace	5	0	0	0
26	0	0	0	0	0	2	38	3	5	18	0	0
27	0	0	0	0	0	10	39	Trace	6	5	0	0
28	0	0	0	0	0	42	17	30	0	1	0	0
29	0		0	0	0	2	Trace	34	0	21	0	0
30	0		0	0	1	Trace	53	30	11	0	0	0
31	0		0		0		24	6		5		0

"Trace" The amount of rainfall which cannot be measured.

Ei Ei Zin
Head Officer
Department of Meteorology & Hydrology

出典：ミャンマー国気象庁、JICA 調査団

過去 5 年の総雨量を整理した結果、ヤンゴン市内の年平均降水量は約 2,800mm であり、日本の年平均降水量 1,800mm の約 1.5 倍であった。

また、2010 年～2014 年の年間降水量を月別グラフに整理した（次図参照）。ヤンゴンは雨季と乾季が明瞭な熱帯モンスーン気候であることがわかる。



Project : Land Mark Project

No.	Test Parameter	Output water acceptable	On site test (Input water)	Input water value max with Yimei system (To follow Output water acceptable)	Compliance
1.	Total Suspended Solids	< 50 (mg/l)	98 (mg/l)	500 (mg/l)	98 < 500 OK
2.	Biochemical Oxygen Demand	30 (mg/l)	10 (mg/l)	40 (mg/l)	10 < 40 OK
3.	Chemical Oxygen Demand	125 (mg/l)	64 (mg/l)	150 (mg/l)	64 < 150 OK
4.	Total Coliform Bacteria	400 (MPN/100ml)	23 (MPN/100ml)	No effect on Coliform Bacteria but value under limits	23 < 400 OK
5.	Oil & Grease	10 (mg/l)	3.1 (mg/l)	12 (mg/l)	3.1 < 12 OK
6.	PH	6-9	7.5	8-9	6 < 7.5 < 9 OK
7.	Total Nitrogen	10 (mg/l)	1 (mg/l)	No effect on Nitrogen but values under limits	1 < 10 OK
8.	Total Phosphorus	2 (mg/l)	0.2 (mg/l)	8 (mg/l)	0.2 < 8 OK

On site tests from DOWA and ISO attached.



GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel:01-2309051/ 09 796935149

Report No. : GEM-LAB-201710117

Revision No. : 1

Report Date : 25 October, 2017

Application No. : 0045-C001

Analysis Report

Client Name : BYMA
Address : FMI Centre, Bogyoke Aung San Road, Yangon.
Project Name : LANDMARK PROJECT

Sample Description

Sample Name : BYMA Sedimentation Tank Discharge Sampling Date : 14 October, 2017
Sample No. : W-1710085 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 17 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	23	1.8
2	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.0	0.0
3	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.2	0.050
4	Oil and Grease	APHA 5220 B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1

Remark : LOQ - Limit of Quantitation

APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

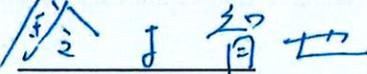
Analysed By :



Ni Ni Aye Lwin
Assistant supervisor



Approved By :



Tomoya Suzuki
Director



LABORATORY



Laboratory Technical Consultant: U Saw Christopher Maung
B.Sc Engg: (Civil), Dip S.E (Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001.
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

WTL-RE-002

Issue Date - 01-12-2012
Effective Date - 01-12-2012
Issue No - 1.0/Page 1 of 1

WW1017 020

WASTEWATER QUALITY TEST RESULTS FORM

Client BYMA Co.,Ltd.

Nature of Water Surface Water Drainage

Location Land Mark Project - Sedimentation Tank Discharge (Near Site Office)

Date and Time of collection 14.10.2017 (10:20 AM)

Date and Time of arrival at Laboratory 17.10.2017

Date and Time of commencing examination 18.10.2017

Date and Time of completing 23.10.2017

Results of Wastewater Analysis

Parameters	Results	
pH	7.5	
Biochemical Oxygen Demand (BOD) (mg/l) (5 days at 20 °C)	10	
Chemical Oxygen Demand (COD) (mg/l)	64	
Dissolved Oxygen (DO) (mg/l)		
Total Solids (mg/l)		
Suspended Solids (mg/l)	98	
Dissolved Solids (mg/l)		
Nitrate (mg/l)		
Ammonia Nitrogen (NH ₃) (mg/l)		
Ammonium Nitrogen (NH ₄) (mg/l)		
Phosphate (mg/l)		

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature:

Name: Zaw Hein Oo
B.Sc (Chemistry)
Sr. Chemist
ISO TECH Laboratory

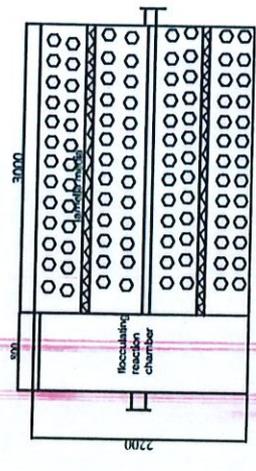
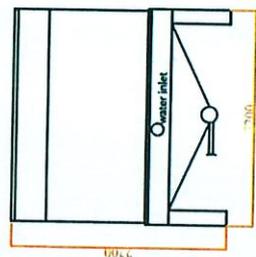
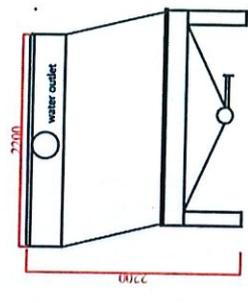
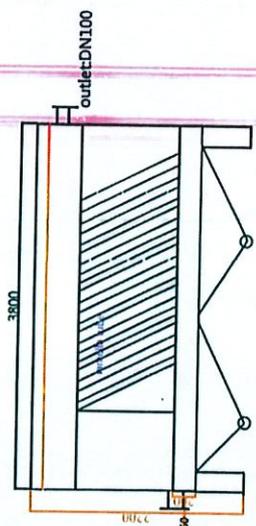
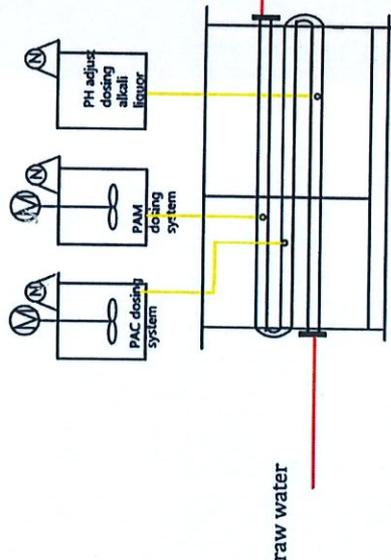
Approved by

Signature:

Name: Soe Thit
B.E (Civil) 1980,
Technical Officer
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.
Ph: 01-640955, 09-73225175, 09-73242162, Fax: 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com



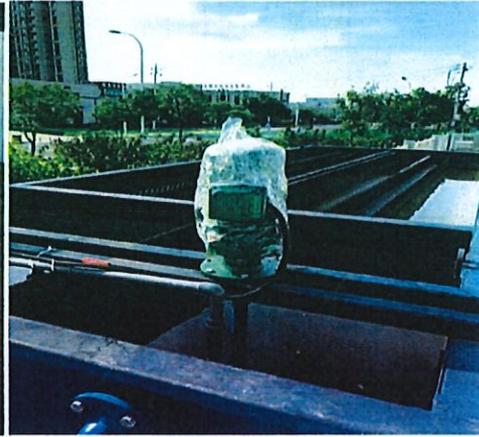
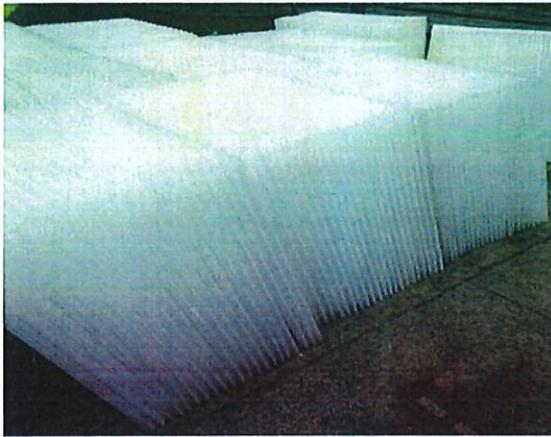
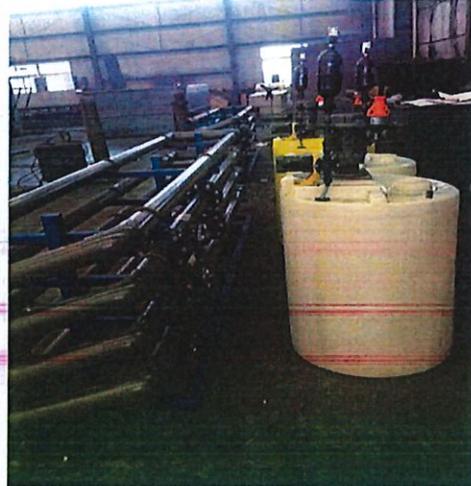
项目信息表

工程名称	项目地点	设计阶段	设计日期
设计单位	项目负责人	审核人	审批人
专业	姓名	职称	日期
设计			
校核			
审核			
审批			
制图			
绘图			
计算			
校对			
审核			
审批			
设计			
校核			
审核			
审批			
设计			
校核			
审核			
审批			
设计			
校核			
审核			
审批			

设计单位: 青岛伊泰环境工程有限公司
 QINGDAO YITAI ENVIRONMENTAL PROJECT CO., LTD



Qingdao YiMei Environment Project Co.,Ltd
Add: No.386,Hai Bin Five Road, Jiao Nan, Qingdao





Qingdao YiMei Environment Project Co.,Ltd
Add: No.386,Hai Bin Five Road, Jiao Nan, Qingdao

1) simple structure, without wearing parts, wear well, decrease maintenance

2) steady operation, easy operation

3) small power, save energy

4) small occupy area, low investment, high efficient

5) short retention time, high sediment efficiency, no sludge backflow.

3. Application scope

1) electroplate effluent contain many kinds of metal ion, cr, cu, Fe, Zn, Ni etc remove rate all above 90%, after treatment, all can reach discharge standard.

2) coal mine, mineral processing waste water all can make the turbidity from 500-1500 mg/L reduce to 5 mg/L.

3) printing and dyeing, bleach and dye etc effluent chroma removing rate reach 70~90%, COD remove rate 50-70%.

4) Tannery, food etc industrial sewage COD remove rate 50~80%, Impurity solids remove rate above 90%.

5) chemical waste water COD remove rate 60~70%, chroma removal rate 60~90%, suspended solids reach discharge standard.



Lamella clarifier

1. Introduction

The lamella clarifier also called inclined plate sediment tank,

It is kind of high efficient combined type settling tank; set many dense

inclined tube packing in sediment area, to make the suspended impurity

in water sediment, water rise flow along inclined tube, the separated

sludge down to the tank bottom along the inclined tube by gravity, then

discharge it in concentration. Such tank can improve sediment efficiency

50~60%, it can improve treatment capacity 3~5 times in the same area. It

can design different flow rate inclined plate sediment device according

to raw waste water test report, it need dose flocculant usually.

Inclined plate sediment water purifier is format by install 60° dip angle

inclined tube above the sludge suspended layer, to make the suspended

solids or floc alum flower by dosing flocculant accumulate into thin

sludge later in inclined tube downside superficial area, slide back to

sludge suspended layer rely on gravity, then settling in sludge collecting

hopper, discharge into sludge tank by sludge pipe for separate

treatment or comprehensive utilization. The supernatant fluid gradually

rise to water collecting pipe discharge or reuse.

2. Feature



Qingdao YiMei Environment Project Co.,Ltd
Add: No.386,Hai Bin Five Road, Jiao Nan, Qingdao

4.Technical data:

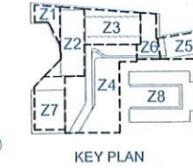
Specification	Treatment capacity M ³ /h	Inlet/outlet mm	Settling time min	Outer dimension mm
YMXG-10	10	DN50/100	40-60	3800x2200x2200

5.Structure introduction

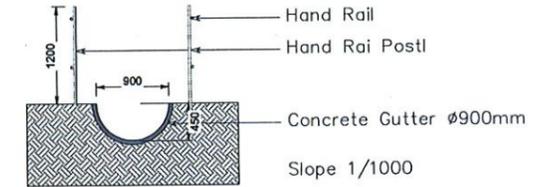
- 1) Inclined tube material: PVC,PE,PP,inclined plate: carbon steel lining
- 2)Inclined tube cross section is regular hexagon, inclined plate cross section can be parallel-plate.
- 3)The cleaning water area height is 1.0-1.5m above the inclined pipe top, the water distribution zone below the bottom no less than 1.0-1.5m, mechanical discharge sludge, the water distribution zone height should more than 1.6m, convenient install and maintenance.
- 4)The Re number in water flow less than 500,Fr number is 10⁻³—10⁻⁵ in inclined pipe.
- 5)Inclined tube design flow rate is 1.0-4.0mm/s, inclined plate 10-20mm/s.

SITE DRAINAGE LAYOUT - STAGE 1 : BEFORE EXCAVATION

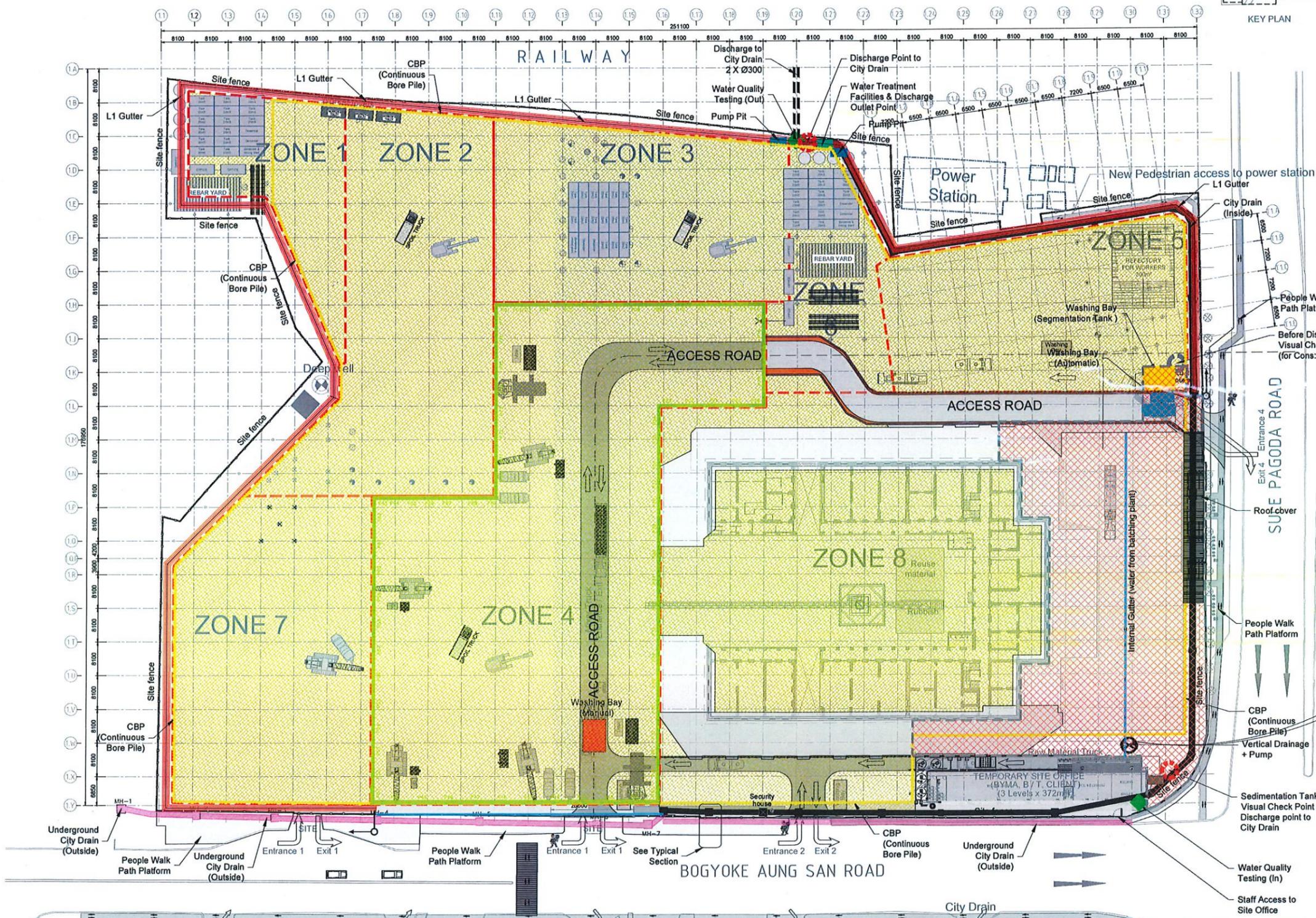
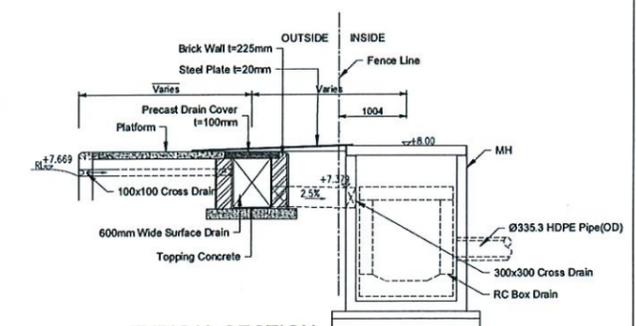
SCALE 1:1000 (A3)



L1 Gutter: Concrete Ø900mm + 100mm Sand Bed



L1 Sand Layer : 400mm of River Sand on all area (Exclude Batching Plant, PYN Retention Frame Slab Area)



LEGEND

- L1 Gutter with Handrail
- Internal Gutter
- Water Quality Testing (In & Out)
- Flow Direction L1 Gutter
- Washing Bay (Manual)
- City Drain (Underground Inside YCP)
- Vertical Drainage + Pump(1)
- Water Treatment Facility & Discharge Outlet Point
- City Drain (Underground Outside YCP)
- Pump Pit (2)
- Discharge Point to City Drain
- CBP
- D-Wall
- Washing Bay (For Concrete Truck)
- Washing Bay (Automatic)
- Batching Plant Area Sedimentation Tank

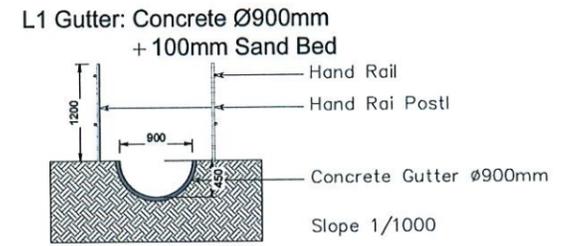
FOR APPROVAL

PROJECT CODE	CONTRACT CODE	DWG TYPE	BLDG / LOCATION	LEVEL	ZONE	COMPANY NAME	DISC	NUMBER	REV	SHEET NO.
YCP	MWL	MD	GENGEL	ALL	ALL	BTJCO	0029	A	02/4	

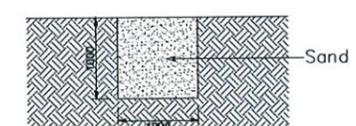
E:\Back Up\2018\Drainage Outside YCP\YCP-MWL-MD-GEN-GEL-ALL-BTJCO-0029-A Site Drainage Layout.dwg

SITE DRAINAGE LAYOUT - STAGE2 : Excavation From L1 to B1 Foundation (Berme Excluded)

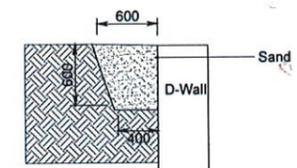
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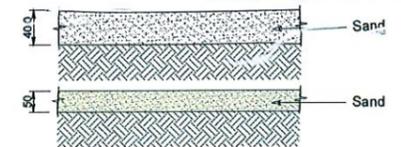
B1 Sand Drain: Trench 1m x 1m Fill with Sand



B1 Tank Sand Drain:



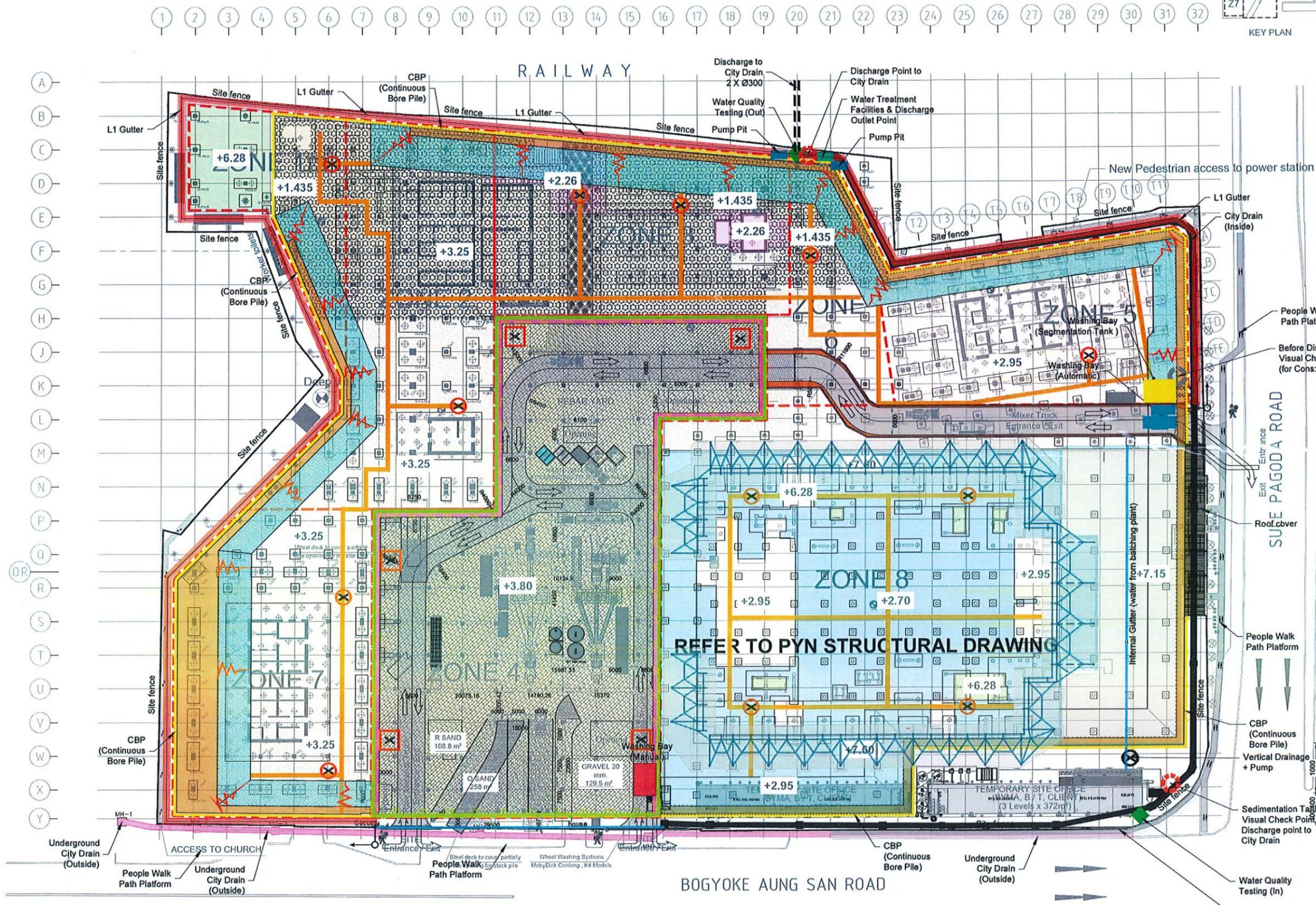
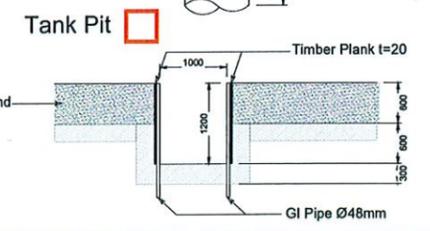
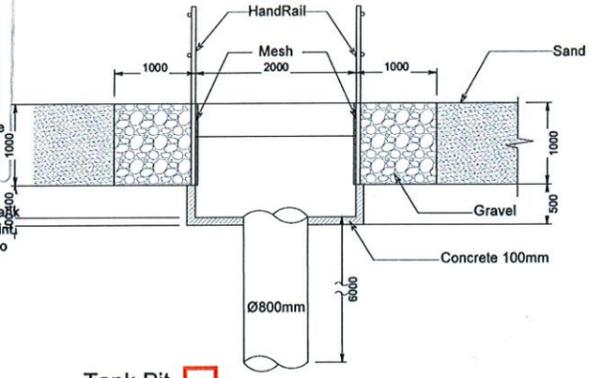
L1 Sand Layer: 400mm of River Sand on all area (Exclude Batching Plant, PYN Wall Retaining Slab, T2 Area & T3 Area)



B1 Sand Layer: 400mm of River Sand on all area (Exclude Zone 4, Batching Plant, Foundation & Berme)



Vertical Drainage (Dimensions Can Varies)



LEGEND

- L1 Gutter with Handrail
- Internal Gutter
- Vertical Drainage + 4" Pump (13)
- Water Quality Testing (In & Out)
- Sheet pile
- Washing Bay (Automatic)
- Washing Bay (Manual)
- Water Treatment Facility & Discharge Outlet Point
- B1 Sand Drain
- City Drain (Underground Inside YCP)
- Tank Pit + 4" Pump (5)
- Pump Pit (2)
- D-Wall
- Batching Plant Area Sedimentation Tank
- B1 Tank Sand Drain
- City Drain (Underground Outside YCP)
- CBP (Continuous Bore Pile)
- Flow Direction L1 Gutter
- Washing Bay (For Concrete Truck)
- Discharge Point to City Drain
- Slope
- Berme

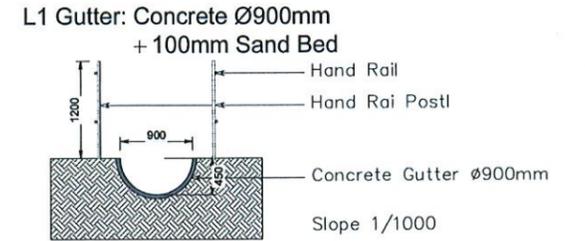
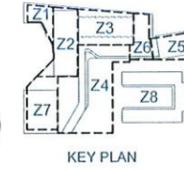
FOR APPROVAL

PROJECT CODE	CONTRACT CODE	DWG TYPE	BLDG / LOCATION	LEVEL	ZONE	COMPANY NAME	DISC	NUMBER	REV	SHEET NO.
YCP	MWL	MD	GENGEL	ALL	ALL	BTJCO	0029	A		03/4

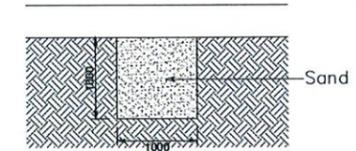
E:\Back Up\2018\Drainage Outside YCP\YCP-MWL-MD-GENGEL-ALL-BTJCO-0029-A Site Drainage Layout.dwg

SITE DRAINAGE LAYOUT - STAGE3 : At The End of Excavation (After Berme Removal)

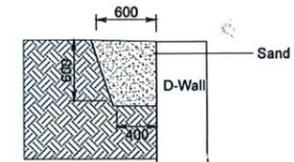
SCALE 1:1000 (A3)



B1 Sand Drain: Trench 1m x 1m Fill with Sand



B1 Tank Sand Drain:



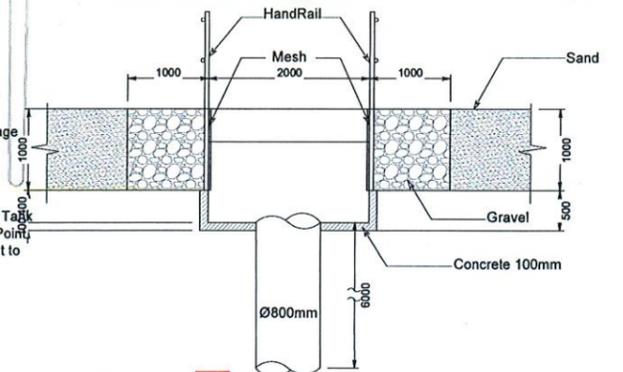
L1 Sand Layer: 400mm of River Sand on all area (Exclude Batching Plant, PYN Wall Retaining Slab, T2 Area & T3 Area)



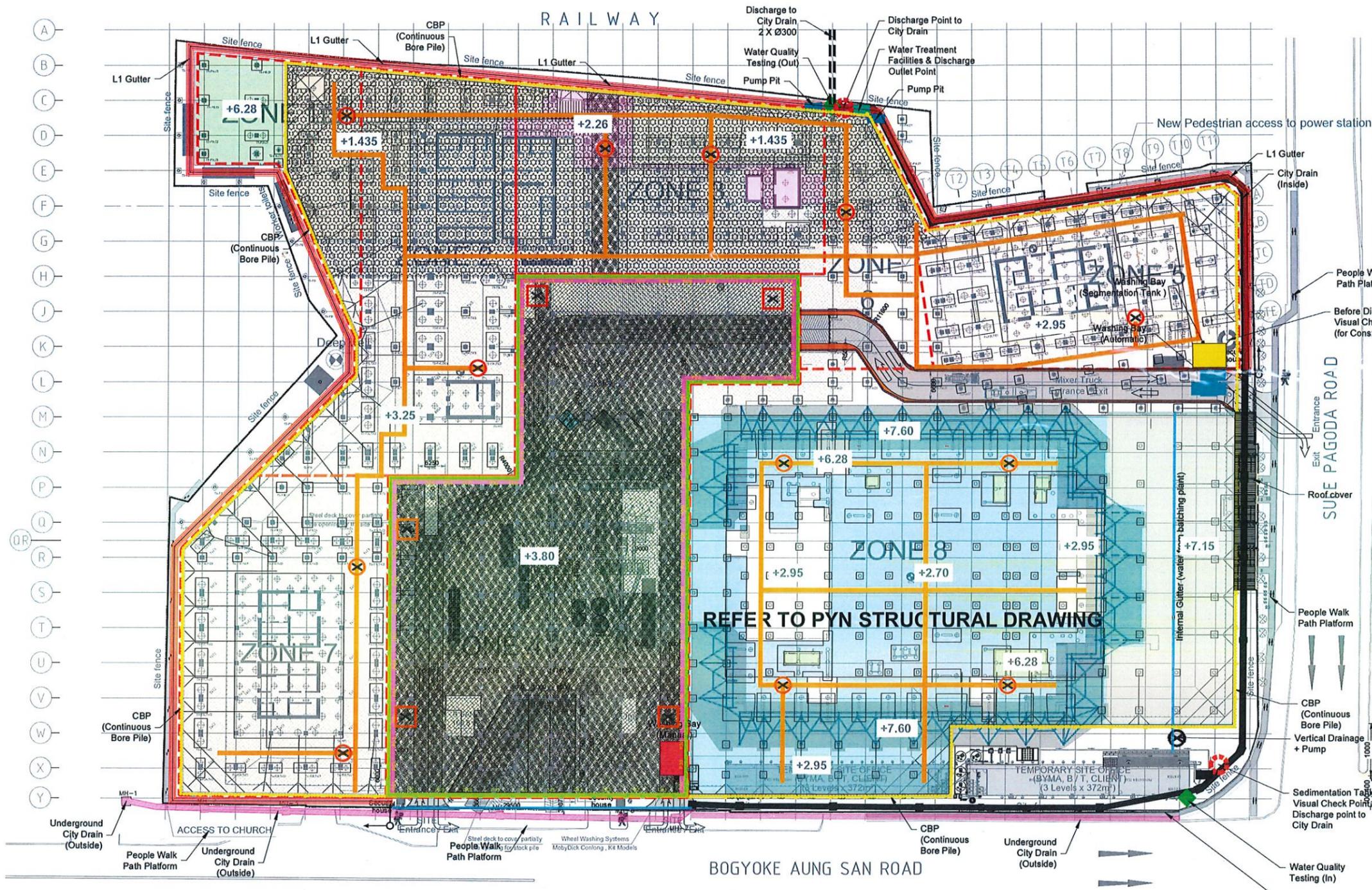
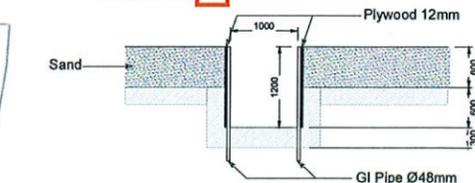
B1 Sand Layer: 400mm of River Sand on all area (Exclude Zone 4, Batching Plant, Foundation & Berme)



Vertical Drainage (Dimensions Can Varies)



Tank Pit



FOR APPROVAL

PROJECT CODE	CONTRACT CODE	DWG TYPE	BLDG / LOCATION	LEVEL	ZONE	COMPANY NAME	DISC	NUMBER	REV	SHEET NO.
YCP	MWL	MD	GENGEL	ALL	ALL	BTJCO	00	029	A	04 / 4

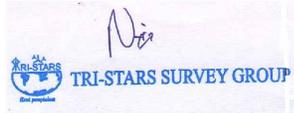
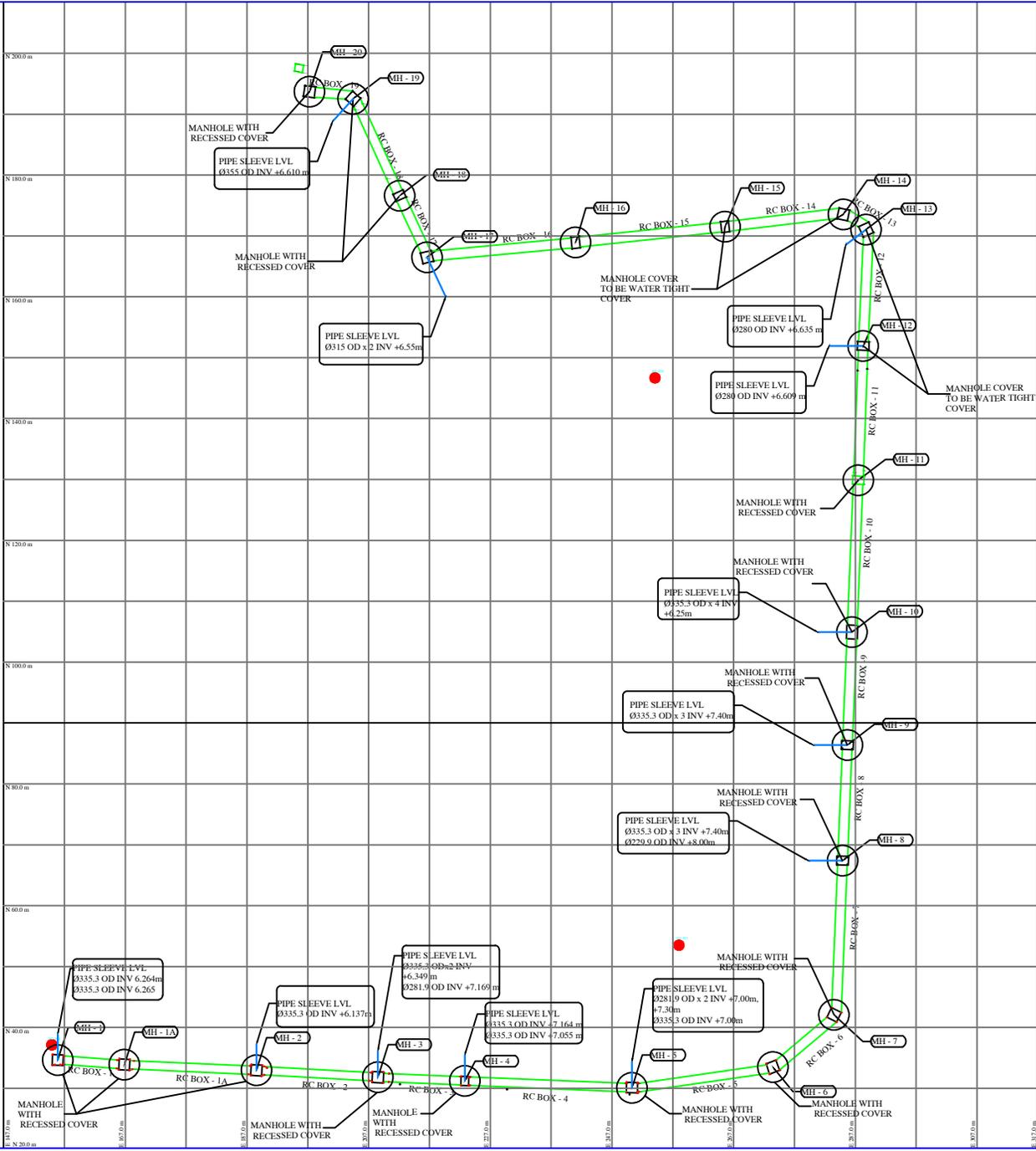
E:\Back Up\2018\Drainage Outside YCP\YCP-MWL-MD-GENGEL-ALL-BTJCO-0029-A Site Drainage Layout.dwg



"STORM WATER DRAINAGE DIVERSION PROJECT"

ZAW HTET PAING ENGINEERING & CONSTRUCTION GROUP CO.,LTD.

THE LANDMARK PROJECT			
REQUEST FOR APPROVAL (RFA)			
RFA No. & Rev: SWD-RFA-MIS-0068-A			
Subject : RFA for As Built Dwg			
DISCIPLINE : STR		Date Submitted : 26-9-2017	
RFA TYPE : MIS		Date/Time Received :	
MC Point of Contact : Phyo Wai Aung		Target Return Date:	
Sub-Contractor Name : -		Previous Status :	
SPECIFICATION/CONTRACT REFERENCE :			
ADDITIONAL REFERENCE DOCUMENTS			
EI/NOC/NOD/CVI :		CDT :	
RFI/MOM/LETTERS :		OTHERS :	
Notes: We'd like to submit "Request for Approval of As Built Dwg" at Landmark Project.			
Does this potentially affect interfacing works (Time/Cost/Quality/etc)			
Tick	Project	Explanation	
<input type="checkbox"/> Y <input type="checkbox"/> N	PYN Blue		
<input type="checkbox"/> Y <input type="checkbox"/> N	PYN White		
<input type="checkbox"/> Y <input type="checkbox"/> N	Other		
ENGINEER'S REPLY			
ITEM	COMMENTS		
Submittal Status :			
STATUS A : APPROVED - Reviewed, no exception taken. No re-submittal required. Proceed with manufacture, fabrication and/or construction. STATUS B : APPROVED WITH COMMENTS - Reviewed as noted, minor comments, resubmit within 28 days or contractor can proceed with works at own risk STATUS C : REJECTED - Incorporate comments and re-submit. Do not proceed with manufacture, fabrication and/or construction.			Status
Contractor	Consultant	Other (If Required)	Engineer/PM
Company: Z.H.P Name Phyo Wai Aung Signed :	Company: Name : Signed :	Company: Name : Signed :	Company: Name : Signed :
Date:	Date:	Date:	Date:
The approval of this document and the incorporation of any comments does not entitle the Contractor to any additional time/costs. If there are cost/time implications you must refer to the NoC/NoD in the Reference Documents above.			



Soe Soe Mu
SOE SOE MU M.E (CIVIL)
 LICENSE STRUCTURAL ENGINEER
 Y.C.D.C SEC No.(155)
 Ph:250245269



STORM WATER DIVERSION PLAN (AS BUILT)

Construction Drawings	
Owner :	
Contractor :	
Project Management :	
Project :	
LANDMARK STORM WATER DIVERSION WORK	
Dwg Name :	
STORM WATER DIVERSION PLAN (AS BUILT)	
Date :	8.8.2017
Drawn By :	C.S.M.O <i>Chit</i>
Check By :	S.S.M <i>Soe</i>
Approved By :	K.N <i>Soe</i>
Revision :	Description:
Dwg No : SWD - ST - AS BUILT - 001	
Scale :	Sheet No :
1:25	1 of 6

DIFFERENCE BETWEEN DESIGN & AS BUILT DWG

STRUCTURE NAME	LOCATION	CONNECTED PIPES (m, MSL)			INNER DIMENSION	COVER LEVEL OF MANHOLE (m, MSL)			DEPTH OF MANHOLE (M) (FROM COVER LEVEL TO BOTTOM OF SUMP ELEV)			SETTING OUT		
		DESIGN	AS BUILT	DIFFERENCE		DESIGN	AS BUILT	DIFFERENCE	DESIGN	AS BUILT	DIFFERENCE	DESIGN	AS BUILT	DIFFERENCE
MH-1	RCC BOX -1	5.990	5.987	-0.003	L=1.50 W=1.50	8.000	7.89	-0.11	2.31	2.20	-0.11	N=34.669 (m) E=155.906(m)	N=34.65 (m) E=155.89(m)	N=0.019 (m) E=0.016(m)
MH-1A	RCC BOX -1	5.968	5.966	-0.002	L=1.50	8.550	8.48	-0.07	2.88	2.81	-0.07	N=33.89 (m) E=166.851(m)	N=33.91 (m) E=166.84(m)	N=0.02 (m) E=0.011(m)
	RCC BOX -1A	5.968	5.966	-0.002	W=1.50									
MH-2	RCC BOX -1A	5.925	5.921	-0.004	L=1.50	8.550	8.50	-0.05	2.92	2.87	-0.05	N=32.936 (m) E=188.537(m)	N=32.97 (m) E=188.56(m)	N=0.034(m) E=0.023(m)
	RCC BOX -2	5.925	5.921	-0.004	W=1.50									
MH-3	RCC BOX -2	5.885	5.882	-0.003	L=1.50	8.000	7.99	-0.01	2.42	2.41	-0.01	N=31.84 (m) E=208.509(m)	N=31.82 (m) E=208.52(m)	N=0.02(m) E=0.011(m)
	RCC BOX -3	5.885	5.882	-0.003	W=1.50									
MH-4	RCC BOX -3	5.856	5.854	-0.002	L=1.00	8.000	7.97	-0.03	2.44	2.41	-0.03	N=31.245 (m) E=222.842(m)	N=31.21 (m) E=222.81(m)	N=0.035 (m) E=0.032(m)
	RCC BOX -4	5.856	5.854	-0.002	W=1.25									
MH-5	RCC BOX -4	5.801	5.798	-0.003	L=1.50	8.050	8.02	-0.03	2.55	2.52	-0.03	N=30.103 (m) E=250.287(m)	N=30.12(m) E=250.30(m)	N=0.017 (m) E=0.013(m)
	RCC BOX -5	5.801	5.798	-0.003	W=1.50									
MH-6	RCC BOX -5	5.754	5.750	-0.004	L=1.50	8.600	8.58	-0.02	3.15	3.13	-0.02	N=33.491 (m) E=273.453(m)	N=33.51 (m) E=273.43(m)	N=0.019 (m) E=0.023(m)
	RCC BOX -6	5.876	5.873	-0.003	W=1.50									
MH-7	RCC BOX -6	5.860	5.856	-0.004	L=1.50	8.600	8.58	-0.02	3.05	3.03	-0.02	N=42.095 (m) E=283.521(m)	N=42.07 (m) E=283.50(m)	N=0.025 (m) E=0.021(m)
	RCC BOX -7	5.860	5.856	-0.004	W=1.50									
MH-8	RCC BOX -7	5.829	5.826	-0.003	L=1.00	8.800	8.80	0.00	3.27	3.27	0.00	N=67.393 (m) E=284.906(m)	N=67.39 (m) E=284.91(m)	N=0.003 (m) E=0.004(m)
	RCC BOX -8	5.829	5.826	-0.003	W=1.50									
MH-9	RCC BOX -8	5.806	5.804	-0.002	L=1.00	8.800	8.80	0.00	3.29	3.29	0.00	N=86.377 (m) E=285.696(m)	N=86.38 (m) E=285.70(m)	N=0.003 (m) E=0.004(m)
	RCC BOX -9	5.806	5.804	-0.002	W=1.50									
MH-10	RCC BOX -9	5.784	5.781	-0.003	L=2.00	10.500	9.00	-1.50	5.02	3.52	-1.50	N=104.93 (m) E=286.468(m)	N=104.93 (m) E=286.47(m)	N=0.00 (m) E=0.002(m)
	RCC BOX -10	5.784	5.781	-0.003	W=1.50									
MH-11	RCC BOX -10	5.754	5.750	-0.004	L=1.00	10.828	8.73	-2.10	5.37	3.27	-2.10	N=129.914 (m) E=287.507(m)	N=129.88(m) E=287.51(m)	N=0.034 (m) E=0.003(m)
	RCC BOX -11	5.754	5.750	-0.004	W=1.50									
MH-12	RCC BOX -11	5.728	5.725	-0.003	L=1.00	9.000	9.05	0.05	3.57	3.62	0.05	N=151.899 (m) E=288.32(m)	N=151.94 (m) E=288.31(m)	N=0.041 (m) E=0.01(m)
	RCC BOX -12	5.728	5.725	-0.003	W=1.50									
MH-13	RCC BOX -12	5.704	5.700	-0.004	L=1.50	9.000	9.04	0.04	3.60	3.64	0.04	N=171.033 (m) E=288.75(m)	N=171.05 (m) E=288.75(m)	N=0.017 (m) E=0.00(m)
	RCC BOX -13	5.704	5.700	-0.004	W=1.50									
MH-14	RCC BOX -13	5.699	5.696	-0.003	L=1.50	8.200	8.26	0.06	2.80	2.86	0.06	N=173.5 (m) E=285.041(m)	N=173.54 (m) E=285.02(m)	N=0.04 (m) E=0.021(m)
	RCC BOX -14	5.699	5.696	-0.003	W=1.50									
MH-15	RCC BOX -14	5.675	5.672	-0.003	L=1.00	8.200	8.25	0.05	2.82	2.87	0.05	N=171.473 (m) E=265.596(m)	N=171.51 (m) E=265.59(m)	N=0.037(m) E=0.006(m)
	RCC BOX -15	5.675	5.672	-0.003	W=1.50									
MH-16	RCC BOX -15	5.645	5.645	0.000	L=1.00	9.790	9.86	0.07	4.44	4.51	0.07	N=168.903 (m) E=241.03(m)	N=168.93 (m) E=241.02(m)	N=0.027(m) E=0.01(m)
	RCC BOX -16	5.645	5.645	0.000	W=1.50									
MH-17	RCC BOX -16	5.616	5.615	-0.001	L=1.50	7.815	7.89	0.07	2.50	2.58	0.08	N=166.485 (m) E=216.611(m)	N=166.51 (m) E=216.61(m)	N=0.025 (m) E=0.001(m)
	RCC BOX -17	5.616	5.615	-0.001	W=1.50									
MH-18	RCC BOX -17	5.603	5.601	-0.002	L=1.00	7.285	7.36	0.08	1.98	2.06	0.08	N=176.596 (m) E=212.076(m)	N=176.60 (m) E=212.08(m)	N=0.004 (m) E=0.004(m)
	RCC BOX -18	5.603	5.601	-0.002	W=1.50									
MH-19	RCC BOX -18	5.581	5.582	0.001	L=1.50	7.285	7.37	0.09	2.00	2.09	0.09	N=192.505 (m) E=204.42(m)	N=192.54 (m) E=204.44(m)	N=0.035 (m) E=0.02(m)
	RCC BOX -19	5.581	5.582	0.001	W=1.50									
MH-20	RCC BOX -19	5.571	5.569	-0.002	L=1.50	7.285	7.37	0.09	2.01	2.09	0.08	N=193.916 (m) E=195.852(m)	N=193.70 (m) E=197.29(m)	N=0.216 (m) E=1.438(m)
					W=1.50									

Notes :

* = to be extend in the future

Construction Drawings

Owner :



Contractor :



Project Management :



Project :

LANDMARK
STORM WATER DIVERSION WORK

Dwg Name :

DIFFERENCE BETWEEN DESIGN &
AS BUILT DWG TBALE

Date : 8.8.2017

Drawn By : C.S.M.O *chik*

Check By : S.S.M *gach*

Approved By : K.N *WMM*

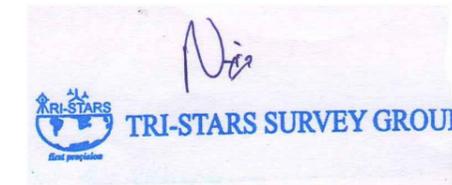
Revision : Description:

Dwg No : SWD - ST - AS BUILT - 002

Scale : Sheet No :

1:40

2 of 6

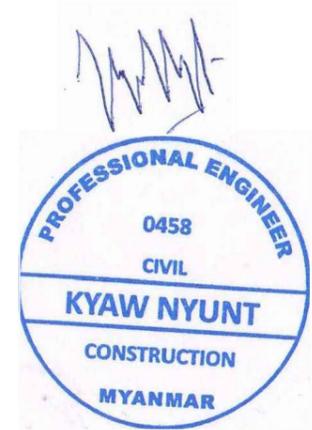
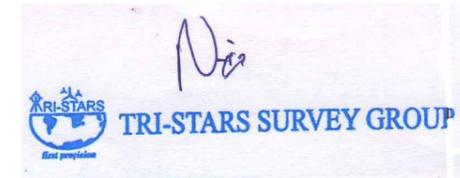


SOE SOE MU M.E (CIVIL)
LICENSE STRUCTURAL ENGINEER
Y.C.D.C SEC No.(155)
Ph:250245269



DIFFERENCE BETWEEN DESIGN & AS BUILT DWG (PIPE SLEEVE LEVEL)

LOCATION	PIPE DIAMETER	Qty (Nos)	PIPE SLEEVE LEVEL (m)		
			DESIGN	AS BUILT	DIFFERENCE
MH-1	335.3	2	6.30	6.264	-0.04
			6.30	6.265	-0.04
MH-1A	-	-	-	-	-
MH-2	335.3	1	6.10	6.137	0.04
MH-3	335.3	2	6.30	6.345	0.04
			6.30	6.347	0.05
MH-4	281.9	1	7.10	7.10	0.00
			7.10	7.164	0.06
MH-5	335.3	2	7.00	7.00	0.00
			7.30	7.30	0.00
MH-6	-	-	-	-	-
			-	-	-
MH-7	-	-	-	-	-
			-	-	-
MH-8	335.3	3	7.40	7.40	0.00
			7.40	7.40	0.00
MH-9	229.9	1	8.00	8.00	0.00
			8.00	8.00	0.00
MH-10	335.3	3	7.40	7.40	0.00
			7.40	7.40	0.00
MH-11	-	-	-	-	-
			-	-	-
MH-12	280	1	6.55	6.609	0.06
			6.55	6.635	0.09
MH-13	280	1	6.55	6.635	0.09
MH-14	-	-	-	-	-
MH-15	-	-	-	-	-
MH-16	-	-	-	-	-
MH-17	315	2	6.55	6.55	0.00
			6.55	6.55	0.00
MH-18	-	-	-	-	-
MH-19	355	1	6.55	6.61	0.06
MH-20	-	-	-	-	-



Construction Drawings

Owner :

www.yomastrategic.com

www.grandmeeyahya.com

www.tmi.com.mm

www.hshgroup.com

Contractor :

**ZAW HTET PAING
ENGINEERING GROUP**

Project Management :

Project :

**LANDMARK
STORM WATER DIVERSION WORK**

Dwg Name :

**DIFFERENCE BETWEEN DESIGN &
AS BUILT DWG TBALE
(PIPE SLEEVE LEVEL)**

Date : 8.8.2017

Drawn By : C.S.M.O *chub*

Check By : S.S.M *gach*

Approved By : K.N *WMM*

Revision :	Description:

Dwg No : SWD - ST - AS BUILT - 003

Scale : 1:40	Sheet No : 3 of 6
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Construction Drawings

Owner :



Contractor :



Project Management :



Project :

LANDMARK
STORM WATER DIVERSION WORK

Dwg Name :

PIPE SLEEVE LEVEL DETAIL
(AS BUILT DWG)

Date :

8.8.2017

Drawn By :

C.S.M.O *ehib*

Check By :

S.S.M *jech*

Approved By :

K.N *WMM*

Revision :

Description:

Rev : 0

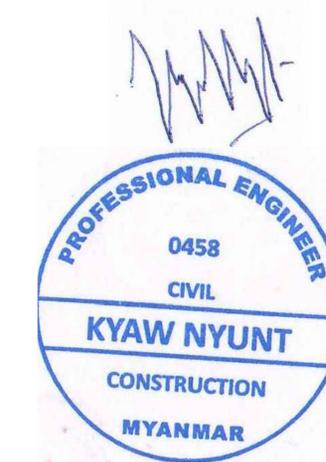
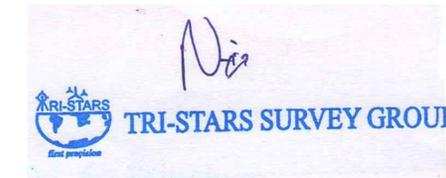
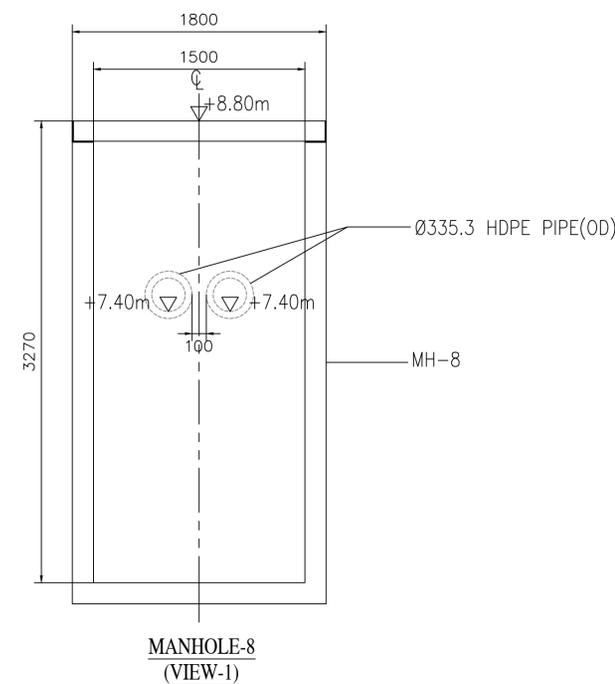
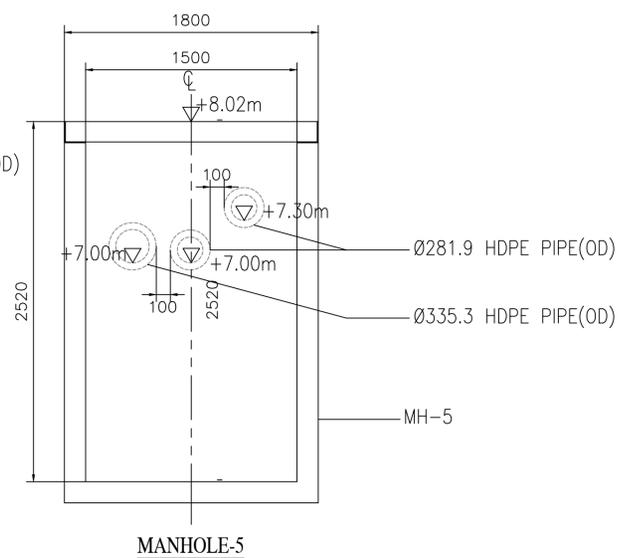
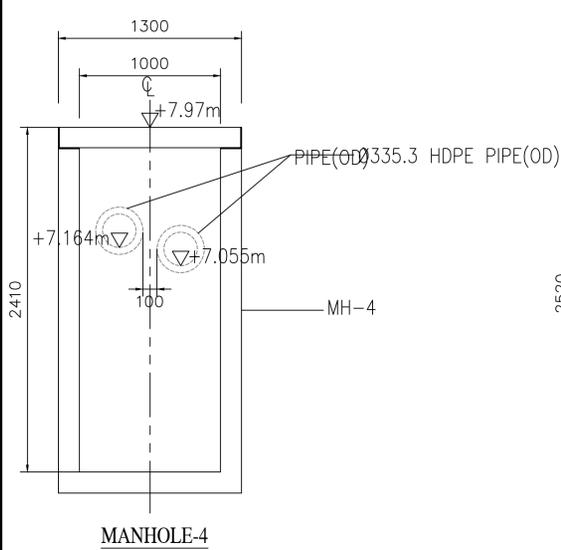
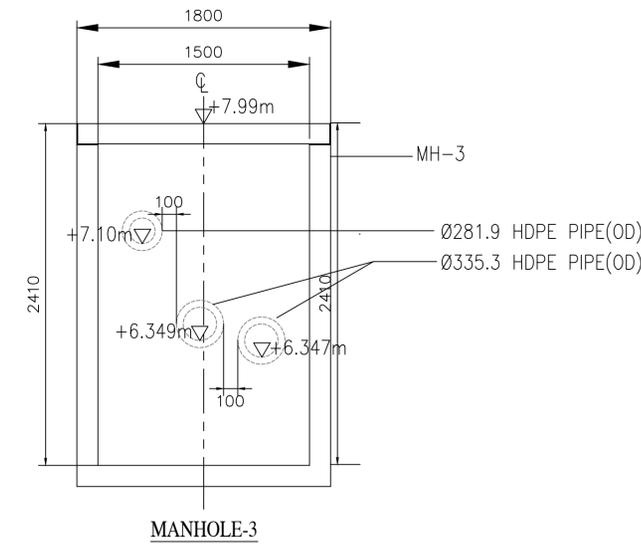
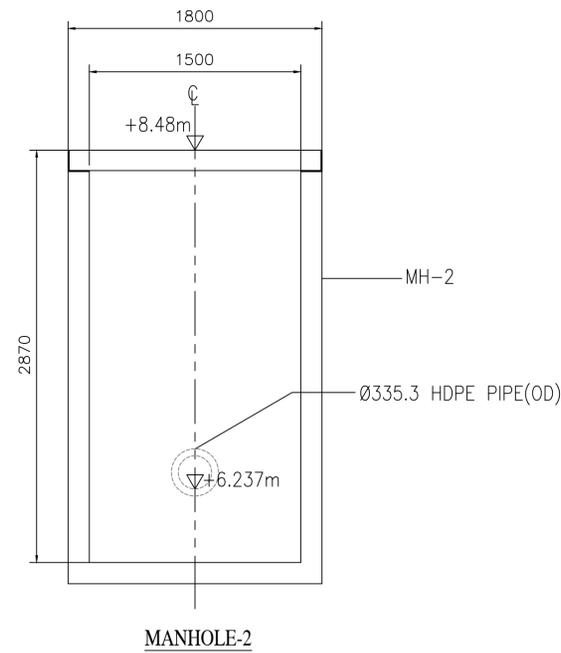
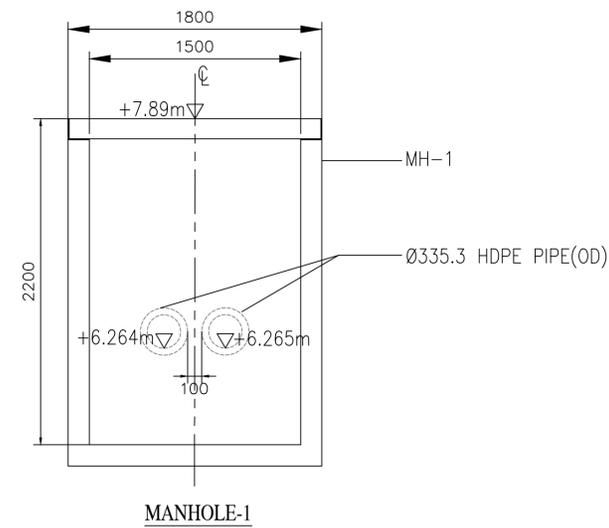
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4 of 6



Construction Drawings

Owner :



Contractor :



Project Management :



Project :

LANDMARK
STORM WATER DIVERSION WORK

Dwg Name :

PIPE SLEEVE LEVEL DETAIL
(AS BUILT DWG)

Date :

8.8.2017

Drawn By :

C.S.M.O

Check By :

S.S.M

Approved By :

K.N

Revision :

Description:

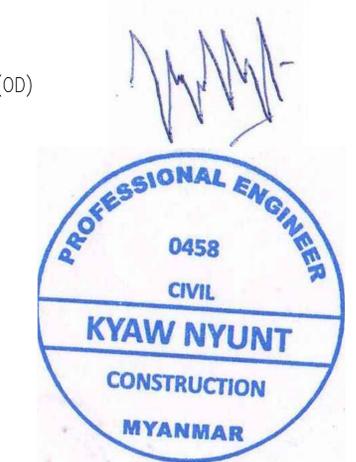
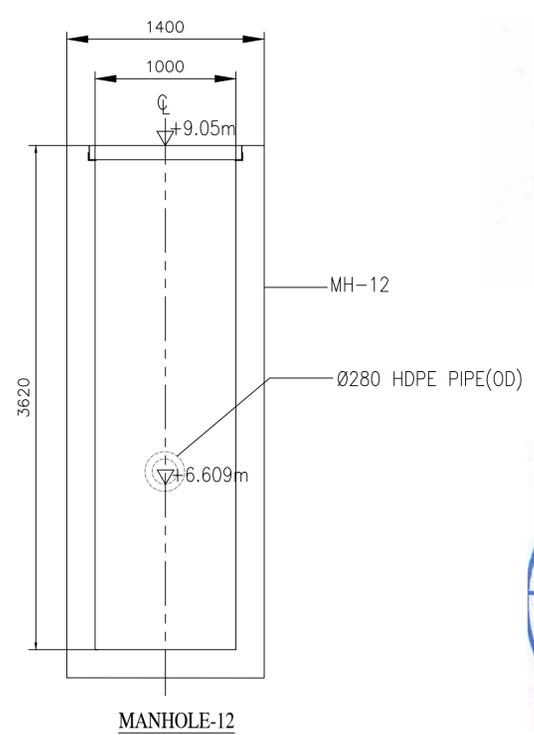
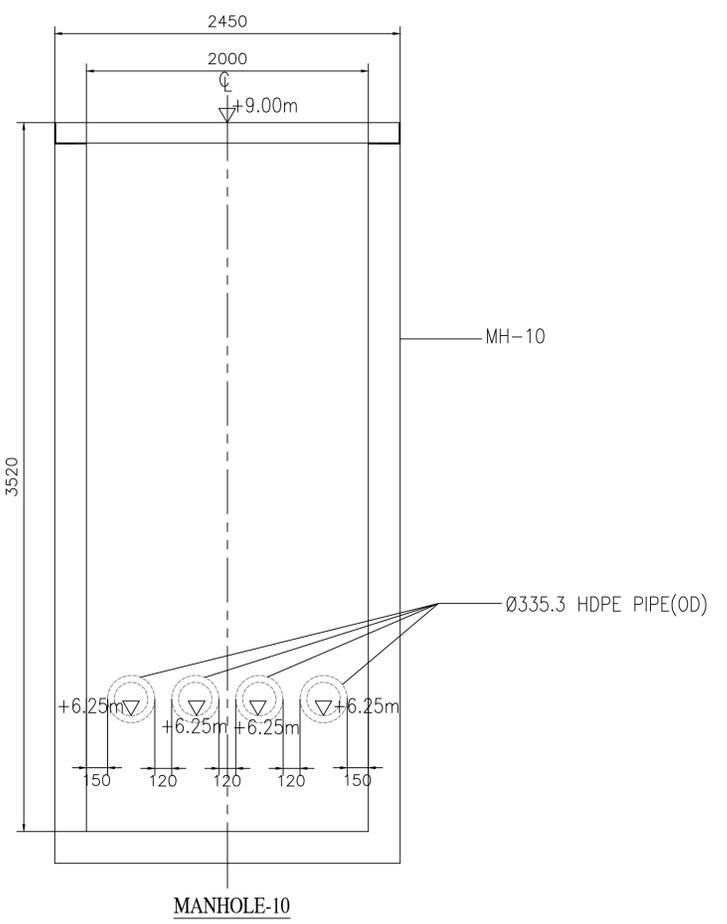
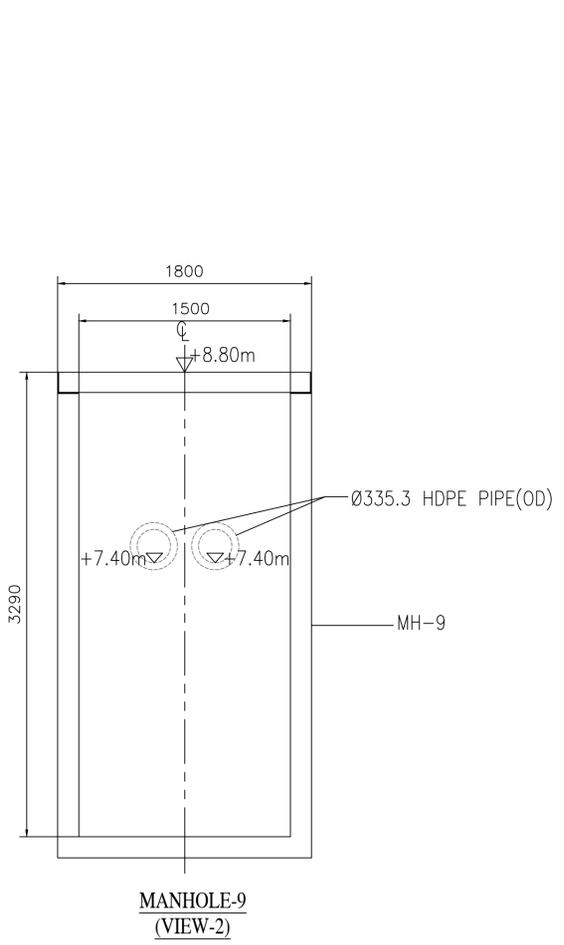
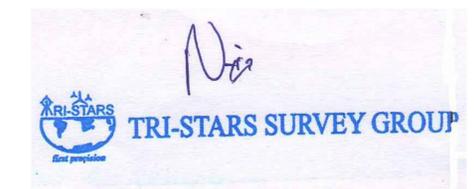
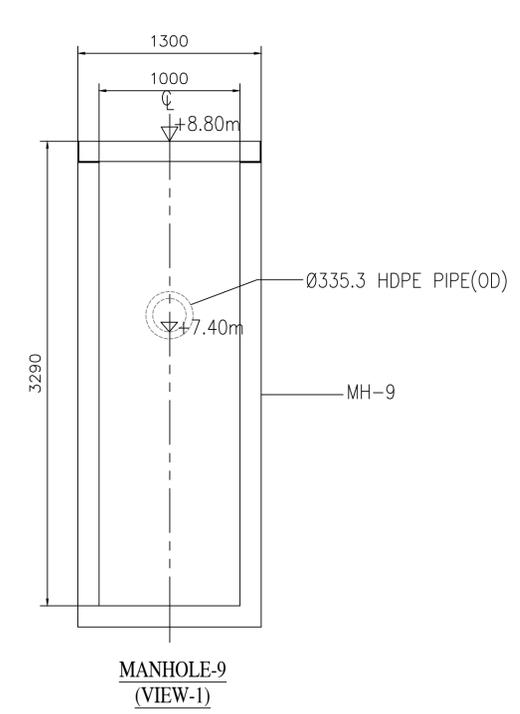
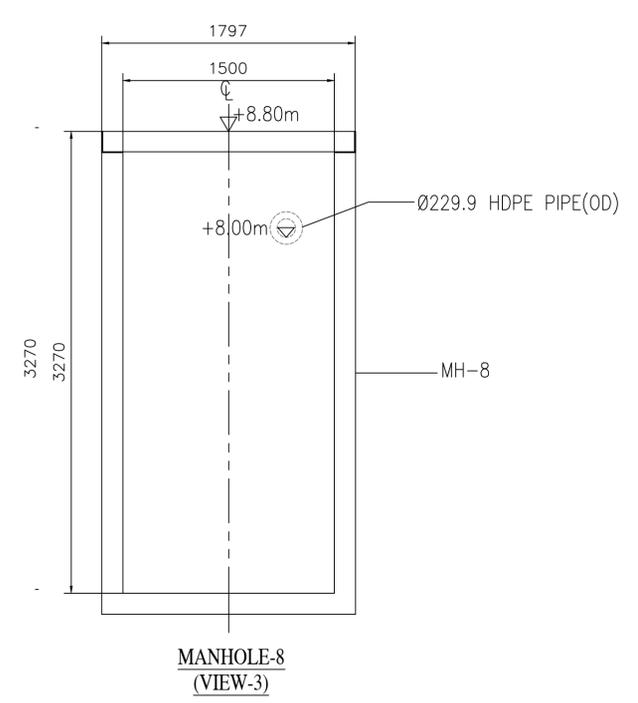
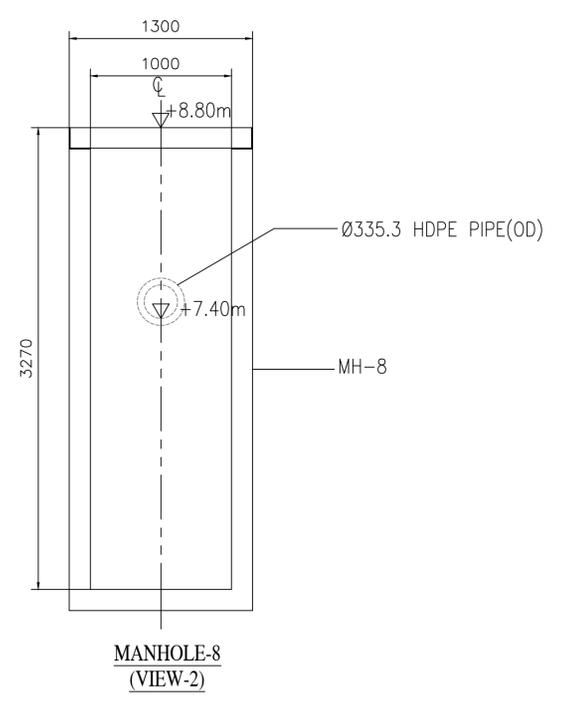
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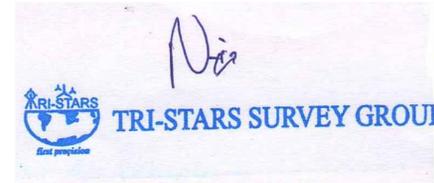
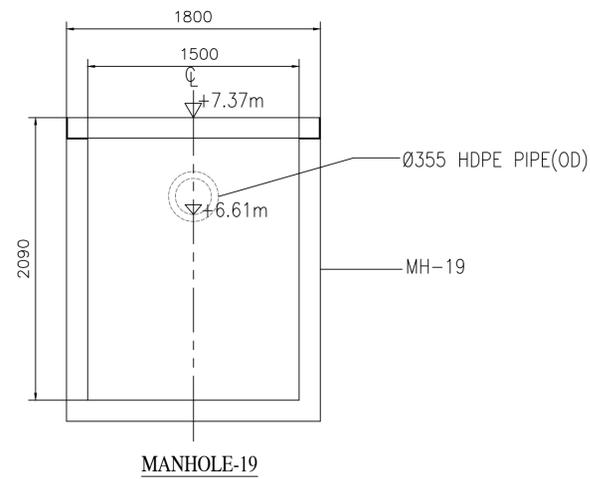
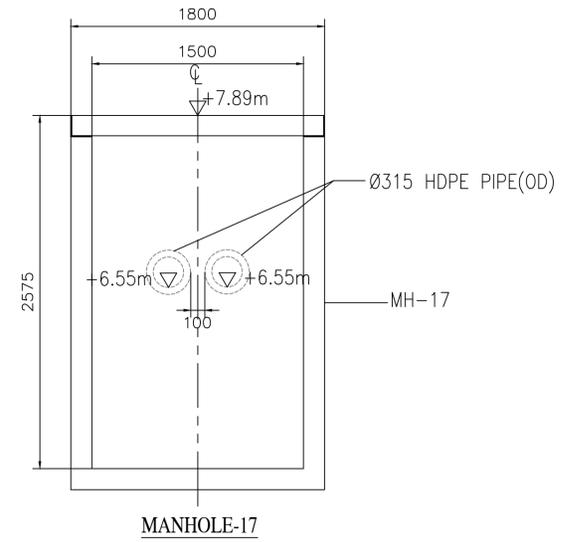
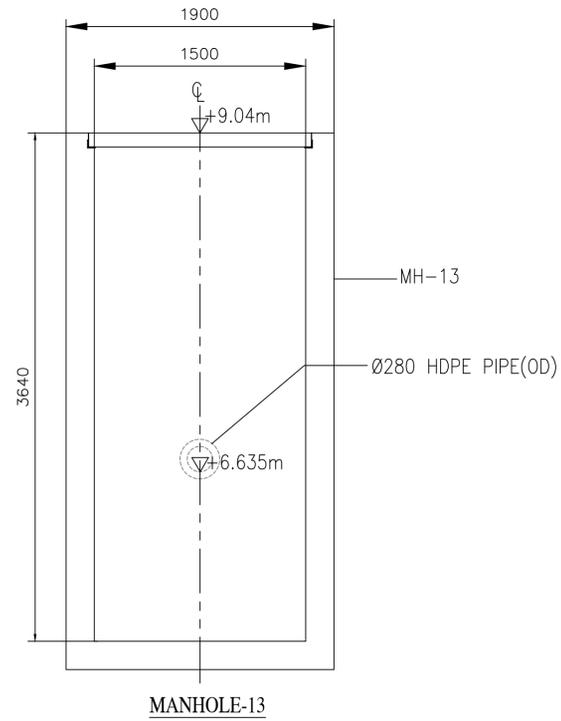
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Sheet No :

5 of 6





Construction Drawings

Owner :



Contractor :



Project Management :



Project :

LANDMARK
STORM WATER DIVERSION WORK

Dwg Name :

PIPE SLEEVE LEVEL DETAIL
(AS BUILT DWG)

Date : 8.8.2017

Drawn By : C.S.M.O *chib*

Check By : S.S.M *jeeth*

Approved By : K.N *KN*

Revision : Description:

Dwg No : SWD - ST - AS BUILT -006

Scale : Sheet No :

Annex 7a Project Health & Safety Plan

YOMA CENTRAL PROJECT			
REQUEST FOR APPROVAL (RFA)			
RFA No. & Rev: YCP-MWL-BTJ-SPA-RFA-MIS-0063-D			
Subject : Project Health and Safety Plan			
DISCIPLINE : ST	Date Submitted :		8-Aug-18
RFA TYPE : MIS	Date/Time Received :		
MC Point of Contact : Mr. Joris	Target Return Date:		22-Aug-18
Sub-Contractor Name :	Previous Status :		B
SPECIFICATION/CONTRACT REFERENCE : Main Works Landmark			
ADDITIONAL REFERENCE DOCUMENTS			
EI/NOC/NOD/CVI :	RFA		
RFI/MOM/LETTERS :	OTHERS :		
We'd like to submit " Project Health and Safety Plan"			
Does this potentially affect interfacing works (Time/Cost/Quality/etc)			
Tick	Project	Explanation	
<input type="checkbox"/> Y <input type="checkbox"/> N	PYN Blue		
<input type="checkbox"/> Y <input type="checkbox"/> N	PYN White		
<input type="checkbox"/> Y <input type="checkbox"/> N	Other		
ENGINEER'S REPLY			
ITEM	COMMENTS		
Submittal Status :			
STATUS A : APPROVED - Reviewed, no exception taken. No re-submittal required. Proceed with manufacture, fabrication and/or construction. STATUS B : APPROVED WITH COMMENTS - Reviewed as noted, minor comments, resubmit within 28 days or contractor can proceed with works at STATUS C : REJECTED - Incorporate comments and re-submit. Do not proceed with manufacture, fabrication and/or construction.			STATUS
Contractor Company: BTJV Name : Mr. Joris Signed : 	Consultant Company: Name : Signed :	Client Engineer/CM Company: Name : Signed :	Client PCM/DM Company: Name : Signed :
Date: 7-Aug-18	Date:	Date:	Date:
The approval of this document and the incorporation of any comments does not entitle the Contractor to any additional time/costs. If there are cost/time implications you must			

YOMA CENTRAL PROJECT

Yangon, Myanmar

	<p>Employer: MEEYAHTA DEVELOPMENT LTD. (MDL)</p> <hr/> <p>Engineer:  SPA DESIGN & PROJECT SERVICES LTD. <small>A MEMBER OF YOMA STRATEGIC HOLDINGS LTD.</small></p>
---	--

CONTRACTOR		Name	Position	Signature
	Prepared by:	Bernie PUSUNG	H&S Manager	
	Reviewed by:	JD LE GALLIC	QSE Manager	
	Reviewed by:	Huynh Van TU	Construction Manager	
	Approved by	Joris THOMAS	Project Director	

Description of the document:

PROJECT HEALTH AND SAFETY PLAN

Document Coding:

Project Code			-	Issuer Code			-	Document Type			-	Document Number			-	Revision
Y	C	P	-	Q	S	E	-	H	S	P	-	0	0	1	-	D



HEALTH AND SAFETY PLAN

Change Tracking:

Revision/Date	Description
A / 2018-03-23	First issue
B / 2018-03-29	Revision to incorporate comments received under RFA: YCP-MWL-BTJ-SPA-RFA-MIS-0063A
C / 2018-07-08	Revise as per comments received under YCP-MWL-BTJ-SPA-RFA-MIS-0063-B
D/ 2018-08-087	Amended as per comments received under YCP-MWL-BTJ-SPA-RFA-MIS-0063-C

Compliance with Comments:

Rev	Comment received	Clarifications / Supporting document
1	Page 4. Comments to include SPA minimum requirements revision date Oct 2016 (Ver01)	Agreed
2	Page 9. Section 3.3 & 3.4. To include required to review after every incident/accident	Agreed
3	Page 10. Section 3.5.1. To include DOB, NCR NO.	Agreed
4	Page 10. To include Project HS Committee Organization Chart	See Clarification
5	Page 11. Section 3.6.7 "Daily Toolbox Talk?"	Disagree: Already clearly highlighted that Tool Box talk will be carried out weekly, not daily.
6	Page 12. To include "Confined Space" on the section	Agreed
7	Page 12. To include on the daily visual mobile plant inspections, "with records/checklist"	Agreed
8	Page 12. To submit inspection forms for various types of mobile plants.	Typical Forms attached
9	Page 13. Section 3.7.4.3 Question raise about who will inspect cranes.	It's already clearly mentioned, inspection will be done by "qualified third party expert". See clarification
10	Page 13. Section 3.7.5.1 Question raise about who will carry out "Quarterly Inspection"	Plant & Equipment inspection will be done jointly by Safety Dept. and Plant & Equipment Dept. Electrical installation shall be done by "Plant & Equipment" electricians. Safety Equipment will be inspected by Safety Staffs
11	Page 14. Section 3.7.8 "Sample of Permit to be included in the submission" and procedure to be included.	Agree: Please refer to "Appendix 3"
12	Page 16. Section 3.12 To submit "Occupational Health Procedure"	Agree: Occupational Health Procedure will be prepared separately
13	Page 16. Section 4. To include access through site to church and to YESC.	Agree: Included



HEALTH AND SAFETY PLAN

14	Page 16. Section 4.1 To add on the section “and other vehicles on adhoc basis if required by authorities (YESC)	Agree: Included
15	Page 17. Section 4.3 To add on the section “clean wheels on the last sentence of section”	Agree: Included
16	Page 18. Section 4.3 To submit Traffic Management Plan”	Agree: Traffic Management Plan has been submitted separately
17	Page 24. Section 8.2 To include in the section “shall provide MSDS of all chemicals/hazardous materials”	Agree: Included
18	Page 24. Section 9.5 To include in the section “There shall be no linked between working platform and loading platform”	Disagree: Not clear in meaning, the engineer to clarity such statement.
19	Page 24. Section 9.14 Hazardous Substance: To include training & briefing on MSDS.	Agree: Included
20	Page 31. To submit “Emergency Response Plan”	Submitted

Rev.B	Comment received	Clarifications / Supporting document
Cover	Risk assessment form	Typical form attached in appendix
Cover	Equipment Inspection Form? And other? Either include all equipment’s types or provide standards form also.	Typical form already attached as example into appendices 10-rev B. Similar forms will be developed for each type of equipment
Cover	Appendices have not been scanned properly	Resubmitted
Cover	See notes/comments as attached	See below
Page 3	Appendices name not inserted properly	Resubmitted
Page3	Include responsibility matrix	Section 2 updated, no requirement for responsibility matrix
Page 4	Safety Act, Bouygues Standards> State current version	There is only one version and it is internal document. No change
Page 4	HS responsibilities> no include HS Specific organization Chart	No requirement to submit such document, there is Project Organization Chart and description of duties and responsibilities for each function
Page 4	PD or PM clarify	Changed, Project Director to be used
Page 5	No HS Manager in summary of the main roles.... No Safety Officer in summary.....	Changed
Page 6	These Titles are not shown in BTJV Staff List	Changed
Page 7	QSE>HS?	Changed in HS
Page 9	Project HS Committee > Insert brief agenda, records.....	Changed Section 5-10



HEALTH AND SAFETY PLAN

Page 10	'Who is site Manager'	Changed in Construction Manager
Page 12	Example of scaffold Tag to be included	Refer to appendix
Page 12	Fire extinguisher inspection record	Changed
Page 17	How to identified First Aiders	Changed
Page 18	List incomplete	The list will be amended depending of legal requirement and method details
Page 18	Information in case of transfer to hospital	Changed
Page 19	PPE Standard	Changed
Page 25	Rigging – Level of training	Changed
Page 25	Rigging - BTJV committed to provide sling and chains from outside Myanmar. Where is this stated?	No specification in reference
Page 35	Confined spaces	Changed
Page 37	Permit Formats	Changed

Rev C	Section 5.4.7. Fire extinguisher location plan to be displayed onsite.	Fire Extinguishers are place on prominent locations & well sign posted, layout not necessary to be displayed onsite. Fire extinguishers locations may change as the site evolves. Current layout will be shared upon request, refer to Appendix 14
Rev C	Comments received: Implement permit to work system for hot works and other high risk work onsite.	Permits are implemented see samples at Appendix 16.



TABLE OF CONTENT

1	PURPOSE	5
2	STATUTORY AND CONTRACTUAL OBLIGATIONS	5
3	HS POLICY	5
4	HS RESPONSIBILITIES, DUTIES AND AUTHORITIES	6
5	HEALTH AND SAFETY MANAGEMENT SYSTEM	9
6	SITE HS RULES / GUIDANCE FOR SAFE WORK PRACTICES	23

Appendices

- Appendix 1: Health and Safety Policy
- Appendix 2: Sanction Policy
- Appendix 3: Permit to Work Procedure
- Appendix 4: Emergency Contact Numbers
- Appendix 5: Typical Weekly Safety Site Walk Inspection Report
- Appendix 6: Induction Request Form
- Appendix 7: Typical Template of Risk Assessment
- Appendix 8: Typical Unsafe Act/Unsafe conditions booklet sheet template
- Appendix 9 Typical H&S Project Risk Register
- Appendix 10: Typical Equipment Inspection forms.
- Appendix 11: Picture of Scaffold Tag Picture used on site
- Appendix 12: Picture of PPE policy posted on site



HEALTH AND SAFETY PLAN

1 PURPOSE

The purpose of this HS Plan is to describe objectives, resources, responsibilities, organization and guidelines in regards of Safety Management for YCP Project. It applies for the benefit of all employees of BTJV, its Partners, Subcontractors and its nominated Sub-Contractors.

The HS plan or subsequent revisions will be disseminated to Managers and Staff. HS plan is live document which will be updated depending on Project progress and organization, at least once a year.

Employees will be made aware of the HS plan and the relevant sections that will affect them via inductions, task launch including method statement presentation and tool box talks.

2 STATUTORY AND CONTRACTUAL OBLIGATIONS

BTJV and its Subcontractors shall comply with

- All relevant local statutory requirements – The Factory Act 1951 (act no 65) when relevant to construction.
- All contractual requirements in regards to Health, Safety and Environmental Protection reference “SPA Minimum Health & Safety Requirements dated 2015 March and Minimum Requirements for Contractors on Environmental & Social Compliance”, dated October 2016 (Ver01).
- Safety Act, Bouygues HS Standard available in the Project server. (Internal Document)

The HS plan has been prepared to comply with SPA requirement in regard of Safety and Health Management system. *‘the contractor must prepare a Safety and Health Management Plan for the Project...The Plan can be arranged as the contractor feels most appropriate, however it must contain at minimum:*

Safety Policy	Comply
Safety Work practices	Comply with description of system in place to develop Method Statement and Risk assessment
Safety Training	Comply
Group Meeting	Comply
Incident investigation and analysis	Comply
In-house Safety Rules and Regulations	Comply
Safety Promotion	Comply
Evaluation, selection and control of Subcontractors	Comply
Safety Inspections	Comply
Maintenance regime for Machinery and Equipment	Comply
Hazard Analysis	Comply
Control of movement and use of hazardous substances	Comply
Emergency preparedness	Comply – Please also refer to separate submittal
Occupational Health Program	Comply

3 HS POLICY

BTJV is committed to protect health and safety of everybody who plays a part in our operations and lives in the communities in which we operate. Our aim is to complete the project with ‘high and exemplary’ standards of health and safety, targeting ‘zero high potential incident/accident’. This target is in line of Bouygues Group and Taisei Corporation HS policy.

BTJV also committed to contribute to raise up level of Safety Standards practices in Myanmar by supporting induction and training of workers and staff (awareness, knowledge of our standards, and best practices), Innovative approach in term of tools, equipment, methods and visual communication, workplace safe conditions and health program for people involved in the project.

Project HS policy is attached in Appendix 1.



4 HS RESPONSIBILITIES, DUTIES AND AUTHORITIES

Organization Chart of the Project is live documents and submitted separately. The Project Director is responsible for the development and implementation of necessary resources to ensure the Health and Safety Management for the Project. Relevant staffs (including subcontractors) under the responsibility of their hierarchy must implement the HS Management Plan. Duties and Responsibilities of the main function are described below.

4.1 Obligation to stop unsafe work

Anyone whom believes that work or activities cannot, or is not done safely or it fails to meet our standards or is a direct threat for the environment, is obliged to report this to his supervisor immediately or to Safety Officer. Work should be stopped immediately if there is a direct threat for Health and Safety (also Environment). STOP AND GO internal process should be implemented: STOP the task, propose corrective measures to be reviewed by HS manager and approved by Project Director prior to restart the task.

4.2 Subcontractor

Each subcontractor has the full responsibility for the execution of his subcontract. Procedures and responsibilities that are set out in this plan also apply for the subcontractors and its personnel unless agreed differently. Subcontractors has to submit their organization chart and details of HS team as per Project QSE requirement for Subcontractors.

4.3 Project Director

The Project Director has the full confidence and authority of the Management and is accountable for all HS aspects of the project. Although he can delegate tasks to the HS Manager, it remains his responsibility to ensure:

- That the HS Policy statement is fully understood and implemented by the Project Management Team;
- The development, implementation and maintenance of the project HS Management System;
- That sub-contractors are aware of their obligations towards HS;
- That interfaces and simultaneous operations are identified, if necessary documented and the related hazards are as Low as reasonable possible;
- That risk assessments are regularly held and documented for all main activities or processes. That the risk assessments are used as a basis for hazard elimination and control;
- Whether the project meets the contractual and the local governmental rules and regulations as documented in the project H&S Management Plan;
- That sufficient qualified and trained personnel are employed on the project;
- That project personnel are made fully aware of their respective HS responsibilities and that they are familiar with appropriate procedures;
- That suitable Personal Protective Equipment (PPE) is provided to the personnel on the Project;
- That all other necessary HS recourses are available when needed;
- Liaise with the client at the highest level for HS matters.

4.4 HS Manager

The Project Director has appointed the HS Manager in his project team. The responsibilities and tasks of the HS Manager include:

- The development and implementation of the HS Management system and HS Plan related to this project;
- Coordination of the HS activities (controls, monitoring, education, etc) in respect of HS policy with clients representatives and subcontractors' HS personnel;
- Coordination of the HS interfaces of simultaneous operations of construction work and subcontractors;
- Set-up of an effective and efficient HS organization,
- Organize effective medical facilities;
- Ensure effective Emergency Response;
- Set-up a Crisis Management Plan and organization;
- Definition, implementation and reporting HS targets;
- Alert and Advice the Project Manager with regard to Policies and HS matters;
- Review and approve subcontractors HS Management systems;
- Initiate and organize HS meetings, workshops, seminars, Project HS Committee... where appropriate;

**HEALTH AND SAFETY PLAN**

- Stimulate pro-active use of Job Safety Analysis (JSA) and risk assessment processes to manage the project hazards as part of Method Statement preparation;
- Coordinate HS Instruction and induction of new project personnel and subcontractors;
- Manage the compliance with contractual and local governmental HS requirements;
- Verification and reporting of HS management system implementation through HS audits.

4.5 Safety Officers

- Reports directly to HS Manager
- Ensure that a high standard is maintained on site in accordance with the HS Policy and Project Health Safety Plan.
- Advise the site HS Management on measures/actions/improvements to be taken in the interest of Health Safety.
- Inspect the workplace to identify hazards (or potential hazards) and report the findings with recommendations for corrective/preventative actions to the site management.
- Complete the daily inspection report and close out actions.
- Assist in Investigating accident / incident (with or without personal injury)
- Ensure site management are complying to legal and contractual requirements affecting health safety and welfare of the workers
- Report immediately to HS Manager any injury.
- Report to HS/Safety Manager information on injuries, damage, losses.
- Alert, STOP and report to Safety Manager any unsafe Conditions/Act.
- Update and maintain area Safety Boards
- Assist HS Manager in carrying out HS inspections
- Report to the HS Management employees violating safety rules.
- Permits: Ensure all relevant permits are issued/completed & checked and recorded
- Assist Area Managers in carrying emergency drills
- Check all safety equipment i.e. (but not limited to) fire extinguishers, harnesses are in accordance with the site regulations, report immediately any defective safety equipment

4.6 Plant and Equipment Manager

The Plant and Equipment Manager reports to the Site Senior Superintendent. In term of HS responsibilities he has to:

- Arrange for installations and equipment to be available to the project in compliance with the HS standards and local laws and regulations in force;
- Implement equipment control project procedures;
- Initiate and monitor maintenance and servicing programme;
- Check the validity of monitoring and regulatory inspection documents for the subcontractors' main equipment and keeps a copy in his archives;
- Liaise with suppliers and subcontractors in order to ensure that equipment provided is in sound operating and safety condition and meets the needs;
- Make sure that operating staff are competent and properly trained (when necessary);
- Prepares and coordinate material and chemical storage plan, etc.

4.7 Construction Manager

The Construction Manager reports to the Project Director. In term of HS responsibilities he has to:

- Implement the HS Management System on site and ensure that all Trades Managers/Engineer and Areas Managers/Engineer are familiarized with the HS management system and company policy;
- Ensure that the system is communicated with sub-contractors;
- Maintain day to day contact with all Trades Managers/Engineer and Areas Managers/Engineer and Subcontractors representatives about HS matters;
- Work close together with the HS Manager to ensure compliance with the system, integration of HS standards practices at task preparation stage and Method Statement draft.
- Manage sub-contractors in such a way that they comply with and/or fit in the construction site management system;
- To participate to incident investigations and implementation of correctives actions.
- Review Risk Assessments established within Method Statements;
- Cooperate actively in drills and exercises, weekly Site Safety Walk



HEALTH AND SAFETY PLAN

4.8 Trades Manager (Package Managers for Structural works, MEP works and Architectural finishes works)

The Trades Managers report to the Construction Manager. In term of HS responsibilities they have to:

- Implement the HS Management System on site;
- Ensure that all Engineer and Subcontractor representatives under their supervision are familiarized with the HS system and company policy;
- Maintain day to day contact with all Site Engineer, Subcontractors and Supervision team about HS matters;
- Investigate and report all incidents and accidents;
- Liaise with the HS department for all HS matters
- Issue Risk Assessments while preparing Method Statement;
- Cooperate actively in drills and exercises, safety site walk, safety toolbox...
- Advise the Construction Manager in regards of any HS issue on site.

4.9 Site Senior Superintendents and Supervision team

Site senior Superintendents manages the supervision team (foreman, supervisor) and report directly to Project Director. Duties of Supervision are:

- Act proactively with regard to the enforcement of HS procedures and instructions towards personnel and subcontractors;
- Initiate, perform, implement and maintain Job Safety Analysis's to ensure that the risks of the work are as low as reasonable possible;
- Apply toolbox meetings, permit to work, Method presentation etc. as a tool to achieve high safety standards of all jobs;
- Ensure supervision of workers focus on HS aspects;
- Immediately report incidents, accidents, spills, damages to the HS department;
- Actively stimulate safety awareness and safety culture on his site;
- Ensure monitoring and implementation of work instructions/procedures that concern HS;
- Maintain good Housekeeping at site.
- Implement sanction policy in case of safety rules breach

4.10 Workers

All project personnel are responsible to comply with the HS policy and Safety rules of the site and task specific.

Further they shall:

- Behave and work according the ruling HS measures and instructions;
- Be responsible for their own safety and the safety of their colleagues;
- Use equipment, machines, vehicles and tools in safe manners;
- Only use tools and equipment if in possession of valid qualifications;
- Ensure, at the end of the work shift, that in the work area, the equipment and tooling used are left in a situation of safety and appropriate to their characteristics, and/or are stored in places or boxes provided for the purpose;
- Use PPE and rescue equipment in the appropriate way and keep it in good shape;
- Report instantly any noticed (possible) danger to supervisory project personnel, incidents and near misses;
- Attend and participate in toolbox and safety meetings; Attend all relevant HS trainings and/or inductions.
- Comply with the instructions given by their supervisor(s) for HS and Environmental;
- Challenge or refuse to work if there is a risk to damage of the environment;
- Not to wilfully or recklessly interfere with or misuse anything provided for workplace health, safety and environment at the workplace;

**HEALTH AND SAFETY PLAN**

5 HEALTH AND SAFETY MANAGEMENT SYSTEM

BTJV deal with HS aspects in the particular project conditions, taking into account the applicable regulations and the particular requirements of the contract. A set of HS procedures to be issued during Project development and approved by the Project Director, subject to approval by the client representative where applicable, and circulated to the project team and subcontractors.

The principles of safety management system is to make sure that prior to start, risks are identified, mitigation measures planned, resources in place, people in charge have proper information then to insure control measures and improvement actions including audit, incident investigations, reporting, safety committee... and finally be ready with emergency response organization.

5.1 Project HS Risk Register

Project HS Risk Register will be maintained up to date by HS Manager reviewed by Construction Manager and approved by Project Director. It is a live document to identify the risk that should be taken into consideration while planning works, delivery, site activities...and also principles of mitigation measures. It gives guidance for work Risk Assessment and should be used during preparation of Method statement. The HS Project Register is reviewed by BTJV Project team as least once a year.

The main general risks identified for the project are:

- Location of the site: congested downtown area, nearby sensitive site, restricted access for delivery.
- Important quantities of manpower (peak at 5000 workers); unskilled workforce with low level in regards of Safety Practices, high level of turnover.
- Weather conditions, with rainy season and hot season.
- Emergency response available in case of accident.
- Interfaces with PYN project on the same plot.
- Interfaces between different contractor packages which required coordination site coordination.
- Number of lifting equipment and operations which required proper follow-up of equipment and skilled operators.
- Contract Time frame of Project which lead to more interface and night works.
- Logistic management in site and in connection with public area

While doing site and work preparation, risk assessment and selection of mitigation measures, the Project Team should consider the following preventive principles:

- Avoiding risks;
- Assessing the risks which cannot be avoided;
- Combating the risks at source;
- Adapting the work to the individual, especially with regard to the design of work places, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work and work at a predetermined work rate and/or reducing their effects on health;
- Adapting to technical progress;
- Replacing the dangerous by the non-dangerous or the less dangerous;
- Developing a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and the influence of factors related to the working environment;
- Giving collective protective measures priority over individual protective measures;
- Giving appropriate instructions to the workers.

5.2 Method statement/Risk Assessment

During Task Launch Process, the Engineer in Charge identified the Method Statement to be prepared for each work to be done on site (permanent works, temporary works and special activities (major delivery or maintenance operation)). The Method describes resources, sequence of work, quality and Safety risk and control measures to be implemented during works process. The Risk identification and Assessment is attached to the appendix of the Method statement.

Method statement should clarify the need of specific Working Permit such as confined space, welding in specific conditions...

The Method statement including Risk Assessment is prepared by Engineer in Charge, reviewed by HS Manager and Construction Manager prior to be approved by Project Director.



HEALTH AND SAFETY PLAN

Review of Method statement is part of Task Launch meeting, and Method sequence and Risk Assessment to be presented to site team in charge of the work.

A specific Internal Guide “Establishment of Work Method Statement” and “How to prepare Risk assessment” has been established in order to write properly such documents. Method statements will be reviewed following an incident/accident occurrence. See typical Risk Assessment template in Appendix.

Short Method statement including Job Safety Analysis to be conducted for works which are not covered by Method Statement with the approval of HS Manager. It is for limited operations (short duration, urgent operation). The request to be prepared and submitted by Engineer in charge and approved by HS Manager and Construction Manager or Site Senior Superintendent.

Routine operations such as routine delivery or maintenance, must be covered by short Method Statement and list of approved/trained people which have been inducted to follow the safety instructions detailed into Short Method Statement.

Temporary works

The temporary installations and structures necessary for the execution of permanent structures are covered by specific measures to ensure that they are designed, constructed, inspected and used in accordance with the applicable prevention regulations and principles. The Construction Manager draws up the list of temporary works and appoints the people responsible for monitoring them in coordination with Design, Methods and HS team.

Separate procedure explaining Design review, Methods, site Check of temporary works is part of HS Management.

5.3 Work Permit System

Permit to Work System will be as per Section 3 “PERMIT TO WORK SYSTEM” of SPA Minimum Health & Safety Requirements March 2015 Revision, with exception of contract qualification such as routine works such as piling works, tunnelling works (n/a on the project), routine lifting operations involving tower crane, mobile or crawler crane, work on scaffolds where a person could fall more than 2 meters (scaffolding erections will be a routine works on the project) including erection, alteration and dismantling of scaffolding.

Work Permit need is to be identified at preparation stage as part of Method Statement risk assessment process. Forms and specific procedure will be issued in dully time. Training will be provided to all those signing for permits/supervising works. Permits will be issued on a reasonable basis and limited depending upon nature of work and with approval from the HS Manager and must be closed, by inspection of each working level by the safety staff and permit holder on a daily basis. Permit to work already identified are Excavation, Confined Space, Hot Work, Demolition.

Principle of Work Permit system is attached in Appendix 3

5.4 Inspections of plant & equipment

Mobile equipment, plants, lifting equipment and listed tools shall be regularly inspected. Inspection planning is maintained by Plant and Equipment Manager with list of equipment and frequency of inspections.

The inspection of equipment is designed to check that it is in sound operating and safety condition and that it meets the needs.

There are several different types of inspection:

- Pre-mobilization inspections, for the main equipment prior to deliver on site when possible.
- Initial inspections, prior to launch operation of main equipment
- Daily visual check for main plant and equipment, duly recorded using checklist.
- Periodic test and Inspections as per regulations and/or operation manual.

5.4.1 Pre-mobilization inspections

These inspections are designated to:

- Verify the condition of the equipment;
- Verify its adequacy to meet the needs.

These inspections must be performed by the subcontractors or suppliers that are going to bring a main equipment (plant, crane,...). Such kind of inspections are usually performed by third party. Typical BTJV forms could be used (see example in



HEALTH AND SAFETY PLAN

Appendix10). While completed, the subcontractors or suppliers must transmit the duly completed inspection form to BTJV HS Department and Plant Department for review and approval.

While the mobile plant will arrive to Project site, these items will be inspected by BTJV Plant department. If the equipment is not complying with the HS standards, it will be not authorize to enter on site.

5.4.2 Initial inspections

Initial inspections will be performed for main equipment and plant arrived on site and prior to start operations. Inspections to be performed by BTJV Plant department staff based on typical forms and operation manuals. These inspections are meant to verify visually the condition of the equipment and to verify if the pre-mobilization inspection has been completed and accepted. It shall also be checked weather the same equipment is mobilized to the site.

If equipment does not comply with basic HS requirements, the subcontractor or supplier shall repair defective or unsafe parts prior to be authorized to enter on site.

After inspection, the equipment must be tagged which includes ref of equipment, date of inspection, planned date for next inspection, and also Name, picture and code of the designed trained operators. Inspection record to be kept by Plant and Equipment Manager you should insure tracking of equipment.

5.4.3 Periodic Inspections

All equipment and plant must be inspected as per operation manual instruction by a qualified persons designated by BTJV Project Director and Project Manager of Subcontractors. Inspections log records and other documentation related to checks, inspections must be kept available in or near the crane on site. After inspection new tag is posted with updated information.

Planning of inspection to be issued by each contractor and kept available to BTJV HS and Plant Managers.

5.4.4 Tower Crane Inspection

Tower cranes must be inspected and tested (as well as their lifting gears) every 12 months by a qualified third party expert (there is no local requirement in regard of third party qualifications, BTJV will select the best service provider to perform with such inspection based on their references). Crane log books and other documentation related to checks, inspections and testing must be kept in or near the crane on site.

5.4.5 Inspections of power tools, lifting gears and safety equipment – Quarterly inspection

All power tools (electric, pneumatic or hydraulic tools, electric cords, etc), lifting gears (slings, chains, shackles, hooks, blocks, etc) and safety equipment (body harness, life jackets, etc) shall be visually inspected by a competent person (a qualified person (electrician, mechanical, etc) on a quarterly basis. BTJV Project Director and Project Manager of Subcontractors to issued list of designated persons for such inspections.

BTJV Plant department is in charge of the inspection of the power tools and lifting gears belong to BTJV.

BTJV HS department is in charge of the inspection of the safety equipment belongs to BTJV.

Subcontractors are responsible to the quarterly inspections of their power tools, lifting gears and safety equipment.

When it is safely operable, a colour coded tag must be displayed on the inspected tools and safety equipment. Lifting gear can be colour coded. The quarterly colour code is shown below:

Figure 5: Inspection tag colour coding

	January, May, September	Orange
	February, June, October	Blue
	March, July, November	Green
	April, August, December	Yellow

**HEALTH AND SAFETY PLAN**

Inspection tags or tape can be used to tag the safe tools / equipment. Tools that are not acceptable shall not be used before re-inspection confirms compliance and bring back to store on dedicated Maintenance area.

5.4.6 Inspections of scaffolds

Scaffold to be erected as per Supplier Manual by trained people. They can be identified by sticker on their helmet after been trained and tested. Random check will be done by HS department on scaffold to insure compliance (stability, access, handrails...).

Scaffolds above 6m shall be inspected by a competent person designated by BTJV Project Director and Subcontractor Project Manager. The competent person shall inspect scaffolds after erection and fill an inspection report. When erection plan is not covered by typical erection as per supplier manual, calculation note to be issued.

After inspection, the competent person shall fill out the inspection tag and attach it to the point of access. Scaffold tags shall be regularly updated prior to work or immediately following any repairs or alterations. The competent person will be required to sign off on the tag. Scaffold shall not be used, at any time unless a valid approval tag is attached.

5.4.7 Inspections of fire extinguishers

Fire extinguishers must be visually inspected on monthly basis. Inspection label must be displayed and completed on cylinders. Tracking of location and inspections is followed by HS department.

5.5 Personnel competency, training and inductions

The basic rules to go on site is to have either Project Badge delivered by HS department, either a Visitor Badge delivered by security team, either Vehicle Pass delivered by security team.

The various badge could be only delivered after Safety induction or Safety Brief

BTJV HS Department will be responsible to provide the training courses listed below:

- Project site HS induction training for BTJV employees and subcontractors;
- Project site HS induction training for visitors;
- Emergency Response for BTJV employees and subcontractors,

The project HS Manager will keep a register of training conducted. The training information will be available on request.

5.5.1 Safety Induction / Safety Brief

Project site HS induction for personnel and subcontractors, service providers, regular visitors....

This induction includes:

- Safety message of the Yoma's Chairman
- Project QSE Policy;
- Lay-out of the site;
- Emergency Response;
- Welfare and medical facilities;
- PPE requirements;
- Specific site HS rules;
- Security instructions, etc.
- Safety regulations and Environmental awareness & responsibilities

The key message of the induction is to convey that Safety is the utmost priority and core on the project. Everyone is held liable of their safety and of the others. The rules are simple, "wear the allocated personal protective equipment (PPE) the mandatory and task specifics. Not to come to work under the influence of alcohol or drugs and only use equipment if trained to do so"...Information which are also part of the Project Booklet and posted into Project sign board panels. The duration of induction is approximately 2 hours and should be renew every 6 months.

After been inducted, and paper checked (copy of ID compared with original, copy of certificates...), the persons are recorded into handscan access control system with unique code. It permits to control access and also to have control of time in, time out of persons.

**HEALTH AND SAFETY PLAN**

On completion of the formalities, the new arrivals are conducted to their area of assignment, where the special features of the work to be performed and the safety measures to be applied are explained to them by the Supervisor and/or the Foreman (this training is recorded on the induction sheet, the original of which is handed over to the project HS Department).

Request for Safety Induction to be submitted at least 24 hours before with necessary completed forms and documents. The request to be filled by requester and signed either by HR department or Project Director to guarantee that people coming on site are legally employed.

Project site HS Brief for visitors

There is a short brief induction for visitors and short period workers who must be full time accompanied on site. A simplified induction will be applied for visitor and short term workers (less than 3 days) which will not perform dangerous work or work that requires a Short Method Statement or Permit to Work. People in such cases to be under supervision of designated person who are also authorized to deliver Safety Brief. These persons should be designated by Project Director (BTJV, BYMA or SPA). Please refer to the form in appendix ... After briefing people will receive Visitor Badge.

Safety Brief for delivery and routine service

There is a specific process linked to logistic purpose. At the gate driver will be checked (driving licence, request for delivery), safety brief will be delivered with layout showing the location of delivery, and temporary Vehicle Pass, and PPE. For 1st visit on site or last visit more than 1 month, the driver will be accompanied in the delivery area by security guard. In principle the driver should stay in his cabin except during unloading/loading/lifting operations.

During the gate check the security guard needs to inform logistic team of delivery arrival. Logistic team in coordination with Safety team needs to access the delivery operation risk and to issue Short Method Statement using typical form. It must include lifting plan for lifting operations.

For routine delivery such as fuel, water, furniture, soil removal, the driver must have been registered and delivered specific vehicle pass with his picture. If Pass is not shown, briefing to be done again.

Black list of unsafe driver will be maintained.

The Project induction Booklet/leaflet

An induction booklet provided by BTJV is handed to each new arrival during his (her) induction on the project. The induction booklet aims to:

- Provide each new arrival with the main information enabling him (her) to have an overall view of the project, this booklet being written in simple language understandable by all personnel;
- Describe briefly the structure to be constructed, the means used, and the people that the personnel will meet;
- Describe the objectives and QSE policy of the project;
- Provide the necessary information regarding outside emergency aid and what to do in case of an accident.

It is commented on and handed over at induction, during which the general safety training is provided. This training and handover of the booklet are recorded on the induction sheet by the HS Department.

Specific one is also prepared and regularly updated for site delivery. (main safety instruction for delivery, site layout showing access and delivery areas)

5.5.2 Training

BTJV HS Department coordinates with Site Superintendent and HR department the following trainings for BTJV personnel: Fire fighting / First aid / Scaffolding erectors and inspectors / Confined space / Traffic Marshall / Riggers-Banksman/ etc...

The subcontractors are responsible for providing relevant trainings to their employees:

Equipment operator / Vehicle driving / Crane operations (riggers/banks man etc) / First aid course / etc...

The subcontractors are requested to show the original qualification and certification documents when a personnel will be appointed to work on the project. A copy of these certificates shall be kept by the HS department. Training program has been submitted separately.



HEALTH AND SAFETY PLAN

First-aid training

First-aid training is provided for volunteer personnel and/or personnel appointed by the project in a ratio of 1 first-aiders per 50 workers. They will be identified by sticker on helmet. Refresh training will be done yearly. In addition they will be briefed on quarterly basis by site doctor.

Firefighting training

A firefighting training course and organisation is set up for each work area (offices, workshops, work areas, etc.).

Exercises with extinguishers will be organised, in cooperation with the Civil Defence, at least once a year for each of the teams designated for fire fighting.

Other specific HS training

Planned training (non-exhaustive list):

- Slings and riggers for cranes;
- Third party training for operators and drivers and internal awareness training;
- Scaffolding;
- VCA or equivalent training, for supervisory staff.
- Safety regulations and Environmental awareness & responsibilities

Operating authorisations

BTJV and its subcontractors make sure of the competence of its personnel before entrusting it with operating a lifting appliance, construction machinery, mobile plant, an installation or an automated system.

The operating authorisation is the recognition by BTJV or the subcontractor of the employee's capability for performing certain works safely. This requires preliminary verification of:

- Medical fitness (performed by a competent medical staff) in relation with health check program.
- Technical capability through a theoretical test and practical test, after training where applicable (provided by an approved instructor/organisation) depending on the machine or the employee's qualifications;
- Knowledge of operating and safety rules, and the locations in which the work is performed;
- Driving license, where applicable.

On Project, an operating authorisation is compulsory for the following machinery equipment:

- Tower cranes;
- Auxiliary and mobile cranes;
- Forklifts;
- Elevated Work Platforms / Man-lifts;
- Construction machinery, remote controlled or rider type;
- Loader, bulldozer....

This authorisation bears the name of the holder, is signed by the representative of his/her employer, and must be able to be presented on the workplace by the operator.

5.6 HS communication

Communication, signage and language

As communication is important, while English shall be the default Project communication, for workers all the communication, signage, toolbox, method presentation, basic training shall also be provided in Burmese/Myanmar language, or other languages (as and where appropriate, to the extent that is practical and needed).

Notice board at the site entrance

This is a general information board for anyone entering the site, on which appear the main common safety instructions such as PPE, sanctions policy, company safety message/bulletin and the main instructions concerning site regulations.

Notice boards within the site

These notice boards are located at the entrance of offices, in construction areas and welfare areas. They indicate:

- by-laws;
- work hours;



HEALTH AND SAFETY PLAN

- internal notes;
- instructions;
- lists of first-aid workers and emergency action team members..

HS shall be repeatedly visible for everybody so that awareness is obtained at all times. This includes but is not limited to:

- Publication boards;
- Posters and stickers;
- Banners;
- Warning signs;
- Cards and booklets, etc.

Task Launching meeting with subcontractors

The project HS Manager takes part in the subcontractor kick-off meeting in order to present the HS management system and the specific requirements and rules of the project.

Toolbox meetings

Toolbox meetings shall be held on weekly basis. Additional toolbox meetings can be organized after an accident, incident or a near miss or decided by BTJV teams based on site observations. Toolbox meetings are to be held by supervisory staff (HS staff should assist the supervisory staff). Subject shall be relevant to the work, all incidents, near misses, damages are to be discussed.

Toolbox meetings takes place in the team's work area, provided that the environment is suitable (safe location, absence of noise, disturbances, other teams or work nearby, etc.). The duration is about a quarter-hour long, it takes place during working hours, at the (appropriate) time chosen by the supervision (at the beginning of shift or after a break). It should in no case take place during rest times.

Records will be kept of each toolbox meeting to include registration of the subjects discussed and attendants. A toolbox meeting must be recorded through training attendance sheet form

Safety incentive programme/Sanction-fine policy

To stimulate the enhanced interest of all project personnel in HS awareness, the Company will introduce awards for the duration of a project.

The Safety Awards will be organized every month.

The awards will be based on the following weighting factors, but not limited to:

- Consistent approach to Health, Safety, Environment and Welfare.
- Standard of Health, Safety Environment and Welfare.
- Attitude, Behaviour and Culture awareness towards safety.
- Attitude and approach to unsafe acts and unsafe conditions reporting – the quality of the reporting rather than the number reported.
- Recognition of hazards and taking preventative action, with a view to elimination of the hazard.
- Forward planning of construction operations to reduce or eliminate the hazard.

The awards will be presented by the Project Director/or his appointed deputy.

The programme will operate on monthly basis (if feasible). Work groups or individuals will have to be identified by trade or discipline. Their (his/her) safety behaviour will have to be assessed. An award will be made to the winning group(s) or individual(s).

In counter party there is also sanction policy as per Company rules and Project fines regulation.

Sanction policy is applicable for people to enforce safe behaviour and ban unsafe behaviour. The sanction is based on Yellow and Red Card principle and explain during Safety Induction.

Safety fines are addressed to Contractor for which employee has been sanctioned or for non-respect of fines policy. The fines are collected on monthly basis and re-invest in preventive actions (purchase of equipment, training, incentive, safety campaign, additional resources...).

**HEALTH AND SAFETY PLAN****5.7 Worker and Staff register and communication**

Apart from the regulatory aspect, these documents enable the Project Manager to:

- be informed (in writing) of the observations of personnel and official organisations;
- check the routine examinations and verifications of equipment and installations;
- check that the removal of any reservation have been performed.

Subcontractors must keep this registers up to date as well. These documents must be kept available to BTJV management upon request.

Project worker's register

The workers' register in particular contain the names, date of birth, NRC no. (for locals), nationalities, jobs, amounts of wage, date of commencement of work, marital status, academic and professional qualifications, leaves of the workers and the penalties inflicted upon them.

If worker did not show during 2 months in the project he will be deleted from the register and handscan system.

Register of work injuries/Site clinic Register

The register of work injuries contains all the work injuries happened during the work completion.

The Nurse register contains all the treatment completed by Project Clinic team (Doctor and Nurse). It could help to identify general health issue for population working on the project and to address communication on this topics.

Liaison officer

Liaison officer office is installed on site and opened 2 times a week to receive any complaint from worker and staff. All topics related to HS will be submitted HS manager and Project Director.

Grievance mechanism

As part of Client policy, Grievance Mechanism is in place to collect all complaints from site people and nearby community. Grievance contact number and Complaints forms are available at Project Gate.

5.8 OCCUPATIONAL HEALTH PROGRAM / EMERGENCY PREPAREDNESS

Occupational Health program to be developed by BTJV is covering:

- Health check for BTJV workers
- Health check for sensitive population (equipment operator, aging people)
- First aid and emergency response in case of accident
- Health awareness campaign

Program will be followed by HS manager with resource of full time Doctor with support of site Nurse. Medical staff are accredited staff.

5.8.1 Health Check for BTJV workers and sensitive population

Even it is not contract or legal requirement, the process for Health check is key topics to insure that BTJV employ "fit to work" people. The Health check is done at the end of probation period and every years for local and regional worker/staff working on site. It could be extend to office staff as well. Priority will be done on workers and supervisor.

At the end of examination the Doctor should notice guidance in regards of task allocation or medical restrictions for each worker/staff if any. This notice will be given to the concerned person and to BTJV HR Department. The "restriction" case should be reviewed by HR and Superintendent/Manager of the concerned person to review the restriction and to take actions (maintain on similar duties with adaptations to guaranty safe workplace and compliance with restrictions, to give new duties to the concerned persons, to terminate the contract due to impossibility to maintain safe workplace or to fulfill other job in BYMA).

The principle of Health check is extending also to sensitive population such as

- People with previous Health issues, disease
- Women
- Night Shift
- People above 55
- People with BMI below 19 or above 28
- Sensitive Equipment operators (crane, boom lift)

**HEALTH AND SAFETY PLAN**

- Welder
- Scaffolder/work at height

Program of health check is developed by Doctor and medical information are confidential.

5.8.2 First aid case/Emergency response

The purpose of emergency measures is to put in place the personnel and structures adapted to the risks, so as:

- Be able to provide an accident victim with first aid before the arrival of outside emergency aid, and to organise as well as possible his (her) evacuation toward outside medical care structures;
- To be able to combat an incipient fire effectively;
- To anticipate exceptional phenomena and put in place special measures according to the site environment.

The information to personnel concerning the main aspects of this system is provided through induction booklet and/or special notes. The information concerns the following points:

- First aid;
- Outside emergency aid, evacuation;
- Fire fighting;
- Special emergency measures.

Details regarding the emergency preparedness and response measures are described in the procedure “**Emergency Response Plan**” submitted separately.

Due to the limited emergency services available in the project congested area, BTJV has decided to set-up site clinic and standby ambulance to secure effective emergency response in case of accident.

All first aid and medical care’s given in the first aid station are recorded into nurse register. Information is used by the BTJV Site nurses in so far as it concerns medical aspects, and by the project HS Department in so far as it concerns prevention and statistical aspects.

Any employee (from BTJV or subcontractors) can come at any time at the site first aid station in case of occupational related or not injury or disease. The care will be given free of charge.

If the health problem cannot be solved at the site first aid station, the person will be sent to public healthcare centre or hospital. In this case the management of the concerned person will be informed.

5.8.3 Health awareness campaign

BTJV will organized regular health campaign on work/health topics that site population are exposed: hot weather, addiction, handling, health food.

5.9 MANAGEMENT OF SUBCONTRACTORS AND SUPPLIERS

The Contracts for Subcontractors, main Service Providers and Suppliers include specific Projects QSE specifications and SPA Minimum HS requirement for major works.

5.9.1 Subcontractors

Contractors must have the expertise and necessary skills to undertake specialised activities. It is part of the Subcontractor Approval Request.

Prior to award of a subcontract package, the potential subcontractor shall be evaluated for compliance with HS requirements of the contract based on past performance and tender interview. The Project HS manager will support Trades/package Manager for the review of subcontractor submittal.

Prior to start Subcontractors and main service Provider, should submit HS plan explaining their commitment to reach Project target, resources and organization, risk register and typical mitigations measures to be implemented on site.

**HEALTH AND SAFETY PLAN**

HS organization to be submitted to BTJV HS department to insure compliance with contract and that designated staff are skilled HS professional.

Prior to start any task, subcontractor shall submit Method Statement which include also Risk Assessment. This Methods Statement is reviewed by BTJV prior to send to the Engineer.

The BTJV Engineer in charge of the subcontractor or Service provider shall ensure the following is performed:

- Subcontractor / main Service Provider comply with regulations and contract specifications
- Subcontract personnel MUST attend the Site Safety Induction; and adhere to the given safety instructions;
- Details of subcontract workers received within 24h prior to commencement on site.
- Name and position of the contractor's HS representative nominated in writing;
- Contractors are included or hold their own Pre-start Meetings;
- Contractors HS practices are monitored and audited;
- Incidents and accidents involving subcontractors are recorded and reported to BTJV
- Ensure that all its project personnel have attended an induction training
- Report any accidents, incidents, near miss, damages to equipment, environmental incident or security breaches during the execution of the subcontract to the Project Manager;
- Provide approved PPE to all of their workers. Costs for PPE shall not be deducted from the wages or salaries of the workers.

Management shall ensure that the performance of the Subcontractor is evaluated (at either the commencement or completion stage of the subcontract) and submitted to the Contracts Manager for inclusion into the List of Suppliers/Contractors.

Each subcontractor is responsible for all relevant HS matters of the subcontract. It shall appoint a person from his organization to act on behalf of the management regarding HS matters and provide HS supervisory staff.

5.9.2 Suppliers

Equipment and Hazardous are systematically purchased in conformance with the standards and, where applicable, shall bear a marking materialising conformity with essential health and safety requirements. If, due to its prototype nature or due to its construction in very limited runs, the equipment ordered cannot be provided with such a marking, the technical department ensures that its technical definition takes into account HS requirements. COSHH (Control of Substance Hazardous to Health) register shall be updated regularly and copy of all MSDS (materials safety data sheet) will be available on the storage areas.

5.10 HS INSPECTIONS, AUDIT, HS Committee

There are numerous tools to identify, analyse and issue control measures for HS findings on site.

5.10.1 HS Inspections

There are different kind of HS inspections to be able to assess measures adopted by the project to ensure that the workplaces are regularly inspected.

Monthly HS Inspections by Project Director – Formalize by Monthly report

The Project Director take the opportunity to participate to BTJV weekly Site walk to proceed with Project Director safety review as per internal process: review of main incident, dashboard review, progress of training plan, follo-up of corrective actions, review of finding analysis trend, ...Record is kept by HS Manager and send to BYMA country QSE Manager as part of the monthly report.

Inspections by Project Team – BTJV weekly Safety site walk

The Construction Manager, with Site Superintendent, HS Manager, Plat and Equipment manager and guests proceed to Safety site walk. The finding are recorded into report, with actions to be undertaken (when not done during the visit) and Person in charge.

At the end of the month the HS manager is preparing synthesis of the main Safety findings to be shared with project team with associated indicators.

**HEALTH AND SAFETY PLAN****HS weekly site inspection by the BTJV HS team and other Contractors HS representatives and SPA HS Team.**

To fulfil his mission, the HS Manager and/or his staff make regular site visits/inspections at various points in time with or without the project supervisory staff or subcontractor's responsible.

The objectives of these inspections are:

- To verify whether the personnel on the project adhere to the relevant standard and specific project HS instructions;
- To instruct personnel on the project, where required.

The reports are submitted by SPA to BTJV which is in charge of reply coordination with its subcontractors. The finding are also include in trend analysis with other internal finding records.

The closeout of finding should be done in reasonable time and submitted to SPA.

Stop and Go process

In case of findings which could lead to immediate and serious incident BTJV launches STOP and GO process. The work is stop, notification is done verbally and formalized. The engineer and supervisor in charge should work with HS department to propose corrective action prior to restart. The proposal is review by HS manager and Construction Manager then forward to the Project Director who is the person in charge of saying GO, meaning restart the work taking into consideration corrective actions.

5.10.2 HS audits**Internal Audits**

HS Audits, within the framework of project internal audits, are carried out annually by the HS department of BTJV and /or Corporate QHS Department.

Subcontractor audits

HS audits by the project HS Manager or corporate QHSE Department, can be triggered for a subcontractor or as a result of a major event or at the request of project management and/or Corporate Operation Department

The company Specific Management Procedure entitled "**Management of Audits**" defines the rules for performing these internal audits.

5.10.3 Project HS Committee

In order to review HS organization of the site, Monthly HS Committee is leading by BTJV, it involved BTJV Project Directors, HS Manager, Project Manager of BTJV Subcontractor, SPA Project Directors and SPA HS Manager, 2 worker representatives and 1 supervisor representative.

The main topics to be reviewed are:

- - HS incident records
- - Summary of Key Findings raised during site walks, audits and complaint register
- - Reviews of worker/supervision comments
- - Site Organization (access, signage, traffic...)
- - Fine regime follow-up
- - Actions for the next month

These minutes are displayed in places where the personnel can easily consult.

5.10.4 Annual Project management review

The project management review is intended to decide, among other things, on the adequacy and effectiveness of the HS system for fulfilling the project's HS policy and achieving the quantified objectives set in the annual HS action plan, and the regulatory HS requirements. It may lead to changes in the HS action programme, and/or in the objectives of the annual HS action plan, during the project.

**HEALTH AND SAFETY PLAN****5.11 Incident Management****5.11.1 Incident Classification**

- **Incident:** any unforeseen situation/uncontrolled event. It is generic terms which could be used for
 - Equipment incident, environmental incident, traffic incident...
 - HPI: High Potential Incident is an incident which could have led to serious consequences/important impacts for the project in term of equipment, progress, reputation...
 - Near miss: it is an incident which could has hurt someone.
- **Accident:** it is an incident with injured persons. It is generic terms which need to be clarified as follows:
 - First aid accident: workplace accident which requirement first aid treatment done by first aider or site nurse. It is minor accident
 - Accident without lost time: it is first aid case which required more than first aid/site nurse treatment meaning to be register as outpatient to doctor, clinic or hospital
 - Accident with Lost Time: it is accident which required recovery period recommended by a Doctor with certificate. It is reportable accident. The number of lost days to consider are calendar day starting from the date of accident.
 - Light duty accident: it is a Lost Time Accident for which the recovery period could be converted into light duty work without impacting the recovery process of the injured person. In such case there will be not lost time records and accident will be recorded as Light duty Accident
 - HPA: High Potential Accident is an accident which could have generate serious damages to a person or a group of person
 - Fatal accident

5.11.2 Incident Notification

In case any accident/incident happened, the injured person or any witnesses should report immediately to his direct Supervisor and Project Safety team for further actions. This is part of the instructions given during Safety Induction.

Anyone involved in or witnessing an accident/incident should respond as follows, depending upon the severity and nature of events:

- Raise the alarm;
- If there is obvious serious injury, call Site Safety Clinic team;
- If minor injury, call for a first aider/Safety or escort the Injured Person (I/P) to the Site Clinic;
- Provide assistance to the I/P if it is safe to do so;
- Do not move the I/P unless there is imminent risk to life (such as a fire);
- If applicable, construction/safety team to coordinate access for emergency services on site;
- If applicable, take essential actions to make the site safe or to prevent a further accident/incident.

After I/P has been assisted, those involved must isolate the accident/incident site or take any essential action to prevent further accident/incident. The accident/incident scene must not be disturbed further until approval to resume work has been given by Project Director or Project HS Manager (according to the severity).

On above confirmation (as relevant), work may start on site restoration, repair work and arrangements to make the site safe. The relevant Construction team and Project HS Manager will inspect the workplace immediately following an accident/incident occurring.

In addition please refer to Emergency Plan procedure.

The notification of incident is reported to HS Manager who report to QSE Manager, Construction Manager, Site senior Superintendent and Project Director.

The first aid cases are reported to HS Manager who report to QSE Manager, Construction Manager, Site senior Superintendent and Project Director. The HS Manager report within 12 hours to SPA HS Team

The Accident cases (with or without lost time) are reported to HS Manager who report to QSE Manager, Construction Manager, Site senior Superintendent and Project Director. The HS Manager reports immediately to SPA HS Team, the Project Director reports within 12hours to SPA Project Directors

For HPI and HPA cases, they are reported to HS Manager who report to QSE Manager, Construction Manager, Site senior Superintendent and Project Director. The HS Manager reports immediately to SPA HS Team, the Project Director reports immediately to SPA Project Directors.

**HEALTH AND SAFETY PLAN**

There is also internal process to report incident to BTJV Board, BYMA Board, Taisei and Bouygues Groups. SPA has also his internal process of reporting (SPA, YOMA, IFC...)

5.11.3 Incident Investigation

The relevant Construction team will obtain support from Project HS Manager to complete the necessary investigation and reports within reasonable delay. Incident report draft to be issued within 24 hours, final draft within 1 week depending of the severity and complexity of the incident.

The investigations should take into consideration:

- Pictures taken before during and after the incident
- Witness and injured person testimonies
- Factual records on site
- Re-creation of incident conditions
- Call for expert
- ect

To be able to understand the sequence of the accident, to compare with planned situation, to identify the possible direct and root causes.

The following internal forms are to be used as required by classification.

- Witness Report
- Injury / First Aid Report
- Safety Alert
- Investigation Report (Accident/Incident)

5.11.4 Incident Report

At the end of investigations, HS manager organised a review of investigations records with persons involved during incident, and adequate team. The draft of the report includes direct and root causes identified and correctives actions plan. All incidents are to be investigated to identify the root causes and corrective and preventive actions determined and implemented accordingly.

The form used is BTJV Incident Report. The Incident report is submitted to SPA within 24h when possible.

BTJV will insure follow-up of Injured Persons status and implementation of corrective actions. The follow-up table will be submitted to SPA via monthly report, evidences will be recorded by BTJV.

5.12 HS Document Control & Records Management

In general WH&S documentation are available for reference, review and auditing. There may however be certain documents that require confidential treatment, such as workers medical records or compensation and rehabilitation entitlements/payments. These documents would be maintained by HR Department to ensure confidentiality.

BYMA will ensure that documents and records are able to be identified, tracked and found in a timely manner and that confidential documents are kept secure and in accordance with relevant confidentiality and privacy legislation.

Types of WH&S documentation and records include:

- General WH&S Correspondence
- Safety Policies/Information/Brochures
- Risk Managements
- Monthly Reporting & Statistics
- Training/Induction
- Committee/Toolbox Meetings
- Monthly Safety Reports

**HEALTH AND SAFETY PLAN**

- Site safety Inspection records
- Emergency Response/Evacuation Trials
- Plant/Equipment Monitoring Records
- Operator competency
- Manufacturers SDS and Hazardous Substance Registers
- First Aid & Rehabilitation
- Incident Investigation & Reporting
- Noncompliance's, infringements & PIN's
- Audit Records
- Medical Records

5.13 HS / Environmental Issues

To assist on some of the specific environmental issues related with the Project construction, the Environmental Engineer works closely with the HS Manager on some of the various Environmental related aspects of the works, including, regulatory aspects and addressing certain environmental issues highlighted in the Tender documents, as well as in any environmental monitoring and management plans. These will be focused in developed in more detail after Contract Award. A separate Environmental.

**HEALTH AND SAFETY PLAN**

6 SITE HS RULES / GUIDANCE FOR SAFE WORK PRACTICES

The following sections are provided as guidance and reflect the minimum standard to be applied on the Project.

6.1 Site facilities

General hygiene measures for working conditions are taken into account whilst considering design, nature and sizing of site facilities. The sizing of site facilities takes into account the number of employees on site and will be adapted according to the maximum employees. The layout plan is regularly submitted and part of the CMR, it mentions the location of the first-aid station, firefighting facilities, rest areas, training room, assembly points, site entrance etc.

Safety signing panels will be installed near work areas with a view to providing information rapidly concerning a potential hazard and facilitating its precise identification. Permanent lighting of traffic and work areas is and/or will be implemented during the site work phase and in the site set-up phase.

6.2 Housekeeping

BTJV and its subcontractors supervisors shall conduct housekeeping inspections of their respective work, storage, lay down areas frequently taking corrective action immediately where necessary.

The following rules for housekeeping shall apply on PROJECT site:

- All materials, equipment and apparatus shall be stored neatly in their designated areas;
- Electrical cords, hoses, welding leads, etc are elevated to prevent tripping hazards;
- Tools, timber and other building materials shall be kept out of the way so not to cause tripping hazards;
- Walkways and passageways are clear;
- Timber and planks with protruding nails and other similar hazardous conditions must be dealt with promptly and removed from site;
- Starter rebars must be bent or protected by rebar caps;
- Suitable bins must be available in workplace for waste disposal;
- The accumulation of waste is prohibited;
- All scrap, construction waste and packing material shall be brought to specially designated areas. This waste will be collected from these areas for disposal on a regular basis as described in Environment Management Plan;
- Each employee shall leave his / her workplace in a clean and safe state on the completion of the task and at the end of each shift.

6.3 Barricading

BTJV team leaders and subcontractors are responsible for erecting and maintaining barriers or barricading that is required to protect workers or designate hazard work areas or exclusion zones.

Obviously, warning tape or similar material is not adequate to prevent a person from falling into a trench or pit.

Floor openings, stairwells, platforms and walkways and trenching where a person can fall any distance shall be adequately barricaded and where necessary, well lit.

Barricades may also be used to prevent personnel entering an area where risk of injury is high e.g. during overhead work activity or electrical testing, etc. Such barricading must provide clear visual warning and be of contrasting colours. The reason for the barrier shall be attached by means of a tag or label.

Where possible, barriers shall be placed at least one meter from the edge of an open trench or excavation.

6.4 Trenches and excavations

All excavation and trenching operation shall be suitably benched, battered and/or shored to ensure that there are systems in place to prevent / control:

- Falling or dislodgement of earth and rock within the excavation
- Instability of the excavation or adjacent structures
- In-rush of water in to the excavation



HEALTH AND SAFETY PLAN

- Placement of spoil and materials impacting or falling into the excavation
- Instability due to persons or plant working adjacent to the excavation

Excavation will also have due consideration to the identification and control of hazards from potential underground services. See section Excavation Work permit.

The following are the general requirements for trenches and excavations on site:

- Before excavation begins, utility services such as electrical, gas, steam, water, and sewer shall be located and identified. Any danger to workers from these utility services must be eliminated or controlled;
- If possible, manual shovels should be used to expose the facility. Special precautions shall be taken when shovelling nearby utility services;
- Trees, utility poles, rocks, material or similar objects near the edge of an excavation must be removed or secured to prevent workers from being injured;
- Excavation work must be carried out in accordance with the method statements provided by competent personnel including risk assessment, shoring design, access, etc;
- Excavation must be properly sloped and shored when required;
- Proper access and egress shall be provided;
- Proper protection shall be installed around the edge of trenches / excavation;
- Adequate warning sign boards shall be posted around the excavation.

These guidance to be integrated in Method Statement and associated Risk assessment which will be submitted prior to start excavation.

6.5 Elevated Work Platforms

The following are the general requirements for use of elevated work platforms on site:

- Where personnel are required to use an Elevated Work Platform / Man-lift a Job Safety Analysis must be prepared. The responsible supervisor must be notified on each occasion and ensure the appropriate procedures are in place before giving his/her consent for this activity to take place;
- The manufacturer safe operating procedures shall be observed at all time;
- Pre-start safety checks must be completed and logbooks filled in prior to use;
- Any personnel required to operate an Elevated Work Platform / Man-lift (Boom type) must have the appropriate operator certificate of competency;
- Full body harness, worn correctly and fitted with the appropriate lanyard attached to a secure anchor point shall be worn at all time by the occupants of the Elevated Work Platform / Man-lift.

6.6 Scaffolding, Work Platforms (WP), Access Towers (AT)

The erection, use and dismantling of scaffolding, WP or AT can create hazards on the project that must be controlled. This section described the minimum procedures to be adopted to manage the level of risk and ensure contractors comply with legislative requirements.

The application of this procedure extends to the management of all mobile, independent, suspended and cantilever scaffolding on site.

The following are the general requirements for erection, use and dismantling of scaffolding, WP or AT on site:

- All scaffolding, WP or AT used outdoor must be industrial heavy duty type,
- All scaffolding, WP or AT shall be erected, modified and dismantled by (or under the supervision of) a competent scaffolder as per supplier notice/instruction.
- Unauthorized persons shall not interfere with completed scaffolding, WP or AT at any time;
- Scaffolding, WP or AT must be built per specification when required (Calculation note by PE for scaffold more than 6 meter or typical erection drawing from supplier when standard equipment);
- All material use to erect a scaffolding, WP or AT must be properly inspected and be in good condition;
- scaffolding, WP or AT must be erected in solid footing / basement;
- Proper access and egress must be provided;
- Work platforms must be fully planked (with overlapping) and provided with double handrails and toe boards;
- Scaffolding, WP or AT must be periodically inspected and tagged by competent person;
- Drums and similar items must not be used on a working platform in order to reach high positioned zone, etc.

**HEALTH AND SAFETY PLAN****6.7 Ladders, steps ladder, A Frame ladder**

Ladder misuse is the cause of many serious accidents with many accidents being able to be prevented by more frequent inspections of the ladder prior to use; adequately securing ladders before use; and the application of safe work methods whilst using a ladder.

The following are minimum guidelines in relation to the safe use of ladders:

- Only ladders that are whole and in a safe, undamaged condition and of approved construction shall be used on site;
- It is not permitted to work on any type of ladder.
- Used of ladder is limited to access, insuring that the ladder is properly installed and fixed with at least 1 m above the targeted level.
- Visual inspections shall be conducted on daily basis to ensure ladders and steps are in good condition;

6.8 Hoisting and lifting equipment

Lifting operations have the potential to create a number of high-risk hazards on the PROJECT site. This section describes the minimum standards to be adapted by BTJV and its subcontractors in relation to the lifting operations on PROJECT site. The planning of a lifting operation is vital in order to maintain safe operation of all equipment. A number of control methods are required by various parties to successfully manage the hazards associated with cranes.

The numerous accident that occur associated with crane activity highlights the need for the implementation of stricter controls such as through documentation, inspection routines, and the enforcing of operation of crane by qualified persons.

All hoisting and lifting operations shall be appropriately registered, services and maintained and shall be required to be inspected and approved by the Project Plant Manager and Project HS Manager prior to entry onto site. Crane operators shall ensure all relevant documentation – including legible copies of the lift charts, operator's certificate of competency, statutory inspection certificates and registration, logbooks, and up to date registers including rigging equipment register are available at the time of inspection.

The lifting operations on site shall comply fully with the relevant legislation.

A lifting plan must be prepared when performing special lifting operation (large load, heavy lifting, etc).

6.9 Rigging

The following are the general requirements for rigging activities on site:

- All personnel involved in rigging or lifting operations shall be designated by their company Project Manager. In addition BTJV organise regular training regarding listing operations.
- All rigging equipment shall be inspected before each use;
- The Safe Working Load (SWL) must be kept visible;
- Damaged slings and equipment shall not be used. They shall be tagged "out of service", destroyed and removed from the site;
- Tag lines must be used to control the load.
- Riggers shall use whistle in order to warn other workers and worn distinctive clothes;
- Riggers and crane operators must have communication means (in case of blind lifting);
- Lifting areas must be properly barricaded before starting lifting operation;

6.10 Vehicles and mobile plants

The following are the general requirements for vehicles and mobile plants use on site:

- Vehicles and mobile plants must be inspected at the entrance gate before entry on Project site;
- Lights, brakes, horns, alarms shall properly work;
- Seat belts shall be worn;
- Any oil or fuel leakage must be repaired / fixed;
- Vehicles and mobile plants must be properly used as per as the recommendation of the manufacturer;
- Regular inspection and maintenance shall be recorded and kept available;
- Beacon flash shall be installed, operable and used;



HEALTH AND SAFETY PLAN

- Fire extinguisher shall be available inside the cabin;
- Proper housekeeping shall be done inside the cabin;
- Safety instructions shall be available in the cabin of mobile plants;
- Only drivers and operators with proper licenses and operating authorization are authorized to drive / operate on PROJECT site;
- Mobile plants must be provided with valid third party inspection certificate (when required).

6.11 Safe use of power tool and electrical safety

The following are minimum guidelines in relation to the safe use of power tools and electrical installations:

- Only properly trained personnel are authorized to work on, repair or maintain electrical installations;
- The manufacturer safe operating procedures shall be observed at all time;
- Pre-start safety checks of power tools must be completed in prior to use;
- Power tools including electrical cords must be kept in good condition and properly stored;
- Electrical cords used outdoor must be hanged to avoid any damage and contact with water;
- Pneumatic / hydraulic hose connections must be properly secured;
- The power tools used must be designed and fitted for the job performed;
- Electrical distribution panels shall be weather proof, locked and properly tagged;
- Mechanical safeguards must never be removed or damaged;
- In case of use of angle grinders, circular saws, etc "RPM" of the disc/stone is higher than the "RPM" of the machine;
- Proper fuse and breaker must be provided;
- Class I electrical equipment must be correctly earthed / connected to the ground;
- Power tools and electrical equipments must be periodically inspected and tagged, etc.

6.12 Fire prevention

As detailed in the **Emergency Response Plan**, the following are minimum guidelines in relation to the fire prevention:

- Fire fighting means shall be placed, according to the risks identified, at fixed stations, easily identifiable and accessible;
- Suitable fire extinguishers must be placed in the vicinity of rooms or places in which flammable products can be found, such as storage rooms, cloakrooms, canteens, transformer room, fuel oil and gas tanks, etc;
- The fire extinguishers shall be adapted to the fire class and to the premises in which they can be used;
- The fire fighting equipment shall be checked each year by a qualified person;
- Part of the personnel shall be trained in fire fighting and distributed judiciously over the site according to the identified risks;
- Flammable materials shall be stored away from other hazardous material (corrosive, harmful, toxic, etc) in order to avoid emission of hazardous gazes in case of fire;
- The storage room of flammable materials must be made from fire-resisting materials and be placed at a safe distance from other facilities;
- No spark or naked flame or any other source of fire are authorized where are stored flammable materials (liquids, gases, solids, waste, etc) including welding and steel cutting work;
- Smoking is prohibited in workplaces (out of smoking areas).

6.13 Welding / Cutting / Grinding

Welding processes have been identified as tasks creating a variety of hazards on the project.

The following are minimum guidelines in relation to the safe welding, cutting and grinding operations:

- Only qualified, suitably trained and approved personnel shall carry out welding operations;
- Welding equipment shall be inspected before use and shall be in good condition;
- Flashback arrestors shall be fitted to oxy-acetylene units at the regulator as well as the torch end;
- If there is a potential for the outbreak of fire, consideration should be given to the use of a fire watchmen;
- Fully operational fire extinguisher shall be accessible within easy reach of the hot work area;
- When conducting welding, oxy-acetylene cutting and grinding operations in elevated areas, fire proof blankets shall be used in order to arrest sparks, reduce the risk of fire, and to protect surrounding structures;
- When welding is being carried out at ground level welding screens / curtains are to be used to minimise sparks and the risk of fire, and to protect nearby workers from flash or penetrating eye injury;



HEALTH AND SAFETY PLAN

- Welding shall not be carried out without appropriate PPE such as welding shield or oxy-gas glasses, welding vest or apron, gloves, mask, cap, etc;
- Oxygen and fuel cylinders shall be properly stored and secured to a fixed part;
- Welding workplace shall be well ventilated.

6.14 Gas and oxygen storage

The following are minimum guidelines in relation to the safe storage of gas and oxygen:

- Always place full bottles with the full bottles and empty bottles with the empty ones, i.e. by gas type and always secure the bottles;
- Oxygen and fuel gases cylinders shall be stored separately by at least 6 meters or by a wall at least 1.5 m high with a minimum half-hour fire resistance material;
- Bottles shall be kept in upright position;
- When acetylene bottles are being used they shall be in a vertical position;
- Always store gas bottles in a rack and underneath a shelter (protect against extreme heat);
- Lifting of gas and oxygen bottles is only allowed with a closed and secured rack, fit for hoisting (lifting lug) and in accordance with the lifting and hoisting operations procedure;
- Transport shall be done in racks or trolley;
- Keep valves and cylinders free from oil and grease.

6.15 Hazardous substances

This section describes the minimum procedures to manage the level of risk and ensure the safe management of all hazardous substances and dangerous goods brought onto or used on PROJECT site.

Hazardous substances and dangerous goods such as fuels, liquefied gases, toxic products, flammable products, etc. Are subject to specific requirements with respect to the documents issued by the manufacturer and to be handed over by the supplier, concerning:

- Storage conditions;
- Conditions of and precautions for use;
- Conditions of waste removal;
- Information relating to safety and health (material safety data sheet (MSDS), for example).

The transport, storage, use and disposal of these substances will be in accordance with their MSDS.

Under no circumstances is any product, designated hazardous or otherwise, allowed to be brought or used on PROJECT if the appropriate controls cannot be implemented and exposure to the substance cannot be reduced.

A HS Risk Assessment is to be completed prior to the use of all hazardous substances on PROJECT site. Exposure to hazardous substances shall be in accordance with Local regulation and shall be kept as low as reasonably practicable (ALARP).

Where a less hazardous substance is available, a review will be initiated to determine if this product can be substituted for the less hazardous product.

All relevant information including a current MSDS shall be provided to BTJV HS Department for inclusion to the site MSDS register and be transmitted to the First Aid Station. Trainings will be carried out about chemical handling and MSDS will be disseminated to all involve prior to use any hazardous substance.

The MSDS provides the main information relating to the product and PPE to be worn, as well as what to do in case of contact, etc.

Moreover, each container of hazardous substances must be properly labelled:

- Name of substance;
- Hazardous nature (flammable, easily flammable, extremely flammable, oxidising, potentially explosive, irritant, corrosive, noxious, dangerous to the environment...)
- PPE required, etc.



HEALTH AND SAFETY PLAN

6.16 SITE ACCESS

The construction site and offices are under 24 hour's security surveillance, including gate security. At the security gate, a visitor's logbook is kept up to date in order to have a continuously updated register of all persons on the site.

Regarding the subcontractors, for each newcomer they shall fill out the "Site Access Request for New Arrival Employee" form and send it to BTJV HS Department. A copy of the official ID card of the newcomer and its specific qualifications (if any) is also required. Qualifications (crane operator, electrician, driving license, etc) will be checked by authorized people during the induction process.

People working on site (BTJV employees as well as subcontractors) are required to get their "site ID badge" (featuring their picture) issued by BTJV during induction process. Specific qualifications will be indicated in the "site ID badge".

A dedicated access will be provided to Saint Gabriel Church next to Bogyoke Market. The access will be a covered walkway protected from potential falling objects during demolition works and during building construction. Adequate lights will be installed with emergency lightings in case of power surge will be provided also. Where access to YESC compound (substation area) on the North will be kept free at all times. Where works need to be undertaken and the access gate will be blocked to proceed with the site operation an alternate route access will be provided prior to any site undertakings. YESC personnel's will be accompanied by BTJV, HS or Security Staff whenever they want to access onsite to enter the substation.

6.17 Access of Vehicles and Mobile plants

Only vehicles and mobile plants deemed to be essential to the construction effort by BTJV will be authorized to access the site and other vehicles on an adhoc basis if required by authorities (YESC).

Drivers of vehicles and mobile plants must be able to show to Security personnel the registration and insurance certificate which must be kept into the cabin. Lifting mobile plants must have a periodical inspection certificate.

Security personnel shall monitor and record vehicle and mobile plants movements through the access points. Security shall conduct random checks of authorized vehicles and mobile plants during the day and total checks and recording of details. Security shall maintain a current listing of all authorized On-Site vehicles and mobile plants and designated drivers. Authorized On-Site vehicles and mobile plants shall be provided with an "Authorized Entry" windscreen sticker for identification.

For delivery activities or temporary works (less than 24 hours) Security personnel will issue a Temporary Vehicle Pass which has to be displayed behind the windscreen of the vehicle or mobile plant.

For drivers, Security personnel will issue a visitor badge in return of an official ID card. In accordance with project induction procedures, drivers will be inducted to the Site and will be required to wear the appropriate personal protective equipment.

All delivery vehicles leaving the Site shall be subject to inspection by Security personnel.

Depending on the drivers' knowledge of the Site and the nature of the delivery point, Security personnel may require a person for whom the delivery is destined to escort the driver to the delivery point.

The equipment(s) and material(s) which are brought by delivery vehicle will be authorized to enter onto the Site only if "Site access request for material / equipment" is filled out and submitted to the BTJV Construction Manager who will transmit the form to HS manager.

Security will log all the details of all the vehicles bringing equipment(s) and material(s) onto the Site.

Vehicles must be securely and safely loaded before being allowed to enter or leave the site. Vehicles leaving the site must be ensured with clean tyres to prevent leaving marks on the public road.

**HEALTH AND SAFETY PLAN****6.18 Entrance of materials and equipment**

Material and equipment will be authorized enter onto the Site only if "Site access request for material / equipment" is filled out and submitted to the BTJV Construction Manager who will transmit the form to HS manager.

"Material" means construction material (sand, aggregates, stones, cement, concrete, plywood, timbers, formworks, pipes, beams, steel sheets, rebars, wires, etc) but also chemical products (gasoline, diesel, hydraulic oil, painting, compressed gas, cement, concrete additives, etc). Chemical products must be delivered on site with their Material Safety Data Sheets. A log book of these MSDS will be stored in Security Gate. A copy of these MSDS will be transmit to BTJV HS Department and then to site paramedic.

"Equipment" means scaffolds, site facilities (WC, containers, offices...), tank (water, fuel, sewage...), air compressors, generator sets, lighting masts, air conditioning units, pump, Personal Protective Equipment, Power tools (grinders, circular saws, drillers, concrete breakers...). This equipment must be delivered on site with their Technical Data Sheets. This equipment must comply with local HS standards.

Project personnel, who bring onto the Site, personal tools and/or equipment in connection with the performance of their work, shall be responsible for the security and protection of these items.

Subcontractors must provide their own security to control and protect their plant, equipment and materials including the protection of their work areas during off work periods such as meal break.

6.19 Traffic Management

A procedure named "Traffic Management Plan" had been established in order to ensure that the impacts of construction works on the public domain, in particular with respect to temporary interruptions to vehicular and pedestrian traffic, are considered by BTJV.

This Traffic Manager ensures that public safety is maintained at all times and that whenever possible interruption to the use of public space is minimised.

Traffic Management plan has been submitted separately for Engineers Approval.

6.20 Protective equipment**6.20.1 Collective protective equipment**

Collective protective equipment is mainly means used to:

- prevent the fall from height (more than 2 meters);
- prevent objects or materials falling;
- ensure proper ventilation of rooms or workplaces which are confined or which could contain hazardous substances.

Falling protection

Areas (working places, accesses, etc) where there is a risk of falling from more than 2 meters height must be protected by double guard rails. To be effective, protection must have an appropriate geometry, stability and resistance, and be continuous in space and permanent in time.

Protection against objects falling from height

All lifting areas (areas where are used cranes, chain blocks, hoists, suspended scaffoldings, etc) must be properly barricaded in order to avoid any entry of persons or vehicles in the dangerous area.

Before starting a lifting operation, the load must be properly checked for any loose part which could potentially fall down during the lifting operation.

All elevated working platform and slab' edges must be provided with proper toe-boards in order to avoid fall of material in lower levels.



BYMA-Talsel Joint Venture (BTJV)



YOMA CENTRAL PROJECT



Document No.: YCP-QSE-HSP-001

Revision: C

Page 30 of 52

HEALTH AND SAFETY PLAN

Ventilation of work atmospheres

Premises with specific pollution, i.e. those in which hazardous substances are emitted (gases, aerosol vapours, fumes, dust etc) have to be properly ventilated. There are two methods:

- General ventilation consisting in reducing the concentration of a pollutant below limit exposure values by supplying fresh air;
- Local ventilation consisting in capturing the pollutant at source and discharging it outside the work atmosphere.

These ventilation systems will be defined according the work progress and the atmosphere contamination level.

6.20.2 Personal protective equipment (PPE)

In addition to compulsory PPE such as the safety helmet, safety shoes, coverall and high visibility jacket, when the risk could not be removed or reduced at source or when setting up collective protection systems proves impossible or incomplete, specific PPE adapted to the job and to the risks incurred is made available to personnel.

Please refer to the Method Statement HS section submitted in regular basis and for special work, the use of specific PPE is described on the posted panel PPE Policy in Appendix 12

Supervisory staff, personnel and the HS Manager are involved in choosing the PPE.

It must be solid, have a performance level appropriate for the intensity of the risks, be comfortable, and it should not interfere with the work, because it would likely not be worn.

The preliminary HS Risk Assessment defines the nature of the PPE to be worn and it is reflected into Method Statement

The Team Leaders must ensure that the requisite PPE is used. This compulsory recommendation is covered by the instructions given at the induction stage.

Employees must be informed of the risks against which the PPE is designed to protect them. They also must receive instructions for use and possibly training in wearing PPE (e.g. safety harness, etc.). These general conditions of use are dealt with regularly at toolbox meetings.



HEALTH AND SAFETY PLAN

Appendix 1: Health and Safety Policy

YOMA CENTRAL PROJECT

PROJECT HEALTH AND SAFETY POLICY



BYMA and Taisei Joint Venture (BTJV) the main contractor for the Yoma Central Project located in Yangon Myanmar, are committed to protecting the health and safety of everybody who plays a part in our operations and lives in the communities in which we operate. Our aim is to complete the project with 'high and exemplary' standards of health and safety, satisfying our client's expectations and by demonstrating that we are unique in this respect to other contractors working in the region.

To meet our commitment BTJV will:

- Be the leading company in all jurisdictions in which we operate and aim towards "zero accidents".
- Pursue the goal of no harm to people, which includes the local communities;
- Ensure induction and training of workers and staff (awareness, knowledge of our standards, and best practices).
- Aim to ensure that all activities are carried out safely by removing/reducing the risks to the health, safety and welfare of all workers to as low a level as reasonably practicable;
- Ensure that there is senior management involvement with all HS matters ensuring exemplary standards with the diligence accorded to all of its other critical business activities;
- Play a leading role in promoting best practice in our industries;
- Develop a framework for workers communication and participation in the project;
- Be a leader and role model in sustainable development satisfying our client's expectations and requirements.
- Protect the environment by efficient use of natural & energy resources & managing waste according to our duty care and minimizing volumes going to landfill, by re-use, recycling and use renewable or recycled materials wherever possible.
- Develop and use energy resources and materials efficiently to build and provide products and services;
- Promote culture in which all Company employees share this commitment;
- Ensure transparency in the reporting of the Company's HS performance.

In this way, we aim to have an HS performance we can all be proud and at the same time earn the confidence of our clients, joint venture partners and the society at large.

BTJV core project objectives are:

- Have a systematic approach and establish a dedicated methodology of HS management designed to ensure that not only BTJV but its partners, contractors and subcontractors are competent; in compliance to local laws, regulations and international standards and that they periodically reviewed.
- To regular review, at least once per year, the Policy, the HS Management System for its efficiency and effectiveness by way of Management Inspection and Review and HS Audit conducted by Senior Management Staff;
- Conduct activities in a manner designed to minimize HS risks to a level which is "As Low As Reasonably Practicable" (ALARP) to ensure that all risk assessments are reviewed, approved and revised as the need arises;
- Set targets for continuous HS performance improvements;
- Measure, appraise and report HS performance in accordance to Country, Corporate and Project requirements;
- Hold appropriately empowered line management (the supervisor and / or manager) responsible for providing and maintaining a safe working environment, safe systems of work, plant and substances in safe condition & facilities for the welfare of all workers. Any information, instruction, training and supervision needed to make sure that all workers are safety from injury and risks to their health.
- Include HS competencies and performance in the selection, appraisal and reward of our staff;
- To establish and maintain a dedicated methodology for reviewing and establishing a system for evaluating Contractors HS competency.
- Ensure management of change is applied when identifying possible hazards, risks are regularly reviewed whenever work methodology change, HS management system and our activities.
- Adopt a zero tolerance policy for alcohol and drug use in the work place.
- Ensure that efficient toolbox talks are conducted on a regular basis.
- Provide an adequate environmental monitoring program and control of all hazardous substances whether in the work phases or in the waste management process.

Each employee has a personal responsibility to comply with this policy. Our leaders are accountable to communicate the requirements of this policy to all our employees, contractors and visitors and to involve them in its implementation

BTJV will implement this policy in line with applicable local HS Regulations



Appendix 3: Permit to Work Typical Procedure

1. Policy Statement

BTJV recognizes that activities undertaken in certain environments can be inherently hazardous to the workers safety and health. As such, the Company is committed to ensuring that exposure to hazardous work environments such as hot work, entry into confined spaces, demolition works and excavation is minimized. Consequently, a Permit to Work is required for all work performed involving hot work, excavations, demolition works and confined space entry.

The requirement for a Permit to Work includes work to be performed by departments and contractors. Permits to Work can only be obtained off one of the designated Responsible Officers as defined below by competent persons as define below.

The Permit to Work Policy is several components dependent on the type of work to be performed. Permit to work to be delivered by designated persons approved by Project Director.

As a minimum permit to work shall comply with **SPA Minimum Health & Safety Requirements March 2015 Revision** with exception of routine works such as piling works, tunnelling works (n/a on the project), routine lifting operations involving tower crane, mobile or crawler crane, work on scaffold where a person could fall more than 2 meters (scaffolding erections will be a routine works on the project) including erection, alteration and dismantling of scaffolding.

2. Definitions

- 2.1 **Permit to Work Officer** - An employee of the Company who has been trained authorized and has satisfactory knowledge of the hazards at a work site to be able to specify a system to eliminate, as far as reasonably practicable, the risks in a particular job.
- 2.2 **Competent Person**- An employee who has been trained in PTW and fully understands the sequences of permit issue and ensures requirements of the permit.
- 2.3 **Confined Space** - A confined space is considered to be any area which, because of its location, contents and the activities performed within it, may be deficient in oxygen or contain flammable/toxic vapors and gases. It may be of any size. Confined spaces usually have limited openings for entry and exit, and unfavorable natural ventilation. They are generally not designed for continuous worker occupancy. Confined spaces may include, but are not limited to:
 - a. Storage tanks, boilers, pressure vessels, silos
 - b. Open topped spaces of more than 1.5m depth, such as degreasers or pits that are not subject to good natural ventilation
 - c. Pipes, sewers, shafts, ducts and similar structures.
- 2.4 **Hot works** – any works that produces sparks such as welding works, cutting works using gas cutting (oxygen-acetylene use), waterproofing works using blow torch.
- 2.5 **Excavation** – Excavation is the process of moving earth, rock or other materials with tools, equipment or explosives. It includes earthwork, trenching, wall shafts, tunneling and underground. Risk involves in excavations includes, damaged to underground services such as electrical cables, pipelines and network cables. Hazardous gas maybe present on deep excavations and the risk of collapse of the side of the excavation is the most common.
- 2.6 **Demolition** – is the tearing down of buildings and other man-made structures. Demolition works on the YCP will be done using mechanical breaking equipments such as mini breakers mounted excavators, manual hacking, saw cutting and the use of long arm excavators. No demolition works will be carried out without a 'Demolition Checklist' issued by the Health & Safety Department. Demolition checklist shall be carried out for each and every location where demolition is being undertaken.



HEALTH AND SAFETY PLAN

3. Work not requiring a Permit

- 3.1 Activities involving routine production and process operations including startup, changes in operational modes and shutdowns do not require a Permit to Work. Routine work includes first line maintenance carried out by operations personnel such as topping up oil/water, tuning controllers, etc.
- 3.2 Normally, the activities of inspectors, surveyors, engineers, draftspersons and visitors will not require a Permit to Work, provided their presence in the operational area is approved in advance by the Responsible Officer and their activity does not interfere with plant or equipment, nor are they carrying potential ignition sources.
- 3.3 Work carried out in designated maintenance (e.g. Company workshops) and construction areas do not require a Permit to Work.

4. What is the Permit to Work System

- 4.1 A Permit to Work System provides a systematic disciplined approach to assessing the risks of a job and specifying the precautions to be taken when performing hot work and/or working in a confined space.
- 4.2 The permit to work system:
 - a. Specifies the work to be done and the equipment to be used
 - b. Specifies the precautions to be taken when performing the task
 - c. Gives permission for work to start
 - d. Provides a check to ensure that all safety considerations have been taken into account, including the validity of permits and certificates and compliance to the Company's policies and procedures and
 - e. On completion of work it provides a checking mechanism that all work has been completed to the Company's satisfaction.

5. Permit Procedure

5.1 Hot Work – Confined Space - Excavation - Demolition

Commencement of work must not begin until the appropriate level of authority has endorsed the Permit for Work.

- a. An employee/contractor wishes to perform work.
- b. The respective competent personnel approach the appropriate Responsible Officer (normally engineer in charge) for permission to work in an area requiring a Permit (Hot Work – Confined Space – Excavation).
- c. Responsible Officer decides whether requested work requires a Permit to Work. If a Permit to Work is not required no further action is taken and the person can begin work.
- d. If a Permit to Work is required the competent personnel employee/subcontractor completes the Permit to Work form and submits to the Responsible Officer. Details provided in the Permit for Work includes work required, work environment and safety precautions (such as provision of fire equipment etc) that will be taken when preparing, performing and completing the task. The permit must be made out in triplicate with one copy going to the approval authority (production) one copy going to the requester (subcontractor) and one copy going to QSE.
- e. **Where deemed necessary** due to safety reasons the QSE department must be notified to ensure that safety precautions present are at a minimum at the start and at the end to check for remaining hazards and cleanliness etc.
- f. When satisfied that the employee/subcontractor has provided sufficient information, safety precautions and is suitably trained to perform the task to specification the Responsible Officer issues the Permit to Work.
- g. Permit to Work once issued will require to be extended by the issuing authority if the work exceeds the stated times, whilst the building has no envelope permits by agreement with the QSE department can be issued for a week period at a time. Once the building for example has an envelope and has flammable materials within the envelope the permit will become a daily issuance and shall be re-issued at the start of each shift by the duty issuing authority.



HEALTH AND SAFETY PLAN

- h. On arrival at the work area the employee/subcontractor notifies the appropriate person within the building/area that they have arrived to perform specified work. Note the permit must be posted next to the works where possible and be placed in a plastic envelope or alike.
- i. Prior to beginning work the employee/subcontractor ensures that there is no combustible material (e.g. paper, wood, gas bottles) near to their work that could lead to a fire with the introduction of hot work. Or in the excavation that all areas meet the requirements of the permit.
- j. Employee/subcontractor completes work as detailed in the Permit to Work and their contract/job specifications. This person is then required to remain at the work area for at least 30 minutes after work has been completed to ensure that there is no possibility of fire (if hot work only). During this period the employee/contractor is to clean up the workplace; contact the QSE and / or maintenance to perform a final inspection of the workplace to ensure there is no possibility of fire or other hazards presenting themselves due to their work.
- k. When leaving the work area the employee/contractor is required to advise the appropriate person within building/area that work has been completed and that they are leaving the building/area.
- l. Employee/contractor returns Permit to Work to Responsible Officer once task has been completed or at the end of the week period or day period dependant on the status of the envelope of the building and or area.
- m. When Responsible Officer is satisfied that work has been completed to job specifications and safety requirements signs off the Permit to Work and files for future record.

5.2 Confined Spaces

Commencement of work must not begin until the Permit to Work has not be signed by the competent designated person.

- a. An employee/contractor wishes to perform work in a confined space.
- b. Approaches the appropriate Responsible Officer (engineer in charge) for permission to work in an area requiring a Permit to Work (Confined Space).
- c. Responsible Officer decides whether requested work requires a Permit to Work. If a Permit to Work is not required no further action is taken and the person can begin work.
- d. If a Permit to Work is required the employee/subcontractor completes the Permit to Work form and submits to the Responsible Officer. Details provided on the Permit to Work includes work required, work environment and safety precautions (e.g. gas detection equipment) that will be taken when preparing, performing and completing the task. The permit must be made out in triplicate with one copy going to the approval authority (production) one copy going to the requester (subcontractor) and one copy going to QSE, QSE will maintain a log of all confine space work.
- e. At least two people must be present when performing work in a confined space at all times. They should also possess a mobile telephone to enable contact to be made with them. While working in a Confined Space, worker must Wear Safety lanyard at all times, with one (1) man holding Safety Lanyard and in communication with said worker in case of an emergency. The telephone number is to be given to the Responsible Officer prior to the commencement of work. QSE Department must be notified and will ensure that all safety requirements are addressed before entry.
- f. When satisfied that the employee/subcontractor has provided sufficient information, safety precautions and is suitably trained to perform the task to specification the Responsible Officer issues the Permit to Work.
- g. On arrival at the permit work area the employee/subcontractor notifies the appropriate person within the building/area that they have arrived to perform specified work. Note the permit must be posted next to the works where possible and be placed in a plastic envelope or alike
- h. If required, toxic, hazardous or oxygen gas detection is to be performed prior to entry in the confined space and is to continue until all works have been completed in the confined space. The requirement of gas detection equipment is dependent on the type of hazards foreseeable in the confined space. Please speak with QSE for more information regarding the requirements of gas detection equipment.
- i. Where entry is not toxic but lacks adequate ventilation this must be provided and maintained throughout the work processes, this can be done in several ways, this can also reduce the heat exposure when working at extreme temperatures.
- j. When working in areas of difficult access (for example re-bar cages) where there is like to be limited access egress, adequate controls shall be put in place to ensure the safety of the worker, such as but not limited to the following:



HEALTH AND SAFETY PLAN

- Access egress is it big enough to allow workers wearing all the necessary equipment to climb in and out easily, and provide ready access and egress in an emergency? For example, the size of the opening may mean choosing airline breathing apparatus in place of self-contained equipment which is more bulky and therefore likely to restrict ready passage
 - Lifelines attached to harnesses should run back to a point outside the confined space,
 - Adequate communications, as a minimum there has to be either a walkie talkie (if not toxic flammable gases) cell phone coverage if no toxic flammable gases) or visual/site control, It will be necessary to station someone outside to keep watch and to communicate with anyone inside, raise the alarm quickly in an emergency, and take charge of the rescue procedures
 - There shall at all times be a competent first aider or a qualified nurse, with clinic facilities dependant on local legislation,
 - Doctor on call 24 hrs
 - Access to emergency services within short distance.
 - Adequate security safety controls in place to allow emergency services to enter freely unhindered.
 - Adequate emergency controls for taking injured parties out of confined space. Where applicable burning equipment (if not toxic flammable)
 - Adequate ventilation, you may need to increase the number of openings and therefore improve ventilation. Mechanical ventilation may be necessary to ensure an adequate supply of fresh air
 - Ensure workers have access to fresh cold water and shelter (if in extreme temperatures),
 - Staggered breaks ensure adequate shelter and cooling down (if in extreme temperatures),
- k. Employee/subcontractor completes work as detailed in the Permit to Work.
- l. Employee/subcontractor advises appropriate person within building/area that work has been completed and that they are leaving the building/area.
- m. Employee/subcontractor returns Permit to Work to Responsible Officer once task has been completed.
- n. When Responsible Officer is satisfied that work has been completed to job specifications and safety requirements signs off the Permit to Work and files for future record.

5.2 Excavation

Commencement of work must not begin until the appropriate level of authority has endorsed the Permit to Work.

- a. An employee/contractor wishes to perform excavation works.
- b. Approaches the appropriate Responsible Officer (engineer in charge) for permission to work in an area requiring a Permit to Work (Excavation Work).
- c. Responsible Officer decides whether requested work requires a Permit to Work. If a Permit to Work is not required no further action is taken and the person can begin working.
- d. Excavation Permit to work required to be taken when underground services are present base on the as built or as per the site installation plan. Deep excavations more than 2 meters requires also permit.
- e. Responsible/Competent person must ensure that all requirements of the permit is satisfied prior to notify Safety Department for inspection. Once Safety Officer/Manager issued the permit, only then the excavation shall commence.

5.3 Demolition works

Demolition works will not be carried out unless a demolition checklist is done and issued by Health and Safety Department. See Annex 4 for checklist use in Demolition works. Checklist will serve as permit to work.



HEALTH AND SAFETY PLAN

Annex A : Typical Hot work Permit

HOT WORK PERMIT																																																																																																																																																																																																																																																		
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HEALTH AND SAFETY PLAN

Annex B : Typical Confined Space Permit

Confined Space Permit														
1.0 GENERAL INFORMATION														
Project:														
Date of Entry:						Duration of Entry:								
Space Location:														
Purpose of Entry:														
Atmospheric Hazards Expected: <input type="checkbox"/> Oxygen Deficiency <input type="checkbox"/> Oxygen Enrichment <input type="checkbox"/> Flammable Vapors <input type="checkbox"/> Toxics (specify)::														
Entry Supervisor (ES):						Attendant(s):								
2.0 CERTIFICATE REQUIREMENTS														
<input type="checkbox"/> Non-atmospheric hazards do not exist in this space <input type="checkbox"/> Communication methods established between entrants and the attendant <input type="checkbox"/> Covers can be remove safely <input type="checkbox"/> Space openings guarded from fall hazards and falling objects <input type="checkbox"/> Continuous forced-air ventilation from a clean air is source is positioned in the immediate area where entrants are working and continue until they have left the space														
3.0 ATMOSPHERIC MONITORING														
Frequency: <input type="checkbox"/> Prior to Entry <input type="checkbox"/> Continuous <input type="checkbox"/> Periodic (specify):														
Instruments: <input type="checkbox"/> Combustible Gas Indicator <input type="checkbox"/> Colorimetric Tubes <input type="checkbox"/> CO Monitor <input type="checkbox"/> H2S Monitor <input type="checkbox"/> Other(specify):														
Substances Monitored: <input type="checkbox"/> Oxygen <input type="checkbox"/> Flammables <input type="checkbox"/> CO <input type="checkbox"/> H2S <input type="checkbox"/> Other (Specify) :														
Monitoring Results			Oxygen		Flammability				Toxicity					
Monitors		Limits		19.5 – 23.5 %		< 10 % of LEL				< PEL/TLV/OEL				
Initials	Date	Time		%		% of LEL				Substance		Level	Limit	
4.0 AUTHORIZATION / ACCOUNTABILITY LOG														
The following individuals have successfully completed confined space training, have attended a preentry briefing, and are authorized to enter the space.														
Name of Entrant	ES Initials		Attendant – check each time an individual enters or exits the space.											
	Trained	Briefed	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
5.0 CERTIFICATE AUTHORIZATION AND CANCELLATION														
Entry Supervisor Signature				Employee Number				Date		Time				
Entry Authorized														
Entry Cancelled														
Problems Encountered During Entry														



HEALTH AND SAFETY PLAN

Annex C : Typical Demolition Permit Safety Check list

		LANDMARK PROJECT Safety Checklist – FMI Demolition			Date: / /		
G = Good I = Improvement Required P = Poor, for immediate Improvement required							
THEMES AND ELEMENTS CHECKED	CHECKED		FINDINGS/REMARKS	G	I	P	
	YES	NO					
INFORMATION, PERSONNEL TRAINING							
Daily Safety Meetings being carried out and recorded							
Method documents posted on site							
Safety Good and Bad practice posted on site							
PPE							
PPE compliance in general and specific							
ACCES AND CIRCULATIONS							
Site access to all level identified and proper signage, lit and clear of obstructions							
Emergency exits, well-marked							
Sufficient lighting for circulation and works							
ELECTRICAL INSTALLATION TOOLS							
Electrical panels checked (free from damage) & locked							
Cable management effective (cable status, cable arrangements, no risk of damages by activities)							
EQUIPMENT AND MACHINERY							
Equipments use are in good condition and no signs of damage, leaks and necessary safety guard in place							
Lorries/BOBCAT are fitted with reverse alarms							
Equipment daily checks carried out by authorized operators?							
WORKING AT HEIGHTS							
Only trained persons for erection, dismantling of decking/scaffold systems							
Proper access and egress (and signage) provided for all scaffold levels							
Scaff tag system in place and completed							
Fall protection (life lines and Harnesses) in good condition, installed/worn correctly and usage understood by wearer							
Fall protection equipment inspection/register maintained							
Guard rails and toe boards installed and comply with standard (weekly inspection and cleaning od scaffold during activity break)							
FALLING OBJECT PROTECTIONS							
Covered walkways installed on all perimeter of the building & the public road							
Safety nets are installed all around the building (Green and Black nettings) and in good condition.							
Debris evacuation areas are cordon off and fully covered with nettings or plywood.							
Metal sheets are installed on two working levels under demolition							
Catch fall and catch nets installed and no gaps							
Exclusion zones are in place on the demolition areas.							
COLLECTIVE PROTECTIONS							
Risers & lift shafts are protected as per the standard & signage displayed							
Floor openings marked and protected							
Floor edges are protected							
Barriers/handrails in place on the lift shafts and void areas.							
DEMOLITION							
Brick structures and main structures identified and clearly marked with paint?							
Structures subject to wire cut and saw cut are supported and propped?							
Workers and supervisors are aware that Bogyoke Market side and Aung San Road side structures are to be wire cut and saw cut only and that hacking is forbidden? In short period time (18H00/22H00 for lifting operations)							
Only authorize and trained workers operates demolition equipments?							



HEALTH AND SAFETY PLAN

HOTWORKS						
Appropriate barricades and signage are in place around hot work areas.						
Gas cutting set kept on a safe distance						
Gas cutting sets are fitted with flash back arrestors						
LIFTING WORKS						
Tower crane daily checks completed?						
Tower crane operated by authorized and competent person?						
Authorized and trained Riggers/Slings are available?						
Lifting gears checks, cut protections being use and no signs of damage?						
Taglines are being use?						
Fire Protection						
Minimum of two (2) extinguishers on each floor and for grinding cutting works in addition of fire blankets.						
Designated smoking areas-Fire point installed, screened off signage						
No smoking signage posted						
STORAGE (Equipment, materials, supplies)						
Storage area exists and neat						
WORKERS WELFARE						
Toilets provided and clean on a daily basis						
Lockers, dining area provided to workers and space adequate						

Information	Number	Comment/Remarks
Tool box talk topic of the day		
Toolbox meeting (number of attendees)		
First Aid Case		
Restricted Work Case		
Medical Treatment Case		
Lost Time Injury		
Incident/Accident		
Near Miss/Dangerous Occurrence		

Safety Inspections conducted With who		
Unsafe Acts and Conditions to be rectified (state deadline date)		
Unsafe Acts and Conditions Outstanding		Reason:
Other Comments:		

Reported by:

Noted by:

Safety Officer

Safety Manager

Endorse to:

Engineer in Charge / Superintendent



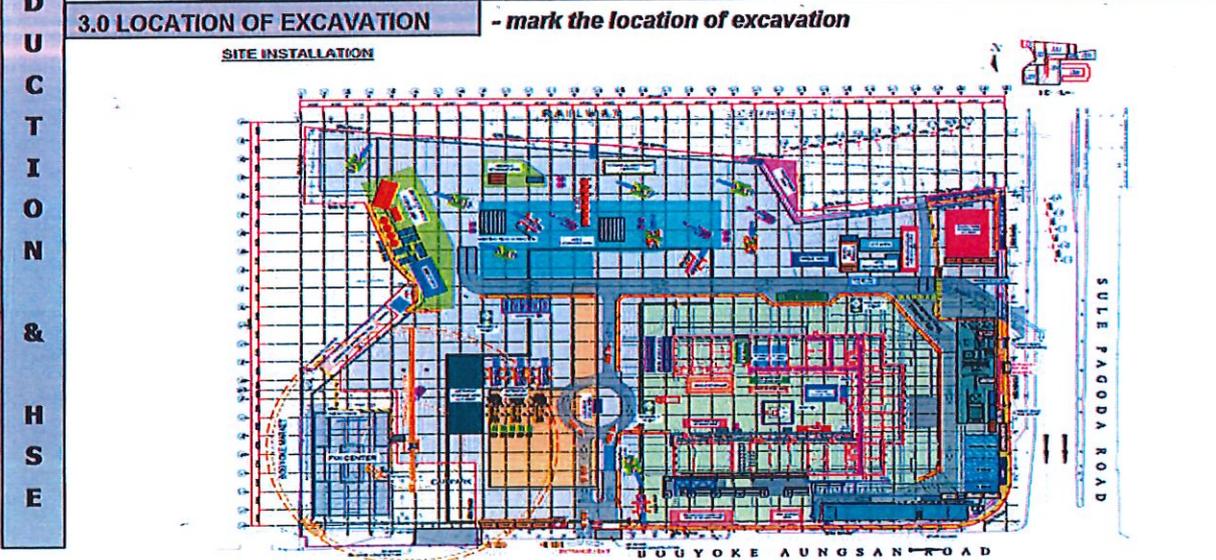
HEALTH AND SAFETY PLAN

Annex D : Typical Excavation Permit

Permit No. : -

I S S U E R	Co Code		Sequential No		
	1.0 ISSUE OF PERMIT				
	Workplace		Name the area i.e. Zone 1 (Please Mark on the Layout) on Section 3.		
	Description of work		Describe works excavation 3m deep 2m wide Length: _____ Width: _____ Depth: _____		
	Plant / Equipment to be used		List all equipment excavators etc		
	Valid Time	Date	From	To	
			d - m - y	am/pm	d - m - y am/pm
	The items listed on the checklist on the 2 nd page have been implemented and checked by me. I issue the Permit to the Person-In-Charge as stated.				
	Name of Person In-charge :		<input type="text"/>	Employer	<input type="text"/>
	Subcontractor				Name of Subcontractor
Name of HSE Officer :		<input type="text"/>	Employer	<input type="text"/>	
Subcontractor HSE Officer				Name of Subcontractor	
Contact Number:		<input type="text"/>	Time of Issue	<input type="text"/>	
				am/pm	

B T J V P R O D U C T I O N & H S E	2.0 RECEIPT OF PERMIT		BTJV Person-in-charge of the Work		
	I declare that the items listed on the pre-excavation checklist on the 2 nd page have been checked before excavation and declare that the relevant / required measures will be fully implemented and closely monitored prior to and during the actual work.				
	Name of Person-in-charge		Site Superintendent	Signature	
	Date	<input type="text"/>	Time	<input type="text"/>	
		d - m - y		am/pm	
	Name of HSE Officer			Signature	
Date	<input type="text"/>	Time	<input type="text"/>		
	d - m - y		am/pm		





HEALTH AND SAFETY PLAN

PRE-EXCAVATION CHECKLIST - 2nd PAGE

(One original copy of this PERMIT TO EXCAVATE must be displayed on the workplace at all times)

PRE-EXCAVATION CHECKLIST

Page 2

**S
U
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Permit No. : -
Co Code Sequential No

5.0 EXCAVATION DETAILS

Drawing(s) attached Yes No (Cannot start excavation)

Dwg.No. _____

Depth of Excavation < 1.5m > 1.5m

Bottom Width of Excavation _____ m

Type of Excavation Open Cut Strutted Excavation
Max Degree of Slope °

"Person-in-Charge of the Work & HSE Officer" must strictly inspect and verify the items below

**B
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6.0 CHECKLIST ITEMS:

Y – yes / N – no /
N/A – not applicable

1.	Method Statement Risk Assessment (if necessary) issued, endorsed and approved	
2.	Have statutory authorities been notified	
3.	Have statutory authorities issued location drawings	
4.	Has CAT and Genny scan been done on all areas	
5.	Has a ground radar survey been carried out (optional)	
6.	Are trial holes required	
7.	Is hand digging required	
8.	Have all personnel been told of the service locations	
9.	Information Drawing + Latest Drawing issued by Public Utility Company	
10.	Combined As-built Drawing	
11.	Construction of trial pit: S/C	
12.	Utility detection conducted – Attach inspection report	
13.	Setting out checked	
14.	Prepare secured fencing at edge of excavation	
15.	Prepare warning notice (signage) and lighting where necessary	
16.	Prepare access ladder (Every 7.5mtrs)	
17.	Prepare access ladder, tag access ladders if entry is below 1.5 meters use green/red tag system (for pile breaking only)	
18.	Is there adequate shoring support (below 1.5mtrs)	
19.	Checked no vehicles within 2mtrs of excavation area	

7.0 ACKNOWLEDGEMENT

Acknowledged by the Person-in-Charge and HSE Officer of the Work

I fully understand the content of this permit and will ensure no person will enter the excavation without firstly ensure the safety of the excavation.

Date	<input type="text"/>	Time	<input type="text"/>	Signature	<input type="text"/>
	d - m - y		am/pm	BBJ Person-in-charge of the Work	
Date	<input type="text"/>	Time	<input type="text"/>	Signature	<input type="text"/>
	d - m - y		am/pm	BBJ HSE Officer	

(One original copy of this PERMIT TO EXCAVATE must be displayed on the workplace at all times) one copy shall be filed by the HSE Department, one copy filed by the Subcontractor



HEALTH AND SAFETY PLAN

Appendix 4: Emergency Contact Numbers (last update on Project Panel Board)

EMERGENCY CONTACT NUMBERS (အရေးပေါ်ဖုန်းနံပါတ်များ)
LANDMARK PROJECTS



IN CASE OF ACCIDENT/INCIDENT/SERIOUS INJURY (မတော်တရားများ၊ ပြင်းထန်သောထိခိုက်ဒဏ်ရာများအတွက်ဆက်သွယ်ရန်)



1. Contact Safety Team. To proceed on the incident vicinity and assess the injured person, ensure first aid (if trained to do so) and mitigation measures. (ထိခိုက်ဒဏ်ရာရလျှင် safety အဖွဲ့သို့ဆက်သွယ်ပါ။ ထိခိုက်ဒဏ်ရာရရှိသူ၏အခြေအနေအထားကိုစစ်ဆေးပြီး လိုအပ်ပါက ပထမအကူအညီ ပေးအပ်ရန်၊ ထိခိုက်ဒဏ်ရာရသူအား အရေးပေါ်ကုသမှုပေးအပ်ရန်နှင့် အခြားဆိုင်ရာကုသမှုများ ပြုလုပ်ရန်အတွက် ဆက်သွယ်ရန်)

Aung Phyo Tu (အောင်မြင်သူ)	Safety Engineer (ဘေးအန္တရာယ်ကင်းရှင်းရေးအင်ဂျင်နီယာ)	09440046805
Win Maung (ဝင်းမောင်)	Safety Officer (ဘေးအန္တရာယ်ကင်းရှင်းရေးအရာရှိ)	09973815991
Bernie Pusung (ဘာနီပူဆွန်)	Safety Manager (ဘေးအန္တရာယ်ကင်းရှင်းရေးမန်နေဂျာ)	09401710058
Andres Gequinto (အန်းဂျေကွင်တို)	Safety Manager (Night Shift) (ဘေးအန္တရာယ်ကင်းရှင်းရေးမန်နေဂျာ ညပိုင်း)	09401146264
Aung Naing (အောင်နိုင်)	Safety Officer (Night Shift) (ဘေးအန္တရာယ်ကင်းရှင်းရေးအရာရှိ ညပိုင်း)	09259092074
Nurse/Doctor Hotline (ဆရာဝန်/ဆရာမ ဖုန်းနံပါတ်)		09425705930

2. Contact Project Team by Safety Manager. To support emergency response and ensure mitigation measures. (ဘေးအန္တရာယ်နှင့်ဆက်သက်သော အန္တရာယ်များကိုလျော့ပါးစေရန်အတွက် ဆောင်ရွက်ရန်အတွက် အကူအညီပေးရန် safety မန်နေဂျာသို့ဆက်သွယ်ပါ။)

Delfim Peraiza (ဒယ်ဖမ်ပဲရိုဆာ)	Senior Site Superintendent (စိုက်ကြိုက်စီမံခန့်ခွဲရေး)	09253820033
Vincent Duvivier (ဝင်းဇင်ဒူဗီယာ)	For PYH Only - Superintendent (ကြီးကြပ်စီမံခန့်ခွဲရေး)	09425531314
Tu Huyn Van (ထူးဟွမ်ဗန်)	For YCP - Construction Manager (ဖောက်လုပ်ရေးမန်နေဂျာ)	09250743257
Quentin LePrince (ကျွတ်တင်လီပရင်စ)	For PYH - Construction Manager (ဖောက်လုပ်ရေးမန်နေဂျာ)	09448070665

3. To inform Client Representatives and Management team by Construction Manager (ဖောက်လုပ်ရေးမန်နေဂျာအား တာဝန်ရှိလျှင် ညွှန်ကြားရေးမှူးအား သတင်းပေးရန်)

Joe Phyo (ကျိုးဖိုး)	SPA Project HS Manager (HS မန်နေဂျာ)	09423722942
Joris Thomas (ဂျော့ရစ်တော့မတ်)	BTJV Project Director (ပထမဦးဆုံး ဒါရိုက်တာ)	09261283318
Marie-Chlothilde Ribierre (မာရီ-စလိုထီးရီဘီယာရီ)	BYMA Project Director (ပထမဦးဆုံး ဒါရိုက်တာ)	03448953205
Jean Daniel LeGallic (ဂျင်ဒနီယိုဂယ်လီဂယ်လစ်)	BTJV/BYMA QSE Director (QSE ဒါရိုက်တာ)	09261283303

BTJV and BYMA Project Director will inform SPA Project Director and Site Client representatives.



USEFUL CONTACT NUMBERS (ထောက်ပံ့ဆောင်ရွက်ရန် ဝန်ထမ်းများ)



Ambulance Service (အရေးပေါ်ကား)	192 / 01214604
Hospital (ဆေးရုံ)	0125611 / 01256123
BYMA Administrative Officer (BYMA ဇီဝစနစ်ဥပဒေအရာရှိ)	09254344992 (Thiha)



IN CASE OF FIRE (မီးဘေးအန္တရာယ်အတွက်ဆက်သွယ်ရန်)



1. Contact Safety Team and state the location of fire (မီးဘေးအန္တရာယ်အတွက် safety အဖွဲ့သို့ဆက်သွယ်ပါ။ မီးဘေးအန္တရာယ်ရရှိနေရာကို ညွှန်ကြားပါ။)

Aung Phyo Tu (အောင်မြင်သူ)	Safety Engineer (ဘေးအန္တရာယ်ကင်းရှင်းရေးအင်ဂျင်နီယာ)	09440046805
Win Maung (ဝင်းမောင်)	Safety Officer (ဘေးအန္တရာယ်ကင်းရှင်းရေးအရာရှိ)	09973815991
Bernie Pusung (ဘာနီပူဆွန်)	Safety Manager (ဘေးအန္တရာယ်ကင်းရှင်းရေးမန်နေဂျာ)	09401710058
Andres Gequinto (အန်းဂျေကွင်တို)	Safety Manager (Night Shift) (ဘေးအန္တရာယ်ကင်းရှင်းရေးမန်နေဂျာ ညပိုင်း)	09401146264
Aung Naing (အောင်နိုင်)	Safety Officer (Night Shift) (ဘေးအန္တရာယ်ကင်းရှင်းရေးအရာရှိ ညပိုင်း)	09259092074

2. Contact Project Team by Safety Manager. To support emergency response and ensure mitigation measures. (ဘေးအန္တရာယ်နှင့်ဆက်သက်သော အန္တရာယ်များကိုလျော့ပါးစေရန်အတွက် ဆောင်ရွက်ရန်အတွက် အကူအညီပေးရန် safety မန်နေဂျာသို့ဆက်သွယ်ပါ။)

Delfim Peraiza (ဒယ်ဖမ်ပဲရိုဆာ)	Senior Site Superintendent (စိုက်ကြိုက်စီမံခန့်ခွဲရေး)	09253820033
Vincent Duvivier (ဝင်းဇင်ဒူဗီယာ)	For PYH Only - Superintendent (ကြီးကြပ်စီမံခန့်ခွဲရေး)	09425531314
Tu Huyn Van (ထူးဟွမ်ဗန်)	For YCP - Construction Manager (ဖောက်လုပ်ရေးမန်နေဂျာ)	09250743257
Quentin LePrince (ကျွတ်တင်လီပရင်စ)	For PYH - Construction Manager (ဖောက်လုပ်ရေးမန်နေဂျာ)	09448070665
Thura Tin (ထူးတင်)	Plant & Equipment Electrical Foreman (အလုပ်ရုံနှင့် ဖွဲ့စည်းရေးအရာရှိ)	09795947142

3. To inform Client Representatives and Management team by Construction Manager (ဖောက်လုပ်ရေးမန်နေဂျာအား တာဝန်ရှိလျှင် ညွှန်ကြားရေးမှူးအား သတင်းပေးရန်)

Joe Phyo (ကျိုးဖိုး)	SPA Project HS Manager (HS မန်နေဂျာ)	09423722942
Joris Thomas (ဂျော့ရစ်တော့မတ်)	BTJV Project Director (ပထမဦးဆုံး ဒါရိုက်တာ)	09261283318
Marie-Chlothilde Ribierre (မာရီ-စလိုထီးရီဘီယာရီ)	BYMA Project Director (ပထမဦးဆုံး ဒါရိုက်တာ)	03448953205
Jean Daniel LeGallic (ဂျင်ဒနီယိုဂယ်လီဂယ်လစ်)	BTJV/BYMA QSE Director (QSE ဒါရိုက်တာ)	09261283303

BTJV and BYMA Project Director will inform SPA Project Director and Site Client representatives.

(BTJV နှင့် BYMA ပထမဦးဆုံး ဒါရိုက်တာမှ SPA ပထမဦးဆုံး ဒါရိုက်တာနှင့်ဆက်သက်သော အန္တရာယ်ရှိသူများအား ဆက်သွယ်ပေးမည်။)



HEALTH AND SAFETY PLAN

IN CASE OF MATERIAL/EQUIPMENT – ELECTRICAL ISSUE – INCIDENT (လျှပ်စစ်နှင့်ပတ်သက်သောပစ္စည်းအတွက်ဆက်သွယ်ရန်)

1. Contact Safety Team and state the location of fire. (စီးပွားရေးရာယ်အတွက် safety အဖွဲ့ သို့ဆက်သွယ်ပါ။)

Aung Phyo Tu (အောင်မြို့သူ)	Safety Engineer (စီးပွားရေးရာယ်ကင်းရှင်းရေးအင်ဂျင်နီယာ)	09440046805
Win Maung (ဝင်းမောင်)	Safety Officer (စီးပွားရေးရာယ်ကင်းရှင်းရေးအရာရှိ)	09973015991
Bernie Pusung (ဘာနီပူဆွန်)	Safety Manager (စီးပွားရေးရာယ်ကင်းရှင်းရေးမန်နေဂျာ)	09401710050
Andres Gequinto (အန်းဂျေကွင်တို)	Safety Manager (Night Shift) (စီးပွားရေးရာယ်ကင်းရှင်းရေးမန်နေဂျာ ညလောင်း)	09401146264
Aung Nwing (အောင်နိုင်)	Safety Officer (Night Shift) (စီးပွားရေးရာယ်ကင်းရှင်းရေးအရာရှိ ညလောင်း)	09259092074

2. Contact Project Team by Safety Manager. To support emergency response and ensure mitigation measures. (စီးပွားရေးရာယ်နှင့်ဆက်သွယ်သောပြဿနာကိုလျှော့ပါးစေရန်အတွက်အထောက်အကူပြုရန် safety မန်နေဂျာသို့ဆက်သွယ်ပါ။)

Delfim Peraiza (ဒယ်ဖမ်ပဲရဲအာဗဲ)	Senior Site Superintendent (စိုက်ကြီးကြပ်ရေးမှူး)	09253020033
Vincent Duvivier (ဗင်စင့်ဒူဗီဗီယာ)	For PYH Only - Superintendent (ကြီးကြပ်ရေးမှူး)	09425531314
Tu Huyn Van (တူဟွမ်ဗန်)	For YCP - Construction Manager (စောက်လုပ်ရေးမန်နေဂျာ)	09250743257
Quentin LePrinca (ကွီတင်လီပရင်ဆင့်)	For PYH - Construction Manager (စောက်လုပ်ရေးမန်နေဂျာ)	09448070665
Thura Tin (သုရတင်)	Plant & Equipment Electrical Foreman (အလုပ်နှင့်ယန္တရားလျှပ်စစ်ဗိုလ်)	09795947142
Cucchi Gilles (ကူချီဂီလ်ဇာလက်)	Plant & Equipment Manager (အလုပ်နှင့်ယန္တရားမန်နေဂျာ)	09403328256

IN CASE OF SPILLAGE / ENVIRONMENTAL CONCERNS (သဘာဝပတ်ဝန်းကျင်နှင့်ဆက်သွယ်သောပြဿနာများအတွက်ဆက်သွယ်ရန်)

1. Contact Environmental Personnels and state location of spill or any environmental concerns (သဘာဝပတ်ဝန်းကျင်နှင့်ဆက်သွယ်သောပြဿနာများအတွက် စောက်စတီဗြိတ် လူများအားဆက်သွယ်ပါ။)

Phyo Wai Lin (မြို့ဝေလင်း)	Environmental Engineer (သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအင်ဂျင်နီယာ)	09973248704
Su Myat Hlaing (စုမြတ်လှိုင်)	Environmental Officer (သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအရာရှိ)	0996232352

IN CASE OF COMPLAINTS AT THE GATE (ခင်းမိတ်တွင်ဖြစ်သောပြဿနာများအတွက်ဆက်သွယ်ရန်)

2. To fill the form "complain form" (complain form ကိုဖြည့်ရန်)
3. To contact Mr. Salai PP (Personnel/Public Relation Officer) – Contact No. 0936626688 (လူမှုဆက်ဆံရေးကိစ္စများအတွက် ဆလိုင်ဗီစီအားဆက်သွယ်ရန်)

IN CASE OF YCDC COMPLAINTS / AUTHORITY (စည်ပင်နှင့် ဆက်သွယ်သောပြဿနာများအတွက်ဆက်သွယ်ရန်)

4. To contact Salai PP (Personnel/Public Relation Officer) – Contact No. 0936626688(လူမှုဆက်ဆံရေးကိစ္စများအတွက် ဆလိုင်ဗီစီအားဆက်သွယ်ရန်)

IN CASE OF COMPLAINT FROM YESC SUBSTATION (လျှပ်စစ်နှင့် ဆက်သွယ်သောပြဿနာများအတွက်ဆက်သွယ်ရန်)

Thiri Win Myint (သီရိဝင်းမြင့်)	Electrical Engineer (လျှပ်စစ်အင်ဂျင်နီယာ)	09798113745
Delfim Peraiza (ဒယ်ဖမ်ပဲရဲအာဗဲ)	Senior Site Superintendent (စိုက်ကြီးကြပ်ရေးမှူး)	09253020033
Thura Tin (သုရတင်)	Plant & Equipment Electrical Foreman (အလုပ်နှင့်ယန္တရားလျှပ်စစ်ဗိုလ်)	09795947142
Cucchi Gilles (ကူချီဂီလ်ဇာလက်)	Plant & Equipment Manager (အလုပ်နှင့်ယန္တရားမန်နေဂျာ)	09403328256

IN CASE OF ELECTRICAL BREAKDOWN (လျှပ်စစ်မီးမြှင့်တက်လျှင်)

5. Contact Plant & Equipment Department (အလုပ်နှင့်ယန္တရားဌာနသို့ဆက်သွယ်ပါ။)

Thura Tin (သုရတင်)	Plant & Equipment Electrical Foreman (အလုပ်နှင့်ယန္တရားလျှပ်စစ်ဗိုလ်)	09795947142
Cucchi Gilles (ကူချီဂီလ်ဇာလက်)	Plant & Equipment Manager (အလုပ်နှင့်ယန္တရားမန်နေဂျာ)	09403328256

IN CASE OF IT ISSUE (WI/F / NETWORK CONNECTION) (IT နှင့် Network ပြဿနာများအတွက်ဆက်သွယ်ရန်) – Contact Hsue : 09421096830



HEALTH AND SAFETY PLAN

Appendix 5: Typical Weekly Safety Site Walk Inspection Report

BYMA		WEEKLY HEALTH & SAFETY INSPECTION REPORT								
Project Name:		Yoma Central Project					Inspection Date:		13/3/2018	
Inspector/s:		Bernie Pusung, Tu Huyn Van, Jean Daniel LeGallic, Joris Thomas, Rober Popelarski					Reference No.:		QSE/HS_YCP-0009	
OBSERVATIONS										
SN	Priority	Location	Company	Description	Photo	Hazard Category	Responsible Person	Close Out Photo	Remarks	
1	B	Zone 3	BYMA	Soil stability to be check including the fence. Steel plate to be put in place preventing collapse of soil on the side.		Stability	Phillippe Trehou/Delfim			
2	A	Zone 1	SEAFCO	Stacking of casings to be done on single layer only to prevent from rolling over.		Stability	Aung Win Maung/Myint Aung		Removed immediately after instruction.	

BYMA		WEEKLY HEALTH & SAFETY INSPECTION REPORT								
Project Name:		Yoma Central Project					Inspection Date:		23/3/2018	
Inspector/s:		Bernie Pusung, Duvivier Vincent, Gareth Herbert, Nguyen Anh Dung, Marie-Clothilde Ribierre (PD), Quentin Le Prince					Reference No.:		QSE/HS_PYN-0012	
OBSERVATIONS										
SN	Priority	Location	Company	Description	Photo	Hazard Category	Responsible Person	Close Out Photo/Status	Remarks	
1	C	All Locations	BYMA	Safety nettings are not installed on scaffoldings whereas toeboards. There is no means of protections against falling objects. Toeboards are to be fitted on the scaffoldings and exclusion zone to be provided preventing access to below area whilst overhead works being carried out.		Falling objects protections	Vincent	No action so far	Pending	
2	A	PYN (South)	BYMA	No Safe means of access to excavation. Ensure access and egress provided to the workers on excavations.		Access & Egress	Vincent Duvivier		Proper access provided	
3	A	All Locations	BYMA	To issue a Memo regarding the mandatory wearing of eye protection on the project. Bernie Pusung to draft the MEMO and issue for signature once reviewed and validated.		PPE's- Eye Protections	Bernie Pusung		Pending	



HEALTH AND SAFETY PLAN

Appendix 6: Induction Request Form

This form to be used for new comer of the project, and service/maintenance provider who are supposed to come more than one day on site. It does not concerns visitors, deliveries, service provider coming for less than 1 day. The Engineer in charge to supervise the activity of the new comer, should submit to Safety department, the day before the arrival. One form per subcontractor /Service provider.



Safety induction prior to access/to start work on site is mandatory.

New employee must be minimum 18 years, in good health and submit clear copy of NRC/Passport at time of Induction

Name of the Company:		Date of arrival:	
Scope of Work:		Nb of Trainee:	
Company Representative (Name and Sign)	By signing I certify that below employees are employed in compliance with Myanmar law.	BYMA/BTJV Engineer :	
		(Name and sign)	
Tel:		Tel:	

Please fill in English the first 3 columns on the following table When complete please forward to Safety department.

Contact: Win Maung 09420003896

Full name	Qualification	NRC n° Passport n°	Signature (During Induction)	Handscan N°



On the day of HS Induction, employee must come with a copy of NCR/Passport/Driving license and a show the original one prior to start Induction. He must also have mandatory PPE: Helmet, High Visibility Vest, Safety Shoes, and Gloves.

Training Record

Date: _____	Time: _____	Venue: _____
Trained by:		
Name: _____		Sign: _____

HS Department to collect copy of legally operator licenses: crane, electrician, operator....



HEALTH AND SAFETY PLAN

Appendix 7: Typical Template of Risk Assessment

BYMA		Task Specific Risk Assessment										Project name					
		DEMOLITION OF EXISTING FENCE										YOMA Central Project					
												Rev: A - 13th January 2018					
Prepared by (individual or team – add)							Reviewed by					BERNIE PUSUNG		Duration of task			
Activity		DEMOLITION OF EXISTING FENCE					Location(s)					YCP - Perimeter Fence		Date of Commencement			
														Date valid until			
SN	Activity	Hazards Identified	Causes	Hazard Effects	Persons In Danger	L	S	R	Time Frame	Control Measures			RL	RS	RR	Responsible Person	Monitoring Party
1	Delivery of Materials to Site	Collision of site base personnel to delivery vehicles	Non use of segregated pedestrian access	Minor or Serious Injury /Fatality /Damage to Property	Site base personnel and anyone within the immediate vicinity	4	4	16	Whilst working throughout duration of work	Site staff to be regularly advise to use segregated access and egress onsite to prevent being hit by delivery lorries.			1	4	4	Site Engineer/Superintendent	Safety Officer
		Unsecured load	Not tied/secured properly			4	3	16		Delivery lorries will be check from the main gate by security and ensure that all loads are tied down and secured properly.			1	3	3	Site Engineer/Superintendent	SE / EIC / Safety Officer
		Impact Collision	No following speed limit, unfamiliar to route onsite			3	4	12		Procedures should be in place regarding the parking of delivery vehicles in and around the site. At all times when maneuvering onsite the truck driver MUST be accompanied by guides on foot. If the load is to go on the main road accompanied by a signman (as per vehicle escort).			1	4	4	Site Engineer/Superintendent	SE / EIC / Safety Officer
		Overturning	Overloading/ Unstable soil condition			3	3	9		Ensure delivery vehicles has the capacity to carry such load			1	3	3	Site Engineer/Superintendent	SE / EIC / Safety Officer
2	Scaffolding /Working At heights	Untrained Person Erecting Scaffolding	Lack of Training	Minor or Serious Injury	Site base personnel and anyone within the immediate vicinity	3	3	3	Whilst working throughout duration of work	Only experience, qualified and deem competent persons shall erect, modify and dismantle scaffolding			1	3	3	Site Engineer/Superintendent	SE / EIC / Safety Officer
		Collapse of Scaffolding	Improper erection/Unstable ground condition			4	4	16		Scaffolding platform shall be resting on sole boards on a properly compacted ground condition.			1	4	4	Site Engineer/Superintendent	SE / EIC / Safety Officer
		Fall from scaffolding/heights	No handrail/signals/ rails/Non use of fall collection			3	3	3		No scaffolding to be use without handrails (mid rail & top rail). Whenever required, fall protections shall be worn and hook on suitable anchor point			1	3	3	Site Engineer/Superintendent	SE / EIC / Safety Officer
		Struck by falling object	Unsheltered tools, no overhead cables, no exclusion zone			3	3	3		All tools use to erect scaffolding or any hand tools use whilst working at heights shall be tethered using nylon ropes to prevent falling from below levels. Install toe board on scaffolding and maintained an exclusion to prevent unauthorized access by site base personnel on the working area.			1	3	3	Site Engineer/Superintendent	SE / EIC / Safety Officer
3	Use of MEWP	Untrained Operator	Lack of competency checks	Minor or Serious Injury/Fatality /Damage to Property	Site base personnel and anyone within the immediate vicinity	3	3	3	Whilst working throughout duration of work	Only qualified, experience and deem competent operator shall use MEWP (boom lifts) with a valid authorization letter or competency certificate.			1	3	3	Engineer, Site Superintendent & Site Foreman	EIC / Safety Officer
		Fall from heights	No fall protection worn			3	3	3		Full body harness shall be worn by occupants on the working platform at all times.			1	3	3	Site Engineer/Superintendent	EIC / Safety Officer
		Overturning	Unstable ground condition/ Overloading of the platform			3	2	6		Prior the use of MEWP's, ensure ground condition is stable and properly compacted. Only two persons will be allowed on the working platform to prevent overloading.			1	2	2	Engineer, Site Superintendent & Site Foreman	EIC / Safety Officer

Likelihood		
Score	Definition	Chances
5	Very Likely	> 90%
4	Likely	51% to 90%
3	Possible	11% to 50%
2	Unlikely	1% to 10%
1	Highly Unlikely	< 1%

Severity		
Health	Safety	Environment
Multiple Deaths	Multiple Deaths	Irreversible Environmental Incident
Life Shortening Health Effect	Single Death or Multiple Major Injuries	Significant Environmental Impact (e.g. contamination of water source)
Irreversible Health Effect or Serious Illness with Full Recovery	Major Injury or Over 3-Days Absence	Moderate Environmental Impact (e.g. fuel tank spillage)
Reversible Health Effect (e.g. minor dermatitis)	Minor Injury or One Days Absence	Local Environmental Impact (e.g. excess inert waste left overnight)
Mid Health Effect ~ No Lost Time (e.g. local skin irritation)	First Aid Case, No Lost Time	Minor Environmental Impact (e.g. minor oil spill)

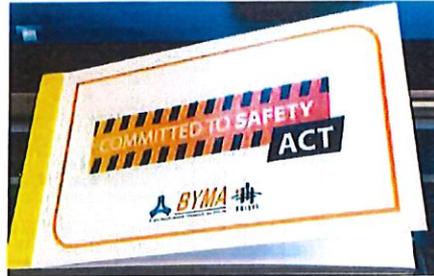
RISK RATING					
LIKELIHOOD	5	4	3	2	1
	6	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
	1	2	3	4	5
	SEVERITY				

KEY TO Table		
12 to 25 (Unacceptable)	Critical risk	Critical Level ~ Do not permit activity to commence.
6-Moderate to 10-High	High Risk	Risk must be mitigated and risk level reduced to Green (4-6) or White (1-3).
3-Low to 6-Moderate	Moderate risk	Investigate controls to minimise reliance on PPE. Provide supervision and monitoring of agreed controls until accepted as routine.
1-3 Low Risk	Minor Risk	Acceptable risk. Review when process changes, or when circumstances change.



HEALTH AND SAFETY PLAN

Appendix 8: Typical Unsafe Act/Unsafe conditions booklet



REPORT	POTENTIAL	Employer	Priority
UC = Unsafe Condition	I = Injury	A = Agency	II = Immediately
UA = Unsafe Act	E = Environmental Incident	B = BYMA & TAISEI JV	M = Within 24 Hours
GP = Good Practice	P = Property Damage	C = Client	L = Specified Date
	NA = Not Applicable	SC = Subcontractor	NA = Not Applicable

CATEGORIES		
1 = Personal Protective Equipment	9 = General Housekeeping	17 = Manual Handling
2 = Non Conformance to Permit	10 = Access & Egress	18 = Excavations
3 = Scaffold	11 = Formworks	19 = Welfare
4 = Fall Protection	12 = Barriers & Protections	20 = Health
5 = Safety Signs	13 = MEWP/Aerial Lift	21 = Hygiene
6 = Gas Cylinder handling & storage	14 = Electrical Safety	22 = Temporary works
7 = Hand and Power tools	15 = Fire Fighting	23 = Environmental Management
8 = Lifting Works	16 = Plant & Equipment	24 = Hole Protections

WHITE (ORIGINAL) To person responsible for the design. Original copy to be returned to the design engineer.

YELLOW COPY To the design engineer.

PINK Copy Remains in site.

Sample Report

SAFE/UNSAFE = ACT/CONDITION REPORT		No:	000001
Issued by:	Issued date:	Project Name	
Bernie Pusung	31-01-2018	Yoma Central Project	
Report	Potential	Employer	Direct <input checked="" type="checkbox"/> SC <input type="checkbox"/>
UA	I	B	
Priority	Category	Employer's Name	
H	25: Ladders	BTJV	
Description			
Operative was found working on a ladder			
Card Issued	Y/N	Card type: Yellow	Orange
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agreed Action			
To use scaffolding or podium steps with integrated working platform and handrails			
Completed by : Hassan AbdulKharim			
Issued to	Signed (Receipt)	Signed (Closed)	Close date
Hassan AbdulKharim	Receiver to sign	Issuer to signed	Date of closure



HEALTH AND SAFETY PLAN

Appendix 9: Typical H&S Project Risk Register

Project Risk Register & Management Programme: Landmark Project

Risk Assessment

Item	Hazard	Risk	Who is at Risk	Risk Rating			Necessary Control Measures	Action By	Residual Risk Rating		
				S	L	Rating			S	L	Rating
1	Attending to work under the influence of drugs/alcohol	<ul style="list-style-type: none"> Heart attack Stroke Sudden death hallucinations 	<ul style="list-style-type: none"> General site workers General site staff 	3	2	6	<ul style="list-style-type: none"> A program of training for managers or supervisors on recognizing the signs of drug abuse Campaign regarding the effect of alcohol and drugs Regular drug and alcohol test to workers. 	CM	3	1	3
2	Contact with existing services / utilities during site grading and clearance	<ul style="list-style-type: none"> Electric shock / Electrical fire Gas leak / gas explosion Water leak / flooding Sewage leak Damage incident – financial penalty 	<ul style="list-style-type: none"> General site workers General site staff Site visitors 	3	3	9	<ul style="list-style-type: none"> Acquire current utility drawings Carry out survey to confirm depth and line of existing utilities (utilize suitable survey equipment relevant to the scope and scale of the work. Survey equipment may include ground radar, cable avoidance tools and accessories (CAT & Genny) As necessary, dig trial pits to locate underground services Mark the line of underground services to ensure visibility to all persons working in the vicinity Prepare method statement for excavation of underground services incorporating the requirements of BYMA – Excavations. Where possible, underground electrical services shall be de-energized prior to excavations. Where services are to be re-routed, no work shall commence until services are confirmed as de-energized / inert Permits shall be secured in advance from the relevant utility / local authority prior to excavation in the vicinity of existing underground services 	CM	3	2	6
3	Unsafe demolition of existing structures & Ongoing modifications of old building structure.	<ul style="list-style-type: none"> Personal injury due to uncontrolled collapse or falling objects Dust Fire due to contact with unidentified / unknown live services or fuel stores Damage to surrounding facilities due to falling / flying objects Damage to plant & equipment – financial and production loss 	<ul style="list-style-type: none"> General site workers General site staff Site visitors 	3	3	9	<ul style="list-style-type: none"> Carry out building survey Prepare method statement Implement exclusion zones to prevent unauthorized access to work area Install protection screens to prevent flying objects extending beyond exclusion zones Install signage to warn of work in progress / hazards Install illumination / lighting as necessary 	CM	3	2	6
4	Unauthorized entry to site	<ul style="list-style-type: none"> Injury to 3rd party 	<ul style="list-style-type: none"> General site workers (other contractors) General public 	3	3	9	<ul style="list-style-type: none"> Keep hoarding / fencing erected Hoarding shall be at least 6' tall and shall be sufficient to prevent unauthorized access Site access points shall include a boom gate (or similar) and security station that is manned 24/7 for the duration of the project Security signage shall be erected Site set up shall be in accordance with the requirements set by BYMA preferences. 	CM	3	1	3
6	Unsafe temporary structures	<ul style="list-style-type: none"> Fire Electrical shock / electrical fire Collapse of temporary structures Damage to materials and equipment – financial and production loss 	<ul style="list-style-type: none"> General site workers General site staff Site visitors 	4	2	8	<ul style="list-style-type: none"> Temporary buildings / structures (e.g. site offices, stores, workshops and fuel stores) shall be structurally sound and installed in line with the BYMA requirements. Electrical services to temporary buildings / structures shall be installed in line with the BYMA requirements 	CM	4	1	4

Project:	YCP-PYN	A – Architect (Architect or Engineer engaged by BYMA) PM – Project Manager CM – Construction Manager LM – Logistics Manager PLM – Plant Manager HSEM – HSE Manager PS – Project Supervisor (BYMA / Subcontractor) SC – Subcontractor BYMA- Main contractor
Assessment Carried out by:	BERNIE PUSUNG	
Assessment Date:	17 th October 2017	

Risk Matrix		Severity				
		1	2	3	4	5
Likelihood of Harm	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25
Key	S = Severe	8 to 25		High		
	L = Likelihood	8 to 12		Medium High		
	Rating = SXL	4 to 6		Medium Low		
		3 to 3		Low		
		1		Negligible		



Appendix 10 Typical Equipment Inspection form.
Other forms are developed along the project



TYPE OF DOCUMENT

**CONTROL OF EQUIPMENTS
Pre-mobilization inspection checklist**

**ALL TERRAIN
FORKLIFT TRUCK**

Rev. _____
Date: _____

To complete by Owner or Supplier

Owner/supplier name: _____
 Address: _____
 Phone number: _____
 Plant's Make: _____
 Plant's Model: _____
 Serial number: _____ / ____ / 20__
 Inspection date: _____
 Inspector name: _____
 Signature: _____

- The mobile plant must comply with manufacturer specifications
- The mobile plant operator must inspect visually his plant before use (on daily basis) and file these inspections reports to the Equipment manager every week.
- When required, the operator must wear necessary Personal Protective Equipments (Reflective vest, glasses, ear protections, safety shoes, gloves...)
- An maintenance note book registering all repairation and maintenance cares must be kept into the cab. It must be available in understandable language for the operator.
- The operator's employer must ensure that the operator has suitable medical fitness and technical competencies to drive the plant.

G B MISCELLANEOUS

G	B	Fire extinguisher
G	B	Spill absorbent kit

G B DOCUMENTATION

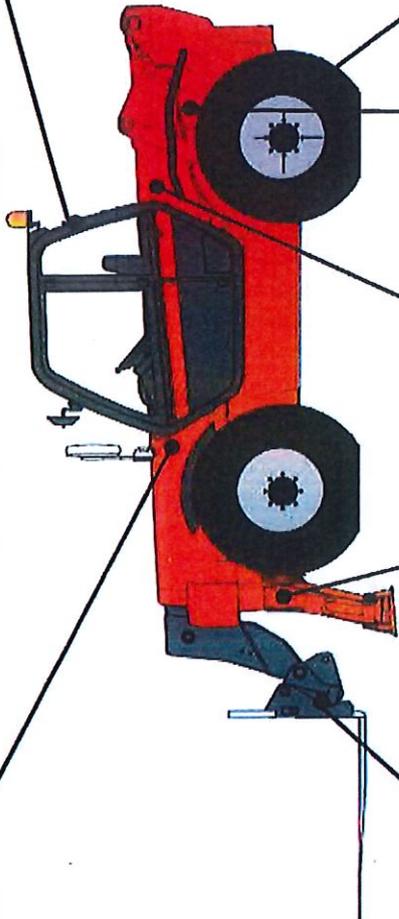
G	B	User manual
G	B	Maintenance note book

G B CAB

G	B	Seat
G	B	Seabelt & mounting
G	B	Electronic devices
G	B	Signage / Pictograms
G	B	Handles
G	B	Pedals
G	B	Window / Windscreen / Wiper
G	B	Mirrors
G	B	Load moment indicator
G	B	Emergency Stopping Button
G	B	Load charts

G B SIGNAGE

G	B	Safe Working Load (SWL)
G	B	Boom angle indicator



G B CAB ACCESS

G	B	Handholds
G	B	Step

G B ENGINE

G	B	Exhaust
G	B	Engine cover / guard
G	B	Battery & Hold downs
G	B	Hydraulic hoses
G	B	Engine coolant, oil and hydraulic oil level
G	B	No hydraulic oil leakage

G B STABILITY DEVICE

G	B	Outriggers
G	B	Outrigger pads
G	B	Hydraulic cylinders
G	B	Hydraulic hoses
G	B	Hydraulic fittings

G B HYDRAULIC SYSTEM

G	B	Hydraulic cylinders
G	B	Hydraulic hoses
G	B	Hydraulic fittings
G	B	Anti return flow device

G B LIFTING SYSTEM

G	B	Boom, pins, bolting

G B WARNING DEVICES

G	B	Horn & Back-up alarm
G	B	Flashing light
G	B	Lights, turn signals, stop lamps, reversing lamps

G B MOTION MEANS

G	B	Tires
G	B	Rims
G	B	Lug nuts
G	B	Brakes
G	B	Parking brakes

G : Good condition / Present B : Bad condition / Missing

Comments:

To complete by SHE Department

Received by: _____
 Date: _____ / ____ / 20__
 Receiver Signature: _____



TYPE OF DOCUMENT

CONTROL OF EQUIPMENTS
Pre-mobilization inspection checklist

AIR COMPRESSOR

Rev. _____
Date: _____

To complete by Owner or Supplier

Owner/supplier name: _____
 Address: _____
 Phone number: _____
 Plant's Make: _____
 Plant's Model: _____
 Serial number: _____ / ____ / 20 ____
 Inspection date: _____ / ____ / 20 ____
 Inspector name: _____
 Signature: _____

- The mobile plant must comply with manufacturer specifications
- The mobile plant operator must inspect visually his plant before use (on daily basis) and file these inspections reports to the Equipment manager every week.
- When required, the operator must wear necessary Personal Protective Equipments (Reflective vest, glasses, ear protections, safety shoes, gloves...)
- An maintenance note book registering all repairation and maintenance cares must be kept into the cab. It must be available in understandable language for the operator.
- The operator's employer must ensure that the operator has suitable medical fitness and technical competencies to drive the plant.

To complete by SHE Department

Received by: _____
 Date: _____ / ____ / 20 ____
 Receiver Signature: _____

G B WARNING DEVICES

G	B
---	---

Lights, turn signals, stop lamps, reversing lamps

G B MISCELLANEOUS

G	B
---	---

Fire extinguisher
Spill absorbent kit

G B PNEUMATIC SYSTEM

G	B
---	---

Compressed air venies
Compressed air hoses
Safety cable

G B CONTROL

G	B
---	---

Ignition key
Emergency Stopping Button
Signage / Pictograms

G B MOTION MEANS

G	B
---	---

Tires
Rims
Lug nuts
Parking brakes

G B DOCUMENTATION

G	B
---	---

User manual
Maintenance note book

G B ENGINE

G	B
---	---

Exhaust
Engine cover / guard
Battery & Hold downs
Hydraulic hoses
Engine coolant, oil and hydraulic oil level
No hydraulic oil leakage

G B STABILITY DEVICE

G	B
---	---

Outriggers

G : Good condition / Present B : Bad condition / Missing

Comments:

TOWER CRANE INSPECTION CHECK-LIST

INITIAL

MONTHLY EQUIPMENT INSPECTION CHECKLIST

Type of Crane	:	
Equipment No.	:	
Capacity	:	
Manufacturer	:	
Subcontractor	:	
Date of Erection	:	

INITIAL INSPECTION CERTIFICATE		
Inspected by	:	
Date of inspection	:	
Approved by	:	
Can be use	:	YES <input type="checkbox"/> / NO <input type="checkbox"/>

Result Column: ✓ Acceptable, X Unacceptable, Not to use, NA Not Applicable

Check Item	Check Points	Result	Remarks
I. CARRIER			
Carrier Body/Frame	Damage, Deformation, All round vision		
Wheels	Tire pressure, Abrasion, Tread depth >2mm		
Steering	Operability, Play, Breakage		
Foot/Hand Brakes	Operating check, Play		
Clutches/Levers	Operating check		
Engine	Starting, Sound, Vibration		
Engine Oil/Filter/Piping	Oil vol., Smudge, Leakage		
Battery/Wiring	Liquid vol., Voltage, Fixing		
Fuel Tank/Pump/Filter/Pipe	Leakage, Breakage, Plugging		
Radiator/Water Pump/Fan Belt	Water vol., Leakage, Damage		
Transmission/Torque Converter	Oil vol., Leakage, Smudge		
Muffler/Flame Arrestor/Chalwyn valve	Exhaust colour, Sound, Missing		
Lamps	Head/Tail Lamp		
Signal Lights	Trafficator, Brake Light		
Horns/Reverse Alarm	Functional check		
Indicator	Fuel, Speed, Temp. meters		
Wiper/Washers/Mirrors	Function, Breakage		
Door Latches/Locks	Defect, Missing		
Fire Extinguisher	Defect, Missing		
Outriggers			

Check Item	Check Points	Result	Remarks
Jacks and Sliders	Function, Damage, Deform		
Level Gauge	Damage, Missing		
Base Plates/Grillage (Mat)	Damage, Missing, Deformation		
Crawler			
Caterpillar/Chains	Breakage, Deform, Looseness		
Upper/Lower Rollers	Breakage, Deform, Looseness		
I. CRANE FUNCTION			
1. Safety Devices			
Over-Hoist Alarm/Anti 2-Block	Breakage, Missing, Function		
Over-Load Alarm	Breakage, Missing, Function		
Boom Angle Radius Indicator	Breakage, Missing, Function		
Load Indicator	Breakage, Missing, Function		
Boom Hoist Limiting Device	Breakage, Missing, Function		
Swing Alarm			
Load/Angle Chart (in the cab)	Possession, Missing, Legible		
2. Power Unit			
Engine/V-belt/Clutch	Starting, Sound, Vibration		
Engine Oil/Filter/Piping	Oil Volume, Smudge, Leakage		
Fuel Tank/Filter/Pump/Pipe	Leakage, Breakage, Plugging		
Radiator/Water Pump	Water vol., Leakage, Fan belt		
Air Cleaner/Hoses/Filter	Air pressure, Leakage, Smudge		
Transmission/Torque Converter	Oil vol., Smudge, Leakage		
Exhaust/Muffler/Flame Arrest/ Chalwyn Valve	Damage, Colour, Sound		
3. Electric System			
Battery	Liquid level, Aging, Terminal		
Starter Motor/Dynamo	Function, Breakage		
Wiring	Damage, Connection		
4. Hydraulic/Pneumatic Devices			
Hydraulic Oil Tank/Filter	Leakage, Smudge		
Hydraulic Pump/Motor	Sound, Leakage, Overheat		
Accumulator	Leakage, Pressure		
Compressor/Air Tank	Damage, Leakage		
Clutch/Brake	Function, Leakage		
Piping/Hose/Joints	Damage, Leakage, Connection		

Check Item	Check Points	Result	Remarks
5. Hoist			
Clutch/Lever	Operating check, Play		
Brake/Lock	Operating check, Play		
Drum Lock/Pawl	Function, Abrasion, Damage		
6. Boom Hoist			
Clutch/Lever/Pedal	Operating check, Play		
Brake (Pedal, Drum, Lining)	Operating check, Play		
Boom Lock	Operating check, Damage		
Boom Cylinder	Operating check, Grease		
Telescopic Cylinder	Operating check, Grease		
7. Swing Device			
Clutch/Lever/Pedal	Operating check, Play		
Swing Brake (Drum, Lining)	Abrasion, Damage		
Hook Roller, Swing Bearing	Clearance, Abrasion, Damage		
Swing Lock	Deformation, Damage		
8. Boom/Jib, Wires			
Wire Ropes/Guy Wire			
Diameter	Reduction more than 7%		
Strand	Breakage more than 10%		
Deformation	Kink, Twist, Abrasion		
Reel Winding	In order		
Sheave/Bush/Sheave Guard	Abrasion, Damage, Bending		
Boom/Mast/Gantry/Spreader	Bend, Deform, Pin, Bolt/Nuts		
Back-Stopper	Damage, Bending		
Hook Block/Safety Catch	Damage, Missing		
9. Miscellaneous			
Indications/Signs			
Operator's Name	Indication		
Warning Signs	Indication		
Initial Inspection Certification	Possession		

Inspected by : _____ Date : _____

Approved by : _____ Date : _____

SIGLE MAST CLIMBING WORK PLATFORM // INSPECTION CHECKLIST

INITIAL

MONTHLY EQUIPMENT CHECKLIST

Name of Inspector	:
Witness by	:
Equipment/Serial No.	:
Manufacturer	:
Capacity	:
Subcontractor	:
Date of Deployment	:
Date of Inspection	:

Inspection	
Location	:
Platform length	:
Platform width	:
Max Mast Height	:
	:

Result Column: ✓ Acceptable, X Unacceptable, Not to use, NA Not Applicable

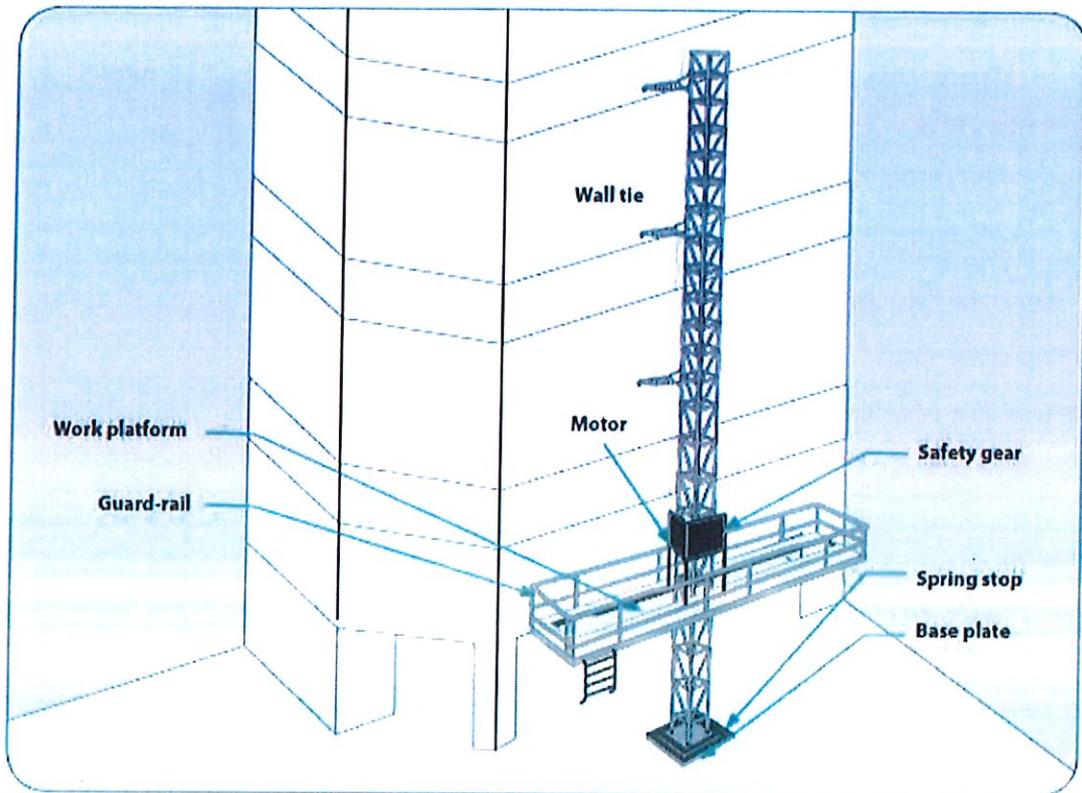
Check Item	Check Points	Result	Remarks
1. ACCES			
Safe access to the platform	Clean, housekeeping, proper leveling		
Safe area around the platform	No storage below, no access below, non-access area marked around		
Tagging on the platform	"Only authorized persons"		
2. GENERAL SAFETY			
Instructions available on the platform in language of the operator			
3. PLATFORM			
Platform elements	All elements are in good conditions		
Platform connections	All connections are properly in place and well fixed: bolts, anchors,...		
Platform on top	Platforms plates in good conditions, toe board and joints cover to avoid falling object		
Platform Guardrail	Guardrails in good conditions, check of fixing system and strength.		
Access door lock	Locking system in place		
Access door contactor/switch	Contacteur to stop the platform while the door is opened		

Result Column: -- ✓ -- Acceptable, -- X -- Unacceptable, Not to use, -- NA -- Not Applicable

Check Item	Check Points	Result	Remarks
4. MAST/PINION DRIVE			
Mast verticality / survey report to be provided	Survey reports (deviation max 1mm in each direction for 300mm height max)		
Base plate and Spring stop	In proper leveling and good conditions		
Mast/Pinion drive connections	Connections to be checked one by one with torch control		
Mast/Pinion drive status	Control of the structure: no damage, no crack,...		
Mast/Pinion drive protection	Fixed protection in all sides in good conditions		
Mast Guide and rollers	Guide and rollers in good conditions and in proper contact with the mast		
5. ELECTRICAL			
Electrical panel board	In good condition, closed, with the name and contact number of the maintenance technician,		
Emergency button	To be tested in operation		
Operating buttons	Clearly identified, (Switch on/off, Up/Down,...) and in good conditions during operating check		
Supply of voltage	Proper connection to the panel board, cable protection/arrangement in good condition		
Cable guide	Good condition and no problem while operating		
Lower limit switch	Tested in operation		
Upper limit switch	Tested in operation		
Motor Brakes	Operating Check		
Gear Boxes	Good conditions		
Emergency descent system	Operating check, Play		

TESTING			
Load Test	Dynamic with 1,1 max SWL		

Inspected by : _____ Date : _____
 Approved by : Plant And Equipment Manager _____ Date : _____
 Safety Manager _____ Date : _____
 Final Review : _____ Date : _____





HEALTH AND SAFETY PLAN

Appendix 12 – PPE policy for specific works
See big panel on site entrance.

BYMA **PPE POLICY**

For everyone in every site

PPE per function / task

★ To have with you to demonstrate compliance

Electrician / Maintenance team	Grinding	Steel Cutting	Welder
Formwork preparation/Installation	Steel Fixer	Steel Cut and Bend	Jack Hammer
Stone/Brick cutting	High pressure	Saw cutting (tile)	Tasks
Skaffolding	Mortar preparation	CONCRETING	Load/Handling
Partition cutting (manual)	Partition Blowing	Tiling (Cutting materials)	Painting



HEALTH AND SAFETY PLAN

Appendix 13 – Fire extinguishers Monthly Inspection



LANDMARK PROJECT

2018 August

MONTHLY INSPECTION OF FIRE EXTINGUISHERS

SN	LOCATION	TYPE	FIRE EXT NO.	SIZE	CHECK DATE	REMARKS
1	Zone 4-Smoking Area	DCP	28	3 KG	1/8/2018	OK
2	Zone 7-South Fence	DCP	27	3 KG	1/8/2018	OK
3	Zone 7-Generator Area	CO2	21	5 KG	1/8/2018	OK
4	Zone 7-Generator Area	CO2	22	5 KG	1/8/2018	OK
5	Zone 7-Generator Area	CO2	23	5 KG	1/8/2018	OK
6	Zone 7-Generator Area	CO2	24	5 KG	1/8/2018	OK
7	Zone 7-Diesel Tank Area	Foam	25	30 KG	1/8/2018	OK
8	Zone 7-Diesel Tank Area	Foam	26	30 KG	1/8/2018	OK
9	Zone 4-Rebar Yard	DCP	62	3 KG	1/8/2018	OK
10	Zone 4-Rebar Coupler Area	DCP	51	5 KG	1/8/2018	OK
11	Zone 4-Rebar Coupler Area	DCP	52	7 KG	1/8/2018	OK
12	Zone 4-West (Bogyoke Market Side)	CO2	20	5 KG	1/8/2018	OK
13	Zone 3-INTRAFOR	DCP	75	6 KG	1/8/2018	OK
14	Zone 3-INTRAFOR	DCP	76	3 KG	1/8/2018	OK
15	Zone 1-West (Fence)	DCP	19	3 KG	1/8/2018	OK
16	Zone 1-West (Fence - Facing Church)	DCP	18	3 KG	1/8/2018	OK
17	Zone 1-West (Fence - Facing Church)	DCP	-	3 KG	1/8/2018	Missing/Replaced
18	Zone 1-North (Fence)	DCP	9	3 KG	1/8/2018	OK
19	Zone 2-North (Fence)	DCP	15	3 KG	1/8/2018	OK
20	Zone 3-North (Fence)	DCP	14	3 KG	1/8/2018	OK
21	Zone 6-Water Treatment Plant	DCP	13	5 KG	1/8/2018	OK
22	Zone 5-Toilets	DCP	10	3 KG	1/8/2018	OK
23	Zone 5-Transformer	CO2	11	5 KG	1/8/2018	OK
24	Zone 5-Transformer	CO2	12	5 KG	1/8/2018	OK
25	Zone 5-PSS Area (YESC)	DCP	-	3 KG	1/8/2018	Missing/Replaced
26	Zone 5-East (Gas Bottle Area)	DCP	8	6 KG	1/8/2018	OK
27	Zone 5-East (Batching Plant-Curing Room)	DCP	78	5 KG	1/8/2018	OK
28	Zone 8-East Fence	DCP	7	25 KG	1/8/2018	OK
29	Zone 8-East Fence (Hand Scan Area)	DCP	6	3 KG	1/8/2018	OK
30	Zone 8-East Fence (PPE Container)	DCP	5	3 KG	1/8/2018	OK
31	Zone 8-Sout Fence (Next to Electrical DB)	CO2	2	5 KG	1/8/2018	OK
32	Zone 8-South Fence (Next to Site Office)	DCP	1	5 KG	1/8/2018	OK
33	Surveyor Office (next to smoking area)	DCP	4	2 KG	1/8/2018	OK
34	Staff canteen	DCP	3	3 KG	1/8/2018	OK
35	Superintendent Office	DCP	45	4 KG	1/8/2018	OK
36	BTJV Office (Ground Floor)	DCP	44	5 KG	1/8/2018	OK
37	BTJV Office (Ground Floor)	DCP	44-1	5 KG	1/8/2018	OK
38	BTJV Office (Ground Floor)	DCP	44-2	5 KG	1/8/2018	OK
39	BTJV Office (Ground Floor)	DCP	44-3	5 KG	1/8/2018	OK
40	Workers Canteen	DCP	37	5 KG	1/8/2018	OK
41	Workers Canteen	DCP	49	5 KG	1/8/2018	OK
42	BTJV Office (Ground Floor)	DCP	34	3 KG	1/8/2018	OK
43	BTJV Office (Ground Floor)	DCP	35	3 KG	1/8/2018	OK
44	BTJV Office (Ground Floor)	DCP	36	3 KG	1/8/2018	OK
45	BTJV Office (Ground Floor)	DCP	33	3 KG	1/8/2018	OK
46	Clinic	DCP	30	2 KG	1/8/2018	OK
47	Zone 8-Office (South Fence)	DCP	43	5 KG	1/8/2018	OK
48	Workers Canteen (Ground Floor)	DCP	38	5 KG	1/8/2018	OK
49	Workers Canteen (1st Level)	DCP	40	5 KG	1/8/2018	OK
50	Workers Canteen (1st Level)	DCP	39	5 KG	1/8/2018	OK



HEALTH AND SAFETY PLAN

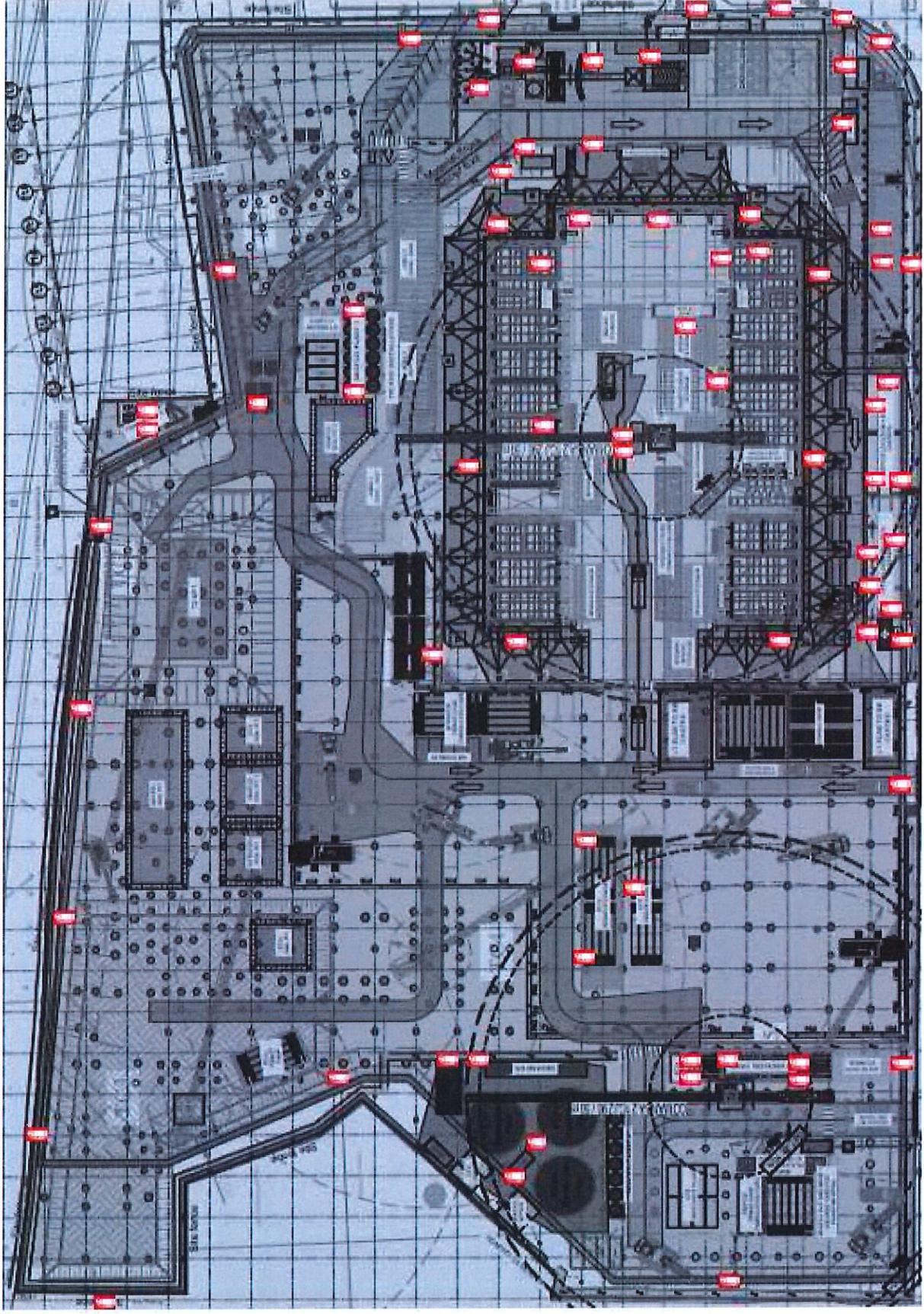
MONTHLY INSPECTION OF FIRE EXTINGUISHERS

SN	LOCATION	TYPE	FIRE EXT NO.	SIZE	CHECK DATE	REMARKS
51	Workers Canteen (2nd Level)	DCP	41	5 KG	1/8/2018	OK
52	Workers Canteen (2nd Level)	DCP	42	5 KG	1/8/2018	OK
53	Hand Scan Area (South Entrance)	DCP	32	5 KG	1/8/2018	OK
54	Hand Scan Area (South Entrance)	DCP	31	5 KG	1/8/2018	OK
55	South Perimeter fence (next to clinic)	DCP	29	4 KG	1/8/2018	OK
56	PYN Generator Area (Courtyard)	CO2	55	5 KG	1/8/2018	OK
57	PYN Generator Area (Courtyard)	CO2	56	5 KG	1/8/2018	OK
58	PYN North East (Ground Floor)	DCP	6	50 KG	1/8/2018	OK
59	PYN South East (Ground Floor)	DCP	1	50 KG	1/8/2018	OK
60	PYN South (Ground Floor)	CO2	58	5 KG	1/8/2018	OK
61	PYN North (Ground Floor)	CO2	57	5 KG	1/8/2018	OK
62	PYN West (Ground Floor)	DCP	66	6 KG	1/8/2018	OK
63	PYN West (Ground Floor)	DCP	72	6 KG	1/8/2018	OK
64	PYN South (Ground Floor External)	DCP	73	6 KG	1/8/2018	OK
65	PYN South (Ground Floor External)	DCP	49	6 KG	1/8/2018	OK
66	PYN East (Ground Floor External)	DCP	48	6 KG	1/8/2018	OK
67	PYN East (Ground Floor External)	DCP	46	6 KG	1/8/2018	OK
68	PYN North (Ground Floor External)	CO2	54	5 KG	1/8/2018	OK
69	PYN North West (Drinking Water Area)	DCP	57	6 KG	1/8/2018	OK
70	PYN North (First Level)	DCP	64	5 KG	1/8/2018	OK
71	PYN North (First Level)	DCP	65	6 KG	1/8/2018	OK
72	PYN North (Second Level)	DCP	70	50 KG	1/8/2018	OK
73	PYN North (Second Level)	DCP	59	50 KG	1/8/2018	OK
74	PYN South (First Level)	DCP	71	50 KG	1/8/2018	OK
75	PYN South (Second Level)	DCP	74	50 KG	1/8/2018	OK
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HEALTH AND SAFETY PLAN

Appendix 14 – Fire Extinguishers allocation Plan





HEALTH AND SAFETY PLAN

Appendix 15 – Fire extinguishers Inspection





Appendix 16 – Permit to Work Sample Onsite

“Hot Works”





HEALTH AND SAFETY PLAN

Appendix 16 – Permit to Work Sample Onsite

“Excavation – 2nd page”



Permit to Excavate

PRE-EXCAVATION CHECKLIST - 2nd PAGE

(One original copy of this PERMIT TO EXCAVATE must be displayed on the workplace at all times)

PRE-EXCAVATION CHECKLIST

Page 2

Permit No. : Ex - DD
Co Code Sequence No

5.0 EXCAVATION DETAILS

Drawing(s) attached Yes No (Cannot start excavation)

Dwg No. _____

Depth of Excavation < 1.5m > 1.5m

Bottom Width of Excavation _____ m

Type of Excavation Open Cut Shuttled Excavation
Max Degree of Slope _____

“Person-in-Charge of the Work & HSE Officer” must strictly inspect and verify the items below

6.0 CHECKLIST ITEMS:

Y – yes / N – no /
N/A – not applicable

1.	Method Statement Risk Assessment (if necessary) issued, endorsed and approved	Yes
2.	Have statutory authorities been notified	Yes
3.	Have statutory authorities issued location drawings	Yes
4.	Has CAT and Genny scan been done on all areas	N/A
5.	Has a ground radar survey been carried out (optional)	N/A
6.	Are trial holes required	N/A
7.	Is hand digging required	N/A
8.	Have all personnel been told of the service locations	Yes
9.	Information Drawing + Latest Drawing issued by Public Utility Company	N/A
10.	Combined As-built Drawing	N/A
11.	Construction of trial pit: S/C	N/A
12.	Utility detection conducted – Attach inspection report	N/A
13.	Setting out checked	Yes
14.	Prepare secured fencing at edge of excavation	Yes
15.	Prepare warning notice (signage) and lighting where necessary	Yes
16.	Prepare access ladder (Every 7.5mtrs)	N/A (No application)
17.	Prepare access ladder, lag access ladders if entry is below 1.5 meters use green/red lag system (for pile breaking only)	Yes
18.	Is there adequate shoring support (below 1.5mtrs)	Yes type of shoring on sides
19.	Checked no vehicles within 2mtrs of excavation area	Yes

7.0 ACKNOWLEDGEMENT

Acknowledged by the Person-in-Charge and HSE Officer of the Work

I fully understand the content of this permit and will ensure no person will enter the excavation without firstly ensure the safety of the excavation.

Date	_____	Time	_____	Signature	_____
	d . m . y		anyone		S&I Person-in-charge of the Work
Date	_____	Time	_____	Signature	_____
	d . m . y		anyone		S&I HSE Officer

(One original copy of this PERMIT TO EXCAVATE must be displayed on the workplace at all times) one copy shall be filed by the HSE Department, one copy filed by the Subcontractor



Appendix 16 – Permit to Work Sample Onsite

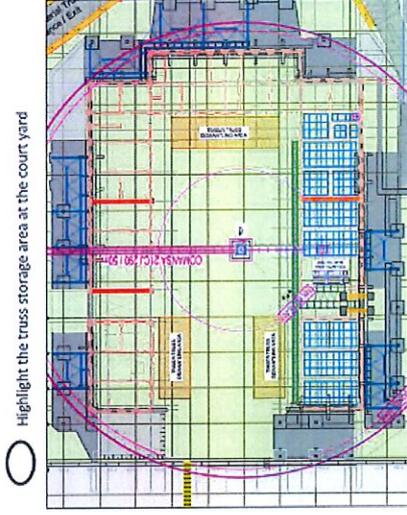
Lifting

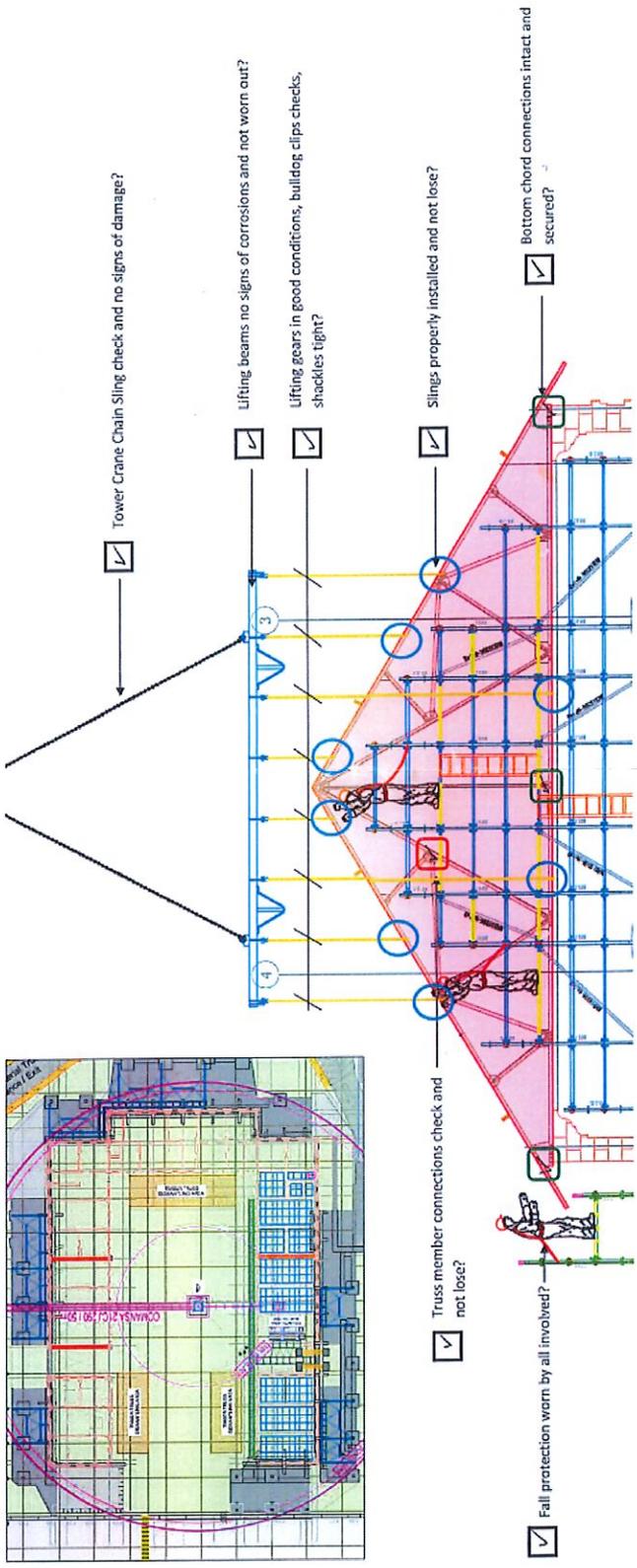


Date: 01-06-2018
 Truss Number: 12

DISMANTLING OF ROOF TRUSS LIFTING PLAN

○ Highlight the truss storage area at the court yard





Tower Crane Chain Sling check and no signs of damage?

Lifting beams no signs of corrossions and not worn out?

Lifting gears in good conditions, bulldog clips checks, shackles tight?

Slings properly installed and not lose?

Truss member connections check and not loose?

Bottom chord connections intact and secured?

Fall protection worn by all involved?

Check By: Hedon

Signature: [Signature]

Approve By: [Signature] (Safety Department)

Signature: [Signature]

Annex 7b Emergency Response Plan

YOMA CENTRAL PROJECT

REQUEST FOR APPROVAL (RFA)

RFA No. & Rev: YCP-MWL-BTJ-SPA-RFA-MIS-0148-B

Subject : EMERGENCY RESPONSE PLAN

DISCIPLINE :	ST	Date Submitted :	4-Jul-18
RFA TYPE :	MIS	Date/Time Received :	
MC Point of Contact :	Joris Thomas	Target Return Date:	18-Jul-18
Sub-Contractor Name :		Previous Status :	

SPECIFICATION/CONTRACT REFERENCE : Main Work Landmark

ADDITIONAL REFERENCE DOCUMENTS

EI/NOC/NOD/CVI :	RFA:
RFI/MOM/LETTERS :	OTHERS :

Notes: We would like to submit " EMERGENCY RESPONSE PLAN".

Tick	Project	Explanation
<input type="checkbox"/> Y <input type="checkbox"/> N	PYN Blue	
<input type="checkbox"/> Y <input type="checkbox"/> N	PYN White	
<input type="checkbox"/> Y <input type="checkbox"/> N	Other	

ENGINEER'S REPLY

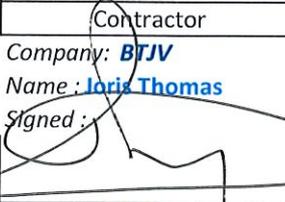
ITEM	COMMENTS

Submittal Status :

STATUS A : APPROVED - Reviewed, no exception taken. No re-submittal required. Proceed with manufacture, fabrication and/or construction.

STATUS B : APPROVED WITH COMMENTS - Reviewed as noted, minor comments, resubmit within 14 days and contractor can proceed with works at own risk construction.

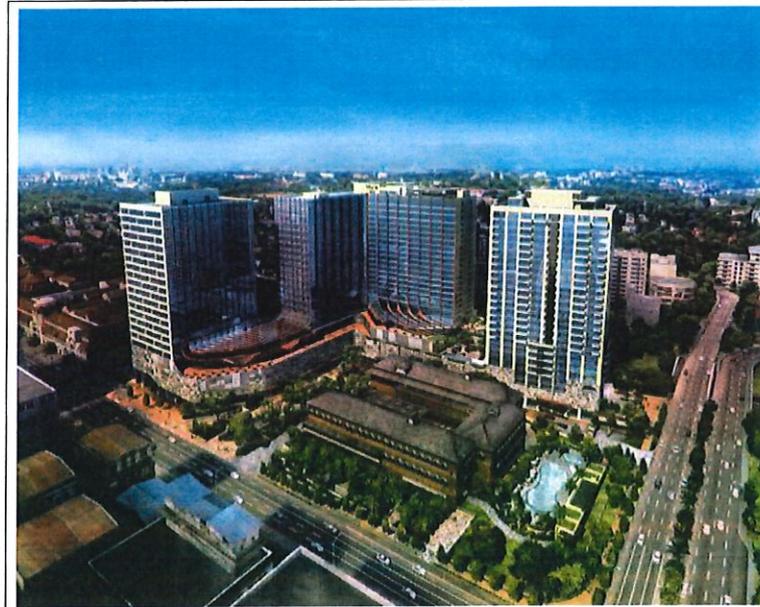
Status

Contractor	Consultant	Client Engineer/CM	Client PCM/DM
Company: BTJV Name : Joris Thomas Signed : 	Company: Name : Signed :	Company: Name : Signed :	Company: Name : Signed :
Date: 4-Jul-18	Date:	Date:	Date:

there are cost/time implications please refer to the NCD in the Reference Documents above. The status provided above on this page by

YOMA CENTRAL PROJECT

Yangon, Myanmar



Employer:
MEEYAHTA DEVELOPMENT LTD. (MDL)

Engineer:



DESIGN & PROJECT SERVICES LTD.

A MEMBER OF YOMA STRATEGIC HOLDINGS LTD.

CONTRACTOR		Name	Position	Signature
	Prepared by:	Bernie PUSUNG	H&S Manager	
	Reviewed by:	JD LE GALLIC	QSE Manager	
	Approved by	Joris THOMAS	Project Director	

Description of the document:

EMERGENCY RESPONSE PLAN

Document Coding:

Project Code			-	Issuer Code			-	Document Type			-	Document Number			-	Revision
Y	C	P	-	Q	S	E	-	E	R	P	-	0	0	1	-	B


Emergency Response Plan
Change Tracking:

Revision/Date	Description
A / 2018-03-23	First issue
B / 2018-07-03	Revision B: SPA comments incorporated

Compliance with Comments:

Revision	Comment received	Clarifications / Supporting document	Engineer Review
Item 1	Do not duplicate H&S Plan – it will create confusion	Appendix I “General Guidance” removed from this procedure as it already highlighted on the H&S Plan	
Item 2	This should provide the method for response to a significant event or significant accident onsite	Kindly refer to Appendix C, D, E and F.	
Item 3	It can be greatly simplified	It is simplified as advise	
A	Section 1: EPR to change to ERP	Comment incorporated	
A	Section 4.3: venerable – wrong wording	Change to “vulnerable”	
A	Section 4.3: Limited drainage options	“Flood control” was improved on the project by providing numbers of sum pits with automatic pumps.	
A	Section 4.5: tentative of group	Change to “potential group of workers could initiate strike”	
A	Section 7.1: Incomplete sentence	Supervisor responsible for <u>person involved</u>	
A	Section 7.3: Team Organisation Chart must include	See APPENDIX A	
A	Section 7.5: Spelling mistake “Authorise”	Corrected to “Authorities”	
A	Section 9: Comment raise regarding the need of 2 ambulance pick up points and fire brigade access points	Agreed hence Sule Pagoda Road access has not been granted by authorities limiting the access to emergency services. In case of emergency, one ambulance can go through the site in order to move from one entrance to another.	
A	Section 10: Which emergency drills needs to be undertaken every 6 months?	Fire	
A	Section 13: Arabic to change to Myanmar	“reworded to Myanmar”	



Emergency Response Plan

A	Appendix A: to fill in the name and contact numbers of emergency team organisation	Filled in as advised	
A	Appendix A: page 14 of 34 – Drill to be carried out twice a year	Corrected	
A	Page 15 of 34 : First Aiders to be trained from Red Cross	All the project First Aiders are trained by RED CROSS.	
A	Appendix C: Safety Manager to inform client on all medical emergency cases – flow chart to be amended	Flow chart amended as per advised.	
A	Appendix G: Possible emergency RV for emergency services , Fire, Ambulance, Police	No permit granted on the Sule Pagoda Road. The access for emergency services, Fire Brigades, Ambulance and Police will remain on the BAS road.	

TABLE OF CONTENTS

- 1.0 PURPOSE
- 2.0 REFERENCES
- 3.0 DEFINITIONS
- 4.0 PROJECT CONTEXT AND RISKS
- 5.0 ROLES RESPONSIBILITIES
- 6.0 TRAINING AND AWARENESS
- 7.0 OUTLINE PROCEDURES FOR SPECIFIC TYPES OF INCIDENTS
- 8.0 SUMMONING THE EMERGENCY SERVICES SITE ENTRY POINTS
- 9.0 SITE ENTRY POINTS FOR EMERGENCY VEHICLES
- 10.0 EMERGENCY DRILLS
- 11.0 FIRE EXTINGUISHERS / FIRE POINTS
- 12.0 FIRE AND SMOKE DETECTORS
- 13.0 EMERGENCY SIGNAGE
- 14.0 SITE SECURITY AGAINST ARSON

APPENDICES

- Appendix A Emergency Team Organisation Chart & Duties
- Appendix B List of Emergency Contact Numbers
- Appendix C Medical Emergency Response Flow Chart
- Appendix D Emergency Evacuation Procedure
- Appendix D Fire Action Flow Chart
- Appendix F Action on discovery of fire
- Appendix G Site Installations and Assembly Points
- Appendix H Office Emergency Evacuation Procedure



Emergency Response Plan

1.0 PURPOSE

This Emergency Response Plan encompasses the extent of the all potential emergency situations that may arise during the construction/deconstruction of Yoma Central project, Yangon. Potential emergency situations are: Fire risk, Major Accidents, Earthquake, and Heavy Flooding during months of summer or any others.

This Emergency Responses Plan (EPR) is designed to set down the organisation for the arrangements for the prevention, detection, alerting and addressing proper mitigation measures and the means of escape within the Yoma Central Project to protect:

- Personnel from injury,
- The assets, including those belonging to YOMA Central Project team, BTJV/BYMA and all others working for the project,
- The environment within and around the worksite,
- The reputation of the Company and its ability to continue to meet its operation and construction commitments.

This procedure shall be approved by the Project Director and reviewed formally every 6 months or after notable changes in the site organization.

The target is to be at any time prepared to deliver an effective emergency response in case of unforeseen event.

2.0 REFERENCES.

- SPA Minimum HS Standards for Major Works
- SPA Emergency Response Plan 1st September 2017
- Bouygues Batiment International MAN 8 Emergency Alert Process
- Project Health and Safety Plan
- Project Environmental Management Plan

3.0 DEFINITIONS

EMERGENCY: is a sudden unforeseen event requiring prompt action.

The following terms are used in this plan with the meanings shown:

Term and Definition	Examples
<p style="text-align: center;"><u>MODERATE RISK</u></p> <p>This is an event/incident which may result in:</p> <ul style="list-style-type: none"> • Injury to personnel • or any other minor incident <p>This is an incident which escalates because:</p> <ul style="list-style-type: none"> • Control is lost to some extent • Immediate action is required • Other people, not immediately connected with the incident, are involved which may have the potential for any of the above 	<p style="text-align: center;"><u>Evacuation of Injured Personnel</u></p> <ul style="list-style-type: none"> • Person injury at the course of employment. • Traffic Accident. <p style="text-align: center;"><u>Epidemic Sickness</u></p> <ul style="list-style-type: none"> • Food poisoning affecting large proportion of work force • SARS affecting large proportion of work force • H1N1 affecting large proportion of work force • Cholera outbreak



Emergency Response Plan

<p style="text-align: center;">HIGH RISK</p> <p>This is an incident which escalates because:</p> <ul style="list-style-type: none"> • Control is lost to some extent • Immediate action is required • Other people, not immediately connected with the incident, are involved <p>The incident is complex, probably involving more than one incident at once</p> <p>This is an incident will escalates into an emergency response if the following become involved in the response:</p> <ul style="list-style-type: none"> • Damage to the environment • Loss of substance, production time or assets • Government departments 	<p style="text-align: center;">Fire or Explosion</p> <ul style="list-style-type: none"> • Fire • Fire requiring evacuation of an area • Fire and explosion in the building • Danger of explosion of gas bottles • Danger of explosion of flammable storage tank <p style="text-align: center;">Oil and Chemical Spillage</p> <ul style="list-style-type: none"> • Hazardous Substances Spillage • Toxic gas cloud or smoke drifting over housing area • Gas escape
<p style="text-align: center;">EMERGENCY / CRISIS</p> <p>This is an incident will escalates into an emergency / crisis if the following become involved in the response:</p> <ul style="list-style-type: none"> • The news media# • Government departments • Stake holders • Relatives of potentially involved personnel on site 	<p style="text-align: center;">Dangerous Occurrences (DO)</p> <ul style="list-style-type: none"> • Scaffold collapse • Crane collapse • Failure of lifting equipment • Structure collapse • Flood

NEAR MISS: A subset of incidents that could have resulted in injury, illness or property damage, if given a different set of circumstances, but didn't. Near misses are also known as 'close calls.' Perhaps the better term to consider is 'near hit.'

INCIDENT: Generic wording of works related event(s) in which an injury, ill health (regardless of severity) or fatality occurred, or could have occurred. It could be classified as equipment incident, environmental incident...

ACCIDENT: Work related event(s) in which an injury, it could be first aid case, accident without lost time, accident with lost time.

4.0 PROJECT CONTEXT AND RISKS ANALYSIS

4.1 Project Context

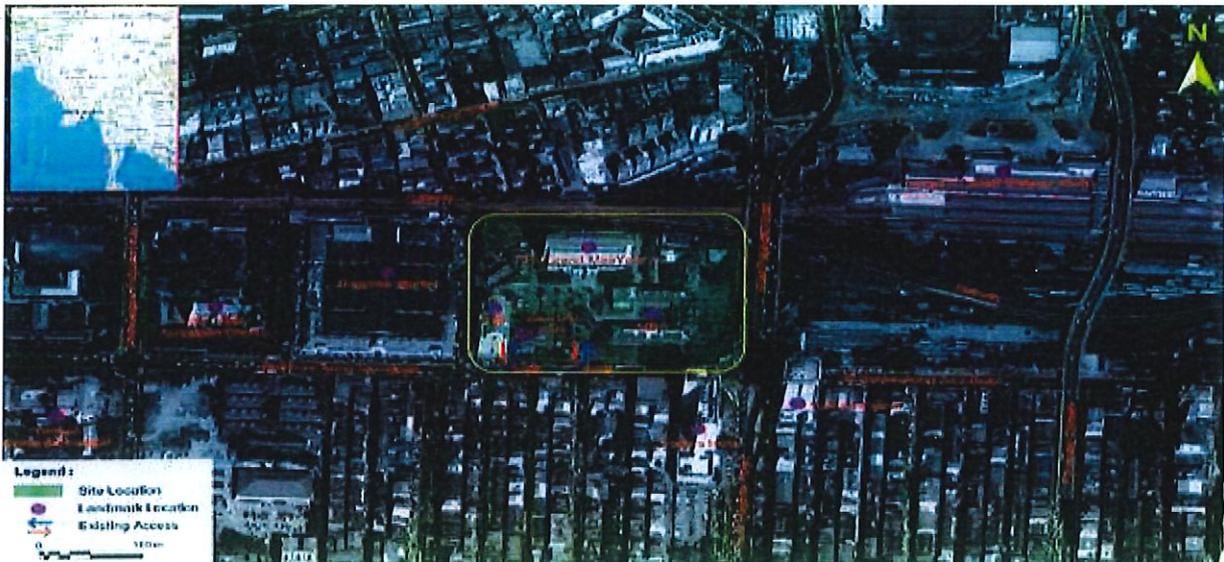
The Yoma Central Project is a Construction project located in central area of Yangon. It has 44 months construction duration, and will involve 5000 workers at peak period.

4.2 Risks Analysis

The project is located in downtown area of Yangon. It is a complex area in term of access; roads are quite congested during the day



Emergency Response Plan



- with the presence of Bogyoke market on West side of the project
- with the Church in nearby proximity of the site
- With Aung San Bogyoke road in South area with high and critical traffic area
- with rail track on north area

4.3 Natural Disaster

Yangon is quite **vulnerable** to natural disaster, such as:

Risk	
Earthquake	Yangon is located on seismic area. For YCP it is not a high risk for construction itself, but risk should be considering for temporary structure (scaffold, crane...) and emergency response.
Heavy Rain / Flooding	Despite a drainage plan has been put in place using sump pits with automatic pumps to prevent flooding on the work locations during rainy season. Yangon is exposed to seasonal event with rainy season between June to October.
Thunder / storm	The Project with the use of sensitive equipment such as mobile and tower crane, with as well high rise building is exposed to this major risk

4.4 Site Activities

The “project’s risks” are quite important due to the activity of construction with lot of equipment’s (crane, batching plant, drilling equipment, formworks, hoists...) logistic issues (important volume of delivery, truck turnover..) and many people involved (5000 at peak) who will be exposed to various risks). Construction projects area usually exposed to unforeseen event such as incidents (equipment, energy, environment...) and accident involving people. It is moderate risks, mostly treated directly on spot or first aid treatment which not required important emergency response, but also specific High Risk which lead to important emergency response (collapse, fall from height, falling object, equipment overturn, hit by vehicles,). Specific preventive measures are describes into risk assessment/method statements.

4.5 General Risks

Risks which could require emergency response: riot outside, **potential group of workers could initiate strike** and as well epidemic cases which could lead to specific site organization.

5.0 ROLE AND RESPONSIBILITIES



Emergency detection and alert is everyone's responsibility and all Yoma Central Project team should be aware of how to prevent and respond in case of emergencies. The Project Director has set-up organisation describe in APPENDIX A. "Organisation chart / duties"

6.0 TRAINING AND AWARENESS

Emergency training will be supported by Toolbox talk program and Drills program (see section below). In principle:

- All staff will receive an induction which will include the basic information on site emergency procedures (what to do in case of incident, who to call, where to go in case of evacuation, safe behaviour).
- Any amendments to the Emergency Preparedness Procedure that may affect any staff shall be communicated by e-mail or memo.
- A suitable number of staff in line with current legislation shall receive training on the safe use of extinguishers.
- Appointed Fire Marshalls will receive training to carry out their duties and the contents of the Emergency Preparedness Plan to deem them competent.
- Any further training which is required to increase competence of all project personnel will be agreed by the Senior Management Team.
- All records of training will be kept with the Health and Safety Department.

7.0 OUTLINE PROCEDURES FOR SPECIFIC TYPES OF INCIDENTS

The outline procedures to be adopted in the event of specific types of emergency are given below.

7.1 Evacuation of Injured personnel

An accident occurred likely to escalate into a full-scale emergency. If the person involved is injured, he should be evacuated from accident location and treated by normal first aid/ hospitalization procedures. If an emergency results, it will be handled as follows;

Anyone observed incident	Call for help. Keep the person in view.
OH&S manager / Officer	Assess the problems - how many people are injured, How best to rescue, what kind of resources are needed.
Rescue Team	Inform to Chief Security Officer To evacuate the injured personnel as required.
OH&S Manager	Check the person's condition and if necessary inform to relatives. Follow up the person's progress until fully recovered or other outcome.
Supervisor responsible for person involved	Complete report, ensuring full inquiry into the cause and recommendation.
H&S Manager	Submit report to Management and IFC



Emergency Response Plan

7.2 Epidemic Sickness

This is a matter for national Health Authorities to deal. In case of epidemic occurred, the matter should be immediately referred to relevant Authorities. It necessary, isolate the area and personnel affected by the sickness until professional medical diagnosis and treatment are available.

7.3 Fire or Explosion

Anyone discovering fire	Raise alarm and ensure that responsible supervisor for the area is informed.
Security Officer / OH&S Manager	<p>Assess the situation and decide whether the emergency is within the capability of in-house resources.</p> <p>Evacuate the area affected and instruct leaders of working teams to check to ensure all personnel are accounted for. If any missing, take action to find the person without endangering further personnel.</p> <p>As appropriate:</p> <ul style="list-style-type: none"> . Mobilize in-house firefighting, rescue and first-aid personnel. . Call the Emergency services. . Mobilize the Emergency Response Team (ERT). Assemble a support team and allocate duties.
Emergency Response Team (ERT)	<p>Allocate duties,</p> <p>Inform as appropriate:</p> <ul style="list-style-type: none"> . Financial, legal and insurance advisors, . Client, . Other local interests if affected, . Other persons with a contractual or financial interest <p>Monitor the situation and keep records.</p> <p>If necessary, set up groups to respond to:</p> <ul style="list-style-type: none"> . media inquiries, . Inquiries from relative of personnel possibly



Emergency Response Plan

Department of Meteorology and Hydrology (Myanmar)	Storm alarm
OH&S Manager	Monitor weather news Put ERT to standby (ERT on Appendix A)
M&E Manager	Arrange necessary manpower and machinery to maintain canal and repair
M&E Manger	Prepare emergency shutdown procedures for generators and EBC supply Brief the team on the procedures Arrange sand bags to isolate the generators and M&E rooms
Project Manager and Construction Manager	Designate building with high floor and area with higher ground for emergency assembly Arrange vehicles for transportation of personnel and equipments Arrange foods and emergency items such as blanket, tents and so
OH&S Manager	Assess the situation and decide whether the emergency is within the capability of in-house resources. Rise alarm if the situation develop to warning level Advice ERT Commander to evacuate the area affected and instructs leaders of working teams to check to ensure all personnel are accounted for. If any missing, take action to find the person without endangering further personnel. As appropriate: <ul style="list-style-type: none"> . Mobilize in-house rescue and first-aid personnel. . Call the Emergency services.
Project Managers, Construction Manager and Emergency Response Team (ERT)	Allocate duties, Inform as appropriate: <ul style="list-style-type: none"> . Financial, legal and insurance advisors, . Client, . Other local interests if affected, . Other persons with a contractual or financial interest, Monitor the situation and keep records. If necessary, set up groups to respond to: <ul style="list-style-type: none"> . media inquiries, . Inquiries from relative of personnel possibly involved. Set up incident investigation team.

7.4 Oil and Chemical Spill

Action to be taken in the event of Oil or Chemical spill depends on:

- a. quantity spilled,
- b. environment affected,
- c. type of oil or chemical.



Emergency Response Plan

In the event of spill within confined space, main effort shall be to:

- a. Isolate the source of spill
- b. Ensure the oil or chemical not to flow into the public drainage system,
- c. Clean up the spill, probably using professional clean-up services contractors.

7.5 Dangerous Occurrence (DO)

The procedure in the event of Danger Occurrence (DO) collapse of pre-cast installation, building structure, crane or scaffolding etc is as follows:

Anyone becoming aware of imminent or actual collapse	Raise alarm by informing to responsible supervisor for the area.
Responsible Supervisor / engineer/ manager	Ensure that: <ul style="list-style-type: none"> . personnel in the areas are evacuated and accounted for, . The area is safe and power-isolated. Inform to the safety supervisor or his nominee.
Chief Security officer / OH&S officer / OH&S Manager	Assess the situation. Mobilize resources to rescue personnel and stabilise the structure involved, without putting personnel at unnecessary risk, Mobilize Emergency Response Team (ERT), if necessary, Assemble a support team and allocate duties. SPA should inform to IFC and the client of all Dangerous Occurrences.
Emergency Response Team (ERT)	If the accident is sufficiently serious, inform to the appropriate: <ul style="list-style-type: none"> . Local Authorities, . Emergency Services, . Contractors, Monitor the progress of work to stabilise the structure and restore normal operation. Set up resources to provide information to relatives of person involved and to the media.

8.0 SUMMONING THE EMERGENCY SERVICES

The Project Emergency Contact Numbers in (Annex F), either of these emergency numbers shall be contacted on any type of Emergency, informing relevant information i.e. type of emergency and exact location of the incident.

During normal working hours the emergency services will be summoned by one of the Emergency Preparedness Co-ordinators. The Emergency Preparedness Co-ordinator is responsible for summoning the emergency services by dialling the appropriate emergency number and giving directions to the correct location. The Fire Safety Co-ordinator will ensure a responsible person is sent to the site entry point for the emergency services to guide them to the scene of the emergency.

Outside of normal site hours the emergency services will be summoned by the BTJV Senior staff member present, this person will ensure that the emergency services are summoned and directed to the correct location. If Police assistance is required then they also should be summoned by dialling (01-371398 Pabedan & 01-371054). The security guard on the main gate will be alerted and advised that the access gate is to be opened. The relevant persons listed in **BTJV Emergency Contact** Numbers in Annex F must be contacted.



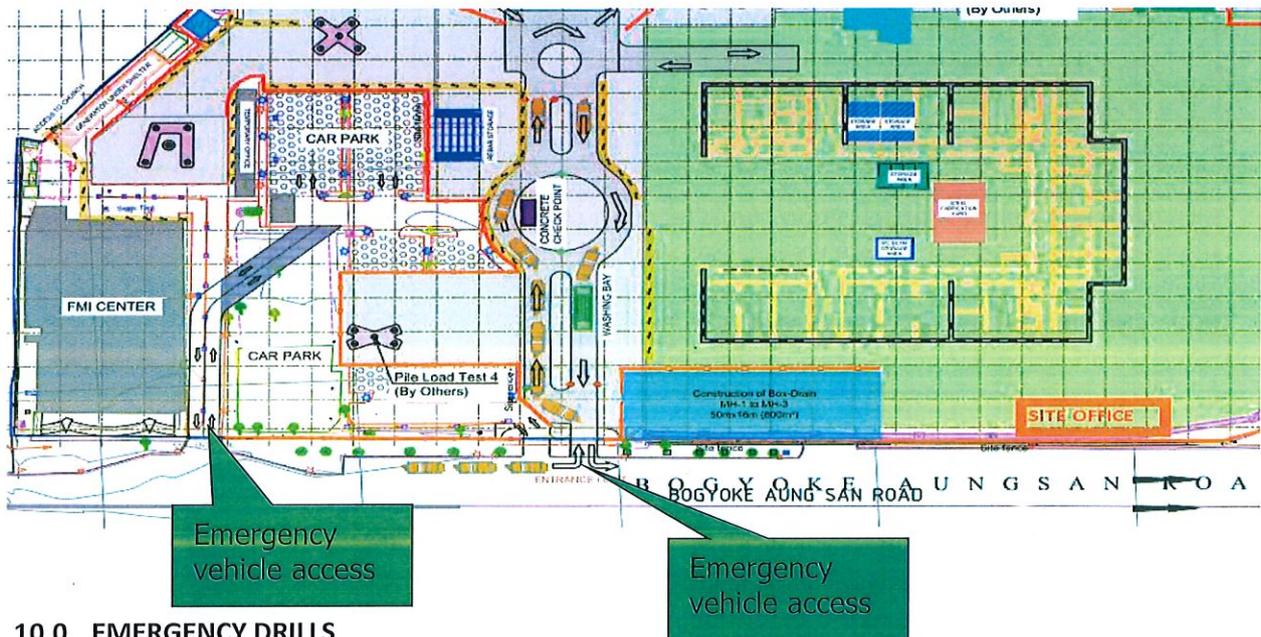
Emergency Response Plan

9.0 SITE ENTRY POINTS FOR EMERGENCY VEHICLES

Depending upon the location and nature of the emergency situation the emergency services shall be directed to attend:

The main gate at the Bogyoke Aung San Road (shown below).

The security staff at the Main Site Entrance will co-ordinate with the appointed Emergency Preparedness Co-ordinator and direct the emergency services to the location of the emergency. Training to be provided as necessary to security staff and they are to understand what to do in emergency.



10.0 EMERGENCY DRILLS

During the superstructure works and or deconstruction works for the FMI Demolition. Fire Drills have been carried out to check the response of the operative and staff working within the buildings. The effectiveness of this evacuation procedure shall be tested via drills. Emergency drills shall be undertaken at least every **six months or once a year** during the superstructure works and or deconstruction works. Depending on the size and complexity of the buildings, the drills can include the whole building or part of the building. This will ensure staff can become competent about evacuating their area.

Fire drills will be performed with the minimal of disruption to service. Emergency Preparedness Coordinator will arrange for someone to activate the alarm and observers (selected individuals) will be stationed at strategic locations throughout the site to observe the actions of the site personnel when the announcement is made. The outcomes of the drill will be recorded on a fire drill record.

Observations will be made for:

- Quick response of all duty holders to their designated duties.
- Response and attitude of the staff in evacuating the floor.
- Closing of all doors to help confine the fire and limit the spread of fire and smoke.
- Evidence of offices and restrooms searched.
- Following correct evacuation procedures.
- Taking a head count at the assembly points.



The main points which are to be covered:

- not hearing the announcement;
- fire equipment blocked or unusable;
- exits and hallways blocked;
- debris in stairwells,
- doors propped open;
- office doors not closed;
- duties not understood or carried out;
- Response of all occupants.

This will enable Senior Managers and Fire Safety Coordinators to identify any failings within the exercise and communicate to staff where weaknesses may still exist.

11.0 FIRE EXTINGUISHERS / FIRE POINTS

- Adequate and suitable fire extinguishers will be provided and maintained throughout the site office, generators, flammable material storage, and electrical control panels. Fire points will be clearly defined and located in conspicuous positions near exits on each floor;
- In the open, they should be mounted above ground or in suitable cabinets / stands bearing the sign "Fire Point" and protected from both work activities and adverse weather conditions;
- Fire extinguishers will be regularly inspected and maintained by a competent person, and weekly visual inspections carried out by the Fire Marshalls. Records of monthly inspection will be recorded on the fire extinguishers;
- Sufficient number (To be determined by area size/type of works/location) of trained personnel in use of fire fighting equipment will be appointed in each area.

12.0 FIRE AND SMOKE DETECTORS

- Adequate and suitable heat/smoke detectors will be installed in all site offices and material stores.
- Smoke or heat detectors linked to a warning light system to be provided to Chemical stores.
- Smoke detectors must be audible throughout the respective area and be inspected on a regular basis

13.0 EMERGENCY SIGNAGE

Suitable signage to indicate fire fighting equipment's and fire escape routes & exits shall be displayed conspicuously. All fire exit and fire route signs shall have a green background with white symbols. Information and warning signs will be provided at the following locations or areas:

- Action in the event of an emergency notices will be prepared and posted throughout the site.
- Adequate and suitable signs will be posted, indicating location of fire points, e.g. extinguishers/alarms, exit routes, exits and assembly points.
- Flammable / Combustible/Chemical/Materials stores

Information notices shall be provided throughout the worksite to inform all persons of the actions that they should take in the event of a fire. All signs and notices will be in Myanmar and English and other languages preferred by employees at the location.



14.0 SITE SECURITY AGAINST ARSON / THEFT

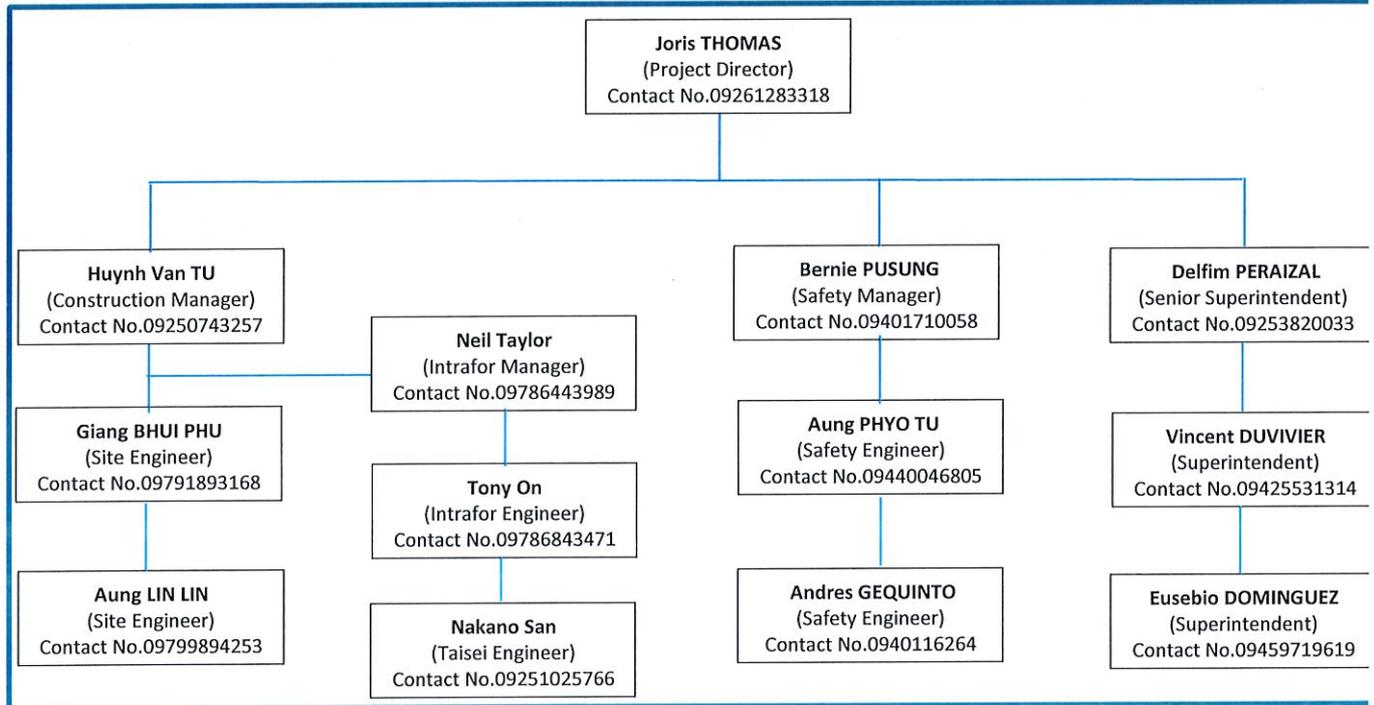
Buildings will be protected against theft and deliberate igniting fires in accordance with the fire risk assessment. The following measures will be taken:

- The site and project offices will be secured against unauthorised entry by 24 hour security;
- Site hoardings will be erected around the perimeter of the site, yard and offices and all access points will be manned by security and locked when not in use.
- Flammable liquids, gases and combustible material stores will be in secure areas and suitably protected.



APPENDIX A

LANDMARK PROJECT – EMERGENCY TEAM ORGANISATION CHART AND DUTIES



Operational Organization Chart

Duties & Responsibilities

PROJECT DIRECTOR – Joris THOMAS

- Ultimate responsibility to ensure that the requirements of this procedure are implemented on site and any deviation/non-compliance is dealt with accordingly.
- Ensure that the necessary trained manpower and materials resources required are available to meet the plan requirements.
- Ensure that arrangements are made to rectify any shortcoming in the procedure arrangements brought to his attention by the Yoma Central Project team.

EMERGENCY PREPAREDNESS COORDINATOR – Delfim PERAIZAL

In the event of an emergency take overall control to ensure all persons are accounted for in his area of responsibility and the emergency services have been summoned to the correct location and that all relevant drawings, plans and all other necessary information is made available to the emergency services.

- Protect and secure the site so as to enable any further injury or damage.
- Note any particular details, which may be of use in any subsequent investigation or report.
- Ensure Fire Marshalls are adequately informed, trained and instructed to enable them to carry out their functions.
- Identify suitable evacuation routes and assembly points and see they are kept clear.



Emergency Response Plan

- Ensure that regular inspections and checks are carried out, with particular emphasis on signage, presence of obstructions/obstacles, appropriate lighting, fire brigade access, fire fighting facilities, e.g. fire extinguishers and alarms etc.

HEALTH AND SAFETY MANAGER – Bernie PUSUNG

- Prepare, and review the Plan on a regular basis.
- Liaise with the Project Directors to ensure that the plan is updated in line with the progress of the work and changes to the site environment
- Report details of fires and emergency situations to BTJV Senior Management, Client and assist as necessary in the reporting to the relevant authorities if required.
- Provide/arrange training as necessary/identified/requested by the senior management, e.g. induction training, fire marshal training.
- Monitor the implementation and effectiveness for the Plan and report findings to the Senior Management Team.
- Liaise with the local Civil Defence when required and ensure a suitable and sufficient risk assessment has been carried out.
- Keep up to date with all current legislation and review plan at suitable intervals.
- Arrange for regular fire drills/evacuation to be carried out to test the emergency arrangements (Note: This can be done in sections rather than a full project evacuation, with each section undertaking a full evacuation every 6 months).
- Ensure site security personnel know and understand action to be taken in the event of fire.
- Maintain and display in prominent locations an up to date list of emergency telephone numbers, maps, drawings detailing access routes and location of emergency equipment.
- Ensure the correct storage of flammable materials, liquids and gases in accordance with project procedures and material safety data sheets.

CONSTRUCTION MANAGER / PRODUCTION ENGINEERS

- Implement the Emergency Preparedness Plan.
- Ensure the relevant engineers execute all the control measures for fire prevention contained within this plan.
- Assign duties to ensure the roles of each sub-ordinate are properly delegated and effectively carried out.
- Ensure training is provided to those appointed/designated with any responsibility to ensure they understand their duties
- Ensure that those appointed have all necessary equipment provided to ensure they can carry out their duties safely and effectively.
- Ensure that ERP has been dispatched and effectively applied by the subcontractors.

FIRE MARSHALLS

- Carry out weekly visual checks of fire-fighting equipment, conduct weekly visual inspections of escape routes, fire brigade access, fire-fighting facilities and work/store areas and monitor the requirements laid down in this Plan, and record, and report any non-conformances to the Emergency Preparedness Co-ordinator/HSE Dept.
- During an alarm/emergency, by using verbal instruction ensure a safe evacuation of the offices/site, as necessary, ensuring the whole area is clear (including checking toilets, storerooms, or any other special areas of zone responsibility).
- Ensure that all staff, personnel and visitors report to the assembly points and report to the Emergency Response Co-ordinator that their area is clear.



Emergency Response Plan

- In the event of a fire, assist in providing accurate information to the Emergency Preparedness Co-ordinator to include location of fire, and access routes for emergency service vehicles/personnel.
- Only if it is safe to do so, tackle the fire using the appropriate fire extinguisher but DO NOT TAKE PERSONAL RISK. The evacuation of the building is of paramount importance.

SENIOR SAFETY OFFICERS / OFFICERS & SITE SUPERVISORS

- Ensuring that they are fully aware of the requirements of this procedure.
- Implementing the requirements of this procedure.
- Carrying out fire safety inspections and identify and report any non-Compliances to the Safety Manager
- Conducting toolbox talks and training sessions covering the fire safety topics.
- Checking fire fighting equipment regularly to ensure readiness.
- Supervising the evacuation of site fire/emergency drills.
- Take the appropriate action upon discovering or suspecting a fire on site.
- They are trained as **first aider** by Red Cross and fire marshal.

STAFF AND CONTRACTORS

- Shall comply with the emergency procedures/signage as detailed during the site induction.
- Attend safety toolboxes and training as and when required by the senior management
- Shall not interfere with or remove any equipment or material provided for fire fighting or fire prevention.
- All persons have responsibility to report hazardous situations. If a potential hazard exists i.e. blocked fire escape, then report it to a Fire Marshall or the Emergency Preparedness Co-ordinator/Safety Dept
- During an alarm/emergency, assist and co-operate with the Fire Marshalls by evacuating the building in a safe manner by the nearest exit and report to the assembly point and report to the Emergency Preparedness Co-ordinator.
- Be responsible for any visitors that are with you and ensure they are accompanied to the assembly point.
- Do not return to the building/site until the all clear has been given by the Emergency Preparedness Co-ordinator.

Specific Role

FIRE MARSHALLS – are persons responsible for ensuring the site offices and buildings/work areas are evacuated in the event of an emergency situation. Fire Marshalls details shall be displayed on notice boards and staff will be made aware of whom they are during induction. They will be identified by specific sticker on helmet.

FIRST AIDERS - Shall perform first aid duties on site. In the event of an Incident, trained and competent First Aiders shall ensure First Aid kits are taken to the scene of any incident. Details of appointed First Aiders (Which will be regularly updated) will be displayed in prominent locations throughout the site. First Aiders must ensure that all records of treatment are recorded and reported to the HSE Manager. They will be identified by specific sticker on helmet.

SECURITY GUARD – Are in general with Safety team the first person to be inform about accident. They will assist for alerting and for emergency response actions.



Emergency Response Plan

IN CASE OF MATERIAL/EQUIPMENT – ELECTRICAL ISSUE – INCIDENT (လျှပ်စစ်နှင့်ပတ်သက်သော အခက်အခဲများအတွက် ဆက်သွယ်ရန်)

1. Contact Safety Team and state the location of fire. (အသားအန္တရာယ်အတွက် safety အဖွဲ့သို့ ဆက်သွယ်ပါ။)

Aung Phyo Tu (အောင်မြို့သူ)	Safety Engineer (အသားအန္တရာယ်ကင်းရှင်းရေးအင်ဂျင်နီယာ)	09440046805
Win Maung (ဝင်းမောင်)	Safety Officer (အသားအန္တရာယ်ကင်းရှင်းရေးအရာရှိ)	09973815991
Bernie Pusung (ဘာနီပုဆွန်)	Safety Manager (အသားအန္တရာယ်ကင်းရှင်းရေးမန်နေဂျာ)	09401710058
Andres Gequinto (အန်းဂျေကွင်တို)	Safety Manager (Night Shift) (အသားအန္တရာယ်ကင်းရှင်းရေးမန်နေဂျာ ညဆိုင်း)	09401146264
Aung Naing (အောင်နိုင်)	Safety Officer (Night Shift) (အသားအန္တရာယ်ကင်းရှင်းရေးအရာရှိ ညဆိုင်း)	09259092074

2. Contact Project Team by Safety Manager. To support emergency response and ensure mitigation measures.

(အသားအန္တရာယ်နှင့်ပတ်သက်သည့် အန္တရာယ်များကို လျော့ချအန္တရာယ်ကင်းရှင်းရေးအတွက် အကူအညီပေးရန် safety မန်နေဂျာသို့ ဆက်သွယ်ပါ။)

Delfim Peraizal (ဒယ်ဖမ်ပရာအယ်)	Senior Site Superintendent (ဆိုက်ကြီးကြပ်ရေးမှူး)	09253820033
Vincent Duviyer (ဝင်းဇန်ညွန့်ဦးယာ)	For PYN Only - Superintendent (ကြီးကြပ်ရေးမှူး)	09425531314
Tu Huyn Van (တူဟွမ်ဗန်)	For YCP – Construction Manager (အောက်လုပ်ငန်းစဉ်မန်နေဂျာ)	09250743257
Quentin LePrince (ကွင်တင်လီယုဇင်)	For PYN – Construction Manager (အောက်လုပ်ငန်းစဉ်မန်နေဂျာ)	09448070665
Thura Tin (သုရတင်)	Plant & Equipment Electrical Foreman (အလုပ်ရုံနှင့်ယန္တရားလျှပ်စစ်ဗိုလ်)	09795947142
Cucchi Gilles (ကူချီဂျိလ်)	Plant & Equipment Manager (အလုပ်ရုံနှင့်ယန္တရားမန်နေဂျာ)	09403328256

IN CASE OF SPILLAGE / ENVIRONMENTAL CONCERNS (သဘာဝပတ်ဝန်းကျင်နှင့်ပတ်သက်သော အန္တရာယ်များအတွက် ဆက်သွယ်ရန်)

IN CASE OF SPILLAGE / ENVIRONMENTAL CONCERNS (သဘာဝပတ်ဝန်းကျင်နှင့်ပတ်သက်သော အန္တရာယ်များအတွက် ဆက်သွယ်ရန်)

1. Contact Environmental Personnels and state location of spill or any environmental concerns

သဘာဝပတ်ဝန်းကျင်နှင့်ပတ်သက်သော အန္တရာယ်များအတွက် အောက်ဖော်ပြပါ လူများအား ဆက်သွယ်ပါ။

Phyo Wai Lin (မြို့ဖေဝင်းလင်း)	Environmental Engineer (သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအင်ဂျင်နီယာ)	09973248704
Su Myat Hlaing (စုမြတ်လှိုင်)	Environmental Officer (သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးအရာရှိ)	09962352352

IN CASE OF COMPLAINTS AT THE GATE (ဝင်ပေါက်တွင် ခြိမ်းခြောက်မှုများအတွက် ဆက်သွယ်ရန်)

- 2. To fill the form "complain form" (complain form ကိုဖြည့်ရန်)
- 3. To contact Mr. Salai PP (Personnel/Public Relation Officer) – Contact No. 0936626608 (လူမှုဆက်ဆံရေးကော်မရှင်အတွက် ဆက်သွယ်ရန်)

IN CASE OF YCDC COMPLAINTS / AUTHORITY (စည်ပင်နှင့် သက်ဆိုင်သော အန္တရာယ်များအတွက် ဆက်သွယ်ရန်)

- 4. To contact Salai PP (Personnel/Public Relation Officer) – Contact No. 0936626688(လူမှုဆက်ဆံရေးကော်မရှင်အတွက် ဆက်သွယ်ရန်)

IN CASE OF COMPLAINT FROM YESC SUBSTATION (လျှပ်စစ်နှင့် ပတ်သက်သော အန္တရာယ်များအတွက် ဆက်သွယ်ရန်)

Thiri Win Myint (သီရိဝင်းမြင့်)	Electrical Engineer (လျှပ်စစ်အင်ဂျင်နီယာ)	09798113745
Delfim Peraizal (ဒယ်ဖမ်ပရာအယ်)	Senior Site Superintendent (ဆိုက်ကြီးကြပ်ရေးမှူး)	09253820033
Thura Tin (သုရတင်)	Plant & Equipment Electrical Foreman (အလုပ်ရုံနှင့်ယန္တရားလျှပ်စစ်ဗိုလ်)	09795947142
Cucchi Gilles (ကူချီဂျိလ်)	Plant & Equipment Manager (အလုပ်ရုံနှင့်ယန္တရားမန်နေဂျာ)	09403328256

IN CASE OF ELECTRICAL BREAKDOWN (လျှပ်စစ်ပိုက်ပြတ်အခက်အခဲ)

5. Contact Plant & Equipment Department (အလုပ်ရုံနှင့်ယန္တရားဌာနသို့ ဆက်သွယ်ပါ။)

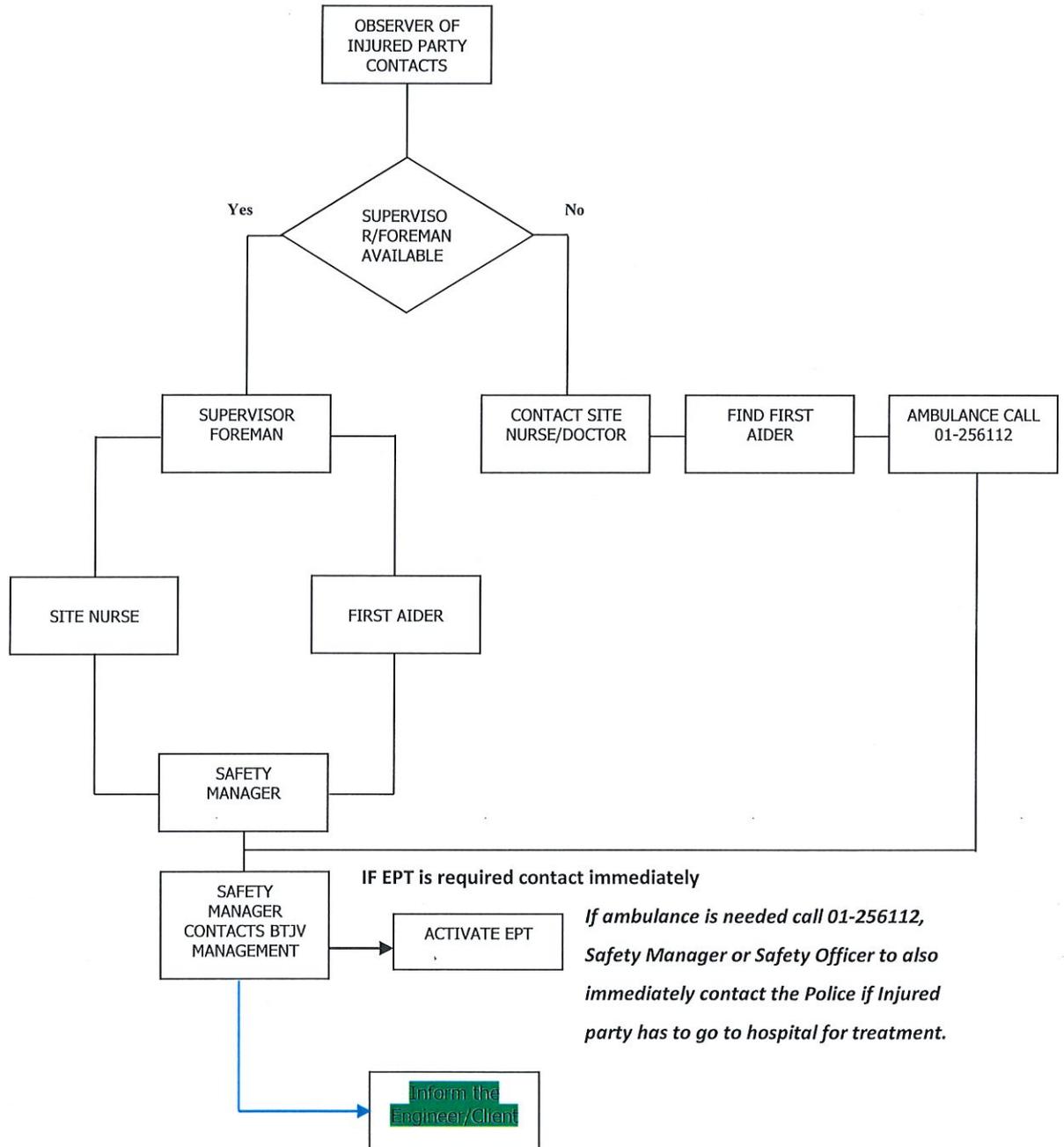
Thura Tin (သုရတင်)	Plant & Equipment Electrical Foreman (အလုပ်ရုံနှင့်ယန္တရားလျှပ်စစ်ဗိုလ်)	09795947142
Cucchi Gilles (ကူချီဂျိလ်)	Plant & Equipment Manager (အလုပ်ရုံနှင့်ယန္တရားမန်နေဂျာ)	09403328256

IN CASE OF IT ISSUE (WIFI / NETWORK CONNECTION) (IT နှင့် Network ပြဿနာများအတွက် ဆက်သွယ်ရန်) – Contact Hse : 09421096830



'APPENDIX C'

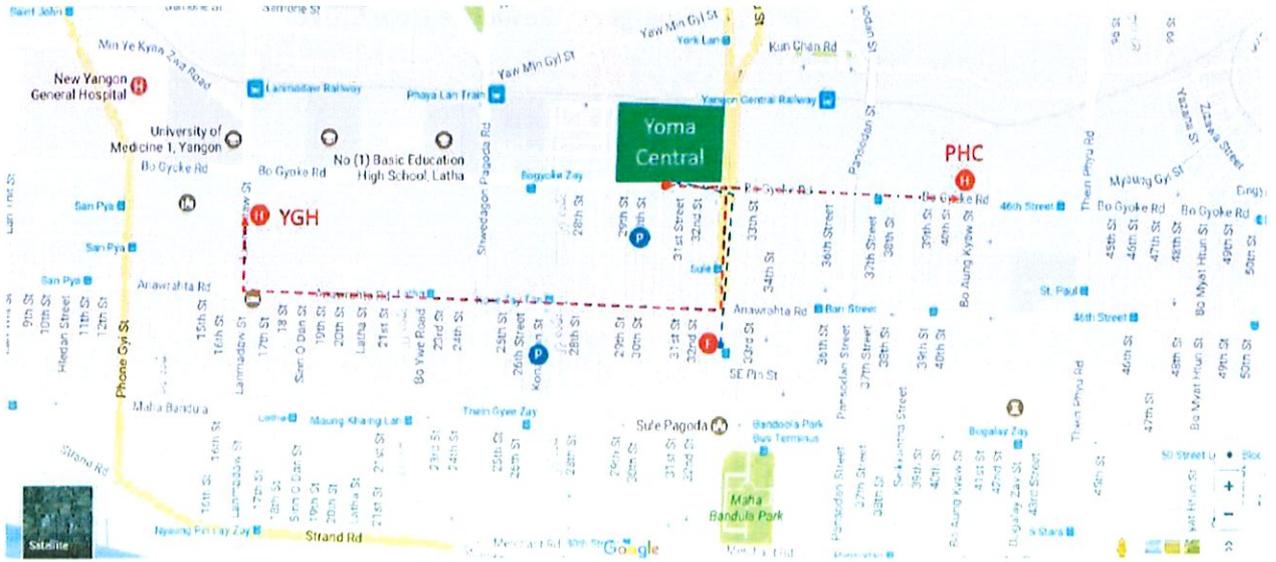
Medical Emergency Response Flow Chart





Emergency Response Plan

Project Location with nearest Hospital & Fire Station Route



-  YGH = A&E at Yangon General Hospital
-  PHC = Pun Hlaing Clinic

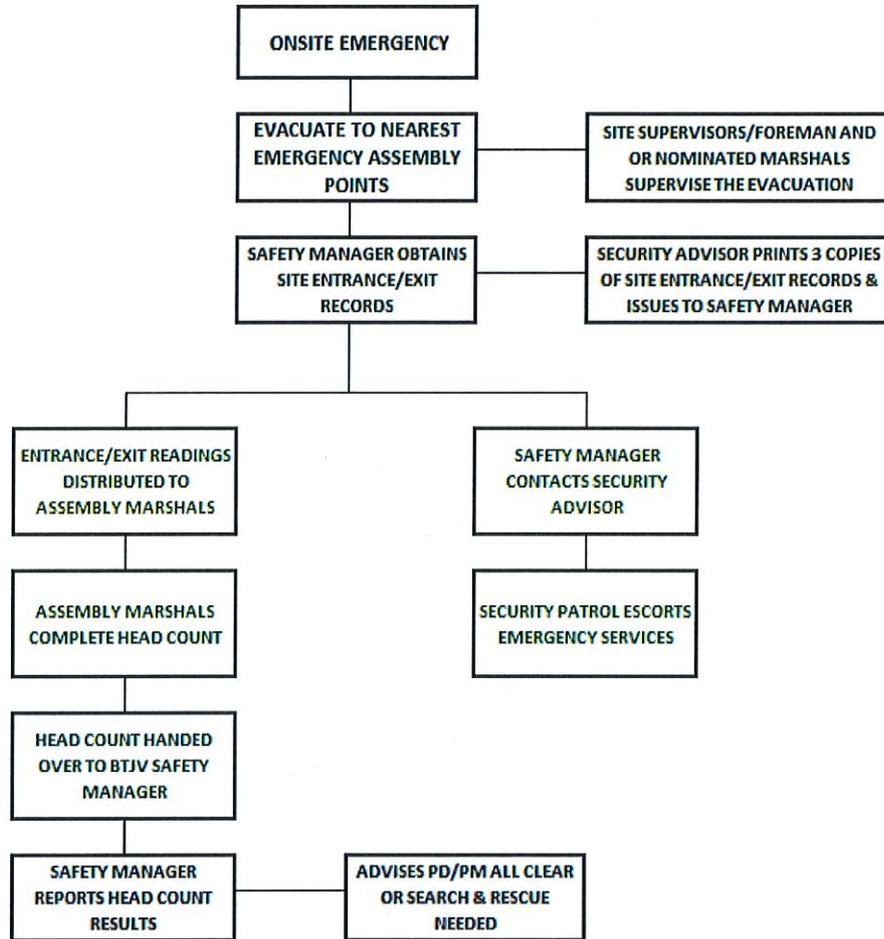
-  = Police Station
-  = Central Fire Station

-  = Ambulance Route
-  = Fire Engine Route



'APPENDIX D'

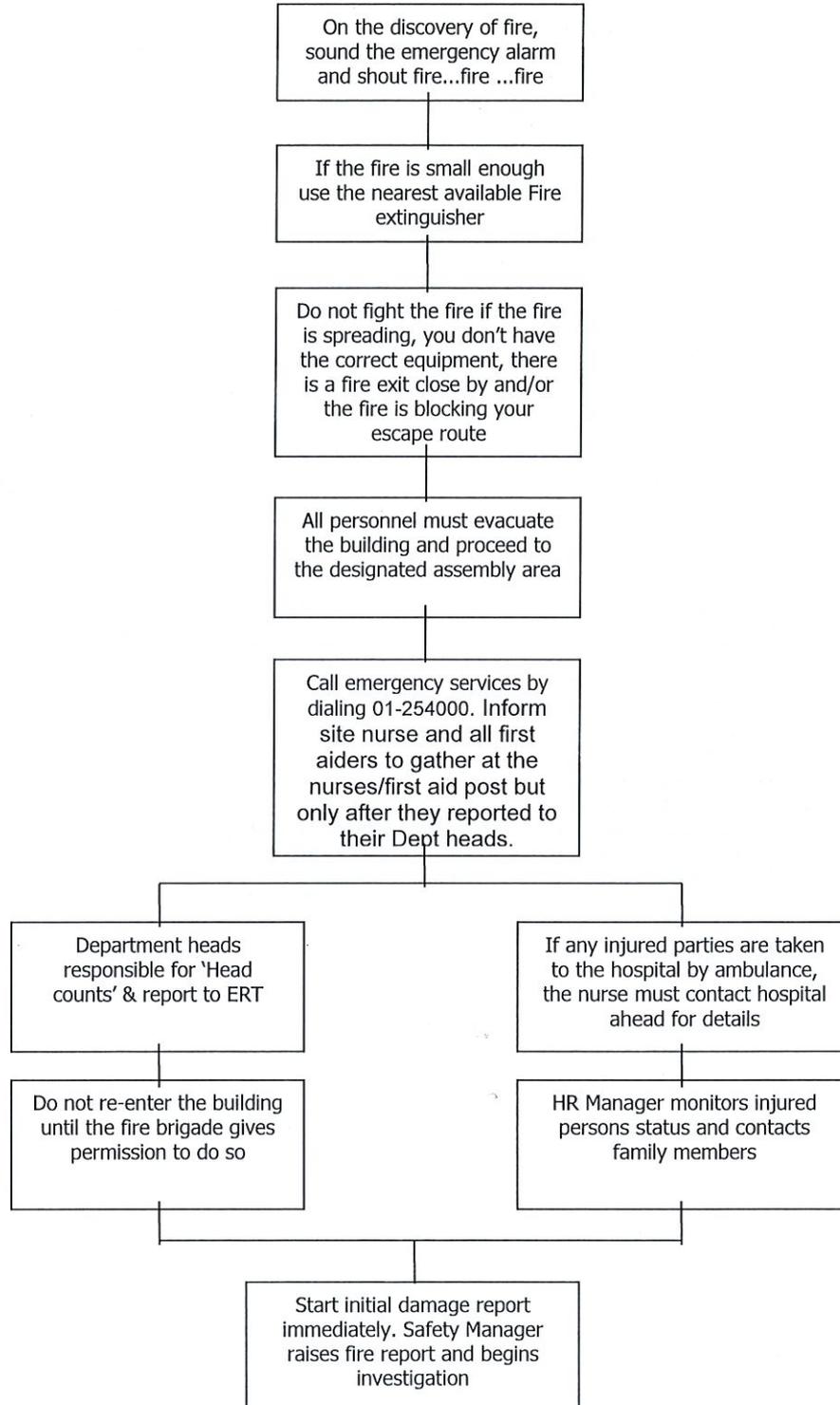
EMERGENCY EVACUATION PROCEDURE





'APPENDIX E'

Fire Action Flow Chart





APPENDIX F

ACTIONS ON DISCOVERY OF A FIRE ON SITE: Remain calm, do not panic

- Raise the Alarm by shouting 'FIRE!' 'FIRE!' 'FIRE!'. Ensure everyone in the immediate vicinity is made aware; also make allowances for people who may be wearing ear defenders.
- On hearing the alarm leave the site by the nearest safest route ensuring all people evacuate from immediate area of fire and go to the Emergency Assembly Point..
- Inform the Emergency Preparedness Co-ordinator or his deputy, by the quickest means possible i.e. telephone, radio, etc. of the exact location and circumstances of the fire.
- If the situation allows and you have been trained, fight the fire with any suitable fire fighting equipment at your disposal. Remove any other flammable and combustible materials away from the scene of the fire, if safe and able to do so.
- DO NOT, UNDER ANY CIRCUMSTANCES PUT YOURSELF AT RISK.
- Switch off or disconnect all electrical tools or appliances.
- Upon attending the fire scene, the Emergency Preparedness Co-ordinator will first ensure all personnel are evacuated from the area and then assess the requirements for control of the fire. If deemed necessary he/she will call/instruct someone to call the Civil Defence.
- The Emergency Preparedness Co-ordinator will ensure, where possible a direct access route is maintained or cleared to the fire scene. He will in turn make arrangements for the Emergency Services to be met at the site entrance by security and directed to the scene of the fire.
- Fire Marshalls to confirm with Fire Safety Co-ordinator that all areas of building have been checked and all personnel are accounted for.
- In the case of a suspected missing person or persons, the fire area is not to be entered but the Fire Services Department upon their arrival are to be immediately informed.
- Nobody is to re-enter the building until the Emergency Preparedness Co-ordinator gives the all clear.
- Offices are subject to a separate fire plan as appended to this document

ACTION DURING /FOLLOWING AN EARTHQUAKE; DO NOT PANIC

Do not panic, remain calm and alert to your surroundings. Stop what you are doing, if working near the edge, make safe by removing tools/materials/equipment away from the edge of the building.

If you're indoors, stay inside and if you're outside, stay outside. Do not attempt to access any buildings or use the lift (Hoist).

If you're indoors, stand against a wall near the core of the building, stand in a doorway, or crawl under heavy furniture (a desk or table i.e. cover your head and neck).

Drop down onto your hands and knees. HOLD ON until the shaking stops.

Do not exit a building during the shaking. Research has shown that most injuries occur when people inside buildings attempt to move to a different location inside the building or try to leave.

Stay away from windows, edge of buildings, shafts and risers and outside doors.

If you're outdoors, stay in the open away from power lines or anything that might fall. Stay away from buildings, street lights and utility wires. Stay outdoor until the shaking stops.



Emergency Response Plan

Don't use matches, candles, or any flame.

When working within any cradle, BMU, mast climber or MEWP's, remain calm, secure what you are working on and then lower yourself to the ground, remaining vigilant for falling materials, alight and move away from the building as quickly and calmly as you can. **DO NOT PANIC.**

The greatest danger exists directly outside buildings, at exits and alongside exterior wall. Many fatalities occur when people run out side of buildings only to be killed by falling debris.

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related casualties result from collapsing walls, flying glass, and falling objects such as signs.

If required and immediately following an earthquake, the site evacuation alarm will be sounded if its considered necessary to evacuate the site, (This will depend upon intensity and duration of the tremor) an immediate damage assessments will be made by management, if the alarm is raised you are to leave the building using emergency escape routes and make your way out of the site to the designated assembly points, **do NOT panic, do NOT run, do NOT return to the building until cleared to do so.**

Lifting Operations during an earthquake:

All lifts to be suspended and loads lowered immediately to safety.

Hoist Operation:

Lift/Hoist operators to lower immediately to ground floor and switch off until further notice.

Scaffolding:

All works to be suspended on any fixed/load bearing scaffold, all to evacuate scaffold and await instruction from your supervisor.

All Supervisory Staff:

Immediate checking of work areas for any damage and report to your senior manager/supervisor if anything is discovered. In the event of an evacuation alarm, you are to help supervise the evacuation of the site and control workers outside, keeping them off the main roads and as far back from the site as possible.

If No evacuation alarm is sounded, check your work area and report any damage the safety and supervisory staff will carry out checks of the edge protection, cranes, hoist, loading bays, back propping, mast climbers, etc, elevators, cradles, counterweights and scaffolding. Remember stay away from the edge of buildings, shafts and floor openings and do not stand directly below and openings/edges of buildings.

During evacuation it is important that you:

- Remain calm and do not panic
- Keep away from the edges of the buildings
- Leave the building in a calm and orderly manner
- Do Not use the lifts (Hoist)
- Take care when leaving the site, KEEP off the main roads and move as far back as possible.
- Do no return to site until told to do so.



Emergency Response Plan

Be patient when returning to work, it takes time to check and clear equipment for use, you should also personally check your own work areas and equipment before first use particularly running lines and anchor points and edge protection.

It is important that emergency routes are NOT blocked, if you are working in the stairwells in particular, please ensure that when you complete your task or finish for the day that you removed any obstacles and re-open the route, keep all emergency routes clear and free from obstruction at all times, **YOU never know when they will be needed.**

Action after an earthquake:

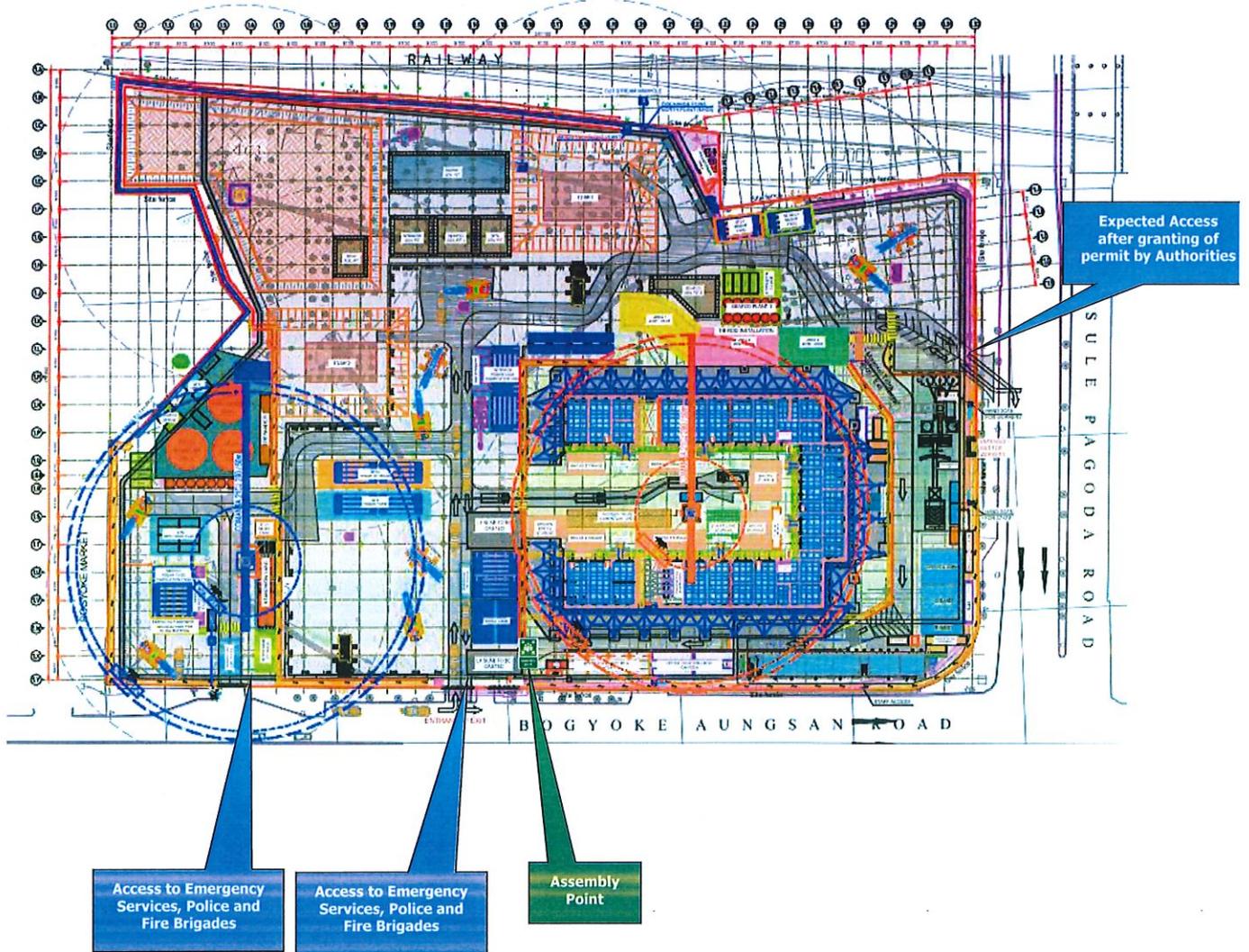
1. Check yourself and others for injuries. Provide first aid for anyone who needs it.
2. Check the building, water, and electric lines for damage. If any are damaged, isolate if possible and report to relevant authorities.
3. Turn on the radio. Don't use mobile phones unless it's an emergency.
4. Stay out of damaged buildings.
5. Stay inside buildings unless directed to do otherwise.
6. Evaluate and critique once a crisis situation is stabilized
7. Expect further aftershocks.
8. Stay away from beaches. Tsunamis sometimes hit after the ground has stopped shaking.
9. If you're at work follow the emergency arrangements and instructions for the particular building after the earthquake.



Emergency Response Plan

'APPENDIX G'

Site Installation and Assembly Points

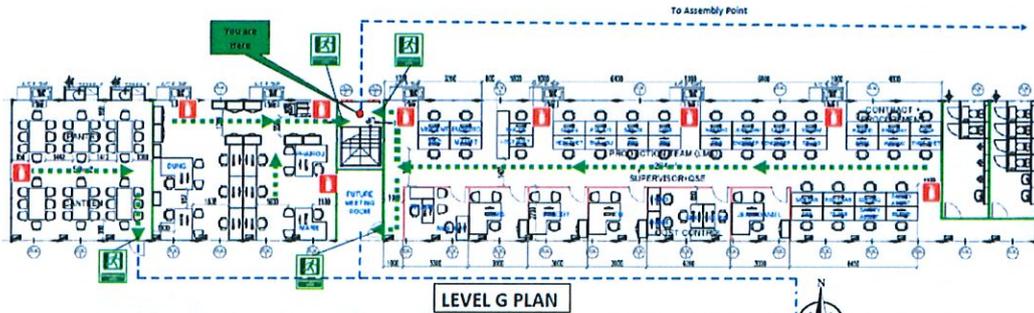




'APPENDIX H'

Office Emergency Evacuation Procedure

EMERGENCY EVACUATION PLAN



EMERGENCY NUMBERS

FIRE 01252022
AMBULANCE 01214604

ACTION DURING THE EVENT OF FIRE

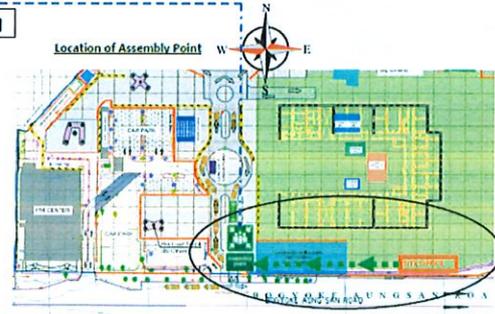
- R** Remove people from immediate danger
- A** Alert people nearby areas and raise the alarm
- C** Contain the fire/smoke only if safe to do so
- E** Extinguish the fire only if trained and safe to do so

EVACUATION PROCEDURE

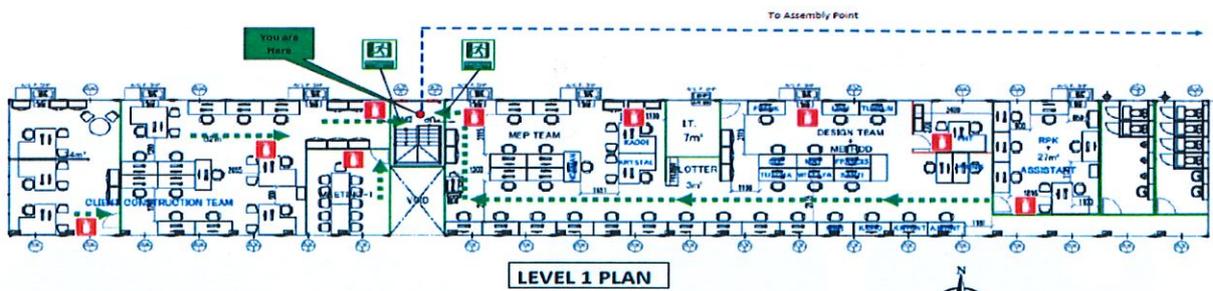
- Follow instructions as directed by the Fire Marshals
- Leave the building by the nearest Emergency exit
- Do not delay in collecting personal possessions
- Assist persons with disabilities as necessary
- DO NOT run-push or overtake
- Proceed to the designated assembly area
- DO NOT re-enter the building UNTIL advised it is safe to do so

LEGEND

- Emergency Exit
- Way to Exit
- Fire Extinguisher
- Assembly Point



EMERGENCY EVACUATION PLAN



EMERGENCY NUMBERS

FIRE 01252022
AMBULANCE 01214604

ACTION DURING THE EVENT OF FIRE

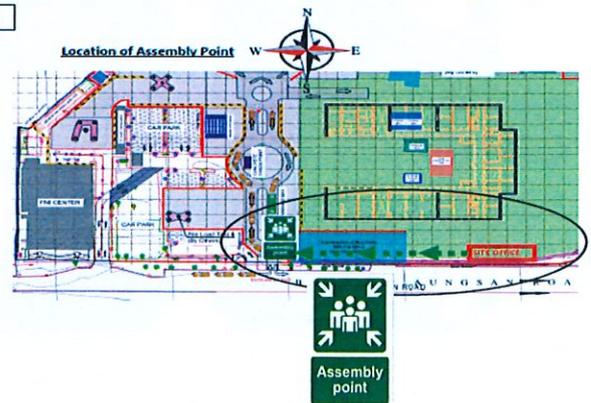
- R** Remove people from immediate danger
- A** Alert people nearby areas and raise the alarm
- C** Contain the fire/smoke only if safe to do so
- E** Extinguish the fire only if trained and safe to do so

EVACUATION PROCEDURE

- Follow instructions as directed by the Fire Marshals
- Leave the building by the nearest Emergency exit
- Do not delay in collecting personal possessions
- Assist persons with disabilities as necessary
- DO NOT run-push or overtake
- Proceed to the designated assembly area
- DO NOT re-enter the building UNTIL advised it is safe to do so

LEGEND

- Emergency Exit
- Way to Exit
- Fire Extinguisher
- Assembly Point





Emergency Response Plan

EMERGENCY EVACUATION PLAN – PYN

EVACUATION PROCEDURE

- Follow instructions as directed by the Fire
- Leave the building by the nearest Emergency exit
- Do not delay in collecting personal possessions
- Assist persons with disabilities as necessary
- DO NOT run-push or overtake
- Proceed to the designated assembly area
- DO NOT re-enter the building UNTIL advised it is safe to do so

LEGEND

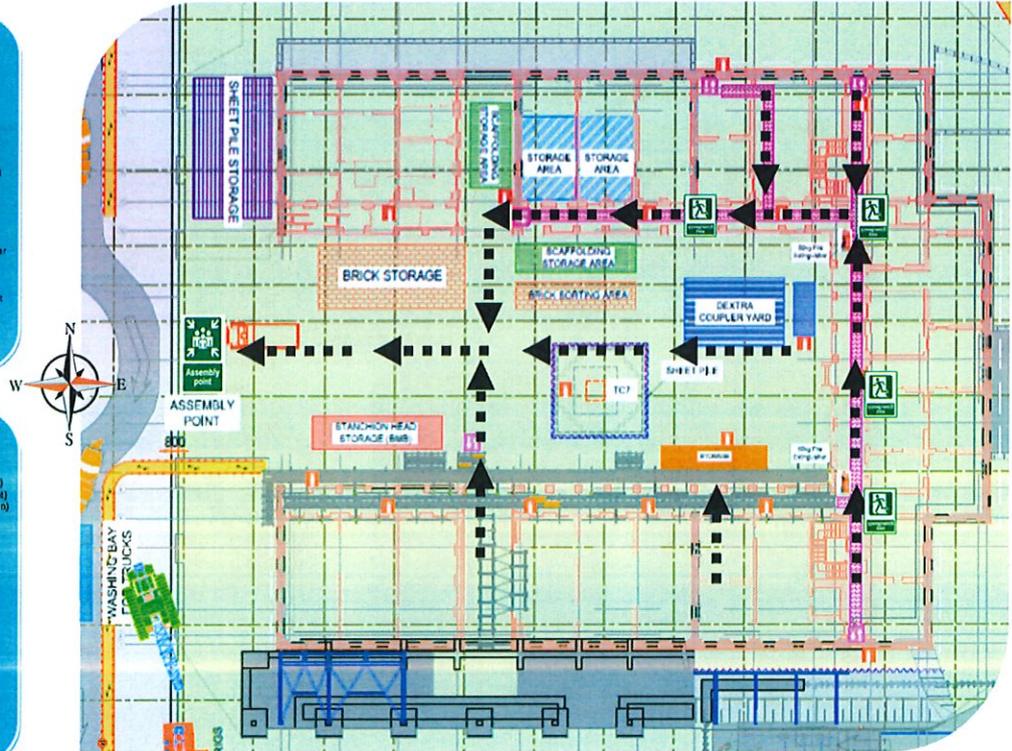
- Emergency Exit
- Fire Extinguisher
- Way to Exit
- Assembly Point

EMERGENCY NUMBERS

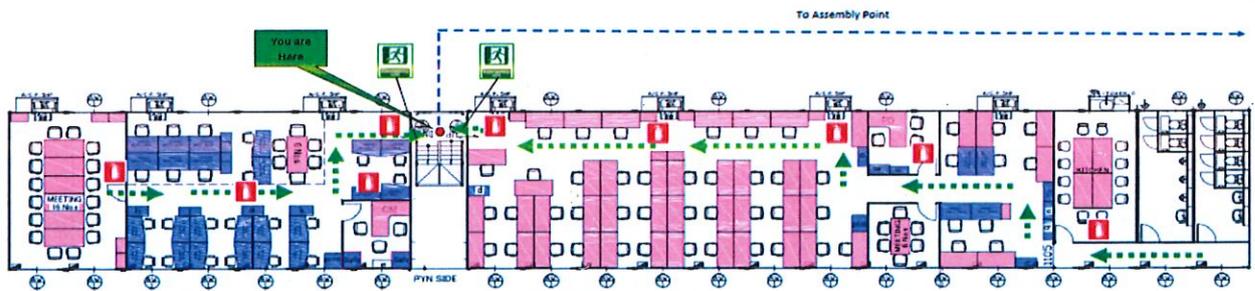
SAFETY MANAGER 0940121005 (Bernie)
 SUPERINTENDENT 0942658989 (Vincent)
 PRODUCTION MANAGER 09448070665 (Queniro)
 AMBULANCE 01214604
 FIRE 01232022

ACTION DURING THE EVENT OF FIRE

- R** Remove people from immediate danger
- A** Alert people nearby areas and raise the alarm
- C** Contain the fire/smoke only if safe to do so
- E** Extinguish the fire only if trained and safe to do so



EMERGENCY EVACUATION PLAN



LEVEL 2 PLAN

EMERGENCY NUMBERS

FIRE 01232022
 AMBULANCE 01214604

ACTION DURING THE EVENT OF FIRE

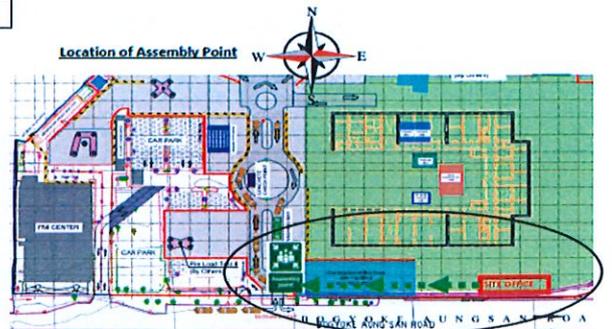
- R** Remove people from immediate danger
- A** Alert people nearby areas and raise the alarm
- C** Contain the fire/smoke only if safe to do so
- E** Extinguish the fire only if trained and safe to do so

EVACUATION PROCEDURE

- Follow instructions as directed by the Fire Marshals
- Leave the building by the nearest Emergency exit
- Do not delay in collecting personal possessions
- Assist persons with disabilities as necessary
- DO NOT run-push or overtake
- Proceed to the designated assembly area
- DO NOT re-enter the building UNTIL advised it is safe to do so

LEGEND

- Emergency Exit
- Fire Extinguisher
- Way to Exit
- Assembly Point





LIST OF EMERGENCY EQUIPMENTS AND TOOLS

- Emergency Evacuation Vehicle
- PPE
- Alarms / Sirens
- Flag Hoist & Red Flag
- Radio / Mobile
- Stretcher
- First Aid Box

All the above listed equipment's and tools will be maintained at BTJV site office which can be mobilised to affected area by a short notice.

Annex 7c Waste Management Plan

WASTE MANAGEMENT PLAN

Waste Management Areas / Facilities

Wherever practical, waste will be transported by the operator (or appointed waste service provider) from the point of generation directly to the centralised waste storage area where it can be safely stored prior to offsite disposal.

The operator will develop a comprehensive system for waste separation at the relevant generation points to facilitate composting. Waste will be separated into items which can be reused, composted, or recycled, and the remaining portion sent to the general waste stream for disposal at landfill.

Specifications of Temporary Waste Storage Areas

All waste/ recycling storage areas are to be constructed according to the following guideline specifications:

- ④ With clear signage that clearly describes the types of materials that can be deposited into recycling bins and general garbage bins; and
- ④ With convenient, access from each operational area to the waste/ recycling storage area(s) and step free access between the point at which bins are collected/ emptied and the waste/ recycling storage area(s);

Operational Management Considerations:

- ④ Arrangement will be in place for the regular maintenance and cleaning of waste/ recycling storage areas. If the operation of waste storage areas is outsourced, details of the way in which waste will be handled and stored within the storage area, will be included in the relevant contact agreement. Details will include:
 - Number and size of bins to be used in the development, including any waste reduction equipment.
 - Qualification of person(s) responsible for the ongoing maintenance and cleaning of the waste storage area(s).
 - Proposed collection methods (including location, truck paths, frequency of collections, etc.).
 - How the service provider will be expected to manage/ transport the waste to the waste storage area.

Legal Compliance

- ④ The Operator will also continually check for potential licensing requirements associated with new waste handling and storage activities and potential updates to the legislation.

Waste Management Plan for the operation phase is implemented based on following considerations. The following predominant waste streams are planned to be generated at the towers:

- ④ **Landscaping and Kitchen Wastes:** These wastes will be grouped into one waste stream, on the basis that they are both amenable to composting and managed collectively. This waste stream specifically excludes kitchen cooking oil, grease and fat which is not suitable for composting.
- ④ **General Waste:** The general waste stream generated at the hotel/ towers are planned to consist of solid waste generated from daily operation activities wood, paper, cardboard metal and plastic packaging, glass etc. These wastes will be managed and stored collectively in the designated area before YCDC collect the waste. Negotiation will be made in detail with YCDC for waste collection.
- ④ **Hazardous Waste:** Designated and isolated Hazardous Waste Container Storage Area will be formed, and recycling programs will be implemented accordingly. Labeling Hazardous Waste Containers will be carefully done for better management of hazardous waste. Common potential hazardous wastes that are expected to be generated from the hotel and offices include:

- Unwanted, expired or contaminated chemicals including cleaning agents and detergents, disinfectants, oils, greases, solvents and solvent based paints, pool, landscaping and pest control substances.
 - Office products including expired printer cartridges and photocopying fluids, and waste electronic equipment;
 - General items such as batteries and fluorescent lamps.
 - Used cooking oils, fats and greases
- ④ **Sewage Sludge:** The septic tanks associated with the sewage treatment plant will need to be periodically desludged which will be done in negotiation with YCDC

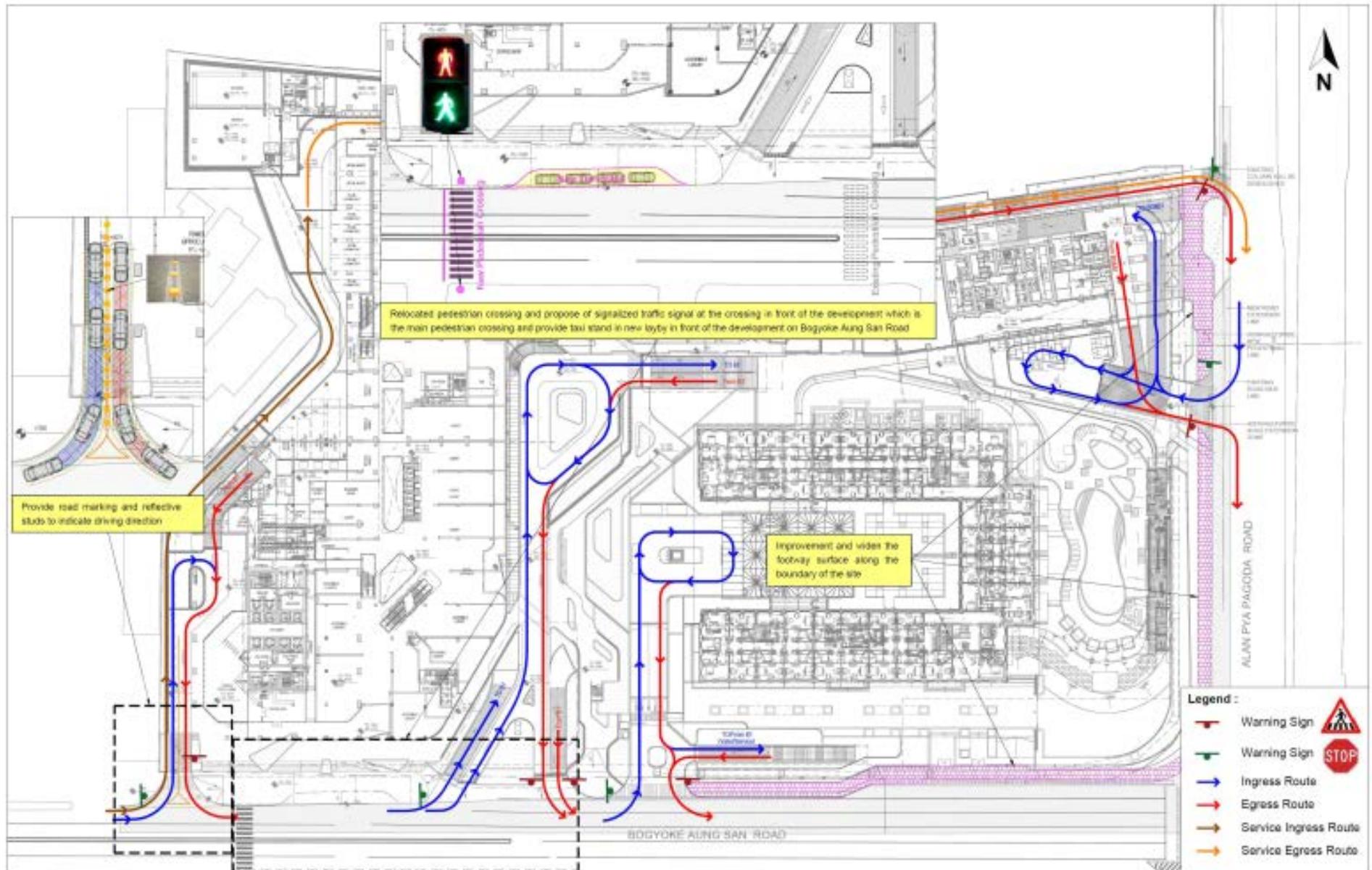
The hierarchy will set forth several waste management strategies or options according to importance and preference in a descending order. The aim is to extract the maximum practical benefits from the products and manage waste in the best possible manner, so that the minimum amount of waste is generated.

Options of the hierarchy included in the Waste Management Plan are as follows:

- ④ **Prevention** will be the best and most preferred strategy or option, and therefore ranks first. It is the most cost effective, as no waste means no cost is involved in its management.
- ④ **Minimisation** of waste generation is the first option that should be considered. It refers to the prevention of wastes arising from optimising material usage. This approach promotes the efficient use of resources and minimises the volume of waste material that must be handled by employees and hauled away from the resort's property. Responsibility for the minimisation of waste generation generally lies with management, who decides what is brought into the property and, thereby, determines what eventually leaves the property as waste.
- ④ **Reuse** refers to the process of using existing material instead of disposing this material to landfill. Whenever possible, reuse items in their original form for the same or a different purpose rather than discarding them. If an item cannot be reused on site, the operator will investigate the possibility of selling it or donating it to employees, charitable organisations, schools, businesses or other interested parties.
- ④ **Recycling** is considered when reuse can no longer be carried out. The important step to ensure effective recycling practices is onsite waste segregation. This is the least favourable of the three waste management options and will be considered only if the reduce and reuse options are not applicable to specific waste streams.
- ④ **Energy Recovery** will be a viable option after reduction; reuse and recycling have been fully explored and generally is the final step in the exploitation of maximum benefits from waste. The heat energy will be converted into power to be used commercially or domestically.

Annex 7d Traffic Management Plan

TRAFFIC MANAGEMENT PLAN



Annex 7e Energy Saving Plan

ENERGY SAVING PLAN

Energy saving plan will be implemented through setting up the energy management program and team where Key staff members who will be primarily involved in overseeing energy conservation plan. The regular energy assessment will be conducted to identify energy savings opportunities.

- Determine efficiency targets for each building depending on the occupancy rate and operating expenses.
- Energy assessment will be conducted to identify energy saving opportunities
- Training programs for employees on green energy initiatives.
- Adopting the environmental practices at each department can serve as an effective tool for reinforcing the importance of energy management
- Make energy efficiency an integral part of the building culture
- Review and emphasize the financial and environmental results of a preventive maintenance program for major systems and components.
- Measure and track energy performance.

Followings are considered to be done for the Project for Energy Conservation in both Construction and Operational Phases:

1. Low E glazing on architectural windows to reduce solar heat gain and associated operational energy consumption by way of reduced air conditioning load.
2. Insulation of external walls.
3. Shared systems for water cooled chiller system for air conditioning.
4. Variable speed drive pumps allowing increased efficiency from differing service loads.
5. Preconditioning fresh air supplies to reduce load on multiple local area AHU/VAV/FCU systems.
6. Variable Frequency drives in AHUs and VRV cooling system allowing increased efficiency from differing service loads.
7. Energy efficient light fitting, bulbs, localized lighting controls.
8. Smart meters.
9. CO₂ sensor/demand-controlled.
10. Occupancy sensors and individual room controls in hotel and residential areas
11. Building management Systems allowing centralized analysis and adjustment of mechanical systems.

WATER USE MANAGEMENT PLAN

Water use management plan will be implemented for each building depending on the nature of business to reveal opportunities for reducing water use.

A plan will include the details of the hotel/shopping malls water use profile and identifies the targeted areas for efficiency improvements. Efficiency measures will be selected to put into action where it is important to monitor changes in water use. Buildings will be equipped with water meters and Automated Meter Reading (AMR) devices that track usage daily and frequent monitoring can be done in a matter of minutes and will help identify leaks and other abnormal spikes in water use.

Initial water use management plan will be implemented according to;

- Measure water consumption and generate a water use profile
- Identify, evaluate, and select efficiency measures
- Plan and implement efficiency measures
- Track implementation progress and changes in water consumption
- Monitor water use frequent
- Using sustainably-produced or green cleaning products

A plan for an audit/ inspection will be indicated in the plan to avoid any breakdown/leaks for the purpose of both sustainable and maintenance purpose.

Rain Water Harvesting System will be considered as an alternative source of water resource if required.

**Annex 8 Invitation Letter for Public
Consultation Meetings**

အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးပွဲသို့ တက်ရောက်ရန် ဖိတ်ကြားစာ

မီးရထားရုံးချုပ်ဟောင်းဝင်းအတွင်း ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်း



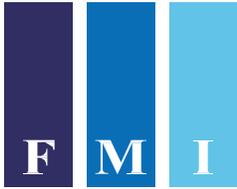
Yoma Strategic Holdings နှင့် First Myanmar Investment ကုမ္ပဏီတို့သည် အခြားမိတ်ဖက်ကုမ္ပဏီအချို့ နှင့် ပူးပေါင်း၍ ဗိုလ်ချုပ်အောင်ဆန်းလမ်းနှင့် ဆူးလေဘုရားလမ်းဆုံ၏ အနောက်မြောက်ထောင့်ရှိ မီးရထားရုံးချုပ်ဟောင်းတည်ရှိရာ ဝင်းအတွင်း ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်းအား ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။

ဤအဆိုပြုစီမံကိန်းအကြောင်း အများပြည်သူမှ ပိုမိုသိရှိနိုင်စေရေးအတွက် ကုမ္ပဏီအုပ်စုမှ Project စီမံခန့်ခွဲမှုအတွက် ခန့်အပ်တာဝန်ပေးထားသော SPA Project Management Services Ltd. မှ ကုမ္ပဏီအုပ်စုကိုယ်စား အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးပွဲ တစ်ရပ်ကို အောက်ပါအချိန်နှင့် နေရာတွင် ကျင်းပပြုလုပ်သွားမည်ဖြစ်ပါသည်။

အချိန်	နေရာ
<p>ဩဂုတ်လ (၁၆) ရက်၊ ၂၀၁၆ ခုနှစ် (အင်္ဂါနေ့) မနက် ၁၀:၀၀ မှ ၁၁:၃၀ ထိ</p>	<p>ကျောက်စိမ်းခန်းမ (Jade Hall) Central Hotel (ပထမထပ်)</p>

ဤဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်းနှင့်ပတ်သက်၍ လူကြီးမင်းအား သတင်းအချက်အလက်များကို ဇယားကားချပ်များဖြင့် ရှင်းလင်းတင်ပြခြင်း၊ လူကြီးမင်းသိလိုသော မေးခွန်းများကို ဖြေကြားခြင်း နှင့် လူကြီးမင်း၏ သဘောထားမှတ်ချက်များ ရယူခြင်းများအတွက် စီမံကိန်းအဖွဲ့ဝင်များမှ အသင့်ရှိ နေမည်ဖြစ်ပါသည်။

သို့ဖြစ်ပါ၍ ဤအခမ်းအနားသို့ လူကြီးမင်းမှ တက်ရောက်ပေးပါရန် ဖိတ်ကြားအပ်ပါသည်။



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Tel: +95 (0)1 240 363
Web: <http://fmi.com.mm>

သတင်းထုတ်ပြန်ချက်
၂၀၁၆ ခုနှစ်၊ ဇူလိုင်လ (၂၆) ရက်နေ့တွင် ထုတ်ပြန်ရန်

The Landmark Development တည်ဆောက်ရေးစီမံကိန်းမှ တစ်ဆင့်ပြည်တွင်းစီးပွားရေးတွင် အမေရိကန်ဒေါ်လာ သန်း (၆၀၀) ကျော် ရင်းနှီးမြှုပ်နှံသွားရန်ရှိခြင်း။

၂၀၁၆ ခုနှစ်၊ ဇူလိုင်လ (၂၆)ရက်၊ ရန်ကုန်။ ဖတ်(စ်)မြန်မာအင်ဗက်(စ်)မင်း(စ်) ကုမ္ပဏီလီမိတက် (FMI) သည် ရန်ကုန်မြို့၊ လယ်၏ အချက်အချာကျနေရာတွင် တည်ရှိသော အဆင့်မြင့်ဘက်စုံတည်ဆောက်ပြုပြင်မှု (Mixed-Use Development¹) နှင့် Peninsula ဟိုတယ် (The Peninsula Yangon) တို့ပါဝင်သော Landmark Development စီမံကိန်းနှင့်ပတ်သက်သည့် နောက် ဆုံးရအချက်အလက်များကို ဝမ်းမြောက်စွာ ကြေညာအပ်ပါသည်။ မကြာသေးမီလများတွင် Landmark Development လုပ်ငန်းဆက်လက်တိုးတက်စေရန် ဆောင်ရွက်ခဲ့ပါသည်။ ၂၀၁၆ ခုနှစ်၊ ဇူလိုင်လ (၂၃)ရက်နေ့တွင် မြန်မာ့မီးရထားမှတစ်ဆင့် ပို့ဆောင်ရေးနှင့် ဆက်သွယ်ရေးဝန်ကြီးဌာနသည် Landmark Development စီမံကိန်းအတွက် သီးခြားအငှားစာချုပ်သစ် နှစ်ခုကို လက်မှတ်ရေးထိုးခဲ့ရာ အဆင့်မြင့်ဘက်စုံအိမ်ရာတည်ဆောက်ရေးအတွက် မြေငှားစာချုပ်တစ်ခုနှင့် Peninsula Yangon ဟိုတယ် ပြုပြင်မွမ်းမံတည်ဆောက်ရေးအတွက် အငှားစာချုပ်တစ်ခုတို့ ဖြစ်ပါသည်။ အငှားစာချုပ်နှစ်ခုစလုံးသည် သက်တမ်းတိုးကာလ နှစ်(၅၀)စီ ရှိကြပါသည်။

The Landmark Development

Landmark Development တည်ဆောက်ရေးစီမံကိန်းသည် FMI ၊ Yoma Strategic နှင့် ကျွန်တော်တို့၏ မိတ်ဖက်များဖြစ်ကြ သော Hongkong and Shanghai Hotels, Limited ၊ Mitsubishi Corporation ၊ Mitsubishi Estate (collectively the "Mitsubishi Companies") ၊ the International Finance Corporation ("IFC") နှင့် the Asian Development Bank ("ADB") တို့အကြား တက်ကြွစွာပူးပေါင်းဆောင်ရွက်သော လုပ်ငန်းတစ်ခုဖြစ်သည်။ ကမ္ဘာ့အဆင့်မီ အိမ်ရာစီမံကိန်းတစ်ခု တည်ဆောက်နိုင်ရန် ဤမိတ်ဖက်ကုမ္ပဏီများအကြား ပူးပေါင်းလုပ်ငန်းသည် ရန်ကုန်မြို့လယ်အား ဖွံ့ဖြိုးရေးနှင့် စီးပွားရေး တိုးတက်မှုကို အထောက်အကူပြုမည် ဖြစ်ပါသည်။ Landmark Development စီမံကိန်းအား ၂၀၂၀ ပြည့်နှစ် မကုန်ဆုံးမီ တည်ဆောက်ပြီးစီးရန် စီစဉ်ထားပါသည်။

ထင်ရှားကျော်ကြားသော ဗိသုကာရှင် Cecil Balmond OBE က ဒီဇိုင်းရေးဆွဲထားသည့် အဆင့်မြင့်ဘက်စုံပြုပြင် တည်ဆောက်ရေး စီမံကိန်းသည် ပထမဆုံး Peninsula အမှတ်တံဆိပ် အဆင့်မြင့် ဇိမ်ခံလူနေအိမ်ခန်းများ၊ ပထမတန်းစား ရုံးခန်း အဆောက်အဦ တာဝါနှစ်လုံး၊ စီးပွားရေးလုပ်ငန်းဟိုတယ်တစ်လုံး၊ ဝန်ဆောင်မှုပါရှိသော လူနေအိမ်ခန်းများ ပါဝင်သော

¹ သတင်းထုတ်ပြန်ချက်၏ ရည်ရွယ်ချက်အရ Mixed-Use Development အား ရည်ညွှန်းရာတွင် Peninsula Yangon မပါဝင်သော Landmark Development ကို ဆိုလိုရမည်။

စုပေါင်းအိမ်ရာတည်ဆောက်ရေး စီမံကိန်းတစ်ခုဖြစ်ပြီး ယင်းအဆောက်အအုံများ၏ အခြေများကို ဈေးဝယ် စင်တာများဖြင့် ချိတ်ဆက်ထား မည် ဖြစ်ပါသည်။ ထို့ပြင် စီမံကိန်းနေရာရှိ မြန်မာမီးရထားရုံးချုပ်ဟောင်းကိုလည်း Peninsula ဟိုတယ် (The Peninsula Yangon) အဖြစ်သို့ ရှေးမူမယုတ် ပြုပြင်ပြောင်းလဲတည်ဆောက်သွားမည် ဖြစ်ပါသည်။ Peninsula Yangon သည် မြန်မာနိုင်ငံတွင် ဧည့်ဝန်ဆောင်မှုကဏ္ဍအတွက် ထူးခြားသော အဆင့်အတန်းသစ်တစ်ရပ်အား ရရှိလာစေလိမ့်မည် ဖြစ်ပါ သည်။

ပြန်လည်ရေးဆွဲထားသော ဒီဇိုင်းပုံစံသစ်ကြောင့် Landmark Development စီမံကိန်းစုစုပေါင်း ကြမ်းခင်းဧရိယာသည် မူလက ခန့်မှန်းခြေ (၂.၁၂)သန်း စတုရန်းပေမှ ခန့်မှန်းခြေ (၂.၄၄)သန်း စတုရန်းပေသို့ ပြောင်းလဲသတ်မှတ်ထားပါသည်။ (Landmark Development စီမံကိန်း၏ နောက်ဆုံးဒီဇိုင်းကို သရုပ်ဖော်ပုံ (က) တွင် ကြည့်ရှုပါရန်)

အဆိုပါစီမံကိန်းနှင့်ပတ်သက်၍ FMI ၏ အမှုဆောင်ဒါရိုက်တာဖြစ်သူ ဦးထွန်းထွန်း က " Landmark Development သည် ကမ္ဘာ့နာမည်ကျော်စီးပွားရေး ကုမ္ပဏီကြီးများနှင့် ပူးပေါင်းဆောင်ရွက်သည့် လုပ်ငန်းတစ်ခုဖြစ်ကြောင်း၊ ယင်းစီမံကိန်းသည် နိုင်ငံတကာ ရင်းနှီးမြှုပ်နှံမှု အမေရိကန်ဒေါ်လာသန်း (၆၀၀)ကျော်ကို ပြည်တွင်းစီးပွားရေးသို့ ရောက်ရှိလာစေမည် ဖြစ်ကြောင်း၊ အဓိက ပြည်တွင်း မိတ်ဖက်တစ်ဦးအနေဖြင့် ဤအရေးပါသောစီမံကိန်းတွင် ပါဝင်ရခြင်းကြောင့် FMI အနေဖြင့် ဂုဏ်ယူမိပါ ကြောင်း၊ Landmark Development သည် ရန်ကုန်မြို့လယ်အား ကောင်းမွန်သော တိုးတက်မှုရရှိစေမည် ဖြစ်ကြောင်းနှင့် မြန်မာနိုင်ငံတွင် အိမ်ရာတည်ဆောက်ရေးလုပ်ငန်းများအတွက် စံသတ်မှတ်ချက်ဖြစ်လာမည်ဟု မိမိတို့ယုံကြည်ပါကြောင်း" ဖြင့် မှတ်ချက်ပြု ပြောကြားခဲ့ပါသည်။

ဘက်စုံတည်ဆောက်ရေးစီမံကိန်း (Mixed Used Development)

ဘက်စုံတည်ဆောက်ရေးစီမံကိန်း (Mixed Used Development) တွင် FMI မှ ၁၂% ၊ Yoma Strategic မှ ၄၈%၊ မစ်ဆူဘီရိုကော်ပိုရေးရှင်းမှ ၃၀% ၊ IFC မှ ၅% နှင့် ADB မှ ၅% အသီးသီးပါဝင်ကြမည် ဖြစ်ပါသည်။ အဆိုပါစီမံကိန်း တစ်ခုလုံးအတွက် စုစုပေါင်းခန့်မှန်းကုန်ကျစရိတ်မှာ အမေရိကန်ဒေါ်လာ သန်း (၆၆၀) ခန့်ဖြစ်ပြီး ယင်းကုန်ကျငွေတွင် ဆောက်လုပ်မှု၊ ဆွေးနွေးတိုင်ပင်မှုများ၊ အထွေထွေအသုံးစရိတ်၊ အရေးပေါ်ကိစ္စများနှင့် ဘဏ္ဍာရေးအသုံးစရိတ်များအပါအဝင် မြေယာရရှိမှုအတွက် ကုန်ကျစရိတ်နှင့် အခြားကုန်ကျစရိတ်များ ပါဝင်ပါသည်။

The Peninsula Yangon

Peninsula Yangon ဟိုတယ်စီမံကိန်းတွင် FMI မှ ၆% ၊ Yoma Strategic မှ ၂၄% နှင့် ဟောင်ကောင်နှင့် ရန်ဟိုင်း ဟိုတယ်အုပ်စုမှ ၇၀% ပါဝင်ပါသည်။ Peninsula Yangon ပြုပြင်မွမ်းမံတည်ဆောက်ခြင်းလုပ်ငန်းမှာ စတင်ခဲ့ပြီးဖြစ်ပါသည်။

ပင်မအငှားစာချုပ်များ

Landmark Development သည် မြန်မာနိုင်ငံ နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှုဥပဒေနှင့်အညီ ၁၉၉၈ ခုနှစ်၊ ဇန်နဝါရီလ (၁)ရက်နေ့တွင် စတင်သော ကနဦးအငှားစာချုပ်သက်တမ်း နှစ်(၅၀)အား သက်တမ်းတိုးထားသည့် ပင်မအငှားစာချုပ်များအရ စီမံကိန်း မြေနေရာနှစ်ခုပေါ်တွင် တည်ရှိပါသည်။ အဆိုပါကနဦးအငှားစာချုပ်နောက်ပိုင်း ၂၀၁၆ ခုနှစ်၊ ဇူလိုင်လ (၂၃)ရက်နေ့တွင် မြန်မာမီးရထားမှတစ်ဆင့် ပို့ဆောင်ရေးနှင့် ဆက်သွယ်ရေးဝန်ကြီးဌာနသည် Landmark Development စီမံကိန်းအတွက် သီးခြားအငှားစာချုပ်သစ်နှစ်ခုကို လက်မှတ်ရေးထိုးခဲ့ရာ သက်တမ်းတိုးကာလ နှစ်(၅၀)စီရှိသော အဆင့်မြင့်ဘက်စုံ အိမ်ရာ တည်ဆောက်ရေးအတွက် မြေငှားစာချုပ်တစ်ခုနှင့် Peninsula Yangon ဟိုတယ် ပြုပြင်မွမ်းမံတည်ဆောက်ရေးအတွက် အငှားစာချုပ်တစ်ခုတို့ ဖြစ်ပါသည်။

စီမံကိန်းအတွက် အရေးပါသည့်တိုးတက်ဆောင်ရွက်မှုများ

Landmark Development အတွက် သီးခြားအငှားစာချုပ်နှစ်ခုအား လက်မှတ်ရေးထိုးပြီးနောက် FMI ကုမ္ပဏီ နှင့် မိတ်ဖက်ကုမ္ပဏီများသည် မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှု ကော်မရှင် နှင့် တကွ သက်ဆိုင်ရာမှ ခွင့်ပြုမိန့်များရရှိရန် ဆက်လက်ဆောင်ရွက်ရမည်ဖြစ်သည်။ Mixed-Used Development အတွက် ခွင့်ပြုချက်များကို ယခုနှစ်မကုန်မီ ရရှိရန် မျှော်မှန်းထားပြီး ရလျှင်ရချင်း လုပ်ငန်းများကို အရှိန်အဟုန်ဖြင့် ဆောင်ရွက်ရန်လျာထားပါသည်။

ဆက်လက်၍ Mixed-Used Development အတွက် ပြည်ပချေးငွေများကို ၂၀၁၇ ခုနှစ် ၊ မတ်လကုန် တွင် ရရှိမည်ဖြစ်ပြီး Branded Residences တိုက်ခန်းများကို ၂၀၁၇ ခုနှစ် ၊ ဧပြီလ မှ စတင်ရောင်းချမည် ဖြစ်ပါသည်။

Landmark Development စီမံကိန်းတည်ဆောက်မှုအား ၂၀၂၀ ပြည့်နှစ် မကုန်မီ ပြီးစီးရန် ခန့်မှန်းထားပါသည်။

FMI အကြောင်း

ဖတ်(စ်)မြန်မာအင်ဗက်(စ်)မင်း(စ်) ကုမ္ပဏီလီမိတက် (FMI) သည် အစုရှယ်ယာဝင်ထောင်ချီရှိသော မြန်မာနိုင်ငံ၏ အများနှင့်သက်ဆိုင်သော ကုမ္ပဏီများအနက် ကုမ္ပဏီကြီး တစ်ခုဖြစ်ပြီး ၁၉၉၂ ခုနှစ်၊ ကုမ္ပဏီစတင်ထောင်ချိန်မှစ၍ အမြတ်အစွန်းရရှိမှု နှင့် အမြတ်ဝေစု ခွဲဝေမှုတို့ကို စဉ်ဆက်မပြတ် ဆောင်ရွက်နိုင်ခဲ့ပါသည်။ FMI ကုမ္ပဏီသည် ဘဏ္ဍာရေးဆိုင်ရာ ဝန်ဆောင်မှု၊ အိမ်ရာဖော်ထုတ်တည်ဆောက်ရေးနှင့် ကျန်းမာရေးစောင့်ရှောက်မှုအစရှိသည့် “မလ္လာင် သုံးရပ်” မဟာဗျူဟာချမှတ်၍ အာရုံစိုက်ရင်းနှီးမြှုပ်နှံထားပါသည်။ FMI သည် ၂၀၁၆ ခုနှစ်၊ မတ်လ (၂၅)ရက်နေ့တွင် ရန်ကုန်စတော့အိတ်ချိန်း၌ စာရင်းဝင်သော ပထမဆုံးကုမ္ပဏီ ဖြစ်လာခဲ့ပါသည်။

သရုပ်ဖော်ပုံ (က) – The Landmark Development အတွက် ရေးဆွဲထားသည့် နောက်ဆုံးဒီဇိုင်း



“ကမ္ဘာ့အနှံ့မှ မိတ်ဖက်ကုမ္ပဏီများဖြစ်ကြသော Hongkong Shanghai Hotels၊ Mitsubishi Corporation၊ Mitsubishi Estate၊ IFC၊ ADB တို့နှင့်အတူ YSH နှင့် FMI ကုမ္ပဏီအုပ်စုသည် Landmark ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်းနေရာကို ရန်ကုန်မြို့ ၏ ပိုမိုကျယ်ပြန့်လာသော စီးပွားရေးလှုပ်အပ်ချက်များ ဖြည့်ဆည်းရန်နှင့် ရှေးဟောင်းသမိုင်းအမွေအနှစ်ထိန်းသိမ်းရန်အတွက် ဟန်ချက်ညီစွာ ပေါင်းစပ်ထားသည့် အထင်ကရစီမံကိန်းကြီးတစ်ခုအဖြစ် တက်ကြွစွာ ပြောင်းလဲမည်ဖြစ်သည်။”

— YSH နှစ်စဉ်ရှင်းတမ်း ၂၀၁၆



ဗိုလ်ချုပ်အောင်ဆန်းလမ်းနှင့် ဆူးလေဘုရားလမ်းဆုံ၏ အနောက်မြောက်ထောင့်တွင် တည်ရှိပြီး ၁၀ဧကခန့် ကျယ်ဝန်းသော မြေနေရာကို YSH နှင့် FMI ကုမ္ပဏီအုပ်စုမှ ဂုဏ်ယူစွာဖြင့် အကောင်အထည်ဖော်မည့် ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်း



ရန်ကုန်မြို့၏ စီးပွားရေးပဟိုချက်နေရာတစ်ခုအား အထင်ကရစီမံကိန်းကြီးတစ်ခုအဖြစ်သို့ ပြောင်းလဲစေခြင်း



T3 & T4
အထပ်ပေါင်း(၁၈)ထပ်တွင် အဆင့်မြင့်ရုံးခန်းများ

T2
အထပ်ပေါင်း(၁၂)ထပ်တွင် ဟိုတယ်အခန်း(၂၈၀) နှင့် အထပ်ပေါင်း(၈)ထပ်တွင် ဝန်ဆောင်မှုပါ နေအိမ်အခန်း (၉၀)

T1
အထပ်ပေါင်း (၂၂)ထပ်တွင် လူနေအိမ်ခန်း (၉၈)ခန်း

အခြေအဆောက်အဦး မြေညီထပ်မှ ၄ထပ်အထိ ဈေးဝယ်နေရာများပါရှိပြီး မြေအောက်အထပ်တွင် စုပါမားကပ်ထားရှိခြင်း

မြေအောက်အထပ် စီမံကိန်းဧရိယာအပြည့်ရှိ မြေအောက်ထပ်တစ်ထပ်နှင့် အလယ်ကွက်လပ်အောက် မြေအောက်လေးထပ်တွင် စီစဉ်ထားသည့် ကားရပ်နားရန် နေရာပေါင်း (၁၂၀၀)ခန့်

မီးရထားရုံးချုပ်ဟောင်း မီးရထားရုံးချုပ်ဟောင်းကို ပြန်လည်ပြုပြင်ထိန်းသိမ်းပြီး ကြယ်ငါးပွင့်အဆင့်ရှိ ဟိုတယ်တစ်ခုအဖြစ် ပြောင်းလဲခြင်း

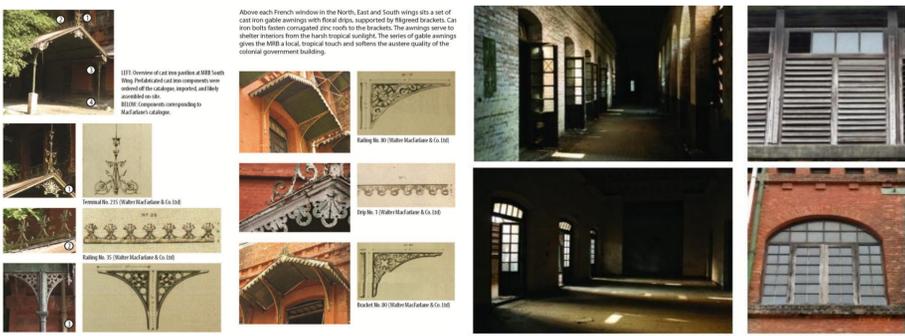
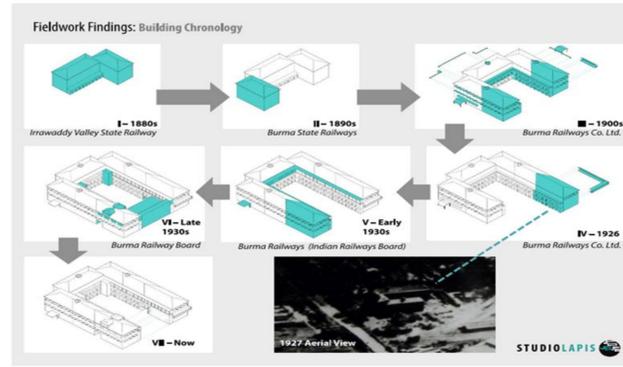
အဆောက်အဦးကန့်သတ်ချက်များနှင့်အညီ လိုက်နာထားသည့် စီမံကိန်းဒီဇိုင်း

- လုံလောက်သော မြေချန်နေရာ
- YCDC ၏ အမြင့်ကန့်သတ်ချက်နှင့်အညီ ထားရှိထားသော
 - လူနေထိုင်နိုင်သည့် အထပ်များ
 - စက်ခန်းများ နှင့်
 - အင်တန်နာနှင့် အချွန်အတက်များ
- မီးရထားရုံးချုပ်ဟောင်း၏ တံစက်မြိတ်လိုင်းအောက် ပိုမိုနိမ့်ကျသော အခြေအဆောက်အဦး အမြင့်

အတိတ်ကို အနာဂတ်သို့ ခေါ်ဆောင်ခြင်း (သို့) မြန်မာ့မီးရထား ရုံးချုပ်ဟောင်းအဆောက်အဦးအား ထိန်းသိမ်းပြုပြင်ခြင်း

သမိုင်းကြောင်း

- မြန်မာ့မီးရထား ရုံးချုပ်ဟောင်းကို ၁၈၈၀ခုနှစ်များ နှောင်းပိုင်းနှင့် ၁၈၉၀ခုနှစ်များ အစောပိုင်းအတွင်း တည်ဆောက်ခဲ့ပြီး ဆယ်စုနှစ်များစွာတိုင် အဆင့်ဆင့် တိုးချဲ့ တည်ဆောက်ခဲ့သည်။
- ရန်ကုန်မြို့ရှိ ကိုလိုနီခေတ်လက်ကျန် သမိုင်းဝင်အဆောက်အဦးများထဲမှ ဂံကျောက်၊ အုတ်တို့ဖြင့် တည်ဆောက်ထားသည့် တစ်ခုတည်းသော အဆောက်အဦးလည်း ဖြစ်သည်။



ပြုပြင်ထိန်းသိမ်းခြင်းအပေါ် ကျွန်ုပ်တို့၏ ရည်မှန်းချက်
 ရန်ကုန်မြို့သာမက မြန်မာနိုင်ငံအတွက် ရေရှည်အကျိုး ဖြစ်ထွန်းစေပြီး စဉ်ဆက် မပြတ် ရှေ့ရှည်တည်တံ့နိုင်စေရေး ရည်မှန်း၍ မြန်မာ့မီးရထားရုံးချုပ်ဟောင်း အဆောက်အဦးအား ထိန်းသိမ်းပြုပြင်တည်ဆောက်ရေး

လုပ်ငန်းစဉ် အကျဉ်းချုံး

- I. သုတေသနနှင့် ကွင်းဆင်းလေ့လာခြင်း
- II. ပြုပြင်ထိန်းသိမ်းရေး မူဝါဒများ
 - သမိုင်းအမွေအနှစ်တစ်လွှာချင်းစီအား ထိန်းသိမ်းခြင်း
 - အဟောင်းနှင့် အသစ်အကြား ဆက်သွယ်ပေးခြင်း
 - အဆောက်အဦး၏ သမိုင်းဝင် အစိတ်အပိုင်းများကို မပျောက်မပျက် ထိန်းသိမ်းပြီး ပြန်လည်အသုံးပြုခြင်းနှင့် လိုအပ်သလို မွမ်းမံအသုံးပြုခြင်း
 - လိုက်လျောညီထွေမှုရှိခြင်းနှင့် ပြောင်းလဲနိုင်မှုရှိခြင်း
 - လိုအပ်သမျှနည်းလမ်းများနှင့် အဆောက်အဦးပုံစံကို အဆင့်မြှင့်တင်ခြင်း
- III. ပြုပြင်ထိန်းသိမ်းခြင်းဆိုင်ရာ စီမံခန့်ခွဲမှု အစီအစဉ်
- IV. ရှေးမူပျက် လိုက်လျောညီထွေ ထိန်းသိမ်းပြုပြင်ခြင်း၊ ထိခိုက်မှုလျော့ချခြင်း နှင့် ပြန်လည် ပြုပြင်ရေးလုပ်ငန်းစဉ်များ

ရှေးမူပျက် လိုက်လျောညီထွေ ထိန်းသိမ်း ပြုပြင်ခြင်း - သမိုင်း အမွေအနှစ် အင်္ဂါရပ်များ ထည့်သွင်း ပေါင်းစပ်ပေးခြင်း



တည်ဆောက်မည့် အစီအစဉ်

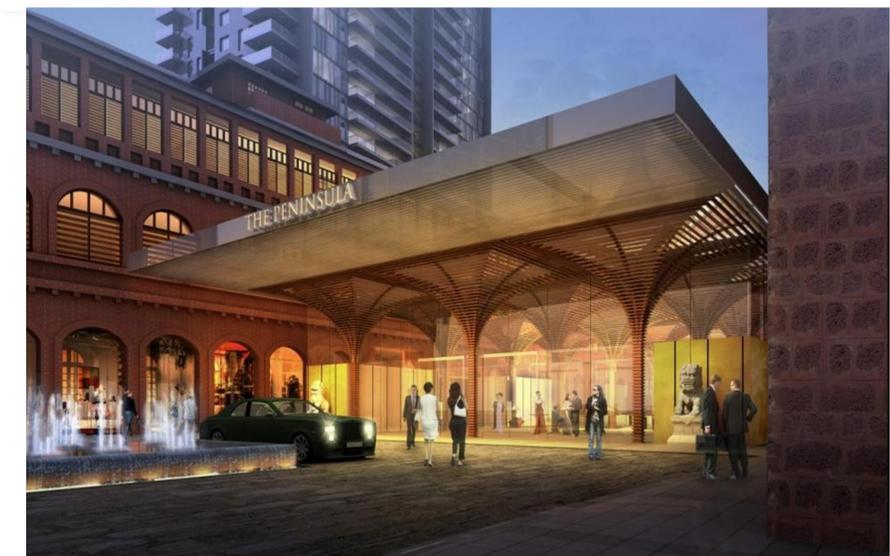


အဆောက်အဦးပြုပြင်ထိန်းသိမ်းရေးဆိုင်ရာ ကျွမ်းကျင်အဖွဲ့များ

Aedas, Singapore	ပိသုကာအဖွဲ့
Studio Lapis, Singapore	ရှေးဟောင်းအဆောက်အဦးဆိုင်ရာ အကြံပေးအဖွဲ့
Wentworth House, UK	ရှေးဟောင်းအဆောက်အဦး ယာယီတည်ဆောက်ရေးလုပ်ငန်း အကြံပေးအဖွဲ့
IEN, Singapore	ရှေ့ရှည်တည်တံ့ရေးဆိုင်ရာ ကျွမ်းကျင်အဖွဲ့
Meinhardt (Thailand)	မြို့ပြတည်ဆောက်ရေး နှင့် စက်မှု လျှပ်စစ်ပိုင်းဆိုင်ရာ ကျွမ်းကျင်အဖွဲ့

ရှေးမူပျက် လိုက်လျောညီထွေ ထိန်းသိမ်းပြုပြင်ခြင်း - မြို့ပြသမိုင်း အမွေအနှစ် အသွင်ပြောင်းလဲခြင်း

လမ်းထောင့်မှ မြင်ရသည့် အထင်ကရ သမိုင်းအမွေအနှစ် မြင်ကွင်းအဖြစ် ပြန်လည် အသက်သွင်းခြင်း

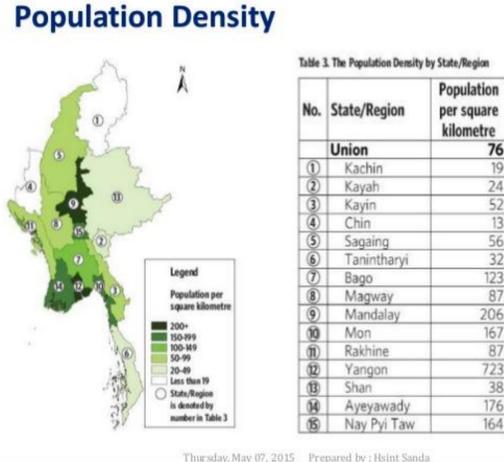
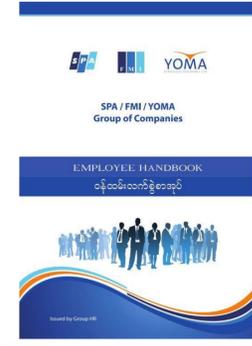


လူမှုရေးဆိုင်ရာ အကျိုးကျေးဇူးများ

မြန်မာနိုင်ငံသားများအတွက် အလုပ်အကိုင် ဖန်တီးပေးခြင်း

- မြန်မာနိုင်ငံသားဦးစားပေးခန့်ထားရေး မူ ရှိခြင်း
- ဆောက်လုပ်ရေးကာလအတွင်း နိုင်ငံသားများအတွက် ဆောက်လုပ်ရေးနှင့် ရုံးအလုပ်ပေါင်း (၄၀၀၀) ကျော် ဖန်တီးပေးနိုင်ခြင်း

စီမံကိန်း စီမံခန့်ခွဲမှုအဖွဲ့ဝင်များ	၁၀၅
ကန်ထရိုက်တာများ၏ လုပ်သားများ၊ ဝန်ထမ်းများနှင့် စီမံခန့်ခွဲမှုအဖွဲ့ဝင်များ	၄,၄၁၅
စုစုပေါင်း	၄,၅၂၀



- တည်ဆောက်ပြီးချိန် လုပ်ငန်းစတင်လည်ပတ်သည်နှင့် အောက်ပါ နေရာများအတွက် အလုပ်ပေါင်း (၇၀၀၀) ကျော် ပွင့်လင်းလာမည်ဖြစ်ခြင်း

အဆောက်အဦးထိန်းသိမ်းရေး/ ဟိုတယ်နှင့် လူနေအိမ်ခန်းများ	၉၉၄
ဈေးဆိုင်ခန်းများနှင့် ရုံးခန်းများ	၆,၁၈၄
စုစုပေါင်း	၇,၁၇၈

- အလုပ်ရာထူးတိုင်းအတွက် သင့်လျော်သည့် အရည်အချင်းနှင့် ပြည့်စုံသူ နိုင်ငံသားတိုင်း လျှောက်ထားနိုင်ခြင်း
- စီမံကိန်းအနီးပတ်ဝန်းကျင်မှ အလုပ်လျှောက်ထားသူ ဒေသခံပြည်သူများအား ဦးစားပေး ရွေးချယ်မည်ဖြစ်ခြင်း

အများပြည်သူနှင့် သက်ဆိုင်သောနေရာ ထားရှိခြင်း

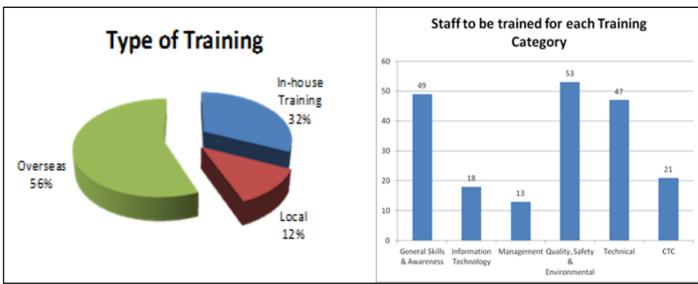
- လမ်းသွားလမ်းလာများကို မြို့ပြရှုခင်းအလှများနှင့် မျက်နှာစာတစ်လျှောက် ချိတ်ဆက်ပေးခြင်း
- ပြည်သူများ လွတ်လပ်စွာ အပန်းဖြေနိုင်ရန် စီမံကိန်း အလယ်ဗဟိုတွင် ရေကန်အလှပရှိသည့် နေရာအကျယ်အဝန်းထားရှိခြင်း
- ပိုမိုစိမ်းလန်းသော ပတ်ဝန်းကျင် ဖန်တီးပေးခြင်း



ဝန်ထမ်းများအတွက် လေ့ကျင့်သင်ကြားမှုများ - ဆောက်လုပ်ရေးကာလ

- ဆောက်လုပ်ရေးဝန်ထမ်းအသစ်တိုင်းကို လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေး သင်ကြားပေးခြင်း
- အလုပ်အမျိုးအစားအလိုက် ဘေးကင်းလုံခြုံစွာ လုပ်ကိုင်တတ်စေရန် အလုပ်မစခင် လုပ်ငန်းခွင်တွင် စည်းဝေးသင်ကြားခြင်း (ရှေးဦးသူနာ ပြုစုခြင်း၊ အမြင့်တွင် အလုပ်လုပ်ခြင်း၊ လျှပ်စစ်အန္တရာယ် သတိပြုခြင်း၊ ငြမ်းများအား ဘေးကင်းစွာ အသုံးပြုခြင်း၊ အပူနှင့် ထိတွေ့ရသည့် အလုပ်များ လုပ်ဆောင်ခြင်း အစရှိသည့် အလုပ်များ)
- မီးရထားရုံးချုပ်ဟောင်းအဆောက်အဦးအား ရှေးမူလကရာ မပျက် ပြုပြင်ထိန်းသိမ်းရာတွင် လိုအပ်သည့် အထူးသင်တန်းများပေးခြင်း
- ရုံးဝန်ထမ်းများကိုလည်း လေ့ကျင့်သင်ကြားပေးခြင်း

လျာထားခံ ကန်ထရိုက်တာ (BYMA) ၏ ရုံးဝန်ထမ်းလေ့ကျင့်ပေးမှုဆိုင်ရာ အချက်အလက်

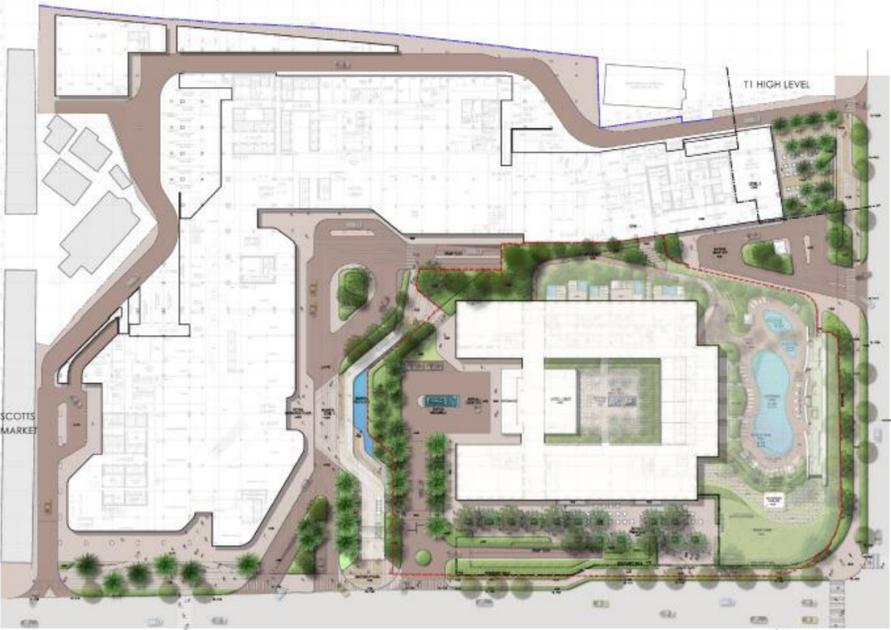


လျာထားခံ ကန်ထရိုက်တာ (BYMA) ၏ လုပ်သားများကို လေ့ကျင့်ပေးမှု အချက်အလက်

Date	Topic	Location	Images	Images	Attendee
9-May-2016	Lifting Safety Knowledge Training/Falling Object Prevention & Loose Items Rigging/Suspend Loads	Zone C Project			350
12-May-2016	Specific PPE for Hacking Grinding (Cutting/Finishing Power Tool Usage) Falling Object Guard Rail Practice	Tower -2			35
13-May-2016	Tower Crane Operator & Rigger/Signal Training(Safe Work Procedure of Lifting)	Zone C Project			12

ဝန်ထမ်းများအတွက် လေ့ကျင့်သင်ကြားမှုများ - လုပ်ငန်းလည်ပတ်မှုတစ်လျှောက်

- စက်မှုနှင့်လျှပ်စစ်ပိုင်းဆိုင်ရာ အလုပ်လည်ပတ်ရေးနှင့် စက်ပစ္စည်းထိန်းသိမ်းရေးအတွက် လေ့ကျင့်သင်ကြားပေးခြင်း
 - အဆင့်မြင့်ဟိုတယ်ဝန်ဆောင်မှုသင်တန်းများပေးခြင်း
 - Peninsula Yangon ၏ ဟိုတယ်ဝန်ထမ်းများကို
 - ရှေးဟောင်းအဆောက်အဦးထိန်းသိမ်းခြင်း
 - သမိုင်းအမွေထိန်းသိမ်းမှုအကြောင်း လူထုကို ပညာပေးခြင်း
- စသည့် နယ်ပယ်များတွင် လေ့ကျင့်သင်ကြားပေးခြင်း



ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ တာဝန်ယူဆောင်ရွက်ချက်များ



အခြေခံအချက်အလက် စုဆောင်းခြင်း - ပတ်ဝန်းကျင်လေထုနှင့် ဆူညံသံ

- ၂၀၁၅ခုနှစ် ဖေဖော်ဝါရီလတွင် စီမံကိန်းအနီး (၃)နေရာ၌ လေထုနှင့် ဆူညံသံအတွက် အခြေခံအချက်အလက်များ ကောက်ယူခဲ့ပါသည်။
- ကောက်ယူရရှိသည့် လေထုညစ်ညမ်းမှု အချက်အလက်များကို ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့၏ လမ်းညွှန်ချက်များနှင့် နှိုင်းယှဉ်ချက်

Parameter (µg/m³)	Duration	LM1	LM2	LM3	WHO Standard			
					Interim1	Interim2	Interim3	Guideline
PM10	24 hour Average	63	58	64	150	100	75	50
PM2.5	24 hour Average	59	38	51	75	50	37.5	25
SO2	24 hour Average	42	94	75	125	50	-	20
NO2	1 hour Average	61	77	94	-	-	-	200

- ကောက်ယူရရှိသည့် အသံဆူညံမှု အချက်အလက်များကို အပြည်ပြည်ဆိုင်ရာဘဏ္ဍာရေးကော်ပိုရေးရှင်း၏ လမ်းညွှန်ချက်များနှင့် နှိုင်းယှဉ်ချက်

Duration	LM1 (dBA)	LM2 (dBA)	LM3 (dBA)	EG- IFC (dBA)
				Industrial/ Commercial
Daytime 0700-22:00	62	59	70	70
Night-time 22:00 - 0700	49	53	62	70

ထိခိုက်မှု လျော့ချနည်းများ - ဆောက်လုပ်ရေးကာလ

ဖုန်မှုန့်၊ ဆူညံသံနှင့် တုန်ခါမှု ထိန်းချုပ်ခြင်း

- စီမံကိန်းနေရာအနံ့ရှိ ဝင်ထွက်သွားလာရာလမ်းများနှင့် မာကျောသောမြေနေရာများ အားလုံးကို ပြန်လည်အသုံးပြုနိုင်သော ရေများဖြင့် ပတ်ဖျန်းပေးခြင်း
- ဆောက်လုပ်ရေးယာဉ်များမှ မြေကြီးဖုန်မှုန့်များ ကပ်ပါပြီး လမ်းမများပေါ်သို့ ပေကျံခြင်း မရှိစေရန် စီမံကိန်းနေရာအထွက်၌ ယာဉ်များဆေးကြောသည့်နေရာ ထားရှိခြင်း
- အမှုန်များလွင့်စင်နိုင်သည့် ပစ္စည်းများ သယ်ဆောင်သော ဆောက်လုပ်ရေးယာဉ်များကို သင့်လျော်သည့် အဖုံးအကာများဖြင့် လုံခြုံစွာ ဖုံးအုပ်စေခြင်း
- တနင်္ဂနွေနေ့များ၊ အများပြည်သူရုံးပိတ်ရက်များနှင့် ညအချိန် ၇နာရီနောက်ပိုင်းများတွင် အသံဆူညံမှု အနည်းဆုံး အလုပ်များကိုသာ လုပ်စေခြင်း
- ဆူညံသံထွက်ပေါ်သည့် ဇာစ်မြစ်နေရာ၌ အကာအကွယ်များ ကာရံပေးခြင်း
- လိုအပ်ပါက အနီးပတ်ဝန်းကျင်ရှိ အဆောက်အဦးများတွင် လေထုညစ်ညမ်းမှု၊ အသံဆူညံမှု၊ တုန်ခါမှုတိုင်းတာသည့် ကိရိယာများ တပ်ဆင်ပေးပြီး အမြဲစောင့်ကြည့်ခြင်း



အဆောက်အဦးဖြိုဖျက်ခြင်း အထူးဂရုစိုက်မှု

- အမှုန်ထွက်ခြင်းလျော့နည်းစေရန် ဖြိုဖျက်မည့် အဆောက်အဦး၏ နေရာကို ဦးစွာရေဖျန်းခြင်း
- အဆောက်အဦးဖြိုဖျက်ရာမှ ထွက်လာသည့်အပိုင်းအစများ အပြင်သို့ လွင့်စင်မကျစေရန် ပိုက်ကွန်များဖြင့် ကာရံခြင်း၊ သတ်မှတ်အမြင့်တိုင်းတွင် ဖမ်းစင်များ တပ်ဆင်ခြင်း
- အသံဆူညံမှု လျော့နည်းစေရန် အသွားပါဝါများဖြင့် ကွန်ကရစ်ကို ချေဖျက်သည့်စက်များ (crushers)ကို အဓိက အသုံးပြုခြင်း



ရောဂါပိုးမွှားမပျက်ပွားအောင် ထိန်းချုပ်ခြင်း

- အသိအမှတ်ပြုလေ့ကျင့်သင်ကြားမှုများ ပြီးစီးထားသည့် နားလည်တတ်ကျွမ်းသူများ ပါဝင်သော ရောဂါပိုးမွှားနိမ်နင်းရေးအဖွဲ့ ဖွဲ့စည်းထားရှိပါမည်
- အပတ်စဉ် ခြင်ဆေးဖျန်းခြင်း
- ရေသေများကို ဖယ်ရှားရန်မဖြစ်နိုင်သော အခါများတွင် ရေမျက်နှာပြင်အပေါ်၌ ဆီအလွှာပါး ဖုံးအုပ်ခြင်းဖြင့် ခြင်ပျက်ပွားမှုကို ကာကွယ်ခြင်း
- ဆောက်လုပ်ရေးတစ်ခွင် အစဉ်အမြဲ သပ်ရပ်သန့်ရှင်းနေစေရန် ဆောင်ရွက်ခြင်း



စွန့်ပစ်ပစ္စည်းများ စီမံခန့်ခွဲခြင်း

- စီမံကိန်းနေရာအတွင်း စွန့်ပစ်ပစ္စည်းများ ယာယီစုပုံထားနိုင်ရန် နေရာထားရှိခြင်း
- “အထွေထွေစွန့်ပစ်ပစ္စည်း”၊ “သတ္တုအပိုင်းအစများ”၊ “အုတ်ခဲ၊ ကွန်ကရစ်အပိုင်း အစများ နှင့် မြေကြီး” အစရှိသဖြင့် အမျိုးအစားခွဲပြီး ထင်ရှားစွာ အမည်ကပ်ထားသော သီးခြားအမှိုက်ပုံးများ ထားရှိခြင်း



- ရုံးခန်း၊ ထမင်းစားဆောင်၊ မီးဖိုဆောင်တို့မှ ထွက်ရှိလာသော လူသုံးစွန့်ပစ်ပစ္စည်း များအတွက် အထွေထွေ အမှိုက်ပုံးငယ်များကို အလုံအလောက် ထားရှိပေးခြင်း
- စွန့်ပစ်အမှိုက်ကန်များ ပြည့်သွားသောအခါ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီ၏ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် သန့်ရှင်းရေးဌာနကို အမှိုက်များ လာရောက်သိမ်းယူရန် အကြောင်းကြားခြင်း

ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ တာဝန်ယူဆောင်ရွက်ချက်များ



ထိခိုက်မှု လျော့ချနည်းများ - ဆောက်လုပ်ရေးကာလ (အဆက်)

ယာဉ်အသွားအလာ ထိန်းချုပ်ခြင်း

- ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီမှ ချမှတ်ထားသော ယာဉ်အသွားအလာအချိန်များနှင့် ယာဉ်အရွယ်အစားကန့်သတ်ချက်များကို လိုက်နာပြီး ယာဉ်ကြောကျပ်တည်းမှုမရှိသည့် အချိန်များတွင်သာ သယ်ယူပို့ဆောင်ရေးလုပ်ငန်းများကို ဆောင်ရွက်ခြင်း
- ဆောက်လုပ်ရေးနှင့် ပြုပြင်ရေးလုပ်ငန်းများအတွက် လိုအပ်သော ယာယီလမ်းပိတ်ဆို့မှုများ ရှိလာမည် ဆိုပါက အများပြည်သူသို့ ကြိုတင်အသိပေးအကြောင်းကြားခြင်း

ထိခိုက်မှု လျော့ချနည်းများ - လုပ်ငန်းလည်ပတ်မှုတစ်လျှောက်

လေထု၊ အသံနှင့် တုန်ခါမှု အရည်အသွေး

- အဆောက်အဦးလည်ပတ်မှုမှ ထွက်ပေါ်လာသည့် ထုတ်လွှတ်အစိုးအငွေ့နှင့် ဆူညံသံများကို အပြည်ပြည်ဆိုင်ရာဘဏ္ဍာရေးကော်ပိုရေးရှင်း၏ စံချိန်စံညွှန်းများနှင့်အညီ စောင့်ကြည့်ထိန်းသိမ်းခြင်း
- လုပ်ငန်းလည်ပတ်ရာမှ မည်သည့်တုန်ခါမှုမှ ဖြစ်ပေါ်မလာနိုင်ခြင်း

စွန့်ပစ်ပစ္စည်းများ စီမံခန့်ခွဲခြင်း

- စီမံကိန်းပါ အဆောက်အဦးတစ်ခုစီမှ ယင်းနှင့် သက်ဆိုင်ရာ အမှိုက်များကို တာဝန်ယူ စီမံခန့်ခွဲစေသည့် စနစ်များ ထားရှိပေးခြင်း
- အဆောက်အဦးတစ်ခုချင်းစီမှ စီမံခန့်ခွဲစွန့်ပစ်လိုက်သည့် အမှိုက်များကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် သန့်ရှင်းရေးဌာနက လာရောက်မသိမ်းဆည်းမီ အမှိုက်များ သိပ်သည်းအောင် ဖိပြားသည့် စက်ပစ္စည်းများ တပ်ဆင်ထားသည့် စုပေါင်းအမှိုက်ပစ်အခန်း များထားရှိခြင်း
- စွန့်ပစ်ရေအမျိုးမျိုး (အိမ်သာ၊ ရေချိုးခန်း၊ လက်ဆေးကန်၊ မီးဖိုချောင်သုံး ရေဆေးကန်များမှ ထွက်ရှိလာသော စွန့်ပစ်ရေများ) တို့ကို မိလ္လာပိုက်လိုင်းနှင့် စီးဆင်းရေးမြောင်းများအတွင်းသို့ စွန့်ထုတ်မှုမပြုဘဲ အပြည်ပြည် ဆိုင်ရာဘဏ္ဍာရေးကော်ပိုရေးရှင်း၏ စွန့်ပစ်ရေစံနှုန်းများနှင့်အညီ သန့်စင်နိုင်ရန် စွန့်ပစ်ရေ သန့်စင်စက်အား ဒီဇိုင်းရေးဆွဲတည်ဆောက်ခြင်း
- သန့်စင်ပြီးရေကို အဆောက်အဦးများအားလုံး၏ လေအေးပေးစနစ်အတွက် လိုအပ်သော ရေအေးအဖြစ် ပြန်လည်အသုံးပြုစေခြင်း



စီးဆင်းရေးမြောင်း

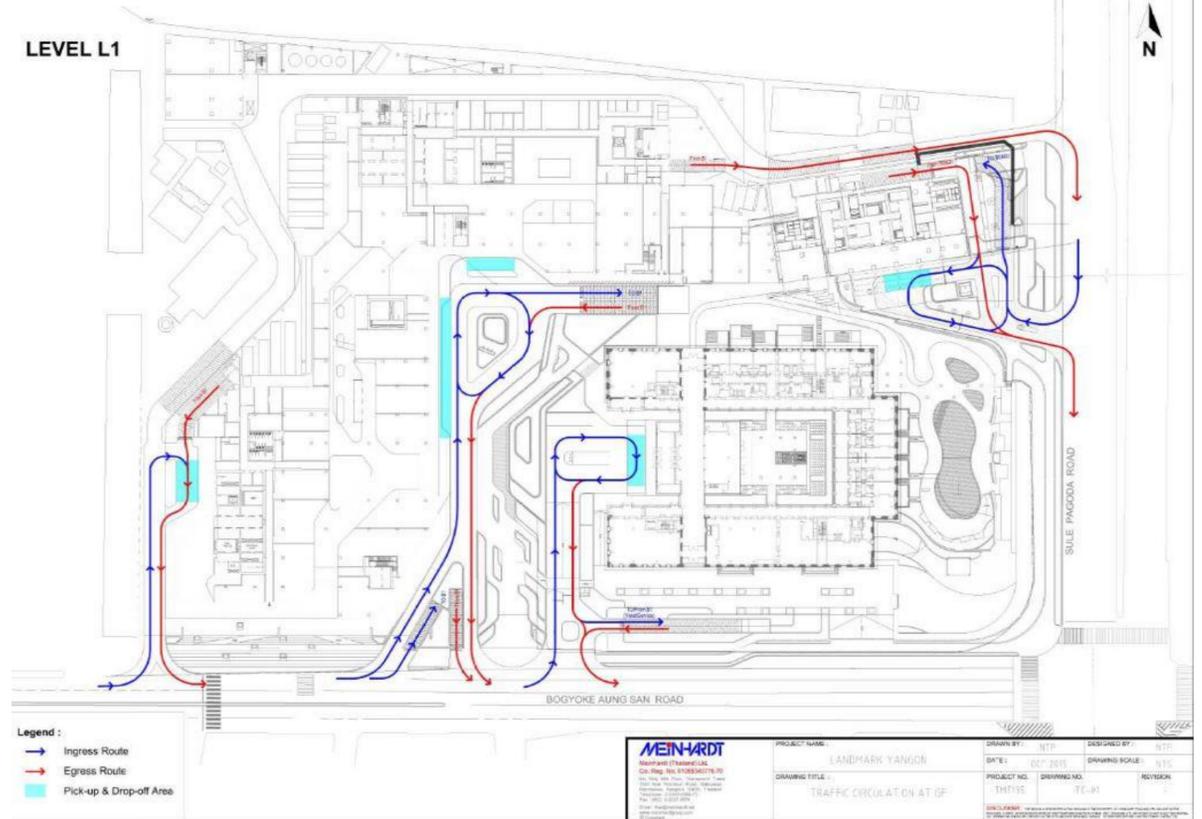
- ရေကြီးရေလျှံခြင်း အန္တရာယ် လျော့ကျစေရန် လက်ရှိ စီးဆင်းရေးမြောင်းကို နေရာရွှေ့ပြောင်းပြီး အဆင့်မြှင့်တင်ခြင်း

ရေ၊ မီး၊ ရယူမှု

- နေ့စဉ်သုံးစွဲရန်လိုအပ်သော ခန့်မှန်းရေပမာဏ ၁၃၀၀ကုပမီတာကို စီမံကိန်းနေရာအတွင်း အဝီစိတွင်း (၄) တွင်းမှ လုံလောက်စွာ ရယူခြင်း
- လုပ်ငန်းခွင်အတွက် လိုအပ်သည့် လျှပ်စစ်ဓါတ်အားကို သီးခြားဓါတ်အားခွဲရုံမှ ရယူခြင်း

ယာဉ်အဝင်အထွက် ထိန်းချုပ်ခြင်း

- လုပ်ငန်းလည်ပတ်ဆောင်ရွက်ခြင်းမှ ဖြစ်ပေါ်လာမည့် ယာဉ်အဝင်အထွက်များ လေ့လာဆန်းစစ် ချက်ကို ၂၀၁၅ခုနှစ် အောက်တိုဘာလတွင် ဆောင်ရွက်ခဲ့ပြီးဖြစ်
- လမ်းသွားလမ်းလာများ ဘေးကင်းလုံခြုံရေးနှင့် ဖော်တော်ယာဉ်များ အဆင်ပြေပြေ ဝင်ထွက်သွား လာနိုင်ရေးအတွက် ယာဉ်ဝင်/ထွက် နေရာများအား အချိုးအစားမျှတစွာ ဒီဇိုင်းရေးဆွဲထားခြင်း
- အမှိုက်သိမ်းယာဉ်၊ ကုန်တင်ယာဉ်၊ မီးသတ်ကား အစရှိသည့် ဝန်ဆောင်မှုယာဉ်ကြီးများအတွက် သက်ဆိုင်ရာနေရာသို့ ရောက်ရှိစေနိုင်သည့် ဝန်ဆောင်မှုယာဉ်လမ်းမ သီးသန့်ထားရှိပေးခြင်း



တက်ရောက်သူများ မှတ်တမ်း

မြန်မာ့မီးရထားရုံးချုပ်ဟောင်းဝင်း ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်းဆိုင်ရာ လူထုတွေ့ဆုံဆွေးနွေးပွဲ
ပန်းဘဲတန်း၊ ရန်ကုန်

နေ့စွဲ - (၁၆)ရက်၊ ဩဂုတ်လ၊ ၂၀၁၆ ခုနှစ်

အချိန် - 3:00PM မှ 4:30PM

စဉ်	အမည်	အဖွဲ့အစည်းနှင့် ရာထူး (သက်ဆိုင်သူများသာ ဖြည့်ရန်)	နေရပ်လိပ်စာ	ဖုန်းနံပါတ်
1	ဒေါ်မောင်ဖြူ	ပေးအပ်ရေးဦးစီးဌာန၊ ရန်ကင်း	၁၇၊ နေပြည်တော်	၀၉-၇၇၁၇၈၂၅၈၁
2	ဒေါ်ခင်အေး	ပေးအပ်ရေးဦးစီးဌာန၊ ရန်ကင်း	၁၇/၁၀ ပေးအပ်ရေးဦးစီးဌာန	၀၉ ၇၃ ၁၅၃၃၅၇
3	Hein Htet Aung	ရန်ကင်းစီးပွားရေးတက္ကသိုလ် (MBA)	လှိုင်စတုရန်းအိုင်ဂျင်နီယာစုဝင်း၊ လှိုင်မြို့နယ်	၀၉-၅၀၉၅၅၁၈
4	ဒေါ်ကျွန်းစိန်	အင်းစိန်	၁/၅ နေပြည်တော် - ၂ - မြောက်ပိုင်း	၇၃၀၄၅၈၈၁
5	ဒေါ်ခင်အေး	အင်းစိန်	၁/၅ နေပြည်တော် - ၆ - မြောက်ပိုင်း	၀၉-၅၁၆၇၈၁၅
6	ဒေါ်အေးအေး	ပေးအပ်ရေးဦးစီးဌာန (ရင်း) သက်ဆိုင်သူ	၀၆/၂၃ ပေးအပ်ရေးဦးစီးဌာန	၀၉၈၃၀၄၂၅၀
7	ဒေါ်ခင်အေး	F.P.P.S	၁၇/၁၀ ပေးအပ်ရေးဦးစီးဌာန	၀၉-၄၂၀၀၃၅၇၃၅
8	ဒေါ်ခင်အေး	Beauty Sloan	၉/ပေးအပ်ရေးဦးစီးဌာန	၀၉-၇၇၆၃၈၃၁၆၈
9	ဒေါ်ခင်အေး	ရန်ကင်း	၂၇ ပေးအပ်ရေးဦးစီးဌာန	၀၉၅၀၀၅၅၀၄
10	ဒေါ်ခင်အေး	ရန်ကင်း	၂၇ - ပေးအပ်ရေးဦးစီးဌာန	၀၉-၅၀၀၁၇၂၂

မေးခွန်းများ
ကို ဖြေဆိုပေးပါ။

စဉ်	အမည်	အဖွဲ့အစည်းနှင့် ရာထူး (သက်ဆိုင်သူများသာ ဖြည့်ရန်)	နေရပ်လိပ်စာ	ဖုန်းနံပါတ်
၇၃	ဦးကျော်ဝင်း	MD. ရတနာပုံဆောက်လုပ်ရေး	ကျောက်(၂၇) လမ်းမင်းကြီးလမ်း၊ အင်္ဂါမြို့နယ်	၀၉၅၁၆၁၅၇၃
၇၄	ဒေါ်ခင်အေး	ဗိုဗို	ကျောက်(၂၅) မြောက်မင်းကြီးလမ်း၊ ၃၂၆ မြို့နယ်	၀၉၃၀၀၀၀၃၇၇
၇၅	ဒေါ်စင်စင်စင်	~	~	၀၉၇၂၀၀၆၃၆၂၂
၇၆				
၇၇				
၇၈				
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၃၄				

တက်ရောက်သူများ မှတ်တမ်း

မြန်မာ့မီးရထားရုံးချုပ်ဟောင်းဝင်း ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်းဆိုင်ရာ လူထုတွေ့ဆုံဆွေးနွေးပွဲ
ပန်းဘဲတန်း၊ ရန်ကုန်

နေ့စွဲ - (၁၆)ရက်၊ ဩဂုတ်လ၊ ၂၀၁၆ ခုနှစ်

အချိန် - 1:00PM မှ 2:30PM

စဉ်	အမည်	အဖွဲ့အစည်းနှင့် ရာထူး (သက်ဆိုင်သူများသာ ဖြည့်ရန်)	နေရပ်လိပ်စာ	ဖုန်းနံပါတ်
1	ကျွန်းသွင်စာပေ	Mayo Co., Ltd Account Executive	Room (E) Katha Condo Mahabandoola Rd. PBD Tsp.	၀၇၇၇၇၀၀၆၀၁၆
2	ဦးစံဝင်း	၇၀ ဇွန် ၇၀၀ ချုပ်ကိုင်မှု ဦးစံဝင်း (၇၀) ဇွန် ၇၀၀	၂၂၇/၃၀၀ နှစ်တော် မဟာဗန္ဓုလမင်း (၇၀) ဇွန် ၇၀၀	၀၉၇၃၁၃၅၅၀၄
3	ဦးစံဝင်း	ဦးစံဝင်း (၇၀) ဇွန် ၇၀၀ ဦးစံဝင်း (၇၀) ဇွန် ၇၀၀	၁၀၅၅ ဦးစံဝင်း (၇၀) ဇွန် ၇၀၀	၀၉၄၅၀၅၅၅၅၅
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စဉ်	အမည်	အဖွဲ့အစည်းနှင့် ရာထူး (သက်ဆိုင်သူများသာ ဖြည့်ရန်)	နေရပ်လိပ်စာ	ဖုန်းနံပါတ်
11	ဦးကျော်စွယ်	ကျောက်တိုင်	၂၆၇/ ဒုတိယ ကျေးဇူးတော်	၀၅-၂၅၀၀၂၄၆၀၀
12	ဦးမြတ်ဦး	Engineer	ပုဇွန် (၁၅) ၊ ၂၅ လမ်း ၊ လမ်းမတော် ၊	၀၅-၉၆၅၃၅၃၄၄၅
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တက်ရောက်သူများ မှတ်တမ်း
မြန်မာ့မီးရထားရုံးချုပ်ဟောင်းဝင်း ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်းဆိုင်ရာ လူထုတွေ့ဆုံဆွေးနွေးပွဲ
ပန်းဘဲတန်း၊ ရန်ကုန်

နေ့စွဲ - (၁၆)ရက်၊ ဩဂုတ်လ၊ ၂၀၁၆ ခုနှစ်

အချိန် - 10:00AM မှ 11:30AM

စဉ်	အမည်	အဖွဲ့အစည်းနှင့် ရာထူး (သက်ဆိုင်သူများသာ ဖြည့်ရန်)	နေရပ်လိပ်စာ	ဖုန်းနံပါတ်
1.	အောင်စွန်း	YSH - Risk Management		09-5194276
2.	အောင်စွန်း	"		09-5022237
3.	Kyaw Thuo Hla	Inwarding	BA Kyanik mypung, Thaw YGA.	09-2109098
4.	Dr. Aung Mye Aung	ပတ်ဝန်းကျင်ဆိုင်ရာ ဦးစီးဌာန လ/မအဖွဲ့ချုပ်		09-32106543
5.	Dr. Zin Mye Win	Rambot Environ. Coll. H.		09250260659
6.	Dr. HSU MYA SHWE SHU	AP & Head (Rtd) YTU	27 (D) MA KYE KYE ROAD, SANCHAUNG	09402875148
7.	Aung Khin	SPA	FMI Centre.	09-250143784
8.	U Aung Ken	အဖွဲ့အစည်း ပြည်ပ	အ.ဆ.အ.	09 5178439
9.	U Kaw Aung	YA YA KA.	NO-204. G.F. 32. St	09. 250142413.
10.	အောင်စွန်း	၇ ဒီဂရီ ဗျူ	၂၂၀/၆၃၀/၂၆၀၆၁	09-970137660

စဉ်	အမည်	အဖွဲ့အစည်းနှင့် ရာထူး (သက်ဆိုင်သူများသာ ဖြည့်ရန်)	နေရပ်လိပ်စာ	ဖုန်းနံပါတ်
11.	F. Guanin	ENVIRON		
12.	Rev. Isaac Kyaw	Asst. Vicar Cbly Trinity Cathedral	No. 446, Bogoke Aung San Road, Pabedan Township	09. 264441985
13.	Myat Myat Khin		NO. 245 30 th St Pabedan Tsp.	09. 2500 27197
14.	ဒေါ်အိမ်အောင်	ဗဟိုဌာန - အုတ်စုမြို့နယ်	လ. ၂၀၇. ရွှေ၊ ၂၂လမ်း	၀၉. ၂၄၁၀. ၃၈၀၃၄
15.	အောင်စိန်	ဧည့်သည်	၂၉ လမ်း အမှတ် ၂၃၅	၀၉. ၃၅ ၁၄၆၈၉၀
16.				
17.				
18.				
19.				
20.				
21.				
22.				

တက်ရောက်သူများ မှတ်တမ်း
မြန်မာ့မီးရထားရုံးချုပ်ဟောင်းဝင်း ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်းဆိုင်ရာ လူထုတွေ့ဆုံဆွေးနွေးပွဲ
ပန်းဘဲတန်း၊ ရန်ကုန်

နေ့စွဲ - (၁၆)ရက်၊ ဩဂုတ်လ၊ ၂၀၁၆ ခုနှစ်

အချိန် - 5:00PM မှ 6:30PM

စဉ်	အမည်	အဖွဲ့အစည်းနှင့် ရာထူး (သက်ဆိုင်သူများသာ ဖြည့်ရန်)	နေရပ်လိပ်စာ	ဖုန်းနံပါတ်
1	Jane David	Secretary, St. Gabriel's Church	388, Bogyoke Aung San St.	09284136816
2	Steven Kyaw Oo	Committee Member	Shwe Pyi Thar .	09963056787
3	Philip Joseph	St. Gabriel's Church Auditor	22, Banyadala Road, Mingalar Taung Myath Township.	09450002854
4	Alex. S. Latnam	St. Gabriel's Church President	"	095789450
5	မောင်မောင်	"	13 မဟာမိတ်လမ်း၊ ပင်လယ်ဧက ဗဟို	095144109
6				
7				
8				
9				
10				

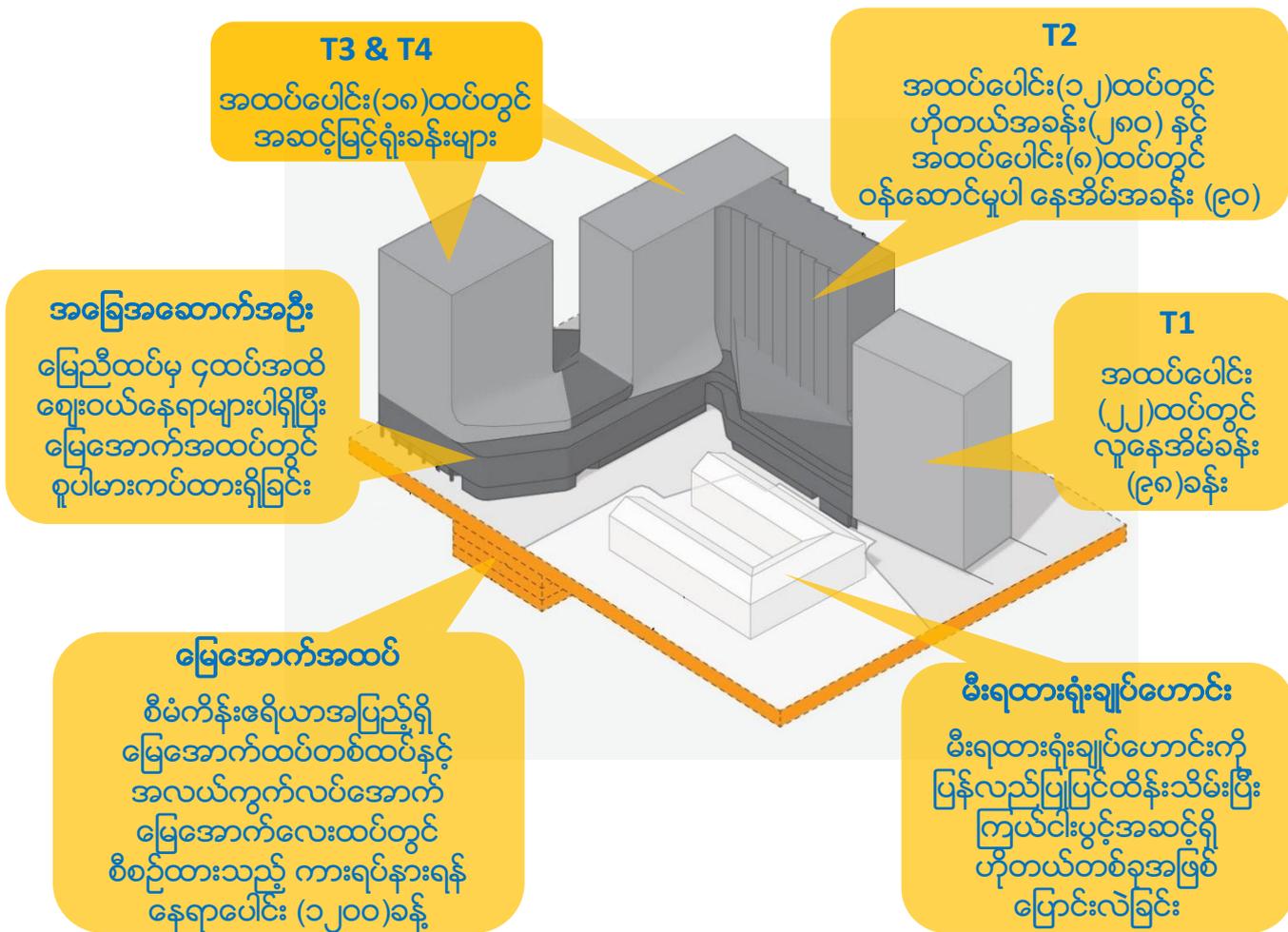
အများပြည်သူနှင့် တွေ့ဆုံဆွေးနွေးခြင်း
နှင့်
သတင်းအချက်အလက်ထုတ်ဖော်ခြင်း

Landmark ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်း

(၁၆) ရက်၊ သြဂုတ်လ၊ ၂၀၁၆ခုနှစ်

(အင်္ဂါနေ့)

၁။ စီမံကိန်းဖော်ပြချက်



အဆောက်အဦးကန့်သတ်ချက် များနှင့်အညီ လိုက်နာထားသည့် စီမံကိန်းဒီဇိုင်း

- လုံလောက်သော မြေချန်နေရာ
- YCDC ၏ အမြင့်ကန့်သတ်ချက် နှင့်အညီ ထားရှိထားသော
 - လူနေထိုင်နိုင်သည့် အထပ်များ
 - စက်ခန်းများ နှင့်
 - အင်တန်နာနှင့် အချွန်အတက်များ
- မီးရထားရုံးချုပ်ဟောင်း၏ တံစက်မြိတ်လိုင်းအောက် ပိုမိုနိမ့်ကျသော အခြေအဆောက်အဦး အမြင့်



စီမံကိန်း၏ အရှေ့တောင်အရပ်မှ ကြည့်လျှင် မြင်ရမည့် မြင်ကွင်း



စီမံကိန်းဝင်းသို့ ဝိုင်းချုပ်အောင်ဆန်းလမ်းမှ အဝင်



ပန်းဆိုးတန်းရုံးကျော်တံတားမှ ကြည့်လျှင် မြင်ရမည့် စီမံကိန်းပုံစံ



ဆူးလေလူကူးရုံးကျော်တံတားမှ ကြည့်လျှင် မြင်ရမည့် စီမံကိန်းပုံစံ



ဆူးလေဝုံးကျော်တံတား အလယ်ကျွန်းမှ ကြည့်လျှင် မြင်ရမည့် စီမံကိန်းပုံစံ

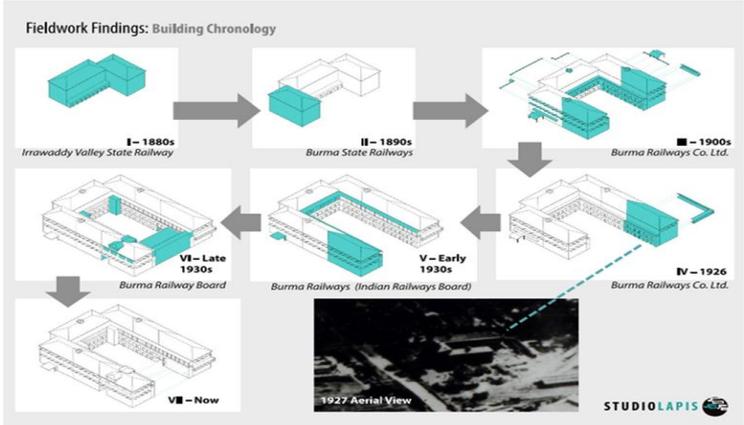


မီးရထားသံလမ်းမှ ကြည့်လျှင် မြင်ရမည့် စီမံကိန်းပုံစံ

၂။ မီးရထားရုံးချုပ်ဟောင်းကို ထိန်းသိမ်းပြုပြင်ခြင်း

သမိုင်းကြောင်း

- မြန်မာ့မီးရထားရုံးချုပ်ဟောင်းကို ၁၈၈၀ခုနှစ်များ နှောင်းပိုင်းနှင့် ၁၈၉၀ခုနှစ်များ အစောပိုင်းအတွင်း တည်ဆောက်ခဲ့ပြီး ဆယ်စုနှစ်များစွာတိုင် အဆင့်ဆင့် တိုးချဲ့ တည်ဆောက်ခဲ့သည်။
- ရန်ကုန်မြို့ရှိ ကိုလိုနီခေတ်လက်ကျန် သမိုင်းဝင်အဆောက်အဦးများထဲမှ ဂဝံကျောက်၊ အုတ်တို့ဖြင့် တည်ဆောက်ထားသည့် တစ်ခုတည်းသော အဆောက်အဦးလည်း ဖြစ်သည်။



အဆောက်အဦးပြုပြင်ထိန်းသိမ်းရေးဆိုင်ရာ ကျွမ်းကျင်အဖွဲ့များ

Aedas, Singapore	ဗိသုကာအဖွဲ့
Studio Lapis, Singapore	ရှေးဟောင်းအဆောက်အဦးဆိုင်ရာ အကြံပေးအဖွဲ့
Wentworth House, UK	ရှေးဟောင်းအဆောက်အဦး ယာယီတည်ဆောက်ရေးလုပ်ငန်း အကြံပေးအဖွဲ့
IEN, Singapore	ရှေ့ရှည်တည်တံ့ရေးဆိုင်ရာ ကျွမ်းကျင်အဖွဲ့
Meinhardt (Thailand)	မြို့ပြတည်ဆောက်ရေး နှင့် စက်မှု၊ လျှပ်စစ်ပိုင်းဆိုင်ရာ ကျွမ်းကျင်အဖွဲ့



ပြုပြင်ထိန်းသိမ်းခြင်းအပေါ် ကျွန်ုပ်တို့၏ ရည်မှန်းချက်

ရန်ကုန်မြို့သာမက မြန်မာနိုင်ငံအတွက် ရေရည်အကျိုး ဖြစ်ထွန်းစေပြီး စဉ်ဆက်မပြတ် ရှေ့ရှည်တည်တံ့နိုင်စေရေး ရည်မှန်း၍ မြန်မာ့မီးရထားရုံးချုပ်ဟောင်းအဆောက်အဦးအား ထိန်းသိမ်းပြုပြင်တည်ဆောက်ရေး

လုပ်ငန်းစဉ် အကျဉ်းချုံး

- I. သုတေသနနှင့် ကွင်းဆင်းလေ့လာခြင်း
- II. ပြုပြင်ထိန်းသိမ်းရေး မူဝါဒများ
 - သမိုင်းအမွေအနှစ်တစ်လွှာချင်းစီအား ထိန်းသိမ်းခြင်း
 - အဟောင်းနှင့် အသစ်အကြား ဆက်သွယ်ပေးခြင်း
 - အဆောက်အဦး၏ သမိုင်းဝင် အစိတ်အပိုင်းများကို မပျောက်မပျက် ထိန်းသိမ်းပြီး ပြန်လည်အသုံးပြုခြင်းနှင့် လိုအပ်သလို မွမ်းမံအသုံးပြုခြင်း
 - လိုက်လျောညီထွေမှုရှိခြင်းနှင့် ပြောင်းလဲနိုင်မှုရှိခြင်း
 - လိုအပ်သမျှနည်းလမ်းများနှင့် အဆောက်အဦးပုံစံကို အဆင့်မြှင့်တင်ခြင်း
- III. ပြုပြင်ထိန်းသိမ်းခြင်းဆိုင်ရာ စီမံခန့်ခွဲမှု အစီအစဉ်
- IV. ရှေးမှုမပျက် လိုက်လျောညီထွေ ထိန်းသိမ်းပြုပြင်ခြင်း၊ ထိခိုက်မှုလျော့ချခြင်း နှင့် ပြန်လည် ပြုပြင်ရေးလုပ်ငန်းစဉ်များ

ရှေးမူမပျက် လိုက်လျောညီထွေ ထိန်းသိမ်းပြုပြင်ခြင်း - မြို့ပြသမိုင်း အမွေအနှစ် အသွင်ပြောင်းလဲခြင်း

လမ်းထောင့်မှ မြင်ရသည့် အထင်ကရ သမိုင်းအမွေအနှစ် မြင်ကွင်းအဖြစ် ပြန်လည် အသက်သွင်းခြင်း



1920s



2013



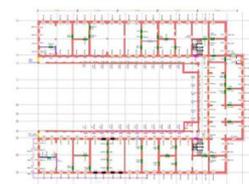
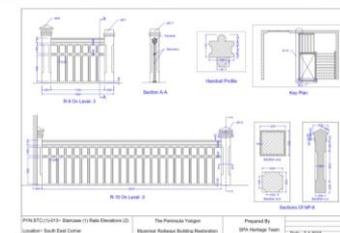
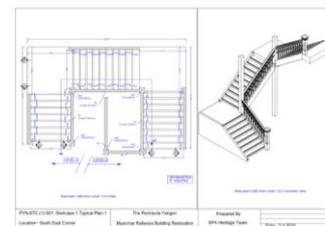
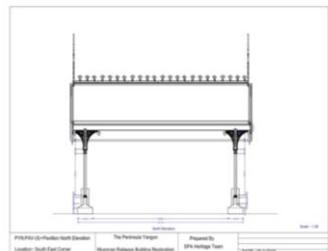
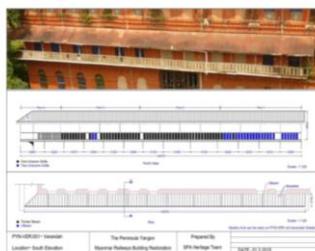
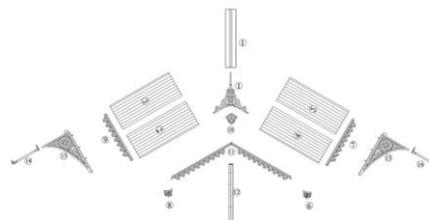
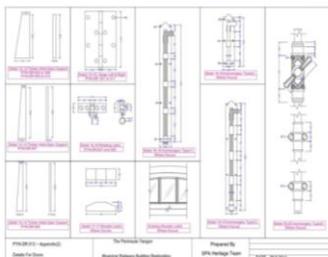
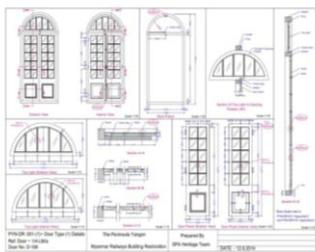
FUTURE

ရှေးမှုမပျက် လိုက်လျောညီထွေ ထိန်းသိမ်းပြုပြင်ခြင်း - သမိုင်းအမွေအနှစ် အင်္ဂါရပ်များ ထည့်သွင်းပေါင်းစပ်ပေးခြင်း

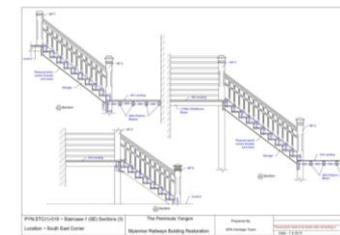
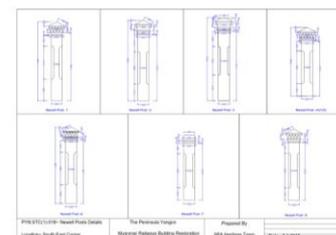


ဆောင်ရွက်ပြီးစီးသော ရှေးမှုမပျက် ပြုပြင် ထိန်းသိမ်းရေး လုပ်ငန်းများ

၁။ အဆောက်အဦးတွင် တပ်ဆင်ထားသော တံခါး၊ သံပန်း၊ နေကာ စသည်တို့ကို စနစ်တကျ မှတ်တမ်းတင် စာရင်းပြုစုခြင်း



Item No.	Item Name	Material	Quantity	Unit	Remarks
1	Concrete	Concrete	100	m ³	
2	Reinforcement	Reinforcement	500	kg	
3	Brick	Brick	10000	nos	
4	Plaster	Plaster	100	m ²	
5	Paint	Paint	100	kg	
6	Wood	Wood	100	m ³	
7	Iron	Iron	100	kg	
8	Steel	Steel	100	kg	
9	Aluminum	Aluminum	100	kg	
10	Copper	Copper	100	kg	
11	Gold	Gold	100	kg	
12	Silver	Silver	100	kg	
13	Mercury	Mercury	100	kg	
14	Lead	Lead	100	kg	
15	Zinc	Zinc	100	kg	
16	Nickel	Nickel	100	kg	
17	Cadmium	Cadmium	100	kg	
18	Antimony	Antimony	100	kg	
19	Strontium	Strontium	100	kg	
20	Barium	Barium	100	kg	
21	Caesium	Caesium	100	kg	
22	Francium	Francium	100	kg	
23	Radium	Radium	100	kg	
24	Actinium	Actinium	100	kg	
25	Thorium	Thorium	100	kg	
26	Protactinium	Protactinium	100	kg	
27	Uranium	Uranium	100	kg	
28	Neptunium	Neptunium	100	kg	
29	Plutonium	Plutonium	100	kg	
30	Americium	Americium	100	kg	
31	Cerium	Cerium	100	kg	
32	Praseodymium	Praseodymium	100	kg	
33	Neodymium	Neodymium	100	kg	
34	Europium	Europium	100	kg	
35	Gadolinium	Gadolinium	100	kg	
36	Terbium	Terbium	100	kg	
37	Dysprosium	Dysprosium	100	kg	
38	Ytterbium	Ytterbium	100	kg	
39	Lutetium	Lutetium	100	kg	
40	Hafnium	Hafnium	100	kg	
41	Tantalum	Tantalum	100	kg	
42	Tungsten	Tungsten	100	kg	
43	Rhenium	Rhenium	100	kg	
44	Osmium	Osmium	100	kg	
45	Iridium	Iridium	100	kg	
46	Rhodium	Rhodium	100	kg	
47	Palladium	Palladium	100	kg	
48	Silver	Silver	100	kg	
49	Copper	Copper	100	kg	
50	Nickel	Nickel	100	kg	
51	Cobalt	Cobalt	100	kg	
52	Iron	Iron	100	kg	
53	Steel	Steel	100	kg	
54	Aluminum	Aluminum	100	kg	
55	Zinc	Zinc	100	kg	
56	Lead	Lead	100	kg	
57	Mercury	Mercury	100	kg	
58	Antimony	Antimony	100	kg	
59	Strontium	Strontium	100	kg	
60	Barium	Barium	100	kg	
61	Caesium	Caesium	100	kg	
62	Francium	Francium	100	kg	
63	Radium	Radium	100	kg	
64	Actinium	Actinium	100	kg	
65	Thorium	Thorium	100	kg	
66	Protactinium	Protactinium	100	kg	
67	Uranium	Uranium	100	kg	
68	Neptunium	Neptunium	100	kg	
69	Plutonium	Plutonium	100	kg	
70	Americium	Americium	100	kg	
71	Cerium	Cerium	100	kg	
72	Praseodymium	Praseodymium	100	kg	
73	Neodymium	Neodymium	100	kg	
74	Europium	Europium	100	kg	
75	Gadolinium	Gadolinium	100	kg	
76	Terbium	Terbium	100	kg	
77	Dysprosium	Dysprosium	100	kg	
78	Ytterbium	Ytterbium	100	kg	
79	Lutetium	Lutetium	100	kg	
80	Hafnium	Hafnium	100	kg	
81	Tantalum	Tantalum	100	kg	
82	Tungsten	Tungsten	100	kg	
83	Rhenium	Rhenium	100	kg	
84	Osmium	Osmium	100	kg	
85	Iridium	Iridium	100	kg	
86	Rhodium	Rhodium	100	kg	
87	Palladium	Palladium	100	kg	
88	Silver	Silver	100	kg	
89	Copper	Copper	100	kg	
90	Nickel	Nickel	100	kg	
91	Cobalt	Cobalt	100	kg	
92	Iron	Iron	100	kg	
93	Steel	Steel	100	kg	
94	Aluminum	Aluminum	100	kg	
95	Zinc	Zinc	100	kg	
96	Lead	Lead	100	kg	
97	Mercury	Mercury	100	kg	
98	Antimony	Antimony	100	kg	
99	Strontium	Strontium	100	kg	
100	Barium	Barium	100	kg	



၂။ အဆောက်အဦးတွင် တပ်ဆင်ထားသော တံခါး၊ သံပန်း၊ နေကာ စသည်တို့ကို ပြုပြင်နိုင်ရန် စနစ်တကျ ဖြုတ်ယူပြီး လုပ်ငန်းစဉ် အဆင့်ဆင့်ကို မှတ်တမ်းတင်ခြင်း

CAST IRON AWNING TRIAL REMOVAL



Removal of top ornament (1)



Dismantle roof sheeting (2,3,4,5)



Unscrew bolts & remove fascia edge (6,8)



Fascia edge (7,9,11)



Frame (12)



Fascia (front piece) (10)



၃။ အဆောက်အဦး မျက်နှာစာ(၁)ခု အား ရှေးမူပျက် အစမ်း ပြုပြင် ကြည့်ခြင်း

၄။ အဆောက်အဦး ပတ်ပတ်လည် အား ငြမ်းဆင်ခြင်း



၅။ အဆောက်အဦး မျက်နှာစာအား စနစ်တကျ သန့်ရှင်းရေး ပြုလုပ်ခြင်း



၃။ လူမှုရေးဆိုင်ရာ အကျိုးကျေးဇူးများ

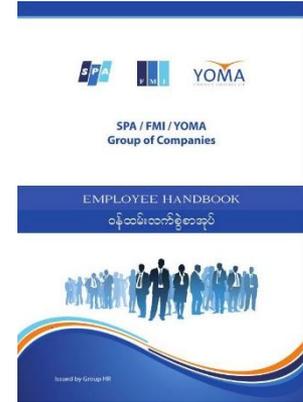
မြန်မာနိုင်ငံသားများအတွက် အလုပ်အကိုင် ဖန်တီးပေးခြင်း

- မြန်မာနိုင်ငံသားဦးစားပေးခန့်ထားရေး မူ ရှိခြင်း
- ဆောက်လုပ်ရေးကာလအတွင်း နိုင်ငံသားများအတွက် ဆောက်လုပ်ရေးနှင့် ရုံးအလုပ်ပေါင်း (၄၀၀၀) ကျော် ဖန်တီးပေးနိုင်ခြင်း

စီမံကိန်း စီမံခန့်ခွဲမှုအဖွဲ့ဝင်များ	၁၀၅
ကန်ထရိုက်တာများ၏ လုပ်သားများ၊ ဝန်ထမ်းများနှင့် စီမံခန့်ခွဲမှုအဖွဲ့ဝင်များ	၄,၄၁၅
စုစုပေါင်း	၄.၅၂၀

- တည်ဆောက်ပြီးချိန် လုပ်ငန်းစတင်လည်ပတ်သည်နှင့် အောက်ပါ နေရာများအတွက် အလုပ်ပေါင်း (၇၀၀၀) ကျော် ပွင့်လင်းလာမည်ဖြစ်ခြင်း

အဆောက်အဦးထိန်းသိမ်းရေး/ ဟိုတယ်နှင့် လူနေအိမ်ခန်းများ	၉၉၄
ဈေးဆိုင်ခန်းများနှင့် ရုံးခန်းများ	၆,၁၈၄
စုစုပေါင်း	၇,၁၇၈



Population Density

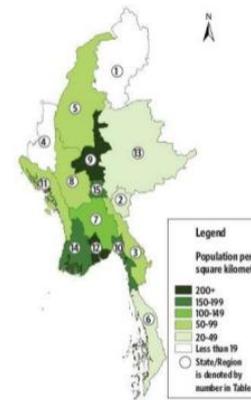


Table 3. The Population Density by State/Region

No.	State/Region	Population per square kilometre
Union		76
①	Kachin	19
②	Kayah	24
③	Kayin	52
④	Chin	13
⑤	Sagaing	56
⑥	Tanintharyi	32
⑦	Bago	123
⑧	Magway	87
⑨	Mandalay	206
⑩	Mon	167
⑪	Rakhine	87
⑫	Yangon	723
⑬	Shan	38
⑭	Ayeyawady	176
⑮	Nay Pyi Taw	164

Thursday, May 07, 2015 Prepared by : Hsint Sanda

- အလုပ်ရာထူးတိုင်းအတွက် သင့်လျော်သည့် အရည်အချင်းနှင့် ပြည့်စုံသူ နိုင်ငံသားတိုင်း လျှောက်ထားနိုင်ခြင်း
- စီမံကိန်းအနီးပတ်ဝန်းကျင်မှ အလုပ်လျှောက်ထားသူ ဒေသခံပြည်သူများအား ဦးစားပေး ရွေးချယ်မည်ဖြစ်ခြင်း

ဝန်ထမ်းများအတွက် လေ့ကျင့်သင်ကြားမှုများ - ဆောက်လုပ်ရေးကာလ

- ဆောက်လုပ်ရေးဝန်ထမ်းအသစ်တိုင်းကို လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေး သင်ကြားပေးခြင်း
- အလုပ်အမျိုးအစားအလိုက် ဘေးကင်းလုံခြုံစွာ လုပ်ကိုင်တတ် စေရန် အလုပ်မစခင် လုပ်ငန်းခွင်တွင် စည်းဝေးသင်ကြားခြင်း (ရှေးဦးသူနာ ပြုစုခြင်း၊ အမြင့်တွင် အလုပ်လုပ်ခြင်း၊ လျှပ်စစ် အန္တရာယ် သတိပြုခြင်း၊ ငြမ်းများအား ဘေးကင်းစွာ အသုံးပြု ခြင်း၊ အပူနှင့် ထိတွေ့ရသည့် အလုပ်များ လုပ်ဆောင်ခြင်း အစရှိသည့် အလုပ်များ)
- မီးရထားရုံးချုပ်ဟောင်းအဆောက်အဦးအား ရှေးမူလက်ရာ မပျက် ပြုပြင်ထိန်းသိမ်းရာတွင် လိုအပ်သည့် အထူးသင်တန်း များပေးခြင်း
- ရုံးဝန်ထမ်းများကိုလည်း လေ့ကျင့်သင်ကြားပေးခြင်း



ဝန်ထမ်းများအတွက် လေ့ကျင့်သင်ကြားမှုများ - လုပ်ငန်းလည်ပတ်မှုတစ်လျှောက်

- စက်မှုနှင့်လျှပ်စစ်ပိုင်းဆိုင်ရာ အလုပ်လည်ပတ်ရေး နှင့် စက်ပစ္စည်းထိန်းသိမ်းရေးအတွက် လေ့ကျင့် သင်ကြားပေးခြင်း
 - အဆင့်မြင့်ဟိုတယ်ဝန်ဆောင်မှုသင်တန်းများ ပေးခြင်း
 - Peninsula Yangon ၏ ဟိုတယ်ဝန်ထမ်းများကို
 - ရှေးဟောင်းအဆောက်အဦးထိန်းသိမ်းခြင်း
 - သမိုင်းအမွေထိန်းသိမ်းမှုအကြောင်း လူထုကို ပညာပေးခြင်း
- စသည့် နယ်ပယ်များတွင် လေ့ကျင့်သင်ကြား ပေးခြင်း



အများပြည်သူနှင့် သက်ဆိုင်သောနေရာ ထားရှိခြင်း

- လမ်းသွားလမ်းလာများကို မြို့ပြရှုခင်းအလှများနှင့် မျက်နှာစာတစ်လျှောက် ချိတ်ဆက်ပေးခြင်း
- ပြည်သူများ လွတ်လပ်စွာ အပန်းဖြေနိုင်ရန် စီမံကိန်းအလယ်ဗဟိုတွင် ရေကန်အလှပါရှိသည့် နေရာအကျယ်အဝန်းထားရှိခြင်း
- ပိုမိုစိမ်းလန်းသော ပတ်ဝန်းကျင် ဖန်တီးပေးခြင်း



၄။ ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ
တာဝန်ယူဆောင်ရွက်ချက်များ

အခြေခံအချက်အလက် စုဆောင်းခြင်း - ပတ်ဝန်းကျင်လေထုနှင့် ဆူညံသံ

- ၂၀၁၅ခုနှစ် ဖေဖော်ဝါရီလတွင် စီမံကိန်းအနီး (၃)နေရာ၌ လေထုနှင့် ဆူညံသံအတွက် အခြေခံအချက် အလက်များ ကောက်ယူခဲ့ပါသည်။
- ကောက်ယူရရှိသည့် လေထုညစ်ညမ်းမှု အချက်အလက်များကို ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့၏ လမ်းညွှန် ချက်များနှင့် နှိုင်းယှဉ်ချက်

Parameter (µg/m ³)	Duration	LM1	LM2	LM3	WHO Standard			
					Interim1	Interim2	Interim3	Guideline
PM ₁₀	24 hour Average	63	58	64	150	100	75	50
PM _{2.5}	24 hour Average	59	38	51	75	50	37.5	25
SO ₂	24 hour Average	42	94	75	125	50	-	20
NO ₂	1 hour Average	61	77	94	-	-	-	200

- ကောက်ယူရရှိသည့် အသံဆူညံမှု အချက်အလက်များကို အပြည်ပြည်ဆိုင်ရာဘဏ္ဍာရေးကော်ပိုရေးရှင်း၏ လမ်းညွှန်ချက်များနှင့် နှိုင်းယှဉ်ချက်

Duration	LM1 (dBA)	LM2 (dBA)	LM3 (dBA)	EG- IFC (dBA)
				Industrial/ Commercial
Daytime 0700-22:00	62	59	70	70
Night-time 22:00 - 0700	49	53	62	70

ထိခိုက်မှု လျော့ချနည်းများ - ဆောက်လုပ်ရေးကာလ

ဖုန်မှုန့်၊ ဆူညံသံနှင့် တုန်ခါမှု ထိန်းချုပ်ခြင်း

- စီမံကိန်းနေရာအနှံ့ရှိ ဝင်ထွက်သွားလာရာလမ်းများနှင့် မာကျောသောမြေနေရာများ အားလုံးကို ပြန်လည်အသုံးပြုနိုင်သော ရေများဖြင့် ပတ်ဖျန်းပေးခြင်း
- ဆောက်လုပ်ရေးယာဉ်များမှ မြေကြီးဖုန်မှုန့်များ ကပ်ပါပြီး လမ်းမများပေါ်သို့ ပေကျံခြင်း မရှိစေရန် စီမံကိန်းနေရာအတွက်၌ ယာဉ်များဆေးကြောသည့်နေရာ ထားရှိခြင်း
- အမှုန်များလွင့်စင်နိုင်သည့် ပစ္စည်းများ သယ်ဆောင်သော ဆောက်လုပ်ရေးယာဉ်များကို သင့်လျော်သည့် အဖုံးအကာများဖြင့် လုံခြုံစွာ ဖုံးအုပ်စေခြင်း
- တနင်္ဂနွေနေ့များ၊ အများပြည်သူရုံးပိတ်ရက်များနှင့် ညဂုနာရီ နောက်ပိုင်းများတွင် အသံဆူညံမှု အနည်းဆုံး အလုပ်များကိုသာ လုပ်စေခြင်း
- ဆူညံသံထွက်ပေါ်သည့် ဇာစ်မြစ်နေရာ၌ အကာအကွယ်များ ကာရံပေးခြင်း
- လိုအပ်ပါက အနီးပတ်ဝန်းကျင်ရှိ အဆောက်အဦးများတွင် လေထုညစ်ညမ်းမှု၊ အသံဆူညံမှု၊ တုန်ခါမှုတိုင်းတာသည့် ကိရိယာများ တပ်ဆင်ပေးပြီး အမြဲစောင့်ကြည့်ခြင်း



ထိခိုက်မှု လျော့ချနည်းများ - ဆောက်လုပ်ရေးကာလ

အဆောက်အဦးဖြိုဖျက်ခြင်း အထူးဂရုစိုက်မှု

- အမှုန်ထွက်ခြင်းလျော့နည်းစေရန် ဖြိုဖျက်မည့် အဆောက်အဦး၏ နေရာကို ဦးစွာရေဖျန်းခြင်း
- အဆောက်အဦးဖြိုဖျက်ရာမှ ထွက်လာသည့်အပိုင်းအစများ အပြင်သို့ လွင့်စင်မကျစေရန် ပိုက်ကွန်များဖြင့် ကာရံခြင်း၊ သတ်မှတ်အမြင့်တိုင်းတွင် ဖမ်းစင်များ တပ်ဆင်ခြင်း
- အသံဆူညံမှု လျော့နည်းစေရန် အသွားပါဝါများဖြင့် ကွန်ကရစ်ကို ချေဖျက်သည့်စက်များ (crushers)ကို အဓိက အသုံးပြုခြင်း



ရောဂါပိုးမွှားမပေါက်ပွားအောင် ထိန်းချုပ်ခြင်း

- အသိအမှတ်ပြုလေ့ကျင့်သင်ကြားမှုများ ပြီးစီးထားသည့် နားလည်တတ်ကျွမ်းသူများ ပါဝင်သော ရောဂါပိုးမွှားနှိမ်နင်းရေးအဖွဲ့ ဖွဲ့စည်းထားရှိပါမည်
- အပတ်စဉ် ခြင်ဆေးဖျန်းခြင်း
- ရေသေများကို ဖယ်ရှားရန်မဖြစ်နိုင်သော အခါများတွင် ရေမျက်နှာပြင်အပေါ်၌ ဆီအလွှာပါး ဖုံးအုပ်ခြင်းဖြင့် ခြင်ပေါက်ပွားမှုကို ကာကွယ်ခြင်း
- ဆောက်လုပ်ရေးတစ်ခွင် အစဉ်အမြဲ သပ်ရပ်သန့်ရှင်းနေစေရန် ဆောင်ရွက်ခြင်း



ထိခိုက်မှု လျော့ချနည်းများ - ဆောက်လုပ်ရေးကာလ

စွန့်ပစ်ပစ္စည်းများ စီမံခန့်ခွဲခြင်း

- စီမံကိန်းနေရာအတွင်း စွန့်ပစ်ပစ္စည်းများ ယာယီစုပုံထားနိုင်ရန် နေရာထားရှိခြင်း
- “အထွေထွေစွန့်ပစ်ပစ္စည်း”၊ “သတ္တုအပိုင်းအစများ”၊ “အုတ်ခဲ၊ ကွန်ကရစ်အပိုင်း အစများ နှင့် မြေကြီး” အစရှိသဖြင့် အမျိုးအစားခွဲပြီး ထင်ရှားစွာ အမည်ကပ်ထားသော သီးခြားအမှိုက်ပုံးများ ထားရှိခြင်း



- ရုံးခန်း၊ ထမင်းစားဆောင်၊ မီးဖိုဆောင်တို့မှ ထွက်ရှိလာသော လူသုံးစွန့်ပစ်ပစ္စည်း များအတွက် အထွေထွေ အမှိုက်ပုံးငယ်များကို အလုံအလောက် ထားရှိပေးခြင်း
- စွန့်ပစ်အမှိုက်ကန်များ ပြည့်သွားသောအခါ ရန်ကုန်မြို့တော်စည်ပင်သာယာရေး ကော်မတီ၏ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် သန့်ရှင်းရေးဌာနကို အမှိုက်များ လာရောက်သိမ်းယူရန် အကြောင်းကြားခြင်း

ယာဉ်အသွားအလာ ထိန်းချုပ်ခြင်း

- ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော်မတီမှ ချမှတ်ထားသော ယာဉ်အသွားအလာအချိန်များနှင့် ယာဉ်အရွယ်အစားကန့်သတ်ချက်များကို လိုက်နာပြီး ယာဉ်ကြောကျပ်တည်းမှုမရှိသည့် အချိန်များတွင်သာ သယ်ယူပို့ဆောင်ရေးလုပ်ငန်းများကို ဆောင်ရွက်ခြင်း
- ဆောက်လုပ်ရေးနှင့် ပြုပြင်ရေးလုပ်ငန်းများအတွက် လိုအပ်သော ယာယီလမ်းပိတ်ဆိုမှုများ ရှိလာမည် ဆိုပါက အများပြည်သူသို့ ကြိုတင်အသိပေးအကြောင်းကြားခြင်း

ထိခိုက်မှု လျော့ချနည်းများ - လုပ်ငန်းလည်ပတ်မှုတစ်လျှောက်

လေထု၊ အသံနှင့် တုန်ခါမှု အရည်အသွေး

- အဆောက်အဦးလည်ပတ်မှုမှ ထွက်ပေါ်လာသည့် ထုတ်လွှတ်အစိုးအငွေ့နှင့် ဆူညံသံများကို အပြည်ပြည်ဆိုင်ရာဘဏ္ဍာရေးကော်ပိုရေးရှင်း၏ စံချိန်စံညွှန်းများနှင့်အညီ စောင့်ကြည့်ထိန်းသိမ်းခြင်း
- လုပ်ငန်းလည်ပတ်ရာမှ မည်သည့်တုန်ခါမှုမှ ဖြစ်ပေါ်မလာနိုင်ခြင်း

စွန့်ပစ်ပစ္စည်းများ စီမံခန့်ခွဲခြင်း

- စီမံကိန်းပါ အဆောက်အဦးတစ်ခုစီမှ ယင်းနှင့် သက်ဆိုင်ရာ အမှိုက်များကို တာဝန်ယူ စီမံခန့်ခွဲစေသည့် စနစ်များ ထားရှိပေးခြင်း
- အဆောက်အဦးတစ်ခုချင်းစီမှ စီမံခန့်ခွဲစွန့်ပစ်လိုက်သည့် အမှိုက်များကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် သန့်ရှင်းရေးဌာနက လာရောက်မသိမ်းဆည်းမီ အမှိုက်များ သိပ်သည်းအောင် ဖိပြားသည့် စက်ပစ္စည်းများ တပ်ဆင်ထားသည့် စုပေါင်းအမှိုက်ပစ်အခန်း များထားရှိခြင်း
- စွန့်ပစ်ရေအမျိုးမျိုး (အိမ်သာ၊ ရေချိုးခန်း၊ လက်ဆေးကန်၊ မီးဖိုချောင်သုံး ရေဆေးကန်များမှ ထွက်ရှိလာသော စွန့်ပစ်ရေများ) တို့ကို မိလ္လာပိုက်လိုင်းနှင့် စီးဆင်းရေမြောင်းများအတွင်းသို့ စွန့်ထုတ်မှုမပြုဘဲ အပြည်ပြည်ဆိုင်ရာ ဘဏ္ဍာရေးကော်ပိုရေးရှင်း၏ စွန့်ပစ်ရေစံနှုန်းများနှင့်အညီ သန့်စင်နိုင်ရန် စွန့်ပစ်ရေ သန့်စင်စက်အား ဒီဇိုင်းရေးဆွဲတည်ဆောက်ခြင်း
- သန့်စင်ပြီးရေကို အဆောက်အဦးများအားလုံး၏ လေအေးပေးစနစ်အတွက် လိုအပ်သော ရေအေးအဖြစ် ပြန်လည်အသုံးပြုစေခြင်း



ထိခိုက်မှု လျော့ချနည်းများ - လုပ်ငန်းလည်ပတ်မှုတစ်လျှောက်

စီးဆင်းရေးမြောင်း

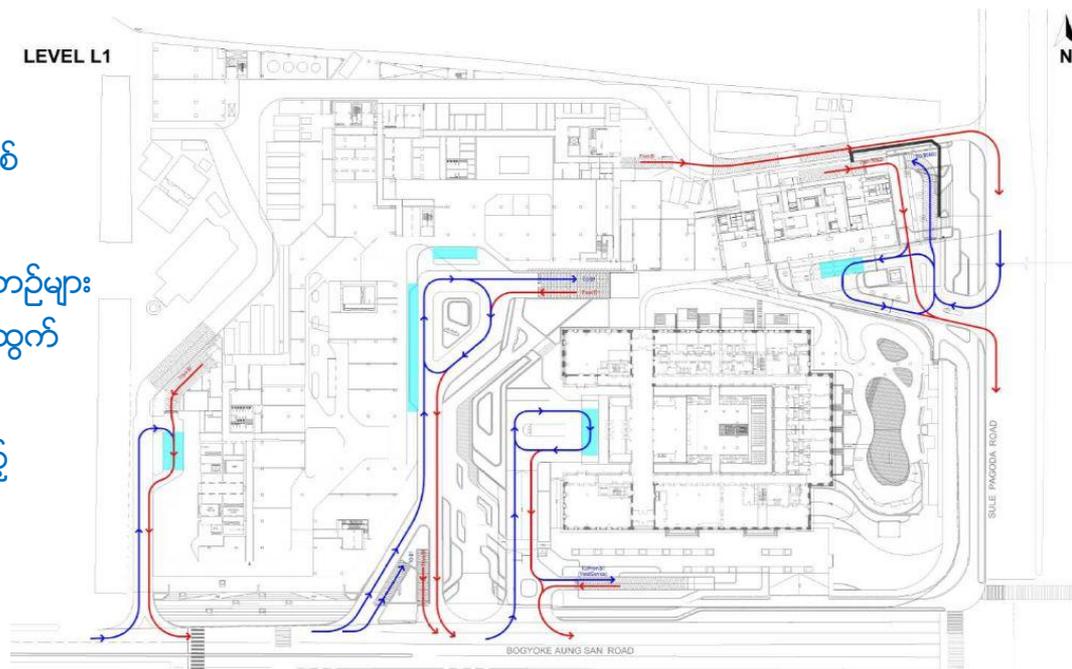
- ရေကြီးရေလျှံခြင်းအန္တရာယ် လျော့ကျစေရန် လက်ရှိ စီးဆင်းရေးမြောင်းကို နေရာရွှေ့ပြောင်းပြီး အဆင့်မြှင့်တင်ခြင်း

ရေ၊ မီး ရယူမှု

- နေ့စဉ်သုံးစွဲရန်လိုအပ်သော ခန့်မှန်းရေပမာဏ ၁၃၀၀ကုဗမီတာကို စီမံကိန်းနေရာအတွင်း အဝီစိတွင်း (၄) တွင်းမှ လုံလောက်စွာ ရယူခြင်း
- လုပ်ငန်းခွင်အတွက် လိုအပ်သည့် လျှပ်စစ်ဓါတ်အားကို သီးခြားဓါတ်အားခွဲရုံမှ ရယူခြင်း

ယာဉ်အဝင်အထွက် ထိန်းချုပ်ခြင်း

- လုပ်ငန်းလည်ပတ်ဆောင်ရွက်ခြင်းမှ ဖြစ်ပေါ်လာမည့် ယာဉ်အဝင်အထွက်များ လေ့လာဆန်းစစ်ချက်ကို ၂၀၁၅ခုနှစ် အောက်တိုဘာလတွင် ဆောင်ရွက်ခဲ့ပြီးဖြစ်
- လမ်းသွားလမ်းလာများ ဘေးကင်းလုံခြုံရေးနှင့် မော်တော်ယာဉ်များ အဆင်ပြေပြေ ဝင်ထွက်သွားလာနိုင်ရေးအတွက် ယာဉ်ဝင်/ထွက် နေရာများအား အချိုးအစားမျှတစွာ ဒီဇိုင်းရေးဆွဲထားခြင်း
- အမှိုက်သိမ်းယာဉ်၊ ကုန်တင်ယာဉ်၊ မီးသတ်ကား အစရှိသည့် ဝန်ဆောင်မှုယာဉ်ကြီးများအတွက် သက်ဆိုင်ရာနေရာသို့ ရောက်ရှိစေနိုင်သည့် ဝန်ဆောင်မှုယာဉ်လမ်းမ သီးသန့်ထားရှိပေးခြင်း



၅။ စီမံကိန်းသတ်မှတ်ကာလ

- ပိုင် အစမ်းရိုက်ခြင်း
 - ✓ စက်တင်ဘာ ၂၀၁၆ - ဒီဇင်ဘာ ၂၀၁၆
- ဂရင်းမီးရထားအဆောက်အဦးဖြိုခြင်း
 - ✓ ဖေဖော်ဝါရီ ၂၀၁၇ - မေ ၂၀၁၇
- FMIစင်တာအဆောက်အဦးဖြိုခြင်း
 - ✓ ဇွန် ၂၀၁၇ - စက်တင်ဘာ ၂၀၁၇
- ပိုင်ရိုက်ခြင်း၊ မြေကြီးတူးခြင်း စသည့် မြေကြီးအောက်လုပ်ငန်းများ
 - ✓ အောက်တိုဘာ ၂၀၁၆ - ဒီဇင်ဘာ ၂၀၁၉
- ဆောက်လုပ်ရေးလုပ်ငန်းအားလုံးပြီးစီးချိန်
 - ✓ ၂၀၂၀ နှစ်ကုန်ပိုင်း

၆။ ထိခိုက်နှစ်နာမှု ဖြေရှင်းရေး နည်းစနစ်

အမေး အဖြေ ကဏ္ဍ

နောက်ထပ် သိရှိလိုသော မေးခွန်းများ (သို့) ပေးလိုသော မှတ်ချက်များ ရှိပါက
ဩဂုတ်လ (၁၈) ရက်နေ့ ညနေ (၅)နာရီ နောက်ဆုံးထားပြီး
အောက်ဖော်ပြပါ ဆက်သွယ်ရန်လိပ်စာကို ရုံးချိန်အတွင်း
အီးမေးလ်ဖြင့် ဖြစ်စေ၊ စာဖြင့် ဖြစ်စေ၊ လူကိုယ်တိုင်ဖြစ်စေ
ပေးပို့နိုင်ပါသည်။

ခင်စန္ဒီလင်း

ESMS Officer

SPA Project Management Services Ltd.

အခန်း(၈၀၁-၈၀၅)၊ ရလွှာ၊ FMI Centre၊ ပန်းဘဲတန်းမြို့နယ်

အီးမေးလ် — khinsandylinn@yomastrategic.com

**Annex 9 Meeting Agenda and
Meeting Transcript**

Public Consultation Agenda

Pabedan Township (Wards 5, 8, 11)

10:00AM – 10:15AM	Guests arrival and registration	15 mins
10:15AM – 10:20AM	Introduction by Environ	5 mins
10:20AM – 10:25AM	Introduction by Than Aye	5 mins
10:25AM – 11:00AM	Presentation	35 mins
	1. Project Description	5 mins
	2. Heritage Conservation	8 mins
	3. Social Benefits	5 mins
	4. Environmental & Social Initiatives	10 mins
	5. Project Timeline	2 mins
	6. Grievance Redress Mechanism	5 mins
	Q&A Session (Moderator – Environ)	15 mins
11:00AM – 11:15AM	Closing by Environ	
11:15AM	Refreshment	15 mins

Public Consultation Agenda

Dagon Township (Yawmingyi Ward)

3:00PM – 3:15PM	Guests arrival and registration	15 mins
3:15PM – 3:20PM	Introduction by Environ	5 mins
3:20PM – 3:25PM	Introduction by Than Aye	5 mins
3:25PM – 4:00PM	Presentation	35 mins
	1. Project Description	5 mins
	2. Heritage Conservation	8 mins
	3. Social Benefits	5 mins
	4. Environmental & Social Initiatives	10 mins
	5. Project Timeline	2 mins
	6. Grievance Redress Mechanism	5 mins
	Q&A Session (Moderator – Environ)	15 mins
4:00PM – 4:15PM	Closing by Environ	
4:15PM – 4:30PM	Refreshment	15 mins

Public Consultation Agenda

Kyauktada Township (Wards 1, 2, 3)

1:00PM – 1:15PM	Guests arrival and registration	15 mins
1:15PM – 1:20PM	Introduction by Environ	5 mins
1:20PM – 1:25PM	Introduction by Than Aye	5 mins
1:25PM – 2:00PM	Presentation	35 mins
	1. Project Description	5 mins
	2. Heritage Conservation	8 mins
	3. Social Benefits	5 mins
	4. Environmental & Social Initiatives	10 mins
	5. Project Timeline	2 mins
	6. Grievance Redress Mechanism	5 mins
	Q&A Session (Moderator – Environ)	15 mins
2:00PM – 2:15PM	Closing by Environ	
2:15PM	Refreshment	15 mins

Public Consultation Agenda

Bogyoke Aung San Market and St. Gabriel's Church Union (Congregational)

5:00PM – 5:15PM	Guests arrival and registration	15 mins
5:15PM – 5:20PM	Introduction by Environ	5 mins
5:20PM – 5:25PM	Introduction by Than Aye	5 mins
5:25PM – 6:00PM	Presentation	35 mins
	1. Project Description	5 mins
	2. Heritage Conservation	8 mins
	3. Social Benefits	5 mins
	4. Environmental & Social Initiatives	10 mins
	5. Project Timeline	2 mins
	6. Grievance Redress Mechanism	5 mins
	Q&A Session (Moderator – Environ)	15 mins
6:00PM – 6:15PM	Closing by Environ	
6:15PM	Refreshment	15 mins

မီးရထားရုံးချုပ်ဟောင်းဝင်းအတွင်း တည်ဆောက်မည့် Land Mark
ဖွံ့ဖြိုးတိုးတက်ရေးစီမံကိန်းအတွက် ပြုလုပ်သော များပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးပွဲသို့
တက်ရောက်လာသူများ၏ ဆွေးနွေးချက်များ

၁၆ ဩဂုတ်လ ၂၀၁၆

နံနက် ၁၀ နာရီ

ပန်းပဲတန်း

မေး - ဗိုလ်ချုပ်လမ်းရဲ့ တဘက်ချမ်းမှာပဲကပ်ပြီးရှိနေတာကြောင့် ဆောက်လုပ်ရေးလုပ်ငန်းတွေ လုပ်လိုက်တိုင်း တုန်ခါမှုတွေခံစားရပါတယ်။ ဒီကအဆောက်အဦတွေမှာ တုန်ခါမှုကို တိုင်းတာ စောင့်ကြည့်ပေးတဲ့စက်ကရိယာတွေတပ်ပြီး လေ့လာစောင့်ကြည့်စေချင်ပါတယ်။ ဒီပါတ်ဝန်းကျင် မှာ ကားရပ်နားစရာ အခက်အခဲအများကြီးရှိပါတယ်။ ဒီကားရပ်နားစရာအခက်အခဲကို စီမံကိန်းအနေနဲ့ ဘယ်လိုစီစဉ်ထားပါသလဲ။ Sule Square Hotel ကြီးဆောက်တော့ ငြိမ်းတတ်ထားတဲ့ပိုက်တွေကို ည (၁၁)နာရီ၊ (၁၂)နာရီလူတွေနားနေချိန်မှာ ဖြုတ်ချတာလုပ်ပါတယ်။ သံပိုက်တွေကို ပစ်ချပုံချတာတွေ ကြောင့်အသံဆူညံမှုကို တော်တော်လေးထိခိုက်ခံစားရပါတယ်။ ဒီလိုဆူညံသံတွေကို ထိမ်းချုပ်ပေး စေလိုပါတယ်။ နောက်တခုကတော့ ဆောက်လုပ်ရေးလုပ်ငန်းယာဉ်ကြီးတွေသွားလာတဲ့အခါ လမ်း ပျက်စီးမှုရှိလာနိုင်ပါတယ်။ အချို့လမ်းတွေက အစိုးရကလုပ်ပေးသလို အချို့လမ်းတွေက ရပ်ကွက်က ပူးပေါင်းလုပ်ထားတာပါ။ စီမံကိန်းကလမ်းပျက်စီးမှုအပေါ်တာဝန်ယူပေးစေချင်ပါတယ်။

ဖြေ - ဒီစီမံကိန်းမှာ ရှေးဟောင်းမီးရထားရုံးဟောင်းကြီးကို ထိမ်းသိမ်းစောင့်ရှောက်ရမှာဖြစ်လို့ တုန်ခါမှု ဒါဏ်တွေကို အထူးသတိထားဆောင်ရွက်မှာပါ။ ဒီရှေးဟောင်းအဆောက်အဦက စီမံကိန်းဝင်းထဲမှာ ရှိနေလို့ ပိုပြီးတောင် သတိထားရမှာဖြစ်ပါတယ်။ ဆောက်လုပ်ရေးလုပ်ငန်းတွေမစမီ အနီးအနားရှိအ ဆောက်အဦတွေကို ကြိုတင်လေ့လာစစ်ဆေးမှုတွေလုပ်ပေးပါမယ်။ တုန်ခါမှုအတွက် တိုင်းထွာတဲ့ ကရိယာတွေကိုလဲ သက်ရောက်နိုင်တဲ့နေရာပါတ်လည်မှာ တပ်ဆင်လေ့လာစောင့်ကြည့်မှာပါ။

ဆောက်လုပ်ရေးနည်းပညာက လွန်ခဲ့တဲ့အနှစ်နှစ်ဆယ်ထက်တော်တော်ကောင်းကောင်းမွန်မွန်ပြောင်း လဲခဲ့ပြီဖြစ်လို့ ခေတ်မှီနည်းပညာတွေ၊ လုပ်ငန်းအတွေ့အကြုံရှိတဲ့အပြည်ပြည်ဆိုင်ရာအဖွဲ့အစည်းတွေ နဲ့ အကောင်းဆုံးဖြစ်အောင်လုပ်ပါမယ်။

ယာဉ်ကြောပိတ်ဆိုမှုနဲ့ပါတ်သက်ပြီး ဆောက်လုပ်ရေးကာလနဲ့ လုပ်ငန်းစတင်လည်ပတ်တဲ့ကာလ တွေအတွက်ကော ယာဉ်ကြောပိတ်ဆိုနိုင်မှုတွေကိုလေ့လာဆန်းစစ်မှုတွေလုပ်ထားပါတယ်။ ယာဉ်ကြောစီးဆင်းမှုအပေါ်ကို သက်ရောက်မှုအနည်းဆုံးဖြစ်စေအောင် ဗိုလ်ချုပ်အောင်ဆန်း လမ်း ဘက်မှ ဝင်ပေါက်နှစ်ပေါက်နဲ့ အလံပြဘုရားလမ်းဘက်မှ ထွက်ပေါက်တခုထားရှိပေးမှာဖြစ်ပါတယ်။

ဒီပါတ်ဝန်းကျင်မှာရှိတဲ့အခြားစီမံကိန်းတွေကြောင့်ဖြစ်ပေါ်လာတဲ့ ယာဉ်စီးဆင်းမှုပိတ်ဆို့နိုင်တာတွေလဲ ဖြစ်နိုင်ပါတယ်။ ယာဉ်လမ်းကြောင်းပိတ်ဆို့မှုအနည်းဆုံးဖြစ်အောင် လုပ်ငန်းအစီအစဉ်ရေးဆွဲရာမှာ ရော၊ လုပ်ငန်းလုပ်ဆောင်မှုကိုပါ အသေးစိတ်စီမံထားပါတယ်။

ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက်လဲ ကိုယ်ပိုင်စည်းမျဉ်းစည်းကမ်းတွေရှိနေသလို အပြည်ပြည်ဆိုင် ရာငွေကြေးရံပုံငွေအဖွဲ့ကြီးက ချမှတ်ထားတဲ့ နည်းနာများကိုလဲ လိုက်နာကျင့်သုံးမှာပါ။

ဆောက်လုပ်ရေးသုံးယာဉ်များနဲ့ ပစ္စည်းအတင်အချတို့ကို YCDCကသတ်မှတ်ထားတဲ့စည်းမျဉ်းစည်း ကမ်းများအတိုင်း ညဦးပိုင်းတွေမှာ အသုံးပြုမှာဖြစ်ပါတယ်။ ကားအကြီးတွေဝင်ဘို့ ထွက်ဘို့ ရှိတဲ့အခါ လဲ သက်ဆိုင်ရာလူထုများကို ကြိုတင်အသိပေးအကြောင်းကြားမှာပါ။ လုပ်ငန်းသုံးယာဉ်တွေကို လမ်း ပေါ်မှာပိတ်ဆို့မနေအောင်အတွက်လဲ စီမံကိန်းဝင်းအတွင်းမှာ နေရာချထားပြီး ဆောင်ရွက်မှာ ဖြစ်ပါ တယ်။

အဆောက်အဦများဖြိုဖျက်မှုကို အများပြည်သူနားနေတဲ့ညဘက်မှာမလုပ်ပဲ သဘာဝဆူညံသံများတဲ့ နေ့ခင်းဘက်တွေမှာ အသံဆူညံမှုအနည်းဆုံး ဖိညှစ်ဖြိုဖျက်တဲ့နည်းစံနစ်ကို အသုံးပြုပြီးလုပ်မှာဖြစ် ပါတယ်။ အသံထွက်အနည်းဆုံးဖြစ်အောင် လုပ်ငန်းစီစဉ်မှုလုပ်သလို အသံတားတဲ့အရာများလဲ ထပ်လောင်းအားဖြည့်ပြီး အသံတွေကို ထိမ်းချုပ်ထားမှာဖြစ်ပါတယ်။

မေး - ညဘက်အသံအတိတ်ဆုံးဖြစ်အောင် မည်သည့်လုပ်ငန်းစတင်လုပ်ပါမည်လဲ။ ဒီမှာ သက်ကြီး ရွယ်အိုများနဲ့ လူမမာများလဲနေထိုင်နေကြပါတယ်။ ဖုန်မှုန့်တွေက ကျမ်းမာရေးအတွက်ထိခိုက်နိုင်စ ရာရှိပါတယ်။ ဆူညံသံတွေကို ဘယ်နှစ်နာရီနောက်အကျဆုံးလုပ်မယ်ဆိုတာသိချင်ပါတယ်။ အချို့ ဆောက်လုပ်ရေးလုပ်ငန်းများကြောင့် ဆူညံမှုကို အတော်ခံစားခဲ့ရပါတယ်။ YCDC ကိုအကြောင်း ကြားတဲ့အခါလဲ ဘာမှညှိနှိုင်းလို့မရပါဘူး။ ယခုစီမံကိန်းမှာ ဆူညံသံတွေဟာ ဘယ်လောက်ထိ ရှိမယ်ဆိုတာကို သိလိုပါတယ်။ ဒါ့အပြင်ထုတ်တဲ့ရေဆိုးရေညစ်တွေ၊ အညစ်အကြေးတွေကြောင့် ပါတ်ဝန်း ကျင်မှာမြောင်းပိတ်တာ အနံ့အသက်ဆိုးရွားတာတွေဖြစ်ပါတယ်။ သုံးနေတဲ့ရေပိုက်ထဲတွေ ကိုလဲ ရေ ဆိုးရေညစ်တွေစိမ့်ဝင်တယ်လို့ သံသယဖြစ်ပါတယ်။ ယခုစီမံကိန်းမှာ အခုလိုပြသနာမျိုး တွေမဖြစ် အောင်ဘယ်လိုစီစဉ်ထားတယ်ဆိုတာသိလိုပါတယ်။

ဖြေ - အပြည်ပြည်ဆိုင်ရာဘဏ္ဍာရေးအဖွဲ့၊ ကမ္ဘာ့ဘဏ်တို့ကအကူအညီနဲ့ လုပ်ဆောင်တဲ့စီမံကိန်းဖြစ် တာကြောင့် နိုင်ငံတကာအဆင့်အတန်းမီမီ ပါတ်ဝန်းကျင်ထိမ်းသိမ်းစောင့်ရှောက်ရေးကို အလွန်ဂရု စိုက်လုပ်ဆောင်မှာဖြစ်ပါတယ်။ စီမံကိန်းကထွက်လာတဲ့ ရေဆိုးရေညစ်များကို မြေအောက်ထပ်မှာ ပြန်လည်သန့်စင်ပြီးတော့ သန့်စင်လိုက်တဲ့ ရေကို လေအေးပေး စက်တွေအတွက် ပြန်လည် အသုံးပြုမှာပါ။ ဖိညှစ်စစ်ထုတ်ပြီးသားအဖတ် များကိုသာ စည်းမျဉ်းနဲ့အညီ သက်ဆိုင်ရာ အဖွဲ့ကနေ တဆင့် ထိမ်းသိမ်းစွန့်ပစ်မှာပါ။

အဆောက်အဦးများဖြိုဖျက်တဲ့အခါလဲ ဖုန်မှုန့်အနဲဆုံးဖြစ်အောင် ရေဝအောင်ဖြန်းပြီးမှ လုပ်မှာဖြစ်လို့ အသံလဲထိမ်းရင်း တခါတည်းဖုန်ထွက်မှုကိုလဲ လျော့နည်းစေမှာဖြစ်ပါတယ်။ ဖြိုချမှာမဟုတ်ပဲ တဆင့်ချင်းစီအလိုက်ဖိညှစ်ချေဖျက်မှာဖြစ်လို့ အသံထွက်မှုလျော့နည်းစေမှာပါ။ နေ့လည်နေ့ခင်းသဘာဝ အလျောက်ကြားနေရတဲ့အသံတွေထက်ထူးပြီး ပိုဆူညံတဲ့အသံထွက်မှာမဟုတ်ပါဘူး။

မြေတူးတဲ့အချိန် ဖုန်မှုန့်တွေပြန်လွင့်မှုမဖြစ်အောင် ကားတွေနဲ့ရေသေသေချာချာဖြန်းဘို့ စီစဉ်ထားပါတယ်။ ဒါ့အပြင်ဖုန်မှုန့်ကာဆီးတဲ့ဇကာများဘေးပါတ်ဝန်းကျင်မှာတပ်ဆင်ထားမှာဖြစ်လို့ ဖုန်မှုန့်ကို ပိုပြီး ထိမ်းချုပ်ထားပြီးသားဖြစ်စေပါလိမ့်မယ်။ ကွန်ကရစ်လောင်းတာကိုလဲ YCDCကသတ်မှတ်ခွင့်ပြုထားတဲ့အချိန်အတွင်းပဲ အစီအစဉ်ချလုပ်မှာဖြစ်ပါတယ်။ တကယ်လို့ သက်ကြီးရွယ်အိုတွေ၊ ဒေသခံပြည်သူလူထုတွေ အိပ်ရေးထိခိုက်တာဖြစ်အောင်ဆူညံရင် ချက်ခြင်းအကြောင်းကြားတာနဲ့ ရပ်ဆိုင်းအောင်စီမံပါမယ်။ စွန့်ပစ်ပစ္စည်းတွေကို စီမံကိန်းပြင်ပထွက်အောင် စီမံကိန်းအတွင်းမှာနေရာတခုနဲ့ လုံလုံခြုံခြုံထိမ်းသိမ်းထားရှိပြီးတော့ စည်ပင်ကိုလွှဲပြောင်းစွန့်ပစ်မှာဖြစ်ပါတယ်။ ဆောက်လုပ်ရေးကာလအတွင်းရေဆိုးတွေကို ရေနှုတ်တူးမြောင်းကောင်းကောင်းပြန်လည်တည် ဆောက်ပြီး သန့်စင်ပြီးမှ စည်ပင်ရေနှုတ်မြောင်းထဲကို စွန့်ပစ်မှာဖြစ်ပါတယ်။

မေး - စီမံကိန်းတွေအပေါ်ယုံကြည်မှုအတော်နဲ့နေပါတယ်။ အာဏာစက်နဲ့စီမံကိန်းတွေပူးပေါင်းပြီး လုပ်ချင်သလိုလုပ်နေကြတော့ ပြည်သူက ဘယ်လိုမှဖြေရှင်းမရပဲ ခံစားရပါတယ်။ အချို့လုပ်ငန်းတွေလို အနံ့အသက်၊ ရေဆိုးရေညစ်တွေစွန့်ပစ်တာမျိုးတင်ပြတာကို လျှစ်လျူရှုတာတွေကြောင့် ယုံကြည်မှုမဲ့နေတာပါ။ ဒီလိုညှော်နဲ့တွေ ရေဆိုးရေညစ်တွေကြောင့် ဘေးထွက်ဆိုးကြီးတွေရှိပါတယ်။ ပြည်သူလူထုကို မေတ္တာထားပြီး ကတိပေးထားရင် ကတိပေးထားသလို လုပ်ပေးစေချင်ပါတယ်။

ဖြေ - ယခုလိုလူထုအပေါ်ညှော်နင်းဆွေးနွေးပြီးလူထုဆန္ဒကိုပါထည့်သွင်းစဉ်းစားတဲ့ လုပ်ဆောင်မှုမျိုး အခြားစီမံကိန်းတွေမှာ လုပ်ဆောင်တာ တွေ့ရမှာမဟုတ်ပါဘူး။ ဒီလူထုနဲ့ညှော်နင်းဆွေးနွေးပွဲနဲ့ သတင်းဖလှယ်မှုလုပ်ငန်းရဲ့အဓိကရည်ရွယ်ချက်ကလဲ လူထုထဲက ဆန္ဒနဲ့သဘောထားကို ရယူဘို့ အတွက်ဖြစ်ပါတယ်။

ဒါ့ကြောင့် ပါတ်ဝန်းကျင်လူထုမှာ အခုလိုခံစားရတာကို နားလည်သလို ကိုယ်ချင်းလဲစာပါတယ်။ ယခု စီမံကိန်းမှာ အပြည်ပြည်ဆိုင်ရာဘဏ္ဍာရေးအဖွဲ့လိုအဖွဲ့မျိုးကြီးတွေရဲ့အကူအညီကို ရယူလုပ်ရတာဖြစ်လို့ ပါတ်ဝန်းကျင်နဲ့လူထုကိုထိခိုက်မှာတွေကို သေသေချာချာဆန်းစစ်ပြီးမှ လုပ်ဆောင်ရပါတယ်။ ဒီလိုမျိုး လူထုကို ထိခိုက်နစ်နာစေမှာတွေမရှိအောင် အထူးသတိထားလုပ်ကိုင်မှာကို စိတ်ချစေချင်ပါတယ်။

နေ့လည် ဘနာရီ

ကျောက်တံတားမြို့နယ်

မေး- FMI စနစ်တာကို ဖြိုချမယ်ဆိုရင် လက်ရှိလုပ်နေတဲ့အလုပ်သမားတွေအတွက် ဘယ်လိုတာဝန်ယူ စီစဉ်ပေးထားတာ ရှိမလဲ သိချင်ပါတယ်။

ဖြေ - လက်ရှိဂရုန်းမီးရထားဟော်တယ်ကတော့ ဘယ်သူမှမရှိပါဘူး။ FMI စနစ်တာနဲ့ အောက်က ကုန် တိုက်မှာ လက်ရှိအလုပ်လုပ်နေတဲ့သူတွေရှိပါတယ်။ ဒီလူတွေကို ကြိုတင်ပြီး အကြောင်းကြားမှာပါ။ FMI စနစ်တာကလူတွေအတွက် နေရာအသစ်ကို ဆောက်လုပ်ထားပြီးတော့ သူတို့ကိုအဲ့ဒီမှာ အလုပ် ပြန်ပေးမှာဖြစ်ပါတယ်။ ကုန်တိုက်ကသူတွေကိုတော့ သတ်မှတ်ကာလတခုအတွင်း အကြောင်းကြား ပြီး သူတို့အလုပ်အကိုင်မဆုံးရှုံးစေရေးအတွက် စီစဉ်ပေးမှာပါ။

မေး - ကြားသိရတဲ့ ကားပါကင်ကို ဘယ်လိုပေအမြင့်တွေနဲ့ ဘယ်သူတာဝန်ယူပြီးတော့ ထားရှိမှာပါ လဲ။ ရန်ကုန်မှာကားက တနေ့တခြားပိုကြပ်ကြပ်လာလို့ မနက်နာရီဆို ကားသွားလို့ မရလောက် အောင်ဖြစ်လာပါပြီ။ ဘယ်လိုပုံစံမျိုးနဲ့ သယ်ယူပို့ဆောင်မှုတွေကိုလုပ်ပြီး အဲ့ဒါအတွက် ပါတ်ဝန်း ကျင်ယာဉ်လမ်းကြောင်းတွေမှာ ဘယ်လိုသက်ရောက်မှုတွေဖြစ်လာနိုင်ပါသလဲ သိချင်ပါတယ်။

ဖြေ - အဲ့ဒီစိုးရိမ်ချက်ဟာ အမှန်ဖြစ်ပါတယ်။ မြန်မာပြည်မှာ ကားတွေက အမှန်ကိုပိတ်နေတာပါ။ ယာဉ်လမ်းကြောင်းအပေါ်သက်ရောက်မှုနဲ့ပါတ်သက်ပြီးပြောရမယ်ဆိုရင် နှစ်ပိုင်းခွဲပြောပါမယ်။ ပထမဆောက်လုပ်ရေးကာလနဲ့ နောက်ပိုင်း လုပ်ငန်းစတင်လည်ပါတဲ့ကာလဆိုပြီး ခွဲခြားကြည့်ပါမယ်။ ယာဉ်ကြောတွေပေါ်မှာသက်ရောက်မှုကို ထိရောက်မှုနည်းအောင်လို့ Mainhardt (ထိုင်းနိုင်ငံ)အဖွဲ့က လေ့လာဆန်းစစ်မှုတွေလုပ်ပါတယ်။ ဒီလိုလေ့လာဆန်းစစ်ပြီးတော့ ပိုလ်ချုပ်လမ်းကနေ စီမံကိန်းဆီ ကိုလုပ်ငန်းဆောင်တာယာဉ်တွေဝင်ဘို့ တပေါက်ထားရှိပါမယ်။ ဒီဇယ်ထဲခွဲယာဉ်တို့၊ မီးသတ်ယာဉ် တို့အစရှိသဖြင့် လုပ်ငန်းဆောင်တာယာဉ်တွေချည်းဝင်ဘို့ပါ။ ဆောက်လုပ်ရေးကာလအတွင်း ဆောက်လုပ်ရေးလုပ်ငန်းဆိုင်ရာယာဉ်တွေကို ရန်ကုန်မြို့တော်စည်ပင်သာယာက သတ်မှတ်ထားတဲ့ အတိုင်း ညဦးဘက်ပိုင်းမှာ ပစ္စည်းတွေအတင်အချလုပ်ရန်စီစဉ်ထားပါတယ်။

လုပ်ငန်းဆိုင်ရာယာဉ်တွေကို လမ်းမပေါ်တွေမှာ ရပ်တန့်ပြီး ယာဉ်ကြောပိတ်ဆို မှုကို ထပ်မံအားဖြည့် တာမျိုးမဖြစ်စေအောင် စီစဉ်မှာပါ။ စီမံကိန်းဧရိယာထဲမှာ နေရာလုံလုံလောက်လောက်ရှိတဲ့အတွက် ဒီ ယာဉ်တွေအားလုံးကို အထဲမှာ နေရာအမြန်ချထားပေးနိုင်ပါလိမ့်မယ်။ ဒီအနားပါတ်ဝန်းကျင်အတွင်း ယခုယာဉ်ပိတ်ဆို မှုမှာ ယခုစီမံကိန်းကြောင့်တော့ ပိတ်ဆို မှုဖြစ်တာမ ဟုတ်ပါဘူး။ စီမံကိန်း ကြောင့်ယာဉ်ပိတ်ဆို မှုမှာ သက်ရောက်မှုရှိနိုင်တာအမှန်ဖြစ်သော်လည်း အဲ့ဒါကို အနည်းဆုံး

ဖစ်အောင်ကြိုးစားလုပ်ဆောင်သို့ အစီအမံတွေ ချမှတ်ထားပါတယ်။ ဆောက်လုံးရေးနဲ့ ပါတ်သက်တဲ့ ယာဉ်တွေကိုလဲ လမ်းများပေါ်မှာ လုံးဝရပ်နားနေတာ မရှိအောင် စီစဉ်ထားပါမယ်။ စီမံကိန်းပြီးသွားပြီး လုပ်ငန်းစတင်လည်ပါတဲ့အချိန်မှာတော့ ဗိုလ်ချုပ်အောင်ဆန်းလမ်းကနေ ဝင် ပေါက်၂ခုရှိမှာဖြစ်ပြီး အလံပြဘုရားလမ်းကနေထွက်ပေါက်တခု ထားပေးမှာပါ။

မေး - ဒီအနားပါတ်ဝန်းကျင်ထဲမှာ ဆောက်လုပ်ရေးအုပ်စုတခုကဆောက်လုပ်နေတာမှာ လမ်းတွေပိတ် ပြီးအများပြည်သူသွားလာလို့ မရတာဖြစ်တာတွေရှိတယ်။ အင်္ဂတေပြိုကျပြီး အန္တရာယ်ဖြစ်ပေါ်စေနိုင် တာတွေရှိပါတယ်။ ဒါတွေကို ဘယ်လိုစဉ်းစားထားပါသလဲ။

ဖြေ - ဒီစီမံကိန်းမှာတော့ မိမိတို့လုပ်ငန်းရဲ့လုပ်ငန်းခွင် လုံခြုံရေးစည်းမျဉ်းစည်းကမ်းများ သေသေချာ ချာချမှတ်ထားတာရှိပါတယ်။ တကယ်လို့ စီမံကိန်းထဲမှာ တခုခုအဆင်မပြေစရာပေါ်ပေါက်လာခဲ့ရင် ညှိနှိုင်းဆွေးနွေးအဖြေရှာရေးကော်မတီကို အကြောင်းကြားပြီး ချက်ခြင်းပြန်လည်တာဝန်ယူဖြေရှင်းတာ လုပ်ပေးမှာဖြစ်ပါတယ်။ ဆောက်လုပ်ရေးနည်းစံနှစ်များမှာလဲ နောက်ဆုံးပေါ်နည်းစံနှစ်များကို အသုံးပြု သွားမှာဖြစ်တဲ့အတွက် ရှေးဟောင်းအဆောက်အဦးမထိခိုက်စေရေးကိုပါ အထောက်အကူဖြစ် စေမှာ ဖြစ်ပါတယ်။ D-Wall လို့ခေါ်တဲ့ Diaphragm Wall စံနှစ်ကိုသုံးမှာပါ။

မေး - D-Wallစံနှစ်ကို အသုံးပြုမယ်ဆိုတော့ အဆောက်အဦးကြီးလေးခုဆောက်လုပ်တဲ့အခါ အဲ့ဒီတုန့်ခါမူတွေက ရှေးဟောင်းအဆောက်အဦးပေါ်မှာ ဘယ်လိုသက်ရောက်မှုတွေရှိမလဲ သိပါရစေ။

ဖြေ - ရှေးဟောင်းရုံးကြီးအတွက် Reaction Frame သေသေချာချာထောက်တာလုပ်ပြီးတော့မှ တူးယူ မှုတွေစလုပ်မယ်ဖြစ်ပါတယ်။ မြေကြီးတူးနေစဉ်မှာလဲ ရုံးဟောင်းကြီးမှာ လေ့လာစောင့်ကြည့်ရေးကရိ ယာတန်ဆာပလာတွေတပ်ဆင်ထားပြီး စီမံကိန်းကသတ်မှတ်ထားတဲ့ ဆူညံတုန့်ခါမူတွေပမာဏ အ တွင်းထဲမှာပဲရှိမရှိ စောင့်ကြည့်နေမှာပါ။ ဒီရှေးဟောင်းအဆောက်အဦးကို ထိခိုက်မှာမခံနိုင်တဲ့အတွက် ဘက်ပေါင်းစုံက အသေအချာစောင့်ကြည့်လုပ်ဆောင်မှာပါ။

မေး - ယာဉ်ကြောပိတ်ဆို မှုတွေဖြစ်လာစရာရှိရင် ဘယ်လိုသတင်းပေးတာလုပ်မလဲ သိချင်ပါတယ်။

ဖြေ - အခုလူထုနဲ့တွေ့ဆုံညှိနှိုင်းတာနဲ့ သတင်းဖလှယ်တာမလုပ်ခင်မှာ လူမှုစီးပွားရေးစစ်တမ်းတွေ ကောက်ယူရင်း စီမံကိန်းနဲ့သက်ဆိုင်နေတဲ့ ဒေသဆိုင်ရာအုပ်ချုပ်ရေးရုံးတွေ အားလုံးနဲ့ဆက်သွယ်ခဲ့ ပါတယ်။ နောက်ပိုင်းလုပ်ငန်းနဲ့ပါတ်သက်လို့ သက်ဆိုင်ရာလူထုဆီကို အကြောင်းကြားစရာတစုံတ ခုရှိလာပြီဆိုရင်လဲ သက်ဆိုင်ရာဒေသအုပ်ချုပ်ရေးအဖွဲ့များကနေတဆင့် ကြိုတင်အကြောင်းကြား ဆက်သွယ်တာလုပ်ပေးမယ်ဖြစ်ပါတယ်။ ထိခိုက်နစ်နာမှုများညှိနှိုင်းဖြေရှင်းရေးကော်မတီကို အခု တော့မဖွဲ့ရသေးပါဘူး။

ညနေ ၃နာရီ

ဒဂုံမြို့နယ်

မေး - အကြီးစားလုပ်ငန်းဖြစ်တဲ့အတွက် သဘောတူညီမှုသက်တမ်း အနှစ်၅၀လို့ ဖော်ပြပါတယ်။ သက်တမ်းတိုးနဲ့ ဆိုရင် အနှစ်၇၀အထိရနိုင်ပြီးတော့ BODစံနှစ်နဲ့ သွားမယ်လို့ ယူဆပါတယ်။ အနှစ် ၇၀ ကြာပြီးရင် မီးရထားကို ပြန်လွှဲအပ်ရမယ်လို့ နားလည်ပါတယ်။ အဲ့ဒါဟုတ်မဟုတ်ကို အတည်ပြု သိချင်ပါတယ်။

ဖြေ - မူလမြေပိုင်ရှင်က မီးရထားဌာနကပါ။ အကျိုးတူပူးပေါင်းတဲ့ BODစံနှစ်ပါ။ ယခင်ဥပဒေအရ အနှစ်၃၀အစားကို ယခုမြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုဥပဒေအသစ်ရ အနှစ် ၅၀ကိုပြောင်းပေးလိုက်တာပါ။ နောက်ထပ် ၁၀နှစ်နှစ်ကြိမ်သက်တမ်းတိုးမှာပါ။ အဲ့ဒါပြီးရင် ထပ်မံ သ ဘောတူမှုလုပ်နိုင်ဘို့ ကြိုးစားမှာပါ။ သက်တမ်းပြီးသွားရင်တော့ မီးရထားဌာနကို လွှဲပြောင်းပေးအပ်ရ မှာပါ။

မေး - MIC ကိုတင်ရင် သဘာဝပတ်ဝန်းကျင်ထိမ်းသိမ်းရေးနဲ့ ပတ်သက်ပြီး EIA, SIA နောက်ပြီး EMP တွေတင်ရတယ်လို့ သိရပါတယ်။ တင်တဲ့အခါလဲ လူထုနဲ့ တွေ့ဆုံဆွေးနွေးမှုမှတ်တမ်းကိုလဲထည့် သွင်းရပါတယ်။ အခုကတော့ MIC ပါမစ်ရပြီးမှ လူထုနဲ့ တွေ့ဆုံဆွေးနွေးတာလုပ်တော့ တိုင်ပင် Sequenceနဲ့အောက်နေသလိုပါပဲ။ ဘာပဲဖြစ်ဖြစ် လုံးဝမတွေ့တာထက်စာရင် အခုလိုမျိုးတွေ့ဆုံခွင့် ရတာကောင်းပါတယ်။

ဖြေ - MIC ပါမစ်ရပြီးသားဆိုတဲ့အချက်က မမှန်ပါဘူး။ အခုမှ တင် ဘို့လုပ်နေတုံးပဲ ရှိပါသေးတယ်။ မေးခွန်းမှာဖော်ပြသလိုပဲ EIA, SIA တွေပါဘို့ လူထုနဲ့ တွေ့ဆုံဆွေး နွေးတာတွေလုပ်ဘို့ လိုအပ်လို့ အခုလူထုညှိနှိုင်းဆွေးနွေးပွဲလုပ်တာပါ။ ဒါတွေကို ESIA အစီရင်ခံစာ ထဲမှာ တွဲထည့်ပြီးမှ တင်မှာပါ။

မေး - နိုင်ငံခြားမှာ အဆောက်အဦးတွေဖြိုဖျက်တဲ့အခါ အောက်ခြေကဖောက်ခွဲရေးပစ္စည်းတွေ တပ်ပြီး မှ အချိန်တိုတိုနဲ့ ဖြိုဖျက်တာမျိုးလုပ်တာ ကြားဘူးပါတယ်။ ဒီမှာအဲ့ဒီလိုနည်းသုံးမလား၊ ဘယ်လိုနည်း စံနှစ်နဲ့ ဖြိုဖျက်တာလုပ်မလဲဆိုတာ သိချင်ပါတယ်။

ဖြေ - ဖောက်ခွဲရေးပစ္စည်းတွေနဲ့ဖြိုဖျက်တဲ့စံနှစ်ကို အခုစီမံကိန်းမှာ အသုံးပြုလို့မရပါဘူး။ အဓိကက တော့ ဒီစီမံကိန်းထဲမှာ ရှေးဟောင်းအဆောက်အဦးပါနေတဲ့အတွက် ထိခိုက်မှုတွေဖြစ်လာနိုင်လို့ ပါ။ အဆောက်အဦးဖြိုဖျက်တာလုပ်တဲ့အခါမှာ အသံဆူညံတဲ့ ထုရိုက်ဖြိုဖျက်ခြင်းကိုမသုံးပဲ စက်ယန္တရား အသုံးပြုပြီး ကြိတ်ညှစ်ဖြိုဖျက်တဲ့နည်းစံနှစ်နဲ့ တလွှာချင်း အဆင့်ဆင့်ဖြိုဖျက်မှာပါ။ ဒီလိုဖြိုဖျက်မှုကို

လုပ်တဲ့အခါမှာ အသံ၊ တုန်ခါမှု၊ ဖုန်မှုန့်နဲ့ ရှေးဟောင်းအဆောက်အဦး ထိခိုက်နစ်နာမှုတွေမဖြစ်အောင်အတွက်လဲ နိုင်ငံခြားမှ အထူးကျွမ်းကျင်သူအဖွဲ့များအသုံးပြုလုပ်ဆောင်မှာပါ။

မေး - ပထမသိချင်တာက မြေအောက် ကားရပ်နားစရာနေရာဟာ ရှေးဟောင်းမီးရထားရုံးကြီးရဲ့ အောက်မှာကော လား။

ဖြေ - ဟုတ်ပါတယ်။ ရှေးဟောင်းမီးရထားရုံးကြီးရဲ့အောက်မှာလဲ မြေအောက်ကားရပ်နားစရာက တပြင်လုံးပါဝင်နေပါမယ်။ ဒါပေမဲ့ မြေအောက်ကားရပ်နားစရာနေရာက တထပ်တည်းပါ။

မေး - ဒီလိုရှေးဟောင်းအဆောက်အဦးရဲ့အောက်ခြေမှာပါတူးပြီးဆောက်တဲ့အခါ ရှေးဟောင်းအဆောက်အဦးအပေါ်သက်ရောက်မှုကို စိုးရိမ်ပါတယ်။ ပြီးတော့ အခုစီမံကိန်းလုပ်တဲ့အခါ လူသွား လမ်းပလက်ဖောင်း ပိုကျဉ်းသွားမှာကိုလဲ စိုးရိမ်ပါတယ်။ အရင်က ဒီပလက်ဖောင်းတွေမှာ ဥယျာဉ် ငှာယောက် လွတ်လွတ်လပ်လပ်သွားလို့ရပါတယ်။ ဒါပေမဲ့ အခု လိုဝင်းကာထားတဲ့အခါက ပူတော့ နှစ်ယောက်တောင်မနံ့ရှောင်နေရပါတယ်။ ပလက်ဖောင်းလူသွားလမ်းငယ်သွားတဲ့အတွက် အသွားအလာ အခက်အခဲဖြစ်စေပါတယ်။ အဲ့ဒါအတွက် ဘယ်လိုစီစဉ်ထားလဲကို သိလိုပါတယ်။

ဖြေ - မြေအောက်ကားရပ်နားစရာအတွက်တူးတဲ့အခါ နိုင်ငံတကာက ကျွမ်းကျင်သူတွေနဲ့ စံနှစ်တကျ လုပ်ကိုင်စေမှာ ဖြစ်ပါတယ်။ အသုံးမပြုနိုင်ပဲထားရှိရတဲ့ ရှေးဟောင်းအဆောက်အဦးကို ပြုပြင်ထိမ်းသိမ်းထားဖို့ ရည်ရွယ်ထားတာဖြစ်တဲ့အတွက် မထိခိုက်အောင် လုပ်ရမှာအဓိကပါ။ Aedas – Singapore ဗိသုကာအဖွဲ့၊ Studio Lapis – Singapore ရှေးဟောင်းအဆောက်အဦးဆိုင်ရာ အကြံပေးအဖွဲ့၊ Wentworth House – UK ရှေးဟောင်းအဆောက်အဦးများယာယီတည်ဆောက်ရေးအကြံပေးအဖွဲ့၊ IEN – Singapore ရေရှည်တည်တံ့ရေးဆိုင်ရာအကြံပေးအဖွဲ့၊ Meinhardt – Thailand မြို့ပြတည်ဆောက်ရေးနှင့် လျှပ်စစ်ပိုင်းဆိုင်ရာ ကျွမ်းကျင်အဖွဲ့ တွေပါဝင်ပါတယ်။ သူတို့ဆီက နည်းပညာအကြံပြုချက်အရ ရှေးဟောင်းအဆောက်အဦးကို သံဝင်ရိုးတွေထောက်ပြီးတော့ ထောက်မထားပါမယ်။ နည်းပညာဆိုင်ရာဆွဲထားတဲ့ပုံများနဲ့ အသေအချာရှင်းပြလို့ရပါတယ်။ အကြမ်းဖျင်းပြောရလျှင် အောက်က ခိုင်ခန့်စွာထောက်မထားပြီးမ တူးဖော်ဆောက်လုပ်ရေးတွေအောက်မှာ ဆောင်ရွက်မှာပါ။ ဒီဆောက်လုပ်ရေးနည်းစံနှစ်က မြန်မာနိုင်ငံမှာ ပထမဆုံး အသစ်အဆန်းဖြစ်နေသေးပေမဲ့ စင်္ကာပူမှာ လုပ်နေတာကြာပါပြီ။ ဒါ့ကြောင့်လဲ သူတို့ဆီက အတွေ့အကြုံရှိတဲ့အဖွဲ့ကို ရွေးချယ်အသုံးပြုတာပါ။ ရှေးဟောင်းအဆောက်အဦးကို ထိခိုက်ပျက်စီးစေခြင်းမဖြစ်စေဖို့က အဓိကရည်ရွယ်ချက်ဖြစ်ပါတယ်။

ဒုတိယမေးခွန်းဖြစ်တဲ့ လူသွားလမ်းကျဉ်းမြောင်းသွားရမှုမှာ ကွဲပြားတော်တို့စီမံကိန်းပါတ်လည်နံရံကာ လိုက်လို့ လူသွားလမ်းကျဉ်းမြောင်းသွားတာမဟုတ်ပါဘူး။ နံရံကိုလဲ မီးရထားဧရိယာကိုသာ စီမံကိန်းမှာ လိုက်နာဆောင်ရွက်ရမဲ့လိုအပ်ချက်အရ ကာရံလိုက်တာဖြစ်ပါတယ်။ လူသွားလမ်းကျဉ်းသွား

ရတဲ့ကိစ္စက စည်ပင်သာယာက လမ်းကို အနဲငယ်ချဲ့လိုက်တဲ့အတွက် လူသွားလမ်းထဲက လမ်းချဲ့ရာ မှာပါသွားတာဖြစ်ပါတယ်။ အခု စီမံကိန်းက ဆောင်ရွက်တာမဟုတ်ပါ။ ဘာပဲဖြစ်ဖြစ် ဒီစီမံကိန်းပြီးစီး သွားတဲ့အခါကျရင် ဒီအခုသရုပ်ပြထားတဲ့ပုံမှာပြထားတဲ့အတိုင်းပဲ လူသွားလမ်းတွေဟာ ဟိုအရင်ခေတ် ကပုံစံအတိုင်းအကျယ်ကြီးထည့်သွင်းထားပေးပါတယ်။

မေး - အခုလူထုနဲ့တွေ့ဆုံညှိနှိုင်းခြင်းအစီအစဉ်မှာ ပန်းပဲတမ်းမြို့နယ်ရဲ့ ပြည်သူ့လွှတ်တော်ကိုယ်စား လှယ်တက်ရောက်ပါသလား။ နောက်ပြီး ထိခိုက်နစ်နာမှုများကို ညှိနှိုင်းဖြေရှင်းတဲ့ ကော်မတီမှာကော ဒီပြည်သူ့လွှတ်တော်ကိုယ်စားလှယ်ကို ထည့်သွင်းထားမှာလားသိပါရစေ။

ဖြေ - ဒီလူထုနဲ့တွေ့ဆုံညှိနှိုင်းဆွေးနွေးခြင်းကို လူများနိုင်တဲ့အတွက် အချိန်ခွဲပြီးနေရာတစ်ခုစီအလိုက် လုပ်ရပါတယ်။ မနက်ပိုင်းအစီအစဉ်မှာ ပန်းပဲတမ်းကလူတွေနဲ့တွေ့ဆုံတာလုပ်ပါတယ်။ ဒီအစီအစဉ် အတွက်ဖိတ်တဲ့နေရာမှာ သက်ဆိုင်ရာရပ်ကွက်ရုံးကို အကြောင်းကြားစာပို့ပေးပြီး ရပ်ကွက်ရုံးတွေရဲ့ အကူအညီနဲ့ သက်ဆိုင်ရာရပ်ကွက်တွေကို အကြောင်းကြားပါတယ်။ ဒီတွေ့ဆုံညှိနှိုင်းဆွေးနွေးခြင်းကို တော့ ပန်းပဲတမ်းကပြည်သူ့လွှတ်တော်ကိုယ်စားလှယ်တက်ရောက်တာ မတွေ့မိပါဘူး။ ပန်းပဲတမ်း ကလူတွေကလဲ သူတို့ရဲ့ စိုးရိမ်ပူပန်မှုတွေကို ဆွေးနွေးသွားကြပါတယ်။

ထိခိုက်နစ်နာမှုညှိနှိုင်းဆွေးနွေးဖြေရှင်းရေးကော်မတီကို အခုထက်ထိတော့ မဖွဲ့ရသေးပါဘူး။ ဒါပေမဲ့ မကြာခင်ဖွဲ့စည်းမှာဖြစ်ပါတယ်။

မေး - ဒီစီမံကိန်းက အဆောက်အဦးတွေကို ငလျင်ဒဏ်၊ မုန်တိုင်းဒဏ်ဘယ်ပမာဏအထိခံအောင် စီမံထားပါသလဲ။ စီမံကိန်းစတဲ့အခါ ပိုင်ရှိက်ရင် အခုအသုံးပြုနေသည့်စံနစ်က သာမန်ပိုင်ရှိက်တာထက် အသံနှုန်းဘယ် လောက်လျော့ကျသွားမလဲကို သိချင်ပါတယ်။

ဖြေ - မြန်မာပြည်မှာ ငလျင်ခဏခဏလှုပ်လာတဲ့အတွက် ငလျင်ဒဏ်ခံနိုင်ရည်ရှိဖို့အ တွက်ကို ထည့်သွင်းစဉ်းစားပါတယ်။ အိုးအိမ်အဖွဲ့အစည်းက သတ်မှတ်ထားတဲ့ စံနှုန်းအတိုင်းကို ပုံစံဆွဲဆောက်လုပ်မှာဖြစ်ပါတယ်။

ပိုင်ရှိက်တဲ့အခါ အသံဆူညံမှုကလူတွေကို အနှောင့်အယှက်ဖြစ်စေတာကို ကွဲပြားတော်တို့ ထည့်သွင်း စဉ်းစားထားပါတယ်။ အခုနောက်ဆုံးအသံထွက်နှုန်းအလွန်နည်းပါးတဲ့ပိုင်ရှိက်စံနစ်ကို သုံးမှာပါ။ ဒီစံ နစ်မှာတောင်မှ ပိုင်တူးပြီး ပါလာတဲ့အရာတွေကို ခါတဲ့အခါ အသံထွက်တတ်တဲ့အတွက် အဲ့ဒီပမာဏ ကိုတောင် အသံဆူညံမှုနဲ့ အနှောင့်အယှက်မဖြစ်စေရေးအတွက် နေ့ခင်းဘက်လုပ်ဖို့ စီစဉ်ထားပါ တယ်။ စမ်းသပ်ပိုင်ရှိက်နှုန်းကတော့ ပြီးသွားပါပြီ။ ဒီကအသံက နေ့လည်သမားရိုးကျကြားနေရ

တဲ့အသံတွေထက် ပိုပြီးဆူညံတာကွာခြားမှုမရှိပါဘူး။ ရာနှုန်းဘယ်လောက်ဆိုတာကို ကိန်းပမာဏ အနေနဲ့ မမှတ်မိပေမဲ့ သာမန်နေ့လည်ပိုင်းကြားနေကြအသံများထက်ပိုဆူညံမှုမရှိတာကတော့ အသေအချာပါ။ အသံဆူညံမှုလျော့ချတာကို ပိုထိရောက်စေဘို့ လုပ်ငန်းအစီအစဉ်ရေးဆွဲတာမှာ လဲ သေသေချာချာ စဉ်းစားထားပါတယ်။

မေး - ရှေးဟောင်းမီးရထားအဆောက်အဦးကြီးအောက်မှာ ကားရပ်နားစရာနေရာအတွက် တူးတယ်ဆိုတော့ တကယ်လို့ တစ်ခုခုဖြစ်ပြီး ရှေးဟောင်းအဆောက်အဦးကြီး တစ်ခုခုဖြစ်ခဲ့ရင် ဘယ်သူတာဝန်ယူမှာလဲ သိပါရစေ။

ဖြေ - တစ်ခုခုဆိုတာ မဖြစ်အောင်ကို စဉ်းစားပြင်ဆင်ထားပါတယ်။

ဒီရှေးဟောင်းအဆောက်အဦးဟာ သက်တမ်းအနှစ်၁၃၀ ကျော်နေပြီး အချို့အစိတ်အပိုင်း တွေ ဟာဆွေးမြေ့နေလို့ YCDCကလူမနေသင့်တဲ့အဆောက်အဦးအဖြစ် သတ်မှတ်ထားခဲ့ပါတယ်။ ရှေးဟောင်းအဆောက်အဦးကို ထိမ်းသိမ်းပြုပြင်ပြီး ဟော်တယ်အနေနဲ့ပြောင်းလဲတဲ့အခါ ဘာမှမ လုပ်ခင် အဆောက်အဦးကို ကြံ့ခိုင်အောင်လုပ်ရပါတယ်။ အဆောက်အဦးမျက်နှာပြင်တွေကို ပြိုလဲ မသွားအောင်အတွက် နံရံတွေအပြင်ဘက်တွေကို ထောက်ကန်ထိမ်းသိမ်းမှုလုပ်ရပါတယ်။ ဘက် ပေါင်းစုံကနေကြံ့ခိုင်အောင် အထောက်အကူပြုလုပ်ပြီးတော့မှ အဆောက်အဦးကို Underpinning ခေါ်တဲ့ ကွန်ကရစ်ထုတ်တန်းအကြီးကြီးတွေနဲ့ခံထားမှာပါ။ အဲ့ဒီလို သေချာအောင်လုပ်ပြီးမှ မြေ အောက်ပါကင်အတွက်ဆောက်လုပ်ရေးစမှာဖြစ်ပါတယ်။

အခန့်မသင့်ဖြစ်နိုင်ချေကတော့ ဘယ်အလုပ်မှာဖြစ်ဖြစ်ရှိနေပါတယ်။ ဒါပေမဲ့ အဲ့ဒီလိုအဖြစ်နဲ့အောင် တဖြည်းဖြည်းချင်းအချိန်ယူတည်ဆောက်မှာဖြစ်လို့ ရှနစ်တောင်မှ အချိန်ယူမယ်လျာထားပါတယ်။

ဒီစီမံကိန်းကိုဦးဆောင်တဲ့အဖွဲ့က တာဝန်အရှိဆုံးဖြစ်ပါတယ်။ တကယ်လို့သာတစ်ခုခုဖြစ်ခဲ့ရင် ဒီစီမံ ကိန်းလုပ်ဆောင်နေတာ နိုင်ငံခြားသားတွေတည်းခိုဘို့ဖြစ်တဲ့အတွက် ကိုယ့်ရဲ့ဂုဏ်သိက္ခာလုံးလုံးက ပျက်ဆင်းစေနိုင်တာအတွက် ဒီလိုတော့ မဖြစ်အောင် လုပ်မှာပါ။

မေး - မြေငလျင်ခံနိုင်အား များများခံနိုင်အောင်လုပ်မယ်လို့ ပြောသွားတာ ကြားရပါတယ်။ ဘာလို့ ဒီလောက်ငလျင်ခံနိုင်အား အထိရည်မှန်းဆောက်လုပ်ထားသလဲ ကိုနားလည်ရခက်ခဲ့ပါတယ်။ ဒီလို ငလျင်ဒဏ်အထိ လှုပ်ရင်ကော ရှေးဟောင်းအဆောက်အဦးကို ပြန်လည်ထိမ်း သိမ်းထားတဲ့ အဆောက်အဦးက ခံနိုင်ရည်ရှိပါ့မလား။

ဖြေ - ရန်ကုန်ဟာ မြေငလျင်လှုပ်နိုင်တဲ့ဇုန်ထဲမှာ ပါဝင်နေတဲ့အတွက် မြေငလျင်ဒဏ်ကို ထည့်သွင်း စဉ်းစား ရတာဖြစ်ပါတယ်။ နိုင်ငံတကာအဆင့်မီလုပ်ပြီး လူတွေနေမယ်သတ်မှတ်ထားတဲ့အတွက် ငလျင်ဒဏ်ကို အလေးအနက်ထည့်စဉ်းစားရတာပါ။ ယခင်လှုပ်ခဲ့တဲ့ငလျင်ဒဏ်တွေအရ အဆောက်

အဦးတွေ ထိခိုက်ခံရတာရှိတဲ့အတွက် ငလျင်ဒဏ်ခံရတဲ့အခါ လူတွေရဲ့ဘေးအန္တရာယ်ကင်းရှင်းရေး အတွက် ငလျင်ဒဏ်မြင့်မြင့်ခံနိုင်အောင် ထည့်စဉ်းစားပါတယ်။ ငလျင်ဒဏ်ခံရလျှင် အဆောက်အဦး ရုတ်တရက်ပြိုမကျပဲ လူတွေအန္တရာယ်ကင်းစေအောင်အတွက် စီစဉ်ဆောက်ရွက်မှာဖြစ်ပါတယ်။

မေး - ကျွန်တော်ဟာ geologist အဖြစ်နဲ့ သက်မွေးဝမ်းကျောင်းပြုတဲ့သူတယောက်ပါ။ မြန်မာနိုင်ငံမှာ ငလျင်အမြင့်ဆုံး(၈) ကျော်ကျော်လောက်လှုပ်ခဲ့ဘူးပါတယ်။ အများစုကတော့ ပြင်းထန်မှု(၈)အောက် မှာပဲ ရှိပါတယ်။ အောက်ခံဖေါင်ဒေးရှင်းက မာကျောတဲ့ကျောက်သားဟာ ရွှေတိဂုံကနေ ဒီဘက်အထိ တွေ့ရပါတယ်။ ဒလတို့လိုကမ်းနားဘက်မှာတော့ ပျော့ပြောင်းတဲ့အောက်ခံမြေသားဖြစ်သွားပါပြီ။ မြေနီကုန်းတို့၊ ရွှေတိဂုံတို့လိုအောက်ခံကျောက်သားမာတဲ့အတွက် ငလျင်ဒဏ်ကို အောက်ခံကျောက် သားပျော့တဲ့ဘက်တွေလောက် မခံရဘူးလို့ geologist အမြင်အရ ကောက်ချက်ပေးလိုပါတယ်။

ဖြေ - ဆောက်လုပ်ရေးမစခင်မှာ မြေသားရဲ့အနေအထားကို စမ်းသပ်စစ်ဆေးမှုလုပ်ပြီး မြေနမူနာရယူ ခဲ့တာရှိပါတယ်။ ရလာတဲ့မြေကို အမျိုးအစားခွဲပြီးတော့ ခံနိုင်ရည်အပေါ်မှာမူတည်ပြီး ဖေါင်ဒေးရှင်း ဒီဇိုင်းဆွဲတာပါ။ ဒါ့ကြောင့်ပိုင်ရိုက်တဲ့အခါမှာ မီတာ၅၀ နဲ့ ၆၀ လောက်အထိအနက်ရအောင် ရိုက်မှာပါ။

၁၆ သြဂုတ်လ ၂၀၁၆

ညနေ ၅နာရီကျော်

ဗိုလ်ချုပ်ဈေး နှင့် ခရစ်ယာန်ဘုရားကျောင်း

မေး - မီးရထားဟိုတယ်ဆောက်တုံးကကော ရေကူးကန်ဖြိုတဲ့အခါမှာကော ဘုရားကျောင်းမှာ ကွဲအက် မှုတွေဖြစ်လာပါတယ်။ အခုစီမံကိန်းကတော်တော်ကြီးမားတဲ့စီမံကိန်းဖြစ်တဲ့အတွက် ဒါရဲ့သက်ရောက် မှုတွေဟာ ဘုရားကျောင်းပြိုတဲ့အထိဖြစ်ပေါ်လာမှာကို စိုးရိမ်ပါတယ်။ မီးရထားရုံးဟောင်းကို ထိမ်း သိမ်းသလို ကျွန်တော်တို့ဘုရားကျောင်းကိုလဲ ဝိုင်းဝန်းဂရုစိုက်ပေးစေလိုပါတယ်။

ဖြေ - မီးရထားဟိုတယ်ဆောက်လုပ်မှုတွေ ရေကူးကန်ဖျက်တာတွေက လွန်ခဲ့တဲ့အနှစ်(၂၀)လောက် ကနည်းပညာတွေဖြစ်လို့ ဘုရားရှိခိုးကျောင်းမှာထိခိုက်မှုတွေဖြစ်ရတာပါ။ ယခုနည်းပညာအသစ်တွေ အများကြီးပြောင်းလဲလာခဲ့ပြီဖြစ်လို့ ဘုရားရှိခိုးကျောင်းမှာ သက်ရောက်မှုသိပ်ဖြစ်မှာမဟုတ်ပါဘူး။ ဒါ့ အပြင် လုပ်ငန်းတွေမစတင်မှီမှာ ယခင်နှစ်ခေါက်လုပ်ခဲ့သလိုပဲ ကြိုတင်လေ့လာစစ်ဆေးခြင်းတွေကို ဘုရားရှိခိုးကျောင်းမှာ ထပ်လုပ်ပြီး ဘုရားရှိခိုးကျောင်းရဲ့လက်ရှိအခြေအနေကို မှတ်တမ်းတင်ထားပေး ပါ့မယ်။ တကယ်လို့တစုံတခုဖြစ်လာရင် ထိခိုက်နစ်နာမှုများညှိနှိုင်းအဖြေရှာရေးကော်မတီကို ချက်ချင်းတိုက်ရိုက်အကြောင်း ကြားပြီး ဖြေရှင်းဆောင်ရွက်မှုလုပ်ပါမယ်။

မေး - ဘုရားရှိခိုးကျောင်းထက်ကိုပိုပြီး ကပ်ရပ်ဘုန်းတော်ကြီးနေတဲ့အိမ်အတွက်စိုးရိမ်ပါတယ်။ ဒီအိမ်ကဘုရားရှိခိုးကျောင်းထက်သက်တမ်းပိုများပြီးတော့ အက်ကွဲကြောင်းတွေပိုများပါတယ်။ ဒါ့ကြောင့် စီမံကိန်းလုပ်တဲ့အခါ ဒီအဆောက်အဦးတွေကိုလဲ ထည့်သွင်းသတိထားစေချင်ပါတယ်။ တခုခုသက်ရောက်တာတွေ့တဲ့အခါလဲ ချက်ခြင်းအကြောင်းကြားပေးပါမယ်။

ဖြေ - ဘုရားရှိခိုးကျောင်းလို ပြောပေမဲ့ တကယ်ရည်ညွှန်းတာက ဒီဝင်းအတွင်းမှာရှိတဲ့အဆောက်အဦးအားလုံးကိုပါ။ ဒီတော့အဆောက်အဦးအားလုံးအတွက်ကို ကြိုတင်လေ့လာစစ်ဆေးမှုတွေ၊ စောင့်ကြည့်တိုင်းထွာမှုတွေလုပ်ပါမယ်။

မေး - ဘုရားရှိခိုးကျောင်းနဲ့အဆောက်အဦးတွေကို ကြိုတင်လေ့လာဆန်းစစ်မှုတွေလုပ်ရင် ဘယ် အချိန်လာလုပ်မယ်ဆိုတာကို ကြိုတင်အကြောင်းကြားပေးစေချင်ပါတယ်။ နောက်တခုတင်ပြလိုတာကတော့ ယခင်ကဘုရားရှိခိုးကျောင်းပရဂျက်ဘေးနားမှာ ရေဆိုးသန့်စင်မှုတွေလုပ်တော့ ဘုရားရှိခိုးကျောင်းမှာ အနံ့ဆိုးတွေရပါတယ်။ အချို့နေရာတွေဆို အတော့်ကိုဆိုးရွားပါတယ်။ ဒီရေဆိုးရေညစ်တွေအတွက်ကို ဘယ်လိုစီစဉ်လုပ်ထားတာရှိပါသလဲ။

ဖြေ - ကြိုတင်လာရောက်လေ့လာဆန်းစစ်မှုတွေကို မလုပ်ခင်စောစောစီးစီးအကြောင်းကြားပေးပြီးတော့ ဘုရားရှိခိုးကျောင်းကကိုယ်စားလှယ်များနဲ့အတူတကွ လေ့လာဆန်းစစ်မှုကိုလုပ်ပါမယ်။ နှစ်ဘက်စလုံးပါဝင်မှာပါ။

ရေဆိုးရေညစ်တွေကိုပြန်သန့်စင်တဲ့အခါ ပိုပြီးအဆင့်မြင့်တဲ့ နည်းပညာကိုအသုံးပြုထားပါတယ်။ ဒါ့အပြင်ရေဆိုးရေညစ်သန့်စင်မှုကို အလုံပိတ်ထားပြီး မြေအောက်ခန်းမှာရှိတဲ့သန့်စင်တဲ့နေရာမှာလုပ်မှာပါ။ အားလုံးအလုံသန့်စင်မှုလုပ်မှာပါ။

ရေဆိုးရေညစ်ကို ပြန်သန့်စင်ပြီး အဖတ်တွေကိုတောင်ဖိအားနဲ့ပိုသိပ်သည်းအောင်လုပ်ပြီးရင် သန့်စင်ထားတဲ့ရေတွေကို စွန့်ပစ်တော့မှာမဟုတ်ပဲ ပြန်လည်အသုံးပြုနိုင်တဲ့အဆင့်ထိသန့်စင်မှု လုပ်ပြီးတော့ ပြန်လည်အသုံးပြုမှာဖြစ်ပါတယ်။

ရေနှုတ်မြောင်းကိုလဲ စည်ပင်သာယာနဲ့ ညှိနှိုင်းပြီး ပိုမိုကောင်းမွန်တဲ့ရေနှုတ်မြောင်းအဖြစ်နေရာလွှဲပြောင်းလုပ်ထားမယ်လဲ အစီအစဉ်ရှိပါတယ်။ ထပ်ပြီးဖြစ်နေရင်လဲ ချက်ခြင်းအကြောင်းကြားပြီးတော့ ဖြေရှင်းဘို့ကြိုးစားပါလို့ တိုက်တွန်းပါတယ်။

**Annex 10 Photolog for Public Consultation
Meeting**



Photo 1: Project responsible team and consultants



Photo 2: Public consultation meeting with Dagon (Yaw Min Gyi) Township



Photo 3: Public consultation meeting with Papedan Township



Photo 4: Public consultation meeting with Dagon Township



Photo 5: Public consultation meeting with Kyauttada Township



Photo 6: Public consultation meeting with Church Committee and Bogyoke Market



Photo 7: Participants of public consultation meeting



Photo 8: Public consultation meeting and stakeholders

**Annex 11 Response to Comments
from MONREC**

Responses to comments from MONREC

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
1	<p><u>Executive Summary</u></p> <p>It is needed to be in Myanmar language although it is in English</p>	<p>It is needed to add the volume of water and units of electricity to be used for the project in the Executive Summary</p>	<p>Section 1.2</p>
2	<p><u>Preamble</u></p>	<p>No comments</p>	
3	<p><u>Policy and Legal Framework, Pledges, Organizational Framework</u></p> <p>Policy, Legal and Organizational frameworks concerning the project are expressed in chapter 3 of the Report. Environmental & Social Management System of MDL is expressed. It is also expressed that resources management, environmental management, health and security measures will be followed in accordance with the IFC guidelines.</p>	<p>It is needed to add laws, rules and regulations concerning environmental, social, social welfare, health and safety matters, rules and regulations and related orders and announcements issued by ministries concerned and pledge to follow them</p> <p>Especially, to express the laws, by-laws, guidelines, norms, order announcements by CQHP, Fire Department, Departments under YCDC such as (Buildings, Roads & Bridges, Water and Sanitation) to be followed in constructing high rise buildings, and pledge to follow them.</p>	<p>Section 3.2</p>
3.1	<p>Although it is expressed on pages 2 and 3 that IFC guidelines will be followed concerning environmental and social matters, it is found out that target level to follow guidelines and norms on environmental, social and health to be followed by project works needs to be expressed and pledge to follow them.</p>	<p>To express target levels to be followed by the project concerning the guidelines and standards to be followed by the project together with the pledge to follow.</p> <p>As is it expressed that IFC guidelines will be followed, environmental quality parameters to be followed and standards need to be prescribed in the bylaws and policy section.</p>	<p>Section 3.5.1</p>
3.2	<p>In chapter (5) basic data monitoring, Ambient Air Quality, Soil Quality, Waste Water Quality, Drinking Water Quality and Noise Levels are expressed in parallel with USEPA and IFC Guidelines, Target level to follow the guidelines and norms by the project and pledge to follow needs to be expressed</p>	<p>To follow the guidelines of NEQEG (Emission).</p> <p>Collected results of baseline data comparison to NEQG standards need to be expressed in the report and not available standards are to be expressed in parallel with the guidelines to be followed by the project.</p> <p>Pledge to follow the HSE guidelines and standards needs to be expressed in the section of policy and by-laws.</p>	<p>Section 3.4</p>
4	<p><u>Project Descriptions and Alternatives</u></p> <p>Although the background descriptions of the project land in chapter (4.2) it is found out to be more complete.</p>	<p>It is needed to express completely the background of the project land in the Project Background description.</p> <p>(If available), documents of land lease and department/ organisation and pledge to follow need to be included.</p>	<p>Section 4.4.1</p>

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
	<p>It is expressed to operate on BOT basis. However, it is needed to express completely about the project background such as project land ownership, year of lease, department/ organisation which lease the land, in the report.</p> <p>It is described about the Landmark Project in the Description of Main Components of the Project consisting of a 26 storey Residence, a 26 storey business hotel and serviced apartment, two office towers, one podium with 4 basement tanks, one 5 storey underground car parking for 1253 cars together with components of each building, layout plan, site plan and view plan.</p> <p>However, it is found that systems to be installed for the project operation need to be inserted (these can be difficulties in reviewing the impacts due to the proposed project and in preparing EMP due to the incomplete description of the project)</p>	<p>It is needed to clearly describe the permits obtained from authorities for the project area.</p> <p>It is needed to express the engineering data such as floor plan and design plan of buildings consisted in the project.</p> <p>It is needed to reinsert the detailed information for each main component of the project in the Project Description Section of the report. For example, energy and fresh water systems, fire prevention systems, lightning prevention systems, ventilation system, water distribution and purification system capabilities, waste disposal system, mitigation measures for waste of energy and water measures, traffic management system need to be described with detailed design and drawings.</p>	<p>Section 3.5</p> <p>Section 4.4</p> <p>Section 4.4.8 – Section 4.4.12</p>
4.1	<p>Time line of the project is described on page (4-15) of the Report as it will take (10) months for demolition of existing buildings, (36) months for foundation and structure work, (35) months for other internal construction (6) months for occupation permit application all together (56) months but there is no description as to the duration of operation on BOT basis.</p>	<p>It is needed to describe the duration of project operations expecting the time of operating and terminating of the project.</p>	<p>Section 4.3 Table 4.2</p>
4.2	<p>Although it is described on page (4-19) that work camp for workers is not needed and IFC Performance Standard 2 will be performed for workers and worksite</p>	<p>To describe the number of workers needed for the construction period and how it is being planned.</p>	<p>Section 6.10.1</p>

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
	conditions, there is no description as to the number of workers needed for construction period.		
4.3	<p><u>Usage of Resources and Utilities</u></p> <p>Although it is described concerning Utilities Survey as to the present electricity usage and measurement of drainage system, there is no description as to the type and volume of water and energy required for the project construction period (page 4-16).</p> <p>On page (4-23), it is described that in the operating period of the project 374,000 cubic meter of fresh water will be needed per year and underground water will be used as primary source and water from YCDC will be used as secondary source.</p> <p>Although it is described to take the required electricity from the National grid, it is needed to express the status of receiving required permits.</p> <p>Where the comparison of other alternative means (page 4-25 to page 4-26) is described it is expressed as "no project alternative, location alternative, design and construction alternatives, equipment and material alternative etc. But those descriptions are not complete.</p> <p>There is no consideration for a greening plan.</p>	<p>Source and volume of water for construction period of hotel and high-rise buildings and evidence of permit from authority concerned to use that source (it is described to dig (12) tube wells).</p> <p>It is needed to express in detail of the availability to 374,000 cubic meter of water from 12 tube wells per year for the operating period of the project and estimated duration of the extraction.</p> <p>It is needed to express whether permit to dig underground tube wells from authority concerned has been received or not.</p> <p>It is needed to check and describe whether the volume of water to be used by the project may affect the people living in the vicinity and how much water can be available from YCDC.</p> <p>The amount of electricity required for the project and permit from authority to use that source to be described.</p> <p>Secondary alternative ways to provide the expected water and electricity sources if they are out of supply in emergency.</p> <p>At the time of operating the project water and electricity consumption will be high and so it is needed to express the optimum means is chosen out of the comparison of other possible mitigation means.</p> <p>To express greening plan to be used in the project to be constructed.</p> <p>To express comparison and consideration of energy saving and water saving for the buildings to be constructed.</p>	<p>Section 4.4.8(b)</p> <p>Section 3.5</p> <p>Section 4.4.8(b)</p> <p>Section 4.4.8(a)</p> <p>Section 4.4.8(a) Section 4.4.8(b)</p> <p>Section 4.4.13</p> <p>Section 4.5</p>
5	<p><u>Description of environment near the project</u></p> <p><u>Scoping of area for studying environmental and social status</u></p> <p>It is described in pages (1-2) and (5-1) of the Executive Summary that Potential of Influence (AoI) by consideration</p>	<p>It is needed to explain why the scope is determined to cover and sufficient for all spread areas by extracting possible impacts by the project when studying the impact</p>	<p>Section 5.1</p>

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
	of nature of project and environmental safety to be 1km radius		
5.1	<p><u>Air Quality Survey</u> It is found out that in surveying Air Quality, 3 locations are used for surveying and compared with WHO Standards in Chapter (6) pages (6-7). Out of the results of Air Quality Survey PM₁₀, PM_{2.5} and SO₂ values are found to be higher than the standard values and so it is needed to check why they are higher.</p>	<p>To describe the results and reasons for choosing the locations of air quality survey. As the survey results are higher than the standards, the results and reasons for higher results are needed to be expressed.</p>	<p>Section 5.5.2.2 Section 5.5.3 Section 6.4.2.2(a)</p>
5.2	<p><u>Noise and vibration monitoring</u> Although there are 3 locations for monitoring noise at the locations of air quality monitoring, there is no monitoring for vibration.</p>	<p>Reasons for choosing locations for noise monitoring when choosing the noise monitoring locations. Results of noise monitoring are found to be compared with industrial/commercial of NEQEG/IFC. This project is residential existing residential, hotels and shops and so to compare with residential. It is needed to express results and reasons for higher results because the monitored results (55dBA) is higher than the residential.</p>	<p>Section 6.5.1.1</p>
5.3	<p>The Statement of Social Economic Status Although it is stated the existing social-geographic status of the Project neighbor, and it is required to state the water and electrical power availability, waste disposal and management system, etc. of residence who are currently living neighborhood of the Project.</p>	<p>Social Economic Survey - Due to the nature of project, water and energy requirements are higher, thus it is required to state status of the existing water resources and availability, and obtaining of electrical power for neighboring public</p>	
5.4	<p>Traffic Survey It is found that Traffic Survey is stated in Annex (1)</p>	<p>Traffic Survey</p>	<p>Section 5.10</p>
6	<p>Defining the Impact, Analyzing and Mitigation Measures</p>		
6.1	<p>The assessment of impact for all stages of the Project</p>		<p>Section 6.5 Section 6.6</p>

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
	<p>The possible impact which might be caused by the Project is stated separately for construction stage and operation stage. Although it is stated demolishing of existing building in project construction process and it will take (10) months, and no assessment for impact on air quality cause by this work activities were found.</p> <p>Assessment on Impact of Noise and Vibration during construction period was estimated and stated at page (6-7 to 6-23)</p>	<p>Assessment on Impact of Noise and Vibration</p>	
6.2	<p>Water Quality Impact Assessment</p> <p>Soil Erosion will be mainly impact on water quality, and It was stated that about 400,000 cubic meter of soil/surface material will be produced from construction and these materials cannot be used for backfilling works, and it has to be hauled out and dumped, thus it will be dumped at YCDC designated area.</p>	<p>Water Quality Impact Assessment During Construction Period</p> <ul style="list-style-type: none"> - Although it is stated that during construction period 400,000 cubic meter of soil/ surface material will be produced and will be hauled out and dumped at YCDC designated area, and it is required to state complete program of how to manage the deposit soil - It is required to state possible type of dispose liquid and calculated volume which can be produced during construction period. - It is stated that discharge liquid will be first let settled in the sedimentation tank, and then it will be discharge, in line with this location of sedimentation tank, dimension, and drainage should be stated detail in maps, and it is required to prove by evaluation that there is no impact on environment due to discharging of liquid as actually doing so. - The sewerage system which providing during construction period and method of disposing sewage should be stated detail and it is required to evaluate the impact. 	Section 4.4.8(c)

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
		<p>During Operation Period</p> <ul style="list-style-type: none"> - After completion of the project construction period, the waste water volume which will produce from operation stage should be estimated and stated. - During Operation Period, it is stated that Wastewater Treatment Plant will be installed and Schematic of WWTP is enclosed; it is required to state detail of above said Wastewater Treatment system which shall include the capacity, method of wastewater collection, storing, transporting, treatment and final discharging. <p>The detail of sewerage system and method of discharging sewage during operation period should be stated and evaluate the impact.</p>	<p>Section 4.4.8(c) Figure 4.9</p>
6.3	<p>Water Utilization</p> <p>There is no separate evaluation on water utilization.</p> <p>It is stated together with Impact on Water Quality.</p> <p>It is stated in page (4-23) that it will be required water volume of 374,000 m³/annum during operation period, and ground water will be used as first source and it will be taking form YCDC as secondary source.</p> <p>Later stage, it will be coordinated with YCDC and trying to take from YCDC.</p>	<p>Water Utilization</p> <p>It is required to carry out separate evaluation for water utilization.</p> <p>It is required to evaluate impact of water utilization not only for during operation period, but also for during construction period.</p> <p>As stated in the Report, required water volume for during operation period is 374,000 m³/annum; it is required to evaluate whether long term use of underground water is possible or not.</p> <p>When evaluating impact of Water Utilization, it should be stated duration of taking underground water and estimate the available volume.</p> <p>To be stated the available water source, duration and volume from YCDC. It should be stated detail of Rain Water Harvesting System and Storm Water Control, plan for reducing water usage, and it required to evaluate impact on Water Utilization.</p>	<p>Section 4.4.8(b)</p>
6.4	<p>Evaluation of Impact of waste material</p> <p>In page (6-33 ~ 6-36), it is stated the estimated waste material from project and potential impact, and suitable method of mitigation, however it is not included detail plan. If it is</p>	<p>Evaluation of Impact of waste material During Construction Period</p> <p>It is required to state detail of type and volume of solid waste which shall be produced during construction period, and method of collecting, storing, transporting and disposing. (e.g. how to dispose extra</p>	<p>Section 6.9.1.4</p>

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
	<p>hiring the Contractor, it is required to state the program the Contractor has to follow. It is not stated the estimated volume of waste material (solid/liquid) which can be produced during operation period.</p>	<p>disposal of excavated earth, and how to coordinate with YCDC). It should be stated the location of solid waste temporary storage area, detail dispose plan of how to dispose at YCDC, and evaluate the impact.</p> <p>During Operation Period</p> <p>Since the Project is including of residence, Shopping Centre, Terminal and Convention Centre and hotel business, thus, it is stated the detail of solid waste management plan for operation stage, as a result it will effectively reduce the impact of solid waste reduce the impact of solid waste disposal, and it is required to evaluate the impact. (it is required to evaluate whether existing YCDC waste collection system is enough or not).</p> <p>It should be stated the status of coordination with YCDC.</p>	
6.5	<p>Evaluation of Impact on Traffic</p> <p>“Traffic Impact Assessment” which was conducted in December 2013, was stated in Annex (1)</p>	<p>Evaluation of Impact on Traffic</p>	Section 6.13
6.6	<p>Health and Safety</p> <p>There is no evaluation of impact on health and safety matters, however, the facts to be included in “Safety and Health Management Plan”, management plan for workers site safety measures are stated in Chapter (6.14.1).</p> <p>Health and safety of project neighboring public is not evaluated.</p>	<p>Work Site Health and Safety</p> <ul style="list-style-type: none"> - “SPA Minimum Health & Safety Standards for Major Work” is stated in Annex (4), in this regard, it is required to clearly state whether it is stating Best Practice or the Project will be following it. - As per the satellite image, it is found that construction activities are already started, the measure of work site health and safety (e.g. using of PPE, warning sign, safety training and other measures) should be stated with records and photos, and impact should be evaluated. - To state the program of coordination with “Factory and General Labor Law Department” for conducting necessary training for work site health and safety. 	Section 6.14

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
		<p>Health and Safety of Project Neighboring Public</p> <p>When evaluating health and safety matter of project neighboring public, it should be evaluated potential impact during construction and operation period, and state including of effective mitigation measures, and to state basic health condition of neighbors.</p>	Section 6.15
6.7	<p>There are no assessment on “Disaster Risk Reduction Measure”</p> <p>The emergency situation, such as - flood, earthquake, fire, site accidents, etc., are considered for both construction period and operation period, and to assess the impact and it is required to state mitigation measures, monitoring program and action plan.</p>	<ul style="list-style-type: none"> - Natural disaster and emergency situation, such as - flood, earthquake, fire, site accidents, etc., are considered for both construction period and operation period, and to assess the impact and it is required to state mitigation measures, monitoring program and action plan. (e.g. Earthquake design, depth of pile, emergency exits for fire, and fire safety measures) - It should be considered for drainage system around project area whether it is enough or not during heavy rain, possibility of flooding or not 	Section 6.16
6.8	<p>Cumulative Impact Assessment</p> <p>Although “Cumulative Impact Assessment” is stated in Chapter (7), it is found general.</p> <p>Quality Assessment should be conducted for impact on existing water resources condition, water consumption volume, electricity requirement, waste disposal system, drainage system, based on the estimated population growth due to the Project, and it should be stated whether any impact or not, if there is impact, mitigation measure should be stated</p>	<ul style="list-style-type: none"> - It should be designated the potential cumulative impacts to related area (e.g. water and electricity, waste collection system) and conduct assessment, and also find out the cumulative impact due to other projects at vicinity of the Project. - To state the mitigation measures for potential cumulative impacts due to the Project. 	Chapter 7
7	<p>Environmental Management Program (EMP)</p>		

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
7.1	<p>The responsible teams and their organization structure who are going to take action on the activities of complying, accountability, reporting, supervision and monitoring of mitigation measures - which are stated in EMP is incomplete. The Work Program of Environmental Team (ET) is stated in page (8-3). It is stated only the name of EMP implementing team in Table (8.6-1) Environmental and Social Management Plan, the organization and responsibility is not stated clearly.</p>	<ul style="list-style-type: none"> - The responsible teams and their organization structure who are going to take action on the activities of complying, accountability, reporting, supervision and monitoring of mitigation measures - which are stated in EMP, has to be stated. - It has to include the organization structure of services provider/ environmental management activities to the occupants after completion of the Project. 	Figure 8.1
7.2	<p>It is not stated Assigning Staff</p>	<p>It is required to state project staff assignment and responsibility who are going to carry out environmental activities of reporting and monitoring.</p>	Section 8.4
7.3	<p>The budget allotment for implementing of EMP The amount of budget allotment for monitoring is stated only for air quality measurement and noise monitoring, and not stated for other activities. (Table 8.6-2)</p>	<p>To state the budget breakdown for each activities of mitigation measure, monitoring program, staff capacity building, training, employment of staff for environmental conservation, vehicles and machinery, etc.</p>	Table 8.3
7.4	<p>The Monitoring Program is stated separately. It is stated only for Monitoring Report Program of table (8.6-1) Environmental and Social Management Plan. The separate programs for Environmental Management and Monitoring are to be stated</p>	<p>Environmental Monitoring Program The Monitoring Program of air quality, water quality, noise, waste water and traffic shall be included in monitoring during construction and operation stage.</p> <p>Construction Stage To measure the quality of air quality, noise and waste water as per the parameters stated in guide line from National Environmental Quality (Emission), and to carry out complying with specified value, and the measurements and activities has to be stated in the Environmental Management Monitoring Report.</p> <p>Operation Stage - During the Operation Stage, the quality of waste water shall be measured as per the parameters stated in guide line from National Environmental Quality (Emission). To comply with the specified value, and the measurements and activities has to be</p>	Table 8.4

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
		<p>stated in the Environmental Management Monitoring Report.</p> <ul style="list-style-type: none"> - The traffic around the Project site should be served at least once a year, and to analyze whether traffic flow is jam or not; and mitigation measure to prevent traffic jam has to be stated in the Environmental Management Monitoring Report. - In addition to Emergency Response Plan for emergency situations (e.g. earthquake, fire) and Occupational Health and Safety Plan <ul style="list-style-type: none"> • Water use management plan • Solid waste management plan • Transportation management plan • Energy saving plan • Greening plan/landscape plan, etc. are drawn as separate plan with detail facts and it is required to include in this Report. - It should be stated detail of the purpose, legal definition, accountability of the organization, map and layouts, photos, satellite photos, the programs to be implemented, management activities, monitoring programs, the cost to implement, etc. 	
7.5	It is not stated the Capacity Development and Training Requirements	To be stated the capacity development and training program for the environmental conservation staff who are going to implement the EMP	Section 8.9.1.2
7.6	It is not stated submission program and frequency to submit Monitoring Programs to ECD	To state the program and time table of submitting Monitoring Report to the Ministry as per the Environmental Impact Assessment Procedure (2015), Chapter (9), Para 108.	Section 8.9.1.2
8	Public Consultation and Information Announcing		
8.1			

No	Findings	Comments	Ref. Section/ Table/ Figure in ESIA
	Meeting with project related departments concerned were started since 2013 and stated meeting with respective departments. The Public Consultation was held on 16-Aug-2016 at Central Hotel, Yangon, and meeting records are stated	<ul style="list-style-type: none"> - It is required to state the main points discussed by participants of Public Consultation, and recommendations are considered in which section of the Report. - It is required to state the mitigation plan and currently being implemented program based on result of each facts from consultation (e.g. noise control program, traffic congestion, and resistance to earthquake and cyclone of the Project buildings, etc.) 	Chapter 9
8.2	It is stated the Complaints and Grievances Mechanism	The plan of posting announcement to the public at significant and visible area stating location where public grievance complaint can be logged during construction and operation period, has to be included in the Report.	Section 8.11.4 Figure 8.5 Figure 8.6
9	The Requirement for Resubmission of Report		
9.1	It is required to include record of revision made in second submission of the Report.	When resubmission of the Report after being revised as per recommendation, to prepare Revision Chart with including of following facts and attached as annex. Chapter, paragraph, recommendations, revision (or) explanation, the page of Second Submission	Annex 10
9.2	It is required to state the Approval Letter of Project Developer	"The Project Developer has to acknowledge in the Form issued by Ministry that following facts are correct – (a) Environmental Assessment is complete and concrete, (b) The preliminary environmental assessment was carried out strictly complying respective laws including of this procedure, (c) The Project will always completely complying the promises, mitigation measures and program stated in the Environmental Assessment Report."	Environmental Pledge
9.3	Publishing of the Report It is not stated of Report is being published.	If the Report is published as per para 65, EIA Procedure (2015), it is required to state the method of announcement and the location where it is being announced.	Figure 9.1 Figure 9.2